Recidivism and Inmate Mental Illness

William D. Bales[1,*], Melissa Nadel[1], Chemika Reed[2] and Thomas G. Blomberg[1]

[1]*Florida State University, College of Criminology and Criminal Justice, Eppes Hall, 145 Convocation Way, Tallahassee, Florida 32306-1273, USA*

[2]*Early Learning Coalition of Miami-Dade/Monroe County Florida, USA*

Abstract: *Purpose*: With over 700,000 mentally ill inmates are held in U.S. jails and prisons, this study provides a comprehensive assessment of the effect of mental illness among released prisoners on a series of re-entry recidivism outcomes.

Methods: Using a cohort of 200,889 inmates released from Florida prisons from 2004 to 2011, several recidivism outcomes are examined among 40,145 individuals with a mental health diagnosis and 10,826 with a serious mental illness are compared with inmates without a mental illness diagnosis. We control for a host of factors known to influence recidivism outcomes using binary logistic regression for one, two, and three year follow-up periods and survival analysis to assess the timing to recidivism.

Results: Inmates diagnosed with any type of mental illness are significantly more likely to recidivate and among inmates with a mental illness, those diagnosed with a serious mental condition are significantly more likely to recidivate than those with a less serious mental illness diagnosis.

Conclusions: Policies and practices need to ensure that in-prison and community mental health systems have sufficient resources and capacity to adequately address the needs of inmates with mental health issues to reduce the likelihood of these individuals re-offending and ultimately returning to prison.

Keywords: Mental illness, recidivism, prisoner re-entry.

I. INTRODUCTION

In 2005, the U.S. Department of Justice reported that over 700,000 mentally ill inmates were being held in U.S. jails and prisons, accounting for 56 percent of inmates in state prisons, 45 percent in Federal prisons, and 64 percent in local jails (James & Glaze, 2006). It was further reported that over 75 percent of these mentally ill inmates had served time in jail or prison prior to their current incarceration with 25 percent having had more than three prior incarcerations. Yet, despite those alarming statistics, the empirical relationship between inmate mental illness and recidivism remains inconclusive. While there is a substantial body of relevant research, the reported findings on the relationship between inmate mental illness and recidivism are mixed and contradictory. This includes findings of an inverse relationship between inmate mental illness and recidivism (Bonta & Hanson, 1998), to findings of a positive relationship (Baillargeon *et al*. 2009), to findings of no relationship (Grann & Farzel, 2008).

Among the potential reasons for these contradictory findings regarding the relationship between inmate mental illness and recidivism have been a series of methodological limitations characteristic of the prior research. According to the U.S. Department of Justice (2014) and the Urban Institute (2014) these major shortcomings include (1) use of only one measure of recidivism rather than multiple measures, (2) limited follow-up periods after release from prison of one to two years rather than three years or more, (3) employment of relatively small sample sizes, and (4) use of limited control variables known to be related to recidivism.

The present study seeks to overcome these methodological limitations identified in the prior literature in order to move beyond the mixed and inconclusive findings concerning the relationship between inmate mental illness and recidivism. Specifically, the study will employ multiple measures of recidivism namely re-arrest, reconviction and incarceration, conduct follow-up within one, two, three, four and five years following release from prison, employ a large cohort of 200,889 inmates released from Florida prisons between 2004 to 2011, and include a comprehensive set of control variables known to be related to recidivism in the analyses.

What follows is a review of the prior literature, a description of the current study's research questions, data and methods, a presentation of the study's findings, and a concluding summary and discussion.

*Address correspondence to this author at the Florida State University, College of Criminology and Criminal Justice, Eppes Hall, 145 Convocation Way, Tallahassee, Florida 32306-1273, USA; Tel: 850-644-7113; Fax: 850-9614; E-mail: wbales@fsu.edu

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II. PRIOR LITERATURE

Prior studies have reported mixed results regarding the relationship between inmate mental illness and recidivism. This includes findings of a positive relationship (Baillargeon *et al*. 2009), findings of an inverse relationship (Bonta & Hanson, 1998), and findings of no relationship (Grann & Fazel, 2008). These studies have ranged from simple comparisons of recidivism rates of inmates with mental illness to those inmates without mental illness to more detailed comparative studies that control for selected variables known to be related to recidivism.

For example, Bonta and Hanson (1998) conducted a meta-analysis of relevant studies and concluded that psychosis was actually inversely related to recidivism which is reflected in a number of risk assessment instruments that identify psychosis as a protective factor for recidivism. A recent meta-analysis of 27 studies of the effect of psychosis upon recidivism found that "individuals with psychotic disorders have a modestly higher risk of repeat offending compared with persons without any psychiatric disorders and a similar risk compared with individuals with other psychiatric disorders" (Fazel & Rongqin, 2011, p. 808). Cloyes, *et al*. (2010) conducted a study employing a sample of 9,245 inmates released from the Utah prison system between 1998 and 2002. The study involved an assessment of the effect of Serious Mental Health (SMI) diagnoses upon recidivism for the entire 9,245 inmate sample. Twenty three percent of sample were diagnosed with SMI and 77 percent of those SMI diagnosed inmates returned to prison within 36 months compared to 62 percent return to prison for those inmates without SMI diagnoses. The researchers controlled for inmate demographics, seriousness/types of offense, and release conditions.

Fisher *et al*. (2014) studied only released inmates with mental health diagnoses and compared the recidivism rates across different types of mental health diagnoses. The study employed a cohort of 1,012 inmates released from the Massachusetts prison system and found no differences in recidivism between different types of mental health diagnoses. The researchers concluded that inmates "whom we deemed to have the most significant and arguably most debilitating conditions, those with mood and thought disorders, were neither more or less likely to be rearrested" (Fisher *et al*., 2014, 821). Feder (1991) examined 147 mentally ill diagnosed inmates and compared them to 400 non-mentally ill inmates released from New York correctional facilities in the 1980s. After controlling for the variables of instant violent offenses, age at first offense, prior adult incarcerations, and age at prison release, no relationship was found in the rate of recidivism between mentally ill and non-mentally ill inmates.

Smith and Trimboli (2010) examined 1,208 inmates who participated in the 2001 Mental Health Survey conducted by NSW Justice Health. The survey data were subsequently linked to NSW's re-offending database to identify the 1,208 inmate's criminal histories five years before their last incarceration and 24 months following their release from their last incarceration. The study's control variables included gender, age, indigenous status, and number of court appearances five years prior to prison admission. The findings were that inmates without a mental illness diagnosis recidivated at a rate of 51%, inmates with a non-substance abuse mental health diagnosis recidivated at a rate of 49%, and those inmates with a comorbid substance and non-substance mental illness diagnosis recidivated at a rate of 67%. The study concluded that a potentially effective way to reduce recidivism would be to expand treatment for those at-risk inmates with combined substance and non-substance mental illness diagnoses (Smith & Trimboli, 2010:1).

Prior studies of the potential link between inmate mental illness and recidivism have employed a single measure of recidivism with limited post-release follow-up periods. For example, Fisher, *et al*. (2014) examined the recidivism effect of inmate mental illness upon re-arrests within two years of prison release. Theliner & Lovel (2008) employed a recidivism measure of convictions for a new felony or misdemeanor within two years of prison release. Walters and Crawford (2014) assessed the effect of Major Mental Illness (MMI) and histories of violence upon prison misconduct and recidivism among 1,163 male inmates admitted to a medium security federal prison. Recidivism was defined as either "general," as measured from the time of prison release to first arrest for any type of crime, to "aggressive" as measured by the timing from release to arrest for a simple or aggravated assault. The study employed two control variables namely age and prior substance abuse. The study found that serious mental illness alone had no effect upon recidivism while the combined effect of violent histories and serious mental illness increased the likelihood of recidivism.

Overall, the prior literature on the relationship between inmate mental illness and recidivism can be characterized as contradictory and inconclusive. Among the methodological shortcomings of this literature have been the use of single definitions of recidivism, generally small sample sizes, lack of adequate control variables, and limited post-release follow-up periods on the timing of recidivism.

III. CURRENT STUDY

This study addresses the fundamental methodological deficiencies identified in the prior literature on inmate mental illness and recidivism. Specifically, the study will employ multiple measures of recidivism, including arrests, convictions and re-imprisonment and examine not only whether recidivism occurs with yearly intervals up to five years but also the timing to failure. The analysis uses a cohort of 200,889 inmates released from Florida prisons between 2004 and 2011 and include 40,145 individuals with a mental health diagnoses and 10,826 diagnosed with a serious mental illness. The study will include more control variables than used in prior studies including; gender, age, race, educational level, substance abuse issues, prior arrest and incarceration record, and length of incarceration.

The following four research questions are addressed in the study. First, does a mental health illness diagnosis have negative, positive, or null effects on the likelihood of post-prison recidivism? Secondly, does a mental illness diagnosis have a differential effect on varying recidivism types, primarily in terms of re-arrest, re-conviction, and re-imprisonment? Third, is the timing to recidivism sooner, the same, or longer among released inmates with mental illnesses than non-mentally ill inmates? Four, are released inmates with a serious mental illness (Major Depressive Disorder, Bipolar, Schizophrenia, or Psychotic Disorders) more, less, or no more likely to recidivate relative to those with a less serious mental illness?

IV. DATA AND METHODS

Sources of Data

There were two primary sources that provided the data required to create the cohort of inmates released and the associated measures used in the analysis. First, corrections data was obtained from the Bureau of Research and Data Analysis (BRDA) located in the Florida Department of Corrections (FDC). For several years, BRDA has created a recidivism dataset on an annual basis for their research and reporting needs (FDC, 2013b). Additionally, data which resulted in the creation of measures of pre− and post−prison arrests were provided by the Florida Department of Law Enforcement (FDLE). The corrections data from BRDA originates from the FDC's Offender−Based Information System (OBIS) which was established in 1979 and contains detailed data on all offenders who were in Florida's correctional system in 1979 and all subsequent offenders sentenced to state prison or community supervision (probation, community control, etc.). OBIS contains detailed sentencing information, the demographic characteristics of offenders, specific data on all inmate movements within and in and out of prison and related to community supervision movements and outcomes (absconding, technical violations, new offenses, and revocations), and initial and all subsequent custody classification decisions. To facilitate the tracking of individual offenders over time, the FDC utilizes a unique offender identifying number that remains constant throughout the system and over the course of each individual offender's criminal career in the state of Florida. There is also data relating to unique personal identification numbers such as the number assigned to arrestees by FDLE when they are booked into a local jail, social security number, and FBI number; as well as their prison experiences, including disciplinary actions, programs completed, educational level, and custody classification. The final dataset analyzed for this research was a cohort of 200,889 inmates released from Florida's prison system from 2004 through 2011.

Measures

All inmates receive a thorough mental health diagnosis by qualified mental health professionals during their three to four weeks in one of the FDOC's six reception centers. Subsequent assessments are made when there is any indication of a change in an inmate's mental condition. The construct of mental illness was defined by two separate dichotomous variables which are the key explanatory variables used in this study. The first establishes whether or not the offender was diagnosed with any Axis I or Axis II mental health disorder at the time they left prison (0=no diagnosis, 1=diagnosis). This definition covers a wide range of diagnoses that vary in their seriousness. Much of the previous research has limited the definition of mental illness to only include some of the more serious diagnoses. In order to explore whether a serious mental health diagnosis has a differential effect, we

also included a dichotomous variable denoting serious diagnosis versus a general diagnosis. Serious diagnoses include schizophrenia, major depressive disorder, bipolar disorder, and non-schizophrenic psychotic disorders (Baillargeon *et al*., 2009; Sims, 2009).

The outcome variables used in the analysis are all indicators of the relative success prisoners experience in re-entering society in relation to re-offending and future contact with the criminal justice system. Guidance on the measures of post-prison recidivism was obtained from a series of multi−state recidivism reports generated by the U.S. Department of Justice, Bureau of Justice Statistics (e.g., Durose, Cooper & Snyder, 2014). The three recidivism outcomes measured include an arrest for a new crime, which does not include violations on supervision or other legal requirements that are not actual new crimes against persons or property, a conviction for a felony offense which are punishable by a state prison sentence, and if the individual returned to Florida's prison system for any reason. Several measures of these outcomes are used in the analysis and include whether they occurred within yearly intervals of post-prison release for one, two, three, four, and five years and, among those inmates who recidivated, the number of months to each of the outcomes.

There are numerous factors that have been proven empirically to be highly associated with increasing or reducing the likelihood that released prisoners will recidivate, which are described in more detail below. When attempting to address the issue of whether or not inmates with any type of mental illness or a serious mental illness has a unique effect on recidivism outcomes, it is imperative that as many as possible other potential influences be controlled for in the analysis. Therefore, our study incorporates a host of control measures known to influence re-entry recidivism outcomes to estimate if mental illness has a unique effect on recidivism.

We control for the demographic characteristics of inmates, including gender, race, and especially age, which are strong predictors of recidivism (Bales & Mears, 2008; Beck & Shipley, 1987; Langan & Levin, 2002). The type of crime which resulted in offenders being imprisoned and their prior criminal record have also been found to influence re-entry outcomes, therefore, the current crime is measured here through nine different crime types and prior criminal record is quantified by the number of prior arrest events and prison commitments (Bales & Mears, 2008; Langan, *et al*., 2003; Putnins, 2005). Studies which have examined the relationship between the length of time inmates served in prison and recidivism have found mixed results from no effect (Beck & Shipley, 1987; Langan, *et al*., 2003), to a positive effect (Visher *et al*., 1991), and a negative relationship (Bales & Mears, 2008; Beck & Shipley, 1997). Therefore, we include a measure of time served in prison in months.

Institutional adjustment and the degree to which inmates follow institutional rules are related to post-prison behavior (Chen & Shapiro, 2007; Kohl *et al*., 2008; Mears & Bales, 2009) and is measured here through the custody level at release, if the inmates were in close management confinement, and the prevalence of disciplinary infractions during their entire period of imprisonment and if they committed an infraction during the last year of their incarceration (Mears & Bales, 2008). Due to the findings of prior research (Florida Department of Corrections, 2013b), a measure of the extent to which inmates are physically or psychologically dependent on drug and their educational level based on their grade level equivalency derived from the Test for Adult Basic Education (TABE) are employed. The presence and the number of tattoos inmates have has been found to be related to increasing recidivism rates among released inmates and therefore, the number of tattoos was included as a control variable (Bales, Blomberg, & Waters, 2013) along with in-prison visitation being associated with lower recidivism rates (Bales & Mears, 2008). Finally whether inmates were under some form of community supervision post-prison was accounted for in the analysis.

Analytic Strategies

Beyond descriptive statistics in the form of percentages and means, we use two statistical model methods to determine the empirical relationship between mental illness among released inmates and recidivism. The first statistical strategy used is commonly called survival analysis but is technically termed Proportional Hazard Models. Two measures are used in this technique. First, whether or not cases are "censored", i.e., they fail anytime during the follow-up period or do not fail. Second the duration from when the case is available to fail, released from prison in our case, to when they do fail or, among cases that do not fail, to the last follow-up date. We measured duration in months. This method therefore provides the ability to quantify the effect of some condition, like mental

illness, or some intervention such as some type of treatment, on not just whether inmates recidivate but also whether these conditions delay the onset of recidivism.

Second, binary logistic regression is used when the outcome of interest is whether or not released inmates recidivate within some period of time (=1) or do not recidivate (=0) (Allison, 1991; DeMaris, 1992; Menard, 1995). These models provide a quantification of the relative effect of inmates having a mental illness diagnoses on the probability of recidivism within the five yearly timeframes compared to inmates who do not have a diagnoses after controlling for all of the independent variables just described.

V. FINDINGS

Demographics

We begin the findings from the empirical assessment of the relationship between mental illness among released prisoners with a summary of the independent mental health variables and the control variables used in the multivariate analysis later to determine the unique effect of mental illness upon recidivism. Approximately 20 percent of the prison population included in the sample (200,889 offenders) was diagnosed with either an Axis I or an Axis II mental disorder. Of those, 27 percent were diagnosed with a serious mental illness. As demonstrated in Table **1**, the majority of the population is male (87.4%), however it is notable that the percent of female offenders in the population increases when limited to only those diagnosed with a mental illness (26.6%), suggesting women are more likely to receive a diagnosis. Approximately 49 percent of the population is Black, and 6 percent are Hispanic. Additionally, the largest majority of subjects were imprisoned for a drug offense (31.2%) and approximately 60 percent had experienced prison commitments prior to the most recent prison commitment. The average time spent in prison was just over two years (25.6 months).

We next provide descriptive statistics relating to the dependent recidivism measures based on the timing to failure and whether releasees failed within annual periods post-release from one to five years (displayed in Table **2**). When examining the dependent variables across the entire population, over 67 percent were rearrested within the five-year follow-up period. The average time to arrest after release was just under 16 months. Approximately 40 percent of the offenders were convicted of a new crime within the follow-up period, with an average of 20 months from release to conviction. Further, just over 39 percent of the population was re-imprisoned within five years of release. There was an average of 36 months between release and imprisonment.

In addition to the demographics of the sample overall, the offenders were also separated into those with and without a mental health diagnosis in order to assess differences between the groups across the control variables. The results show that the two groups differed substantially across nearly all of the characteristics (Tables available upon request). These results are salient in the context of numerous previous recidivism studies that have consistently found these same factors significantly influence post-prison recidivism outcomes. In other words, the soundness of our findings relative to whether mental illness among incarcerated populations and the seriousness of those conditions have a direct effect on post-prison re-offender are enhanced.

To answer the specific research questions articulated earlier in the paper, we turn to multivariate Proportional Hazard survival models to determine the unique effect of inmate mental illness on the likelihood and timing to recidivism and logistic models to examine the unique effect of mental illness on the likelihood of recidivism within annual follow-up periods from one to five years.

Survival Analysis

The variables listed in Table **1** were incorporated into a multivariate proportional hazard survival model for each of the three dependent variables, as displayed in Tables **3** and **4**. Table **3** displays the results for when the independent variable of any mental health diagnosis was included in the model. These findings indicate that the presence of a mental health diagnosis is significantly likely to increase the likelihood of and hasten the occurrence of re-arrest, re-conviction, and re-imprisonment. More specifically, at any point in time, the likelihood of being rearrested among inmates with a mental health diagnosis is 14.2 percent greater than the likelihood among those without a diagnosis. This pattern continues with a hazard ratio of 1.142 for re-conviction, and 1.135 for re-imprisonment. Race, ethnicity, and age were also significant in this direction, with black, Hispanic, and older offenders more likely to reoffend sooner than white and younger offenders. This was additionally the case with prior prison

Table 1: Descriptive Statistics of Independent and Control Variables

	Number	Percent/Mean
All Cases	200,889	
Independent Variables		
Mental Health Diagnosis		
No	160,744	80.0%
Yes	40,145	20.0%
Serious Mental Health Diagnosis		
Non-Serious Mental Health Diagnosis	29,319	73.0%
Serious Mental Health Diagnosis	10,826	27.0%
Control Variables		
Gender:		
Male	175,528	87.4%
Female	25,528	12.6%
Race/Ethnicity:		
White	88,924	44.3%
Black	98,776	49.2%
Hispanic	13,189	6.6%
Age at Prison Release	200,889	34.6
Primary Offense at Prison Admission		
Murder/Manslaughter	2,983	1.5%
Sex Offense	7,784	3.9%
Robbery	12,639	6.3%
Other Violent	26,456	13.2%
Burglary	28,077	14.0%
Property	31,614	15.7%
Drugs	62,659	31.2%
Weapons	6,892	3.4%
Other Offenses	21,785	10.8%
Prior Arrest Events	200,889	13.6
Prior Prison Commitments	200,889	.6
Time Served in Prison (months)	200,889	25.6
Close Management Confinement	3,455	1.7%
Custody Level Community	25,195	22.3%
Custody Level Close	44,882	12.5%
Disciplinary Infractions Per Month Served	200,889	.1
Disciplinary Infraction Within Last Year	75,617	37.6%
Substance Abuse Issue Scale (DSSI)	200,889	2.7
Educational Level	200,889	7.3
Number of Tattoos	200,889	2.9
Gang Member-Suspected or Confirmed	107,769	5.4%
Visits Per Month Served	200,889	.3
Post-Prison Supervision	63,903	31.8%

Table 2: Descriptive Statistics of Dependent/Recidivism Variables

	Number	Percent/ Mean
All Cases	200,889	
Arrest		
If Failed During Follow-up Period	135,612	67.5%
Months to Arrest (Only Failures)	135,612	15.9
Within One Year	76,005	37.8%
Within Two Years	105,501	55.6%
Within Three	118,433	67.2%
Within Four Years	124,548	75.2%
Within Five Years	127,857	81.8%
Conviction		
If Failed During Follow-up Period	82,098	40.9%
Months to Conviction Among Failures (Average)	82,098	20.2
Within One Year	35,039	17.5%
Within Two Years	53,260	28.3%
Within Three	58,436	36.1%
Within Four Years	56,525	41.8%
Within Five Years	50,253	46.4%
Imprisonment		
If Failed During Follow-up Period	79,266	39.5%
Months to Imprisonment (Only Failures)	79,266	37.2
Within One Year	22,692	11.9%
Within Two Years	38,906	22.7%
Within Three	45,407	32.9%
Within Four Years	44,193	39.8%
Within Five Years	37,947	45.0%

commitments and several other control variables. However factors such as gender, post-release supervision, and offense type were significantly associated with a delay in all categories of reoffending.

The second set of models included in Table **4** assess the effects of a diagnosis of serious mental illness compared to those with any other mental health diagnosis on the timing to recidivism. On all three outcomes—re-arrest, re-conviction, and re-imprisonment—there was a significant positive association between serious mental illness and recidivism. At any given time during the follow-up period, the likelihood of re-arrest among inmates with a serious mental illness is 4 percent greater than the likelihood among for those with a non-serious diagnosis. In addition, the likelihood for re-conviction was 3 percent greater, and the likelihood for re-imprisonment was approximately 6 percent greater. In sum, receiving a serious diagnosis, versus any other diagnosis was found to hasten the likelihood of recidivating. The relationship between the control variables and the outcomes was similar to the models in Table **3** in terms of race, ethnicity, age, and gender. However, unlike the prior models, prior prison commitment was only significant with the re-conviction outcome, increasing the hazard of recidivism by approximately 5 percent. Overall, the survival models document that a mental health diagnosis increases and hastens the likelihood of recidivating.

Logistic Regression

In addition to survival models, we also created logistical regression models for each of the three recidivism outcomes at 1-year, 2-year, 3-year, 4-year,

Table 3: Proportional Hazards Models: Effect of Mental Illness on Recidivism

Variables	Arrest		Conviction		Imprisonment	
	Coefficient	Hazard Ratio	Coefficient	Hazard Ratio	Coefficient	Hazard Ratio
Any Mental Health Diagnosis	.138***	1.148	.133***	1.142	.126***	1.135
Male	-.055***	.947	-.049***	.953	-.099***	.906
Black	.057***	1.058	.021**	1.021	.002	1.002
Hispanic	.010***	1.105	.075***	1.078	.102***	1.107
Age at Prison Release	.004***	1.004	.001***	1.001	.007***	1.007
Murder/Manslaughter	-.056*	.946	-.017	.984	.013	1.013
Sex Offense	-.136***	.872	-.107***	.898	-.146***	.864
Robbery	-.068***	.934	-.046**	.955	-.022	.978
Other Violent	-.056***	.946	-.045***	.956	-.007	.993
Burglary	-.002	.998	.005	1.005	.028*	1.028
Drugs	-.004	.996	.009	1.009	.040***	1.041
Weapons	-.002	.998	-.265***	1.080	.124***	1.132
Other Offenses	-.015	.985	.077***	1.026	.046***	1.047
Prior Arrest Events	.000	1.000	.000	1.000	-.004***	.996
Prior Prison Commitments	.045***	1.046	.056***	1.057	-.006	.994
Time Served in Prison	.000	1.000	-.000**	1.000	.000	1.000
Close Management Confinement	.027	1.027	.107***	1.113	.128***	1.137
Custody Level Community	-.147***	.863	-.139***	.870	-.139***	.870
Custody Level Close	-.018	.982	.004	1.004	.036***	.964
Disciplinary Infractions	-.340***	.721	-.253***	.776	-.384***	.681
Disciplinary Infractions-3 Months	.035**	1.035	.020**	1.020	.011	1.011
Substance Abuse Scale	.008*	1.008	.006*	1.006	.003	1.003
Educational Level	-.003*	.997	-.005***	.995	-.002*	.998
Number of Tattoos	.031***	1.032	.020***	1.021	.025***	1.026
Gang Member-Suspected/Confirmed	.099***	1.105	.149***	1.611	.019	1.019
Visits Per Month Served	.101***	1.107	.100***	1.105	.129***	1.138
Post-Prison Supervision	-.019*	.982	-.027***	.974	-.052***	.949
Number of Cases	200,889		200,889		200,889	

Notes: *p<.05, **p<.01, **p<.001, Reference categories: white, property offense, custody level minimum/medium. The arrest recidivism measure used in this analysis was an arrest for a criminal offense, i.e., technical violations of supervision, failing to register as a felon, etc. were excluded. However, models using different measures of arrest for recidivism outcomes, including arrest for any reason and arrest for a felony crime produced similar results to those reported here.

and 5-year follow-up periods (results presented in Table **5**). We begin by examining the models that included any mental health diagnosis as the key independent variable. Mental illness had a significant positive association with re-arrest at all five follow-up periods, ranging from 9 percent greater odds of re-arrest at one year and nearly 15 percent greater odds at five years. Mental illness was only significant through the first four years of the follow-up period for the re-conviction outcome. The power of this association decreased with each year, with the odds of re-conviction being six percent higher at one year, but only about four percent higher at four years. A similar trend of decreasing effect occurred with the re-imprisonment outcome. At the one-year follow-up, individuals with a mental illness diagnosis are nearly seven percent more likely to be re-imprisoned than those without a diagnosis. This increased likelihood goes down to just under four percent by the five-year follow-up period. In summary, any mental health diagnosis increases the likelihood that an offender will recidivate after release. However, with re-arrest the

Table 4: Proportional Hazards Models: Effect of Serious Mental Illness on Recidivism

Variables	Arrest		Conviction		Imprisonment	
	Coefficient	Hazard Ratio	Coefficient	Hazard Ratio	Coefficient	Hazard Ratio
Serious Mental Health Diagnosis	.041*	1.042	.029*	1.030	.056***	1.058
Male	-.187***	.830	-.173***	.841	-.221***	.802
Black	.189***	1.080	.052**	1.053	.002	1.002
Hispanic	.126***	1.134	.088***	1.092	.113***	1.120
Age at Prison Release	.006***	1.006	.005***	1.005	.009***	1.009
Murder/Manslaughter	-.013	.987	-.033	.968	-.008	.992
Sex Offense	-.087*	.917	-.099**	.905	-.143***	.867
Robbery	-.093*	.911	-.082**	.921	-.006	.942
Other Violent	-.008	.992	-.017	.984	.013	1.014
Burglary	-.010	.990	-.024	.976	-.022	.978
Drugs	.044	1.045	.009	1.009	.021	1.021
Weapons	-.039	.961	.011	1.011	.069	1.071
Other Offenses	-.002	.998	.004	1.004	.016	1.017
Prior Arrest Events	.001	1.001	-.001	.999	-.004***	.996
Prior Prison Commitments	.025	1.025	.049***	1.050	-.004	.996
Time Served in Prison	.001***	1.001	.000*	1.000	.000	1.000
Close Management Confinement	-.020	.980	-.088*	1.092	.102*	1.108
Custody Level Community	-.145***	.865	-.124***	.883	-.133***	.875
Custody Level Close	.023	1.023	.025	1.025	.010	.990
Disciplinary Infractions	-.141*	.868	-.094*	.910	-.197***	.821
Disciplinary Infractions-3 Months	.012	1.012	.017	1.018	.002	1.002
Substance Abuse Scale	-.009	.991	-.005	.995	-.013*	.987
Educational Level	.002	1.002	-.000	1.000	.001	1.001
Number of Tattoos	.044***	1.045	.038***	1.038	.021***	1.021
Gang Member-Suspected/Confirmed	.027	1.027	.073*	1.076	.008	1.008
Visits Per Month Served	.071***	1.074	.077***	1.080	.104***	1.106
Post-Prison Supervision	-.010	.990	-.026	.974	-.046**	.956
Number of Cases	40,145		40,145		40,145	

Notes: *p<.05, **p<.01, **p<.001, Reference categories: white, property offense, custody level minimum/medium. The arrest recidivism measure used in this analysis was an arrest for a criminal offense, i.e., technical violations of supervision, failing to register as a felon, etc. were excluded. However, models using different measures of arrest for recidivism outcomes, including arrest for any reason and arrest for a felony crime produced similar results to those reported here.

likelihood increases with time, while with re-conviction and re-imprisonment the magnitude of the likelihood of recidivism decreased with time.

The relationship is not nearly as strong when comparing those with serious mental illness against those with any other diagnosis. While survival analysis indicated strong positive significance across all three recidivism outcomes, the logistic regression models resulted in very few significant outcomes. Having a serious mental health diagnosis was only significant at the one and two-year follow-up periods for re-arrest. Those with a serious diagnosis have 12.7 greater odds of being arrested at the one-year mark than those with less serious diagnoses, and 9.6 percent greater odds to be arrested at the two-year follow-up. Serious mental illness was only significant at the five-year follow-up period for re-conviction. However, this relationship was in the opposite direction. Offenders with a serious mental illness had a 10.5 percent lesser odds of being reconvicted within five years. There was no significant relationship between serious mental illness and re-imprisonment at any of the five time points.

Table 5: Effects of Mental Health on Recidivism: Hazard Ratios from Proportional Hazards Models and Odds Ratios from Logistic Models

Recidivism Measure	Type of Model	Mental Health Measure	
		Any Diagnosis	Serious Diagnosis
Arrest	Survival Model	1.148***	1.042*
	Logistic Models:		
	One Year	1.095***	1.127***
	Two Years	1.082***	1.096***
	Three Years	1.091***	1.108
	Four Years	1.128*	1.042
	Five Years	1.148***	1.110
Conviction	Survival Model	1.142***	1.030*
	Logistic Models:		
	One Year	1.067***	1.017
	Two Years	1.043**	1.003
	Three Years	1.035*	.969
	Four Years	1.039*	.943
	Five Years	1.031	.895**
Imprisonment	Survival Model	1.135***	1.058***
	Logistic Models:		
	One Year	1.068**	1.076
	Two Years	1.061***	1.017
	Three Years	1.034*	1.015
	Four Years	1.045**	1.014
	Five Years	1.039*	.980

VI. SUMMARY AND DISCUSSION

Prior studies of the potential relationship between inmate mental illness and recidivism have reported mixed and inconclusive findings. Moreover, these prior studies have suffered from a series of methodological shortcomings including the use of a single measure of recidivism versus multiple measures, limited post release follow-up of one to two years versus three years or more, use of small sample sizes, and employment of limited control variables known to be associated with recidivism. This study overcame these methodological shortcomings by employing multiple measures of recidivism, extending post-release follow-up from one and two years to three, four, and five, using a large cohort of 200,889 inmates, and applying a much more comprehensive set of control variables known to be associated with recidivism. The study's four research questions and a brief summary of the findings follow:

Research Question 1: Does a mental health diagnosis have a negative, positive, or a null effect on the likelihood of post-prison recidivating?

Survival analysis found in all of the models that there was a significant positive association between any mental health diagnosis, and particularly a serious mental health diagnosis and the likelihood of recidivating after release. When the models were broken down by year in the logistic regression models, the majority of the associations between any mental health diagnosis and the recidivism measures were positively significant. However, serious mental health diagnosis only had a significant positive association with the first two follow-up years on re-arrest, and had a negative association with the final follow-up year on re-conviction. All other associations had a null effect. Therefore, overall the answer to the first question is that a mental illness diagnosis does have a positive effect upon post-release recidivism.

Research Question 2: Does a mental health diagnosis have a differential affect on different measures of recidivism, primarily in terms of re-arrest, re-conviction, and re-incarceration?

Survival analysis found similar effects across all three recidivism outcomes for both independent variables: any mental health diagnosis, and serious

mental health diagnosis. However, logistic regression models did find differential effects across the recidivism measures. With any mental health diagnosis, the odds of re-arrest increased with each follow-up period, while the higher odds of recidivating decreased with time on the re-conviction and re-imprisonment measures. In contrast, a diagnosis of serious mental illness was only significant on re-arrest and re-conviction.

Research Question 3: Does a mental health diagnosis differentially affect the timing to recidivism?

The positive association found in all of the survival analysis models suggests that both the presence of any mental illness, and more particularly a serious mental illness, increased the likelihood that an offender would recidivate after release.

Research Question 4: Are offenders with serious mental illness (Major Depressive Disorder, Bipolar, Schizophrenia, or Psychotic Disorders) more, less, or no more likely to recidivate relative to those with a less serious mental illness?

Both the survival models and the logistic regression models indicate that individuals diagnosed with a serious mental illness, rather than just any mental health diagnosis, were more likely to recidivate, and recidivate sooner. This relationship is supported on all three recidivism outcomes with survival analysis. However it is only supported on the re-arrest measure for the logistic analysis. Therefore, overall, a diagnosis of serious mental illness does have a positive effect on recidivism that declines over time. This declining result for those with more severe mental health issues may reflect the fact that these inmates receive more in-prison and post-release mental health services than those inmates less serious mental health issues.

The findings reported in this study on the positive relationship between inmate mental illness diagnoses and recidivism raise a number of research and policy implications regarding the potential/value of in-prison and reentry mental health programs and services. Mental illness among inmates increases their likelihood to recidivate. As a result, in-prison and community mental health systems need to be sufficient in capacity, as well as coordinated and integrated. Not only are mental health in-prison programs and services needed but these programs and services must be aligned and coordinated with community mental health services that provide inmates and prison releasees with a mental health “continuum of care” based upon “best practices” for successful reentry. Collaboration between correctional and community mental health service providers is essential with information sharing protocols, and the employment of recognized standards for in-prison and community mental health practices. (Lurigio & Harris, forthcoming)

Regarding recommendations for future research, it is important to note that while this study has advanced the existing scientific evidence regarding the effect of any type of mental health diagnoses and serious diagnoses specifically on recidivism, there is a need for similar research in other states or federal prison settings to determine if these findings occur under different conditions. Clearly, subsequent research that is focused upon the in-prison and early reentry experiences of inmates with serious mental health diagnoses would be timely and valuable to the overall effort to better align and coordinate in-prison and reentry mental health programs and services for this particular “high recidivism risk” group of inmates. Additionally, further examination is needed relative to whether specific mental illness diagnoses and if dual diagnoses of mental illness and substance abuse dependence result in even greater rates of post-prison re-offending. It is also very important from the perspective of making decisions relative to the allocation of limited mental health services within correctional settings that future research in this area examine the impact of mental illness on recidivism across various types of inmates returning to their communities. Specifically, determining if the effect of mental illness on recidivism is different across gender, racial, and age groups as well as typologies of past criminal offending and incarceration experiences, would be invaluable to practitioners and policy makers in maximizing the effectiveness of their limited mental health treatment expenditures and human resources.

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