Estimating the Impact of Mental Illness on Costs of Crimes: A Matched Samples Comparison

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ESTIMATING THE IMPACT OF MENTAL ILLNESS ON COSTS OF CRIMES

A Matched Samples Comparison

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This study uses a propensity scoring and matching approach to compare the costs of crimes committed by former inmates with mental illness (MI) and without MI. Our findings indicate that the recidivism costs of those with MI over the course of 3 years of follow-up are nearly 3 times as large as similar reintegrating former inmates without MI. However, prior to matching on mental health indicators, the costs of the reoffense patterns of the average reintegrating individual with MI are less than half those of the average former prisoner without MI. Our discussion centers on the identification of relevant groups that corrections officials should focus their rehabilitative resources on and whether those with MI should be a group they focus on during this process.

Keywords: costs of crime; reentry; reintegration; recidivism; rearrest; corrections

Former inmates with mental illness (MI) receive increased attention by corrections officials because they typically identify these concerns as criminal risks. Developing research about the monetary costs associated with offending patterns offer empirically supported approaches to guide criminal justice resource allocations to mitigate the costs associated with criminal careers and recidivism. This study uses a propensity scoring and matching approach to compare the costs of crimes committed by former inmates with and without MI. Our findings indicate that the recidivism costs of those with MI over the course of 3 years of follow-up are nearly 3 times as large as similar reintegrating former inmates without MI. However, prior to matching on MI indicators, the costs of the reoffense patterns of the average reintegrating individual with MI is less than half that of the average former inmate without MI. Our discussion centers on the identification of relevant groups that corrections officials should focus their rehabilitative resources on and whether those with MI should be a group they focus on during this process.

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Individuals with MI problems are disproportionally represented in the criminal justice system (Abram, Teplin, & McClelland, 2003; Ditton, 1999; Lamb & Weinberger, 1998; McNiel & Binder, 2007; Skeem, Emke-Francis, & Louden, 2006; Wormith & McKeague, 1996). Using nationally representative data from a survey of state and federal inmates who were incarcerated in midyear 2005, the Bureau of Justice Statistics found that approximately 56% of state inmates, 45% of federal inmates, and 64% of jail inmates had either a recent history (within the past 12 months) or active symptoms of a MI problem based on criteria specified with the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association [APA], 1994; James & Glaze, 2006). These findings have important national-level policy and public safety implications given that only a small portion of the incarcerated population receives appropriate treatment regimens (Human Rights Watch, 2003; Petersilia, 2003) and that recent studies have demonstrated that reintegrating former inmates who have MI are at an increased risk of recidivism when compared with otherwise similar former inmates without MI (Baillargeon, Binswanger, Penn, Williams, & Murray, 2009; Cloyes, Wong, Latimer, & Abarco, 2010; Ostermann & Matejkowski, 2012).

People released from prison generally have difficulty remaining crime free once released. Two nationally representative studies of multistate release cohorts have indicated that, within 3 years of release from prison, more than 60% of former inmates are rearrested for new crimes and more than 40% are convicted on either new felony or serious misdemeanor charges (Beck & Shipley, 1989; Langan & Levin, 2002). When costs are attached to the reoffending patterns of statewide prison release cohorts, findings have indicated that, within 3 years of release, the costs of crimes committed by this population exceed US$2 billion (Ostermann & Caplan, 2012). The major policy implications from the broader costs of crimes literature consists of identifying members of chronic and serious offending groups early in their criminal careers and preventing them from either beginning or continuing their careers. Doing so can potentially save hundreds of millions of dollars associated with the costs of their offense patterns. However, this policy approach does not comport well with the reintegrating population because those leaving prison typically have established criminal careers at the time of their release (Beck & Shipley, 1989; Langan & Levin, 2002). As a result, this group of offenders is likely beyond the point of early childhood intervention.

Research in the field of effective correctional interventions has largely demonstrated that recidivism rates can be reduced by identifying criminal risks, addressing criminogenic needs, and being responsive to individual offender learning styles (termed the *Risks, Needs, Responsivity* or *RNR model*; Andrews & Bonta, 2010; Dowden & Andrews, 1999a; Lowenkamp & Latessa, 2005; Lowenkamp, Latessa, & Holsinger, 2006; Lowenkamp, Latessa, & Smith, 2006; Lowenkamp, Pealer, Smith, & Latessa, 2006). Studies have consistently shown offenders with MI typically have a higher frequency and severity of criminogenic needs than offenders without MI (Matejkowski, Draine, Solomon, & Salzer, 2011; Skeem, Nicholson, & Kregg, 2008). The broad acceptance of the RNR model has largely translated into correctional officials identifying MI as a criminal risk factor despite the literature demonstrating that the existence of MI is a weak predictor of recidivism when compared with other primary criminogenic needs such as antisocial attitudes, negative peer associations, an unsupportive family life, and substance abuse (Bonta, Law, & Hanson, 1998; Skeem, Encandela, & Eno Louden, 2003; Skeem & Louden, 2006).

Given the strained resources that correctional systems currently experience, it is important to analyze the costs associated with the reoffending patterns of those that exit prisons. Doing so may lead to the identification of populations that differ from those targeted for services based solely on risk and the RNR model including offender groups that should receive greater rehabilitative focus to lower the costs associated with reoffending patterns. While the mentally ill population is generally perceived as higher risk by correctional officials, and some studies have indicated that this population is at an increased risk for new criminal (Baillargeon, Binswanger, et al., 2009; Cloyes et al., 2010; Ostermann & Matejkowski, 2012) and noncriminal violations of supervision (Lovell, Gagliardi, & Peterson, 2002; Solomon, Draine, & Marcus, 2002) after prison release, whether the offending patterns of this group are associated with greater monetary costs to society has not been explored.

The purpose of this study is to first estimate the costs associated with the offending patterns of former inmates with MI relative to those without MI, and then to focus on the relationship between MI and the costs of reoffending. To accomplish this, we use data from former inmates released from New Jersey prisons in 2006 (n = 7,929) and attach costs to the crimes they commit within a 3-year follow-up period. We use a propensity scoring and matching routine to match released offenders with and without MI in an effort to isolate the impact of MI on the costs of reoffense patterns. The following sections review literature on MI, reentry, and costs of crimes. After presenting information about the data and analytic strategies used for this study, we present results from our statistical analyses. We reflect on the results of our study and provide insight into potential policy implications from our work in the concluding section.

LITERATURE REVIEW

MI AND REENTRY

It is consistently reported that the rates of MI (Diamond, Wang, Holzer, Thomas, & Cruser, 2001; Ditton, 1999) and severe MI (Jemelka, Rahman, & Trupin, 1993) are higher in prison than in the community. Estimates of MI among incarcerated populations vary from study to study, but in general, approximately 16% of state prison inmates have some form of MI (Ditton, 1999) and "somewhere between 10% and 25% of prisoners have some form of serious mental illness" (Haney, 2006, p. 249). Reducing the high rates of MI behind bars has been a national priority for a decade (The President's New Freedom Commission on Mental Health, 2003). As a result, programs have been established at various points in the criminal justice system to divert individuals with MI away from traditional justice processing and into treatment (Munetz & Griffin, 2006) as well as to assist those released from prison with community reentry (Draine, Wolff, Jacoby, Hartwell, & Duclos, 2005). The needs of recently released offenders with MIs are complex, and without assistance, a high proportion of released mentally ill offenders will quickly be rearrested and returned to the correctional system (Council of State Governments, 2002; Feder, 1991a, 1991b; Jacoby & Kozie-Peak, 1997; Walsh & Holt, 1999; Wilson, Tien, & Eaves, 1995). Nonetheless, when considering where to target resources for reducing costs of crime to society, other groups of offenders may provide a greater return on investment.

There is evidence that the offenses for which many people with MI are incarcerated are low-level, low-cost crimes. For example, in its seminal consensus statement, the Council of

State Governments (2002) reported that "most crimes committed by people with MI are minor, and may involve no victim" (p. 78). This claim is supported by research conducted in the State of Florida that followed over 3,700 offenders with serious MIs for 4 years after their release from jail and found that the average number of arrests for (relatively low cost) misdemeanors was nearly twice the average number of arrests for (more costly) felony crimes (2.5 vs. 1.4; Constantine et al., 2010). Another study involving 337 offenders released from Washington State prisons in 1996 and 1997 who had in-prison histories of MI (Lovell et al., 2002) found that only 2% of recidivism incidents involved a serious violent felony and 4.4% involved felony crimes against another person. Supervision violations and misdemeanors accounted for 72% of recidivism events. The prevention of such low-level crimes and the reductions in the relatively small costs to society resulting from such crimes indicate that investments in recidivism reduction programs aimed at individuals who commit such crimes would reach a point of diminishing returns much more quickly than if efforts were to target those individuals who are more likely to commit felonies, violent crimes, and crimes against people (i.e., crimes that are higher cost to society).

However, there is also evidence that crimes committed by recently released offenders with MI are likely to incur substantial costs. For example, using a definition of MI based on a self-reported "mental or emotional condition" or an overnight stay in a mental hospital, unit, or treatment program, Ditton (1999) reported that State prison inmates with a mental condition were more likely than other inmates to be incarcerated for a violent offense (53% compared with 46%) and to be violent recidivists (53% compared with 45%). Another study conducted in Ohio involving 261 released jail inmates diagnosed with *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., revised; *DSM-III-R*; APA, 1987) Axis I or Axis II mental disorders found that 188 were rearrested during the 3-year follow-up period (Ventura, Cassel, Jacoby, & Huang, 1998). Of the 188 who were rearrested, 34% were arrested for violent offenses and another 19% for nonviolent felonies while only 14% were rearrested for nonviolent misdemeanors and 5% for parole or probation violations (Ventura et al., 1998). Thus, there is conflicting evidence regarding the offense patterns of people with MI.

The differing results may be due to the way MI is operationalized in the preceding studies. Studies that utilize broader definitions of MI may include findings that reflect individuals who differ in important ways from those who are diagnosed with a serious and persistent MI. For example, the study by Ventura and colleagues (1998) included in the study sample, individuals with any Axis I or Axis II disorder. As a result utilizing such a broad definition, the largest diagnostic category present in the sample was personality disorder (33%) and for over a quarter of participants their inclusion in the study sample was due to the presence of an adjustment disorder. While personality and adjustment disorders are certainly debilitating conditions, individuals with these disorders are likely involved in crimes that differ from those committed by individuals without personality disorders and more severe Axis I disorders. A similar concern about overinclusiveness among illness indicators has also been voiced (Draine, Salzer, Culhane, & Hadley, 2002) regarding the operationalization of MI utilized by Ditton (1999). It is likely that the use of more clinically valid indicators of MI to circumscribe a study group (e.g., Constantine et al., 2010; Lovell et al., 2002) excludes from analyses those individuals who do not present with sequelae or characteristics associated with the presence of severe and persistent MI, and results in the differing offense patterns reported in the studies just reviewed. Therefore it is particularly important to assess how

these characteristics impact study findings and the implications these measures have for the targeting of resources.

COSTS OF CRIMES

The Bureau of Justice Statistics estimates that it costs in excess of US$214 billion a year to operate the American Criminal Justice System (Hindelang Criminal Justice Research Center, 2012). While this figure is staggeringly high, it represents only a fraction of the potential monetary impacts of crime (Nagin, 2001). For example, research has estimated that in a given year victims of crime suffer US$876 million in lost workdays (Anderson, 1999). Anderson (1999) estimated that the annual national-level costs of crimes exceed US$1.7 trillion when indirect costs such as crime induced production (the production of goods that have no societal value other than crime reduction), opportunity costs (criminals spending time planning and enacting crimes rather than in more productive activities), and the transfer of assets from victims to criminals are factored into crime impact equations.

M. A. Cohen and his colleagues are responsible for much of the development behind the costs of crimes literature (see M. A. Cohen, 1988; M. A. Cohen, Miller, & Rossman, 1994; M. A. Cohen & Piquero, 2009; M. A. Cohen, Piquero, & Jennings, 2010; M. A. Cohen, Rust, Steen, & Tidd, 2004; Miller, Cohen, & Wiersema, 1996). Much of the earlier work (prior to 2004) within this literature uses a bottom-up (BU) or *ex post* method of attaching costs to crimes (Ludwig, 2010). This method has largely been based on victim compensation from jury awards and entails estimating and attaching costs to various components of crime commission, activities performed by criminals related to preparing for criminal enterprises, system-level responses to crimes, and tangential impacts of crime experiences. Components include, but are not limited to, victim medical fees, lost wages, police and prison expenditures and intangible items such as pain and suffering, and reduced quality of life (M. A. Cohen, 1988; M. A. Cohen, 1998; M. A. Cohen et al., 1994; M. A. Cohen et al., 2004; McCollister, French, & Fang, 2010; Miller et al., 1996). Research that has used this method has estimated that the average cost of a criminal career is between US$1.3 million and US$1.5 million with a potential monetary savings of US$1.7 million to US$2.3 million attached to saving a high-risk juvenile by preventing their onset of a criminal career (M. A. Cohen, 1998; DeLisi & Gatling, 2003). The major problem with the BU method is that the monetary values that are attached to crimes are understandably abstract.

More recent research has developed and used a willingness to pay (WTP) approach to estimate the costs of crimes. Based on a contingent valuation approach developed within environmental economics literature (Arrow et al., 1993), M. A. Cohen et al. (2004) conducted a nationally representative survey of 1,300 U.S. residents to ascertain their relative WTP to have a select group of crimes reduced by 10% in their community. In summary, the process entailed telling respondents that a crime prevention program successfully prevented 1 in every 10 of a certain type of crime from taking place (e.g., murder) and asked whether the person would be willing to pay a random dollar amount ranging from US$25 to US$225 per year to continue the program. The data were subsequently weighted to adjust for probabilities of selection and to adjust for nonresponse attached to various demographic characteristics (M. A. Cohen et al., 2004). The resulting costs associated with the WTP approach were between 1.5 and 10 times higher than previous estimates based on the BU approach. When the WTP method was applied to the estimation of the costs associated with criminal

careers, findings indicated that saving a 14-year-old high-risk juvenile was associated with a savings between US$2.6 and US$5.3 million (M. A. Cohen & Piquero, 2009).

M. A. Cohen et al. (2010) demonstrated the policy relevance of engaging in costs of crimes research within their study of the costs of offender trajectories using data from the Second Philadelphia Birth Cohort Study. In this study, the researchers attach costs to the offense patterns of individual offenders starting at the age of 8 and continuing to the age of 26. Group-based trajectory modeling is used to statistically formulate appropriate groups according to the frequency and severity of their offending patterns. Findings from this study indicated that the costs of crimes associated with different levels of offenders varied dramatically with the crimes of the most high rate chronic offending group costing approximately US$200 million. This group committed more than a third of the total crimes of the entire cohort and accounted for more than half of the total costs associated with the crimes committed by the entire cohort. Costs were largely driven by the frequency of offending in the juvenile years and the seriousness of offending in the adult years.

The findings from M. A. Cohen et al.'s (2010) work have substantial policy implications that strongly favor early intervention and prevention efforts for would-be chronic and serious juvenile offenders. However, adult correctional officials largely encounter and are charged with gearing services toward a population that is beyond the point of early childhood intervention. Former inmates typically have well-established criminal careers at the time of their release (Beck & Shipley, 1989; Langan & Levin, 2002). The prevention of future offending by these former inmates still can incur substantial savings but, given the strained resources that correctional officials currently experience, it is important that they focus their efforts on populations that pose society the greatest potential costs on their release. Former inmates with MI have largely been identified as a risky population and have received substantial attention within the research literature, but the costs associated with their offending patterns relative to those who do not have MI has yet to be explored.

In line with previous findings and resultant policy implications from the costs of crimes literature, analyses of the costs of crimes of criminal populations can give empirically based support to the costs associated with the interventions geared toward these populations. Previous work within this literature has statistically identified appropriate high-risk groups through trajectory modeling. This allows for a strong case to be made for gearing relevant interventions toward members of this group to reduce offending patterns. The present research attaches costs of crimes to a group that is clearly established in the minds of correctional officials as risky (see Matejkowski, Caplan, & Cullen, 2010; Matejkowski et al., 2011; Skeem et al., 2003; Skeem & Louden, 2006; Skeem et al., 2008) and analyzes whether the costs associated with the offending patterns of this group on their release from prison warrants this increased attention by correctional officials relative to other reintegrating individuals without MI.

DATA AND METHOD

DATA COLLECTION

Data for this study were gathered from the New Jersey State Parole Board (SPB) and a management information system that abstracts "rap sheet" information called the Computerized Criminal History (CCH) system. The SPB data were used to construct a dataset reflecting individuals released from New Jersey prisons in 2006 with attendant

background factors such as age at release, gender, date of release and date of sentencing, scores on prerelease Level of Service Inventory–Revised (LSI-R) assessments, marital status, whether the individual was released to parole supervision or not, and whether the individual had a MI. The total number of releases from New Jersey prisons in 2006 was 12,555. Of these releases, 11,277 were successfully matched to the CCH system. Releases that did not have complete data on all of the measures included within our analyses were dropped. Cases have incomplete data due to nonsystematic archiving issues that are common with agency records data such as staff oversight and/or reporting errors. After deleting cases that did not have complete information we had a final sample of 7,929 cases.

DATA ANALYSIS

We use a propensity scoring and matching approach to address the question of how much the crimes committed by released offenders with MIs cost relative to similar former inmates without MIs (non-MI). Propensity score matching is traditionally used to address potential selection bias(es) across different treatment conditions (see Becker & Ichino, 2002; Rosenbaum & Rubin, 1983). Results from statistical models that use covariate adjustments (such as multivariate regression models) can be useful under stringent research conditions, such as when respondents are randomly assigned to particular treatment statuses, to represent the actual impact of treatment on a dependent variable of interest (King, Massoglia, & MacMillan, 2007). Having a MI is clearly not a randomly occurring event, nor is it a treatment status that can be assigned by a program manager. As discussed by Rosenbaum and Rubin (1983), propensity score matching approaches allow for researchers to replicate the conditions of a random assignment protocol by allowing the treatment variable to be treated as though it occurred at random and allowing other cases under analysis to be homogeneous on all other factors except for the treatment variable in question, in this case MI (King et al., 2007).

Unlike covariate adjustment methods, propensity score matching rules out confounding impacts of observed background factors on the treatment effect (Rosenbaum & Rubin, 1983). This method is particularly useful to address the research questions we pose in this study because it allows for greater ease in the interpretation of the total and average costs of crimes committed between our groups of interest. This is accomplished by omitting between-group differences in regard to background factors that may influence postrelease costs of crimes because those who do not share common background factors to those with MIs (i.e., those in the comparison group pool who are not matched to similar treatment cases) are dropped from the analyses after the matching procedure takes place.

Propensity scores were estimated through the use of a probit regression predicting an inmate's MI status (1 = an affirmative MI). We matched those with and without MI through a one-to-one nearest neighbor routine without replacement. Covariate imbalance was tested through the use of independent-samples *t* tests and calculations of standardized biases (Rosenbaum & Rubin, 1985). The standardized bias coefficient is equivalent to Cohen's *d* (J. Cohen, 1988), and an established rule of thumb used to determine whether the standardized bias is large (communicating that a covariate is imbalanced) is that the absolute value of the standardized bias should not be ≥20 (Apel & Sweeten, 2010). We use the standardized bias estimate in response to recent criticisms about the use of *t* tests to ascertain covariate balance after estimating propensity scores (see Imai, King, & Stuart,

2008, for a detailed discussion). Because, unlike *t* tests, standardized bias estimates incorporate variability as well as difference, results from these estimates have been regarded as sufficient to assume covariate balance (Butler, Goodman-Delahunty, & Lulham, 2012; Caliendo & Kopeinig, 2005).

It is important to note here the effect this matching procedure has on the interpretation of our findings. In essence, through matching, we attempted to make the group of released offenders without MI "look" as much like the group of offenders who have MI. This allows for isolation of the impact of MI on the outcome variables. Prior to matching, the group of offenders without MI was a large and diverse group. The matching procedure, by excluding offenders who did not display characteristics predictive of MI, made this group much more similar to the group of individuals who had MI. Therefore, findings reported on the group of offenders without MI prior to matching reflect many offenders who do not have much in common with the group of offenders who have MI. Following the matching procedure, these dissimilar offenders were removed from the analyses.

MEASURES

A unique nonredundant state-level identifying number called the State Bureau Identification (SBI) index number identifies each case within the SPB data system. The SBI is assigned at an individual's initial arrest and is associated with their fingerprint. This identifier was used to query the CCH system for criminal history and recidivism information over the course of 3 years after release from prison. Within this study, we define recidivism as an arrest for a new crime.

We use rearrests, rather than reconvictions or reincarcerations, to indicate recidivism for several reasons. First, this definition of recidivism is consistent with prior costs of crimes research (see M. A. Cohen, 1988; M. A. Cohen, 1998; M. A. Cohen et al., 1994; M. A. Cohen et al., 2004; Miller et al., 1996). Second, the cost measure that gauges an estimated WTP to have a certain crime prevented is a reflection of the public's interest in preventing specific crimes from taking place. Rearrests, as opposed to reconvictions and/or reincarcerations, likely represent the closest approximation of the actual criminal behaviors given that other definitions of recidivism encompass court mechanisms such as plea bargaining, which create error in measures of actual behaviors.

Maltz (1984) and Blumstein and Cohen (1979) empirically explored errors associated with using rearrests or reconvictions as recidivism measures; termed *errors of commission and omission*. Commission errors reflect individuals who are arrested without sufficient cause and are not convicted for a new offense. These types of errors may be particularly relevant to people with MI who are arrested for the primary purpose of crisis intervention and facilitation of treatment. Omission errors reflect individuals who are factually guilty but have not been convicted and are therefore not considered recidivists. While both studies generally acknowledge weaknesses in each approach, Blumstein and Cohen found that "the errors of commission associated with truly false arrests are believed to be far less serious than the errors of omission" (p. 565). Maltz, and Blumstein and Cohen thus contend that rearrest is a superior indicator of recidivism when compared with a reconviction (Spohn & Holleran, 2002).

We compare rearrest rates, the number of postrelease arrests, and the total and average BU and WTP costs associated with rearrest events between matched and unmatched groups.

TABLE 1: Estimated Bottom-Up and Willingness to Pay Costs of Crimes (2007 Dollars)

	Bottom-Up (in US$)	*Willingness to Pay (in US$)*
Murder	5.0 million	11.8 million
Rape	150,000	290,000
Armed robbery	50,000	280,000
Robbery	23,000	39,000
Aggravated assault	55,000	85,000
Simple assault	11,000	19,000
Burglary	5,000	35,000
Motor vehicle theft	9,000	17,000
Larceny	2,800	4,000
Drunk driving crash	30,000	60,000
Arson	60,000	115,000
Vandalism	1,000	2,000
Fraud	3,500	5,500
Other crimes	500	1,000

Note. This table was adapted from Cohen, Piquero, and Jennings (2010, p. 286). Copyright 2010 by the American Society of Criminology.

Chi-square and independent-samples *t* tests are used to ascertain whether the proportional and mean differences between the groups are statistically significant. The CCH data system presents arrests according to each crime the individual was charged with by an arresting officer. All charges are date stamped. We attached the BU and WTP monetary costs associated with each arrest charge an individual had within the CCH system. The costs that we used for each arrest charge came from Table 1 of M. A. Cohen et al.'s (2010) article "Studying the Costs of Crime Across Offender Trajectories" (p. 286). Their work was adapted and is presented in Table 1. Costs are measured in 2007 dollars. Costs of crimes that occurred prior to and after an individual's 2006 release were summed to estimate the costs of criminal history and reoffending. After attaching costs to each charge, arrest charges were collapsed into arrest events according to the date on which the charges occurred. to ascertain the costs of each arrest event, only the most serious (i.e., most costly) charge was retained for each event. This method of attaching costs to arrests coincides with the Cohen, Piquero, and Jenning's study on which this research is based (A. R. Piquero, personal communication, June 7, 2011).

For example, if an individual was released in 2006 and rearrested two times within 3 years of their release date we would assign a cost to each of the two arrest events according to the most costly charge within each of those individual events. So, using WTP costs, if the individual was first arrested and charged with burglary (cost = US$35,000), larceny (cost = US$4,000) and aggravated assault (cost = US$85,000) and then arrested a second time and charged with fraud (cost = US$5,500), drug possession (this is considered an "other crime"—cost = US$1,000), and arson (cost = US$115,000), the cost of the first arrest would be considered US$85,000 (the cost of the aggravated assault—the most expensive of the three charges within the first arrest event) and the cost of the second arrest would be considered US$115,000 (the cost of the arson—the most expensive of the three charges within the second arrest event). The total cost of crimes of the reoffending patterns of this individual is US$200,000 (US$85,000 + US$115,000). We add these total costs across

individuals according to whether they do or do not have MI to represent a total group cost of crimes. This total group cost is divided by the number of individuals within a given group to represent an average cost of crimes for an individual according to whether they do or do not have MI. We also divide the total group cost by the number of individuals who were rearrested within a given group to represent an average cost of crimes for a recidivist within a given group.

The MI variable is assigned to cases by the New Jersey Department of Corrections (DOC) and serves as an alert status to the SPB. Offender alerts communicate various pieces of pertinent information (e.g., serious substance abuse issues, numerous and/or serious disciplinary infractions while incarcerated, a history of violence, etc.) that may impact whether an individual will be released to parole supervision and/or case planning on their release. The MI indicator specifically communicates whether an inmate (a) has been committed to a psychiatric facility during their incarceration, (b) presents with a current or prior psychiatric history of concern (as deemed by a licensed mental health professional housed within DOC), or (c) constitutes a danger to self and/or others due to his or her mental condition (as deemed by a licensed mental health professional housed within DOC). While not based on an established diagnostic research tool, this operationalization is informed by licensed mental health professionals and indicates that those identified with MI have presented with clinically severe behaviors. The prevalence of MI in the sample based on this operationalization (approximately 6%) comports with prior research on the rates of MI in prison (Fazel & Danesh, 2002), further indicating that the sample of offenders identified as having MI in this study are representative of the population of offenders in New Jersey who have MI. Of our total sample of 7,929 individuals who were released from prison in 2006, 523 had MI.

We regressed several background factors on the MI variable to construct our propensity scores. Specific measures include age at release; gender (1 = male); minority status (1 = minority, 0 = White); marital status (1 = single, 0 = not single); whether the individual was released to parole supervision (1 = parole, 0 = unconditional release); the individual's prerelease LSI-R score; the number of months they served in prison for the sentence for which they were being released; the type of offenses (property, drug, sex, violent, or other with other as the referent category) and the number of offenses for which they were incarcerated (1, 2, 3, or 4 or more, with 4 or more as the referent category); the total number of prior arrests; the number of prior violent and prior nonviolent arrests; and an empirical measure of the relative level of deprivation of the county to which they were to return on their 2006 release. This latter measure was constructed through the use of Census information reflecting county-level measures of the proportion of the population that is black, the unemployment rate, the proportion of female-headed households, and the proportion whose income is below the poverty level. These measures were combined using factor analysis ($\alpha = .763$).

PARTICIPANTS

Results from the probit regression model used to construct propensity scores as well as the results from the propensity score imbalance testing routines are presented in Table 2. The probit model provided for a statistically significant good fit for predicting the propensity of having MI (log likelihood = −1,496.83, $\chi^2 = 860.83$, $df = 18$). The covariates contained within the model explained approximately 22.33% of the variance in the likelihood of having MI. Statistically significant predictor variables include age ($\beta = .01$, $SE = .003$, $p < .01$), gender ($\beta = -1.44$, $SE = .06$, $p < .001$), minority status ($\beta = -.35$, $SE = .06$, $p < .001$),

TABLE 2: Propensity Score Matching Results: Released Inmates With and Without Mental Illness

		Unmatched				*Matched*			
	Coefficient (SE)	*No mental illness (n = 7,406)*	*Mental illness (n = 523)*	*S.B.*	t	*No mental illness (n = 523)*	*Mental illness (n = 523)*	*S.B.*	t
Age	.01 (.003)**	34.02	37.07	33.2	7.28***	37.21	37.07	−1.6	−.26
Male	−1.44 (.06)***	94.47%	55.26%	−101.3	−33.98***	55.26%	55.26%	0	0
Minority	−.35 (.06)***	81.77%	63.67%	−41.5	−10.18***	64.63%	63.67%	−2.2	−.32
Single	−.10 (.01)	83.54%	77.25%	−15.9	−3.72***	78.39%	77.25%	−2.9	−.45
Parole	−.04 (.05)	70.79%	64.05%	−14.4	−3.26***	65.58%	64.05%	−3.3	−.52
LSI-R score	.06 (.004)***	23.09	26.44	55.0	12.25***	26.12	26.44	5.2	.87
Time served (months)	.001 (.001)	26.69	25.83	−2.9	−.71	25.50	25.83	1.1	.17
Prior arrests	−.001 (.01)	8.43	9.86	20.9	4.70***	9.73	9.86	1.9	.26
Prior violent arrests	.01 (.02)	.82	.92	7.7	1.75	.90	.92	1.3	.18
Prior nonviolent arrests	−.001 (.01)	7.16	8.48	21.1	4.74***	8.49	8.48	−.10	−.02
County deprivation	−.03 (.03)	−.003	−.159	−15.5	−3.47***	−.126	−.159	−3.3	−.54
Instant offense									
Property	.11 (.13)	15.85%	25.43%	23.8	5.72***	27.15%	25.43%	−4.3	−.63
Drug	−.13 (.13)	50.46%	40.92%	−19.2	−4.22***	42.64%	40.92%	−3.5	−.56
Sex	−.18 (.30)	1.52%	0.77%	−7.2	−1.39	1.50%	0.77%	−7.2	−1.16
Violent	.10 (.14)	24.09%	28.69%	10.1	1.68	28.69%	28.69%	0	−.01
Other (ref.)	—	—	—	—	—	—	—	—	—
Number of instant offenses									
One	.04 (.08)	39.09%	43.21%	8.4	1.87	46.46%	43.21%	−6.6	−1.06
Two	−.10 (.08)	28.71%	24.28%	−10.0*	−2.17	25.43%	24.28%	−2.6	−.43
Three	−.06 (.09)	15.89%	15.87%	−.1	−.01	14.91%	15.87%	2.6	.43
Four or more (ref.)	—	—	—	—	—	—	—	—	—

*Note. Model statistics for propensity score estimations: Log likelihood = −1,496.83; χ^2 = 860.83 (df = 18)***; Variance explained = 22.33%. LSI-R = Level of Service Inventory–Revised.*

*$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.

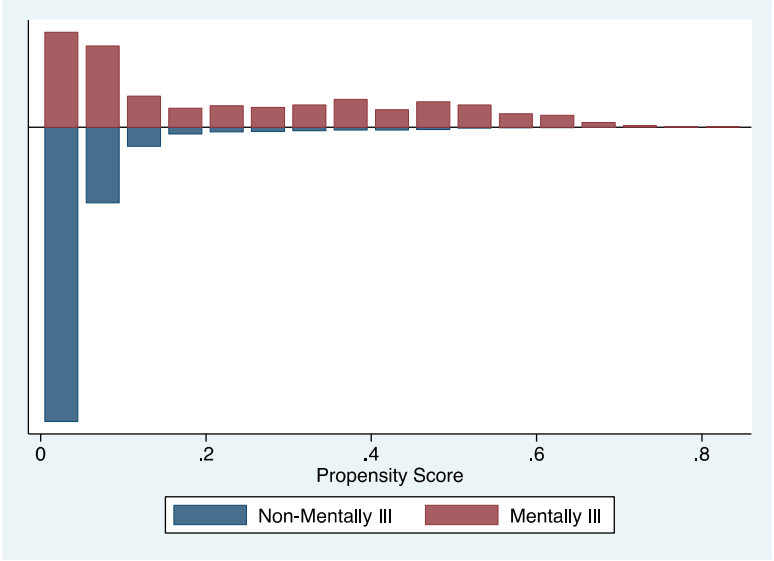

Figure 1: Propensity Score Distribution for Groups With and Without Mental Illness Prior to Matching.

and LSI-R score (β = .06, *SE* = .004, $p < .001$). Being older, a female, a nonminority, and having a higher LSI-R score at the time of release from prison were all associated with an increased likelihood of having a MI.

Prior to matching, those with and without MI significantly differed on several of the background factors. Those with MI were, on average, approximately 3 years older at the time of their release from prison ($t = 7.28$, $p < .001$), had a much higher female representation (approximately 45% of this population were female as opposed to about 5% of the population without MI; $t = -33.98$, $p < .011$), and were less likely to be classified as a minority (about 64% were classified as non-White) when compared with those without MI (about 18% of the non-MI population were non-White; $t = -10.18$, $p < .001$). A significantly higher proportion of those without MI were single (proportional difference = 6.29%, $t = 3.72$, $p < .001$) and were supervised by the parole board on their 2006 release (proportional difference = 6.74%, $t = -3.26$, $p < .001$) when compared with those with MI. Those with MI had significantly higher prerelease LSI-R scores ($t = 12.25$, $p < .001$), had a greater number of prior arrests ($t = 4.70$, $p < .001$), particularly nonviolent prior arrests ($t = 4.74$, $p < .001$), came from more deprived areas ($t = -3.47$, $p < .001$), were more likely to be serving time for property offenses ($t = 5.72$, $p < .001$), and less likely to be serving time for drug offenses ($t = -4.22$, $p < .001$) when compared with those without MI.

Because of these significant differences, large amounts of standardized biases on several of the covariates were present between the two groups prior to matching. The standardized biases between the unmatched groups for the variables of age, gender, minority status, LSI-R score, prior arrests, prior nonviolent arrests, and whether the individual's instant offense was a property crime all exceeded |20|. These marked differences between the MI and non-MI groups prior to matching resulted in large imbalances in propensity scores. These imbalances are illustrated in Figure 1 by the lack of proportional symmetry in propensity scores between the groups.

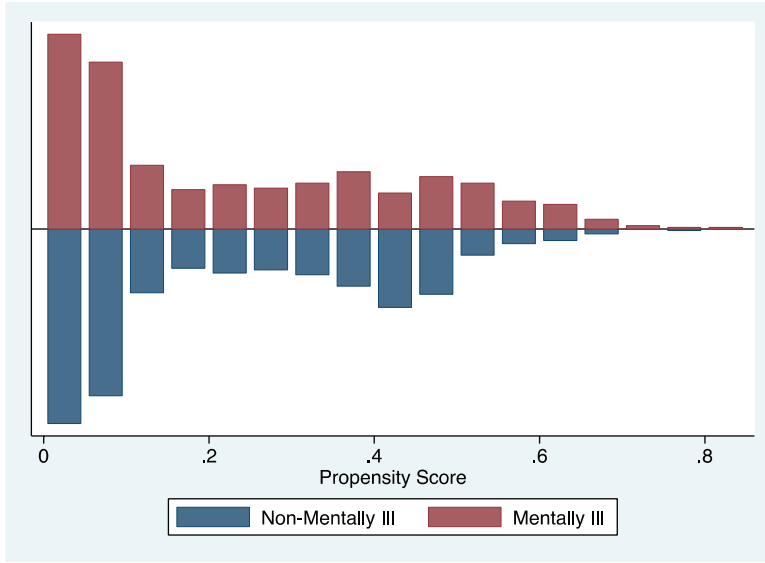

Figure 2: Propensity Score Distribution for Groups With and Without Mental Illness After Matching.

RESULTS

After using the propensity scores that were constructed from the probit model to perform the nearest neighbor matching between the two groups, all of the previously statistically significant differences became nonsignificant. The entirety of the MI sample was retained after the matching took place, and the routine was successful at finding appropriate one-to-one matches for those with MI within the pool of potential comparison group cases that did not have MI. The matched groups were statistically balanced as evidenced by the nonsignificant *t* tests that were performed for each of the background factors. In addition, none of the standardized biases exceeded |20|. The balancing principle is illustrated in Figure 2 by the proportional symmetry of propensity scores between the matched groups.

Differences between unmatched and matched groups regarding the proportion rearrested within 3 years of release from prison, the number of postrelease arrests, and the average costs of these recidivism events are presented in Table 3. Those with and without MI did not significantly differ from one another according to the proportion of the group that was rearrested within 3 years of their release or the number of postrelease arrests they experienced prior to and after between-group matching took place. Prior to matching, about 63% of those with MI and about 61% of those without MI were rearrested. After matching, about 58% of the non-MI group was rearrested. On average, prior to and after matching the MI and non-MI groups experienced an average of about 1.5 postrelease arrests.

The average costs associated with the reoffending patterns of these two groups significantly differed prior to and after matching. Recall that the matching procedure eliminates from postmatching results many offenders from the group of offenders without MI who do not share characteristics in common with the group of offenders who have MI. Before these groups were matched on the background factors, the rearrests that were experienced by the average member of the non-MI group were much more costly according to the BU and

TABLE 3: Costs of Rearrests and Recidivism Rates Over 3 Years After Release From Prison for Matched and Unmatched Groups According to Mental Health Status

	Unmatched			*Matched*		
	No mental illness (n = 7,406)	*Mental illness (n = 523)*	*χ^2 or t test*	*No mental illness (n = 523)*	*Mental illness (n = 523)*	*χ^2 or t test*
Rearrested	60.71%	63.29%	1.37	57.74%	63.29%	3.36
Average number of postrelease arrests	1.45	1.62	4.15	1.40	1.62	3.49
Average cost of crimes of an individual (BU, total group)	US$39,455.21	US$17,162.33	1.54***	US$6,390.06	US$17,162.33	1.28*
Average cost of crimes of an individual (WTP, total group)	US$91,100.26	US$38,914.91	1.52***	US$13,448.38	US$38,914.91	1.26***
Average cost of crimes of an individual (BU, recidivists)	US$64,992.28	US$27,117.52	1.72***	US$11,066.23	US$27,117.52	1.02***
Average cost of crimes of an individual (WTP, recidivists)	US$150,064.17	US$61,487.92	1.69***	US$23,289.74	US$61,487.92	1.04***
Total cost of rearrests (BU)	US$292,205,312	US$8,975,900	—	US$3,342,000	US$8,975,900	—
Total cost of a rearrests (WTP)	US$674,688,512	US$20,352,500	—	US$7,033,500	US$20,352,500	—

Note. Total group costs are averaged across all individuals within the group. Recidivist costs are averaged across only those individuals within a group that are rearrested during the follow-up time.
*$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.

WTP measures. While, prior to matching, the rearrests of the average individual within the MI group cost approximately US$17,000 or US$39,000 according to these two measures (respectively), the average costs of rearrests experienced within 3 years of release by the average member of the non-MI group more than doubled these figures costing approximately US$39,000 according to the BU measure and approximately US$91,000 according to the WTP measure ($t = 1.54$, $p < .001$ and $t = 1.52$, $p < .001$ for BU and WTP measures prior to matching). These patterns are also apparent when isolating the costs of crimes to recidivists within the groups. While the average cost of crimes committed by recidivists within the MI group were approximately US$27,000 or US$61,000 according to the BU and WTP measures, the average cost of crimes of recidivists within the non-MI group were approximately US$65,000 or US$150,000 according to these two measures ($t = 1.72$, $p < .001$ and $t = 1.69$, $p < .001$ for BU and WTP measures prior to matching). The total costs of the reoffending patterns of the unmatched groups dramatically differed with those without MI costing about US$292 million or US$675 million and those with MI costs about US$9 million or US$20 million according to the BU and WTP measures. These sizable differences in total costs are not surprising, however, given that the non-MI group is about 14 times the size of the MI group.

The between-group differences remain statistically significant after matching; however, the relationship is in the opposite direction. Once the non-MI and MI groups were matched on similar background factors, the costs of rearrests experienced by those without MI were significantly less according to the BU and WTP measure when compared with otherwise similar recently released inmates with MI. After matching to isolate the influence of MI, the average costs associated with the rearrests of the non-MI group were less than half that of the MI group with the reoffending patterns of the average former inmate without MI costing approximately US$6,000 or US$13,000 according to the BU and WTP measures ($t = 1.28$, $p < .05$, and $t = 1.26$, $p < .001$, for BU and WTP measures after matching). When isolating these costs to recidivists, the average cost of crimes for reintegrating former inmates without MI were approximately US$11,000 or US$23,000 according to the BU and WTP measures ($t = 1.02$, $p < .001$, and $t = 1.04$, $p < .001$, for BU and WTP measures after matching. The total costs of crimes committed by the groups markedly differ with the non-MI group costing approximately US$3 million or US$7 million after matching on background factors with the MI group. These figures are about 87 times (BU) and 95 times (WTP) larger for the non-MI group prior to matching.

DISCUSSION AND CONCLUSION

The purpose of this study was to estimate the costs of crimes committed by reintegrating former inmates with MI and compare these costs to those without MI. Propensity scoring and matching were used to isolate the impact of MI on costs of crimes. Findings indicated that while those with MI were no more likely to be rearrested during the follow-up time or to have a greater frequency of postrelease arrests when compared with those without MI, the average costs of crimes committed by an individual with MI were more than twice as high as the average costs of crimes of an otherwise similar individual without MI. This finding is apparent when averaging costs of crimes across all individuals within a group as well as when they are isolated to recidivists within a group. In addition, the total costs of crimes committed by the group of those with MI was approximately 3 times as high as the group of those without MI after matching on background factors. However, prior to matching, the average costs of crimes committed by an individual with MI were less than half the average costs of crimes committed by an individual without MI. Consistent with prior research, former inmates with MI significantly differed from those without MI on several pertinent background factors that have been previously found to be predictive of criminal recidivism (Matejkowski et al., 2010; Matejkowski et al., 2011; Skeem et al., 2003; Skeem & Louden, 2006). Those with MI were far more likely to be older, White, female, and to have heightened prerelease LSI-R scores relative to those without MI.

An immediate conclusion from our propensity score matching results is that MI are associated with greater reoffending costs when compared with similar former inmates without MI. But, it is unlikely that MI should be an area of immediate focus for correctional officials who have a finite amount of rehabilitative resources at their disposal if they are primarily interested with mitigating the costs of crimes committed by reintegrating former offenders. As was highlighted in the Methods section, the matching procedure eliminated from postmatching analyses offenders who did not share in common many characteristics of offenders with MI. Prior to matching, the average costs of crimes committed by those with MI were much lower than the crimes committed by those without MI when looking at all individuals within a group as well as recidivists. The direction of this relationship reversed

postmatching (i.e., the average costs of crimes committed by those with MI were much *higher* than the crimes committed by those without MI), when those who were not similar to offenders with MI were removed from the analyses. This suggests that the characteristics of the high cost subgroup within the reintegrating population are unrelated to MI indicators. Along these lines, it is important to note that the costs of crimes within this study were likely more reflective of reoffense severity rather than frequency given the truncated follow-up period inherent in recidivism analyses in comparison to other prior costs of crimes analyses that follow a criminal careers approach. Taken as a whole, MI can exacerbate the costs associated with reoffense patterns, but those with MI should not receive increased attention from correctional officials who typically perceive members of this group as at a greater risk for societal harms due to their illness.

We are not suggesting that efforts are misplaced that aim to link with treatment on community reentry (or even divert from traditional criminal justice processing) those people whose psychiatric illness is the main precipitating factor in their criminal behavior. Such efforts are morally and medically justifiable. However, when considering where to target resources for reducing costs of crime to society, other groups of offenders may provide a greater return on investment. As we mentioned, prior to matching—when average costs of offenses for offenders without MI problems were nearly 2.5 times the amount of offenders with MI problems—members of this latter group were more likely to be older, White, and female than members of the former group. As a result of these differences, matching likely excluded from the group of offenders without MI problems many young, non-White males' recidivism events, drastically reducing the average costs of crimes committed by this group. Thus, targeting resources to more effectively reduce recidivism among young minority males may provide more return on investment than attempting to reduce reoffending by offenders with MI problems.

RISK FOR RECIDIVISM AND COSTS OF CRIMES

Prior to matching, those with MI had significantly higher average recidivism risk assessment scores when compared with those without MI (by about 3 points; likely due to LSI-R items that assess past/present mental health treatment and level of psychological interference due to personal/emotional stressors). However, those with MI had similar rates of rearrest when compared with those without MI and their average costs of crimes were significantly lower prior to matching. While our access was limited to total LSI-R scores (i.e., we did not have individual item scores), these findings may indicate that offenders with MI are being ascribed higher risk for criminal recidivism based on a characteristic (e.g., current or past mental health treatment) that prior research indicates, in itself, is not a substantial predictor of criminal recidivism (Bonta et al., 1998).

When LSI-R scores were controlled postmatching, rearrest rates remained similar between the two groups while associated costs of crimes decreased dramatically among non-MI offenders, indicating the limited ability of pure recidivism risk assessments to forecast potential costs of crimes. Research has strongly suggested that targeting high-quality correctional interventions toward high-risk individuals in line with their criminogenic needs and responsivity characteristics can decrease the likelihood that these individuals will recidivate in the community. However, risk assessment instruments such as the LSI-R attempt to measure the general likelihood of the occurrence of recidivism events rather than the costs associated with these events. Essentially, risk assessment instruments inform practitioners

about a "yes" or "no" conversation about recidivism rather than a severity or scalability conversation (note that specialized risk assessment instruments such as the Violence and/or Sex Offender Risk Appraisal Guide can inform practitioners about the likelihood that former inmates will engage in high cost recidivism events, but these instruments do not typically guide overall programmatic and treatment regimens that are geared toward the reintegrating population).

Overall decreases in recidivism can be tied to cost savings within corrections systems if they can result in, among other things, prisons closing and/or decreases in the number of corrections staff members needed to maintain security in correctional settings. But, while they tend to drive release and programmatic decision-making, general risk assessment instruments such as the LSI-R are not informative about the relative severity of the crimes that may be committed by former inmates as they attempt to reintegrate back into their communities. By extension, these instruments are not informative about the estimated monetary costs of crimes that may be committed by these individuals. Research that seeks to augment and enhance risk assessment instruments with information about the likelihood that former inmates will engage in certain types of high cost crimes should be explored if corrections officials are interested in lowering the overall rates of recidivism to mitigate the costs of corrections as well as potentially lowering the costs of crimes associated with recidivism events.

Future research should perform similar analyses as M. A. Cohen and his colleagues (2010) to identify the characteristics of high cost reoffending groups within release cohorts. These sorts of research endeavors can shed more light onto the characteristics of individuals that should be prospectively targeted for rehabilitative interventions. While the literature about effective correctional interventions to reduce recidivism (specifically the RNR approaches) is quite robust, this literature focuses on preventing the occurrences of recidivism events rather than mitigating the costs of these occurrences. Research from this branch of literature has demonstrated that appropriately focusing correctional resources can lead to reductions in postrelease recidivism (defined as returns to custody) by as much as 19% (Dowden & Andrews, 1999b). However, the costs of crimes literature has clearly established that not all criminal events have equivalent monetary costs, and that these monetary costs largely serve as proxies for relative levels of societal harm (M. A. Cohen et al., 2010). Future studies should combine the approaches from the correctional interventions and costs of crime literature in an effort to develop theoretically informed practices that can reduce high cost rather than general recidivism events.

This study focused on the costs associated with the reoffending patterns of those with MI; however, this group likely has much higher societal costs that are not linked to the criminal justice system when compared with those without MI. Research has demonstrated that relapse episodes associated with MI issues that result in rehospitalizations have enormous national-level costs (Welden & Olfson, 1995). However, while these costs are certainly relevant within a broader policy discussion about treating those with MI issues, they are likely not the primary focus of correctional officials looking to lower recidivism rates and lowering the impacts of recidivism events.

LIMITATIONS

This study provided insight into the potential impacts of MI on the costs of crimes. However, there are several limitations to this study that should be considered when

consuming the results. First, the arrest data stemmed from officially recognized events that occurred within the state of New Jersey. Findings may not generalize to offender groups in other states. For example, New Jersey contains several highly dense, major metropolitan areas that could provide the opportunities for crimes that differ from more sparsely populated states. As types of crimes would differ, aggregated associated costs, as reported here, would also differ. The costs of unreported crimes and those that occurred across state borders were not able to be included within this study, so the costs of crimes committed by the former inmates within this study are conservative measures. In addition, the MI indicator that was used in this study indicated significant mental impairment but did not include measures of particular risks, needs, recency of impairment, or diagnoses. However, as mentioned in the Methods section, this operationalization of MI is an indication of severe impairment assigned by a licensed clinical professional and the rate of MI within our cohort (approximately 6%) is comparable with previous studies showing the prevalence of MI in prisons and in release cohorts (Fazel & Danesh, 2002; Ostermann & Matejkowski, 2012).

Selection bias was not completely eliminated, as propensity score matching cannot take into account all factors that influence study outcomes. Indeed, important variables were not able to be included in this study's matching procedures, chief among which may be an indicator of substance abuse history. Substance use disorders among nonmentally ill offenders (Dowden & Brown, 2002) and co-occurring substance use disorders among those with a MI (Baillargeon, Williams et al., 2009; Wilson, Draine, Hadley, Metraux, & Evans, 2011) are strong predictors of recidivism. Though our total scores from the LSI-R include several items assessing drug and alcohol use severity unfortunately, diagnostic data on the presence of a substance use disorder were not available for the current study. Future research on this topic should control for the role of clinically assessed substance abuse in impacting costs associated with recidivism.

Finally, the reintegrating population that was analyzed within this study included those who were released to parole supervision. As a result, some former inmates may have not had the opportunity to be rearrested due to being reincarcerated because of a technical parole violation. While the groups were matched according to their release status, prior research has demonstrated that parolees with MI are at an increased risk of experiencing technical parole violations relative to those without these concerns (Ostermann & Matejkowski, 2012; Skeem et al., 2006). This, again, would likely result in the costs associated with the reoffending patterns of those with MI to be conservative estimates. Notwithstanding these limitations, the results of this study indicate that MI can exacerbate the costs of crimes committed by certain members of the reintegrating population, but that those with MI should not be the primary group that is focused on by correctional officials interested in lowering the costs of crimes of those released from prisons.

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