Co-Occurring Substance Use Disorder and Mental Illness in Criminal Offenders

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Abstract

The high rate of comorbid substance use disorder and other mental illness (“dual diagnosis”) poses an enormous obstacle to public policy and sentencing in criminal cases. It is estimated that almost half of all Federal, State, and jail inmates suffer from dual diagnosis – a significantly higher prevalence than in the general population. Yet such inmates lack access to proper and effective treatments for their conditions. Several etiological theories have been put forth to explain the occurrence of dual diagnosis in general. However, virtually no studies have explored possible etiological reasons for the higher prevalence of dual diagnosis specifically in criminal offenders. This remains a vastly understudied cross-section of science and law. Research in this area could help to improve assessment and treatment of dual diagnosis in criminal offenders, thereby reducing the associated costs of incarceration and recidivism to society as well as improving quality of life and overall well-being for this population.
I. INTRODUCTION

The strong link between substance use and crime, and to a lesser extent other mental illness and crime, is well established not only by the vast number of incarcerated offenders who suffer from substance use disorder or mental illness, but also from the high rates of recidivism associated with each. Over the past few decades the majority of jurisdictions have attempted to tackle this public policy issue with innovative approaches to sentencing such as the use of specialized courts, for example Drug Courts and Mental Health Courts, which typically have jurisdiction over drug offenses and those assessed to be mentally ill, respectively. Despite these efforts, however, too few criminal offenders receive treatment. For example, in 2005 only one-third (1/3) “of State prisoners with mental health problems had received treatment since admission” into a state prison.

More recently, society has begun to realize another obstacle to public policy in the realm of criminal law. The high rate of comorbidity of substance use disorder and other mental illness, called “dual diagnosis,” in criminal offenders has come to light, posing a new challenge for the criminal justice system. In 2006 the Bureau of Justice Statistics estimated that nearly

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1 See Marlowe, Douglas B. (2003). Integrating substance abuse treatment and criminal justice supervision. Sci. Pract. Perspect., 2(1), 4-14 (“More than 50 percent of violent crimes, including domestic violence, 60 to 80 percent of child abuse and neglect cases, 50 to 70 percent of theft and property crimes, and 75 percent of drug dealing or manufacturing offenses involve drug use on the part of the perpetrator” (citing the National Institute of Justice, 1999))
3 James & Glaze, supra note 2, at 1
three-quarters of all inmates with mental health problems also met the DSM-IV criteria\textsuperscript{4} for dependence or abuse of alcohol or drugs. Specifically, 76\% of local jail inmates, 74\% of State prisoners, and 64\% of Federal prisoners with mental health problems had co-occurring substance abuse or dependence at midyear 2005.\textsuperscript{5} In other words, just under half of all inmates suffer from co-occurring substance and mental health problems.\textsuperscript{6}

Along with the high prevalence of and lack of treatment for dual diagnosis among criminal offenders, evidence further suggests that dual diagnosis is associated with substance relapse and recidivism.\textsuperscript{7} Thus, proper assessment and treatment of such offenders by the criminal justice system is necessary to improve public safety, decrease costs of the criminal justice system including the high cost of imprisonment and costs associated with recidivism, and to improve the lives of those who suffer from mental health problems.

II. Method

Law review articles were found using the following search terms: (“dual diagnosis” or “comorbid mental illness” or “comorbid substance use”) and “criminal offender.” Other articles

\textsuperscript{4} The DSM, or Diagnostic and Statistical Manual of Mental Disorders, classifies mental disorders and aids clinicians in diagnosis as well as researchers across many disciplines. Due to the newness of the current edition of the DSM – the DSM-5 – the vast majority of studies utilize DSM-IV and DSM-III criteria.

\textsuperscript{5} Id.

\textsuperscript{6} E.g., for State prisoners, 56\% of inmates have mental health problems, 76\% of which have both substance use problems and mental health problems meaning that approximately 43\% of all State inmates have both substance use problems and mental health problems.

and studies were found using the same search terms with and without “criminal offender.”

Statistical data on the rates of mental illness and substance use disorder as well as recidivism among criminal offenders were found from the Bureau of Justice Statistics. Articles and studies were reviewed and analyzed for trends as well as points of divergence.

III. EPIDEMIOLOGY OF DUAL DIAGNOSIS IN CRIMINAL OFFENDERS

Substance use and mental illness occur at considerably higher rates in criminal offenders than in the general public. Estimates for 12-month prevalence rates for any mental illness within the general United States population range from 18.6% to 32.4% among adults. In comparison, the approximate 12-month prevalence rate of mental illness among criminal offenders may be as high as 55.3%. The Bureau of Justice Statistics (BJS) estimates that over half (approximately 56%) of State inmates had a mental health problem in 2005. The estimates for Federal inmates and jail inmates are 46% and 64%, respectively. The BJS based its assessment on two measures: (1) recent history of a mental health problem indicated by clinical diagnosis or treatment by a mental health professional within the previous 12 months; or (2) symptoms of a mental health problem based on DSM-IV criteria.

A chi square test comparing the prevalence of inmates with any mental illness to the prevalence of mental illness in the general population in a 12-month period yields a statistically

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9 See James & Glaze, supra note 2

10 ld. at 1

11 Id.
significant difference in rate of mental illness, even when the high estimate for the general population is used.\textsuperscript{12} Due to the large difference in the total number of individuals in each sample, choosing a sample of 100 for each group and using their respective percentages to determine number of individuals with and without mental illness still results in a statistically significant difference at \( p<0.01 \). Thus, mental illness affects a significantly larger portion of inmates than it does the general population. It is important to note that the BJS data looks only at inmates and not all criminal offenders such as those who receive probation and no jail time and those who have not come into contact with the criminal justice system. However, except for offenders who receive only probation, this limitation should minimally affect analyses of how the criminal justice system should address the issue of mental illness among criminal offenders since the reach of the criminal justice system extends only to those offenders who come into contact with it.

Comorbid mental illness and substance use disorder is also grossly overrepresented in the prison and jail populations. This could be due in part to the high rate of mental illness among criminal offenders. However, the 12-month prevalence of comorbid mental illness and substance use disorder among criminal offenders is even higher than the 12-month prevalence rate in the general population, and is more similar to that of clinical populations.

\textsuperscript{12} Number of each population was obtained from the BJS 2006 Special Report on the mental health of inmates and from the National Comorbidity Study Replication 12-month prevalence estimates at \url{http://www.hcp.med.harvard.edu/ncs/}. The percentages used to calculate number of individuals with and without mental illness were 55.3\% and 32.4\%, respectively.
The rate of comorbid substance use disorder in individuals with mental illness in the general population is slightly less than half.\textsuperscript{13} In clinical populations, as many as 72.0\% of patients with mental illness may also have a substance use disorder.\textsuperscript{14} In comparison, according to the 2006 BJS Special Report, the percentages of inmates with mental illness who also met criteria for either substance abuse or dependence of any alcohol or drugs mid-year 2005 were 74.1\% for State prisoners, 63.6\% for Federal prisoners, and 76.4\% for local jail inmates, which averages to approximately 71.4\% of all inmates.\textsuperscript{15} Furthermore, in all three populations, a higher percentage of inmates suffered from the more severe diagnosis of dependence than from abuse.\textsuperscript{16,17}

While comorbidity of mental illness and substance use disorder is associated with a more persistent, severe, and treatment-resistance course compared to single disorders,\textsuperscript{18} this combination appears to be particularly potent among the criminal offender population. For example, Ruiz et al. (2012) found that criminal offenders with co-occurring mental illness and substance use disorder committed their first offense at a significantly younger age than offenders without a single disorder.\textsuperscript{19} The researchers also found that the offenders in their


\textsuperscript{14} Bennett et al., supra, at 48

\textsuperscript{15} James & Glaze, supra note 2, at 5

\textsuperscript{16} Id.

\textsuperscript{17} The DSM-5 no longer makes the distinction between “abuse” and “dependence,” and rather classifies such disorders under “substance use disorder” and specifies severity based on the number of criteria met

\textsuperscript{18} Bennett et al, supra note 11, at 54

\textsuperscript{19} Ruiz et al., supra note 6, at 81-82
sample with co-occurring disorders had committed a significantly greater number of violent offenses than those without co-occurring disorders.\textsuperscript{20}

Furthermore, recidivism among criminal offenders is high. The 2014 BJS Special Report on recidivism estimated that over two-thirds, or 67.8\%, of released prisoners are re-arrested within 3 years of release, and as many as 76.6\% are re-arrested within 5 years of release.\textsuperscript{21} Due to the high prevalence of mental illnesses and substance use disorders among inmates as well as evidence suggesting those with comorbid mental illness and substance use disorder have committed significantly more offenses than those without comorbidity, it is likely that dually diagnosed offenders drive a significant amount of recidivism. Thus, untreated comorbidity poses a huge obstacle to reduction of recidivism.

IV. ETIOLOGICAL THEORIES OF DUAL DIAGNOSIS

Temporally, mental illness typically arises in an individual prior to any substance use disorder, particularly when it comes to anxiety disorders and conduct disorder.\textsuperscript{22} Anxiety and externalizing disorders, such as conduct disorder, often begin between middle childhood and early adolescence, whereas substance use disorders tend to begin between late adolescence and early adulthood.\textsuperscript{23} The difference between the age of onset for such primary mental disorders and subsequent substance use disorder typically ranges from 5 to 10 years.\textsuperscript{24}

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\textsuperscript{20} Id. at 82
\textsuperscript{21} Durose et al., supra note 2, at 1
\textsuperscript{22} Kessler, supra note 11, at 731
\textsuperscript{23} Id.
\textsuperscript{24} Id.
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Several etiological theories of dual diagnosis have been proposed. The theories are not necessarily mutually exclusive, and it is widely assumed that more than one theory may account for comorbidity in any given individual and that different theories may also apply to different groups of people. Mueser et al. (1998) explore four general models regarding the etiology of dual diagnosis. These four models consist of common factor models, secondary substance use disorder models, secondary psychiatric disorder models, and bidirectional models.

Common factor models posit that comorbid substance use disorder and other mental illness results from shared vulnerabilities, or risk factors. Such risk factors could include shared genetic vulnerabilities, socioeconomic status, or antisocial personality disorder, among others. There is evidence to suggest that shared etiology initially contributes to comorbidity of multiple substance use disorders in adolescents, but that such shared etiology diminishes over time as individuals reach adulthood. Burt, Krueger, Mcgue, & Iacono (2003) postulate that parent-child conflict, along with other common genetic and environmental factors, “[acts] as a common vulnerability that increases risk for multiple childhood disorders,” particularly for externalizing disorders such as attention-deficit/hyperactivity disorder (ADHD), oppositional

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26 *Id.* at 718
27 *Id.* at 718-722
defiant disorder (ODD), and conduct disorder (CD). Lahey et al. (2012) further postulate that the fact that all mental disorders, including substance use disorder, appear to correlate with a “general bifactor” supports “the hypothesis that these prevalent forms of psychopathology have both important common and unique features,” possibly because they share etiological and neurobiological elements.

None of these theories, however, explain the high rate of comorbidity specifically of substance use disorders with other mental illness. While Mueser et al. assert that evidence for shared genetic vulnerabilities between serious mental illness (SMI) and substance use disorder from family history studies, as well as from twin studies, is “overwhelming,” other researchers have more recently expressed skepticism for common fact models of dual diagnosis. Bennett et al. (2014) point out that reviews of family, twin, and adoption studies tend to suggest that substance use disorders and other mental illnesses are transmitted separately. Similarly, Gregg, Barrowclough, & Haddock (2007) have concluded that, in light of conflicting studies and failure to identify any common genes or neurobiological mechanisms among individuals with schizophrenia and comorbid substance use disorder, little empirical evidence exists for the common factor model of etiology at least for that subset of dually diagnosed individuals.

However, evidence for shared genetic vulnerabilities among substance use disorders or other

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31 Mueser et al., *supra* note 23, at 719

32 Bennett et al., *supra* note 11, at 72-73

mental illness does seem stronger for externalizing disorders such as conduct disorder and antisocial personality disorder, as opposed to internalizing disorders such as depression.\(^3^4\)

Thus, Bennett et al. propose that multivariate models may better account for common factors in dual diagnosis. For example, in the case of bipolar disorder and comorbid substance use disorder “a family history of psychopathology inspires both dysfunctional family interactions and the inheritance of deviant personality traits that are associated with the development of both.”\(^3^5\) Mueser et al. lists several common risk factors that might be involved in a multivariate approach including dysphoria, “social isolation, poor interpersonal skills, poor cognitive skills, school and vocational failure, poverty, lack of adult role responsibilities, lack of structured daily activities, association with deviant subgroups, and living in a neighborhood with high rates of drug availability.”\(^3^6\)

Secondary substance use disorder models postulate that mental illness is itself a risk factor for development of a subsequent substance use disorder.\(^3^7\) Sub-models include psychosocial risk factor sub-models, such as self-medication and alleviation of dysphoria, and the biologically based super-sensitivity model.\(^3^8\) Psychosocial risk factor sub-models contend that substance use disorders develop secondary to other mental disorders due to interaction with both social and psychological factors. For example, under the self-medication theory individuals with mental disorders attempt to alleviate distressing symptoms by self-

\(^3^4\) Kessler, *supra* note 11, at 732
\(^3^5\) Bennett et al, *supra* note 11, at 73 (Multivariate models may consider a number of different factors including, but not limited to, those already discussed, neurophysiology, and postnatal development factors such as family stress)
\(^3^6\) Mueser et al., *supra* note 23, at 723
\(^3^7\) *Id.* at 722
\(^3^8\) *Id.*
administering specific substances. Self-medication may better explain comorbidity of substance use disorders with some mental disorders, such as anxiety and other mood disorders, as opposed to others.\textsuperscript{39}

Self-medication theories generally require specificity between the substance and the symptom sought to be relieved, an element harnessing little empirical support.\textsuperscript{40} This assumption greatly limits self-medication theories because, although the effects of substances vary, common neurobiological pathways, particularly those involved in reward regulation, operate across most, if not all, substances of abuse.\textsuperscript{41}

This limitation is partially taken into account by the alleviation of dysphoria model, which proposes a broader-spectrum model of substance use disorder that arises when individuals self-administer psychoactive substances in order to “feel good” or alleviate “feeling bad” in general.\textsuperscript{42} This model may be particularly relevant to comorbid psychosis and substance use disorder.\textsuperscript{43} The multiple risk factors model, discussed above, which postulates that mental illness is associated with multiple risk factors that create a greater vulnerability to substance use disorder, subsumes the alleviation of dysphoria model.\textsuperscript{44} Finally, the social facilitation


\textsuperscript{40} Mueser er al., supra note 23, at 722


\textsuperscript{42} Mueser et al., supra note 23, at 723

\textsuperscript{43} Gregg et al, supra note 31, at 505

\textsuperscript{44} Mueser et al., supra note 23, at 723
model suggests that individuals with severe mental disorders that impair social and interpersonal skills may use substances to help facilitate social engagement that would otherwise be stressful or avoided.  

The biologically based super-sensitivity model emphasizes the interaction between psychobiological vulnerability (e.g., genetics) and environmental stress. This model suggests that individuals with mental illness may experience negative effects of substances to a greater extent than those without mental illness and are at an increased risk of developing a comorbid substance use disorder. Gonzalez et al. (2007), however, did not find support for this hypothesis and found that individuals with dual diagnosis were similar to individuals with substance use disorder only in terms of their substance use.  

Some researchers have proposed another biologically based model suggesting that neurological deficits and abnormalities associated with mental illness may predispose affected individuals to developing a substance use disorder as well. Applying this model, evidence suggests that abnormalities in neural circuitry associated with schizophrenia affect regulation of positive reinforcement, incentive motivation, behavioral inhibition, and addictive behavior,

45 Bennett et al., supra note 11, at 75  
46 Mueser et al., supra note 23, at 723-724  
48 Id. at 487  
49 Bennett et al., supra note 11, at 76
thereby increasing the risk of some with schizophrenia to develop a subsequent substance use disorder.\textsuperscript{50}

Secondary psychiatric illness models theorize that primary substance use increases vulnerability to the development of mental illness, or precipitates mental illness via mechanisms such as behavioral sensitization and kindling.\textsuperscript{51} For example, several studies suggest a possible link between cannabis and subsequent development of schizophrenia.\textsuperscript{52} Mueser et al. postulate that behavioral sensitization and kindling mechanisms may play a role in such development.\textsuperscript{53} Behavioral sensitization occurs when increased sensitivity of response to a psychoactive substance results from repeated or continuous administration.\textsuperscript{54} Kindling refers to increased electrophysiological and behavioral responses due to such administration.\textsuperscript{55} However, both prospective follow-up studies of substance users and studies of long-term psychosis following substance abuse are wrought with limitations and alternative explanations, and provide little definitive support.\textsuperscript{56}

Bidirectional models posit a reciprocal relationship between the effects of mental illness and substance use disorder.\textsuperscript{57} For example, substance use could trigger the development of a mental illness, the maintenance of which would be supported by continued substance use. Alternatively, mental illness could trigger the development of a substance use disorder, and the

\textsuperscript{51} Mueser et al., \textit{supra} note 23, at 725
\textsuperscript{52} Gregg et al, \textit{supra} note 31, at 495
\textsuperscript{53} Mueser et al., \textit{supra} note 23, at 725
\textsuperscript{54} \textit{Id.}
\textsuperscript{55} \textit{Id.}
\textsuperscript{56} \textit{Id.} at 725-727; Gregg et al., \textit{supra} note 31, at 497-500
\textsuperscript{57} Mueser et al., \textit{supra} note 23, at 727
mental illness could subsequently maintain the substance use disorder, which could in turn aggravate the mental illness. Unfortunately, these models have yet to be thoroughly explored through empirical research, and research on bidirectional models provides little empirical support.

More recently, Brady & Sinha (2005) explored the role of the neurobiological effects of stress on the relationship between substance use disorders and four different mental illnesses. The researchers propose two, potentially non-exhaustive, hypotheses based on neurobiological findings regarding “molecular biology, neurotransmitter systems, and neural circuitry involved in mental illness and substance use disorders.” First, substance use disorders and other mental disorders may be different manifestations of the same, or similar, underlying neurobiological abnormalities. Second, neuro-adaptations in stress and reward circuits in the brain resulting from repeated administration of a psychoactive substance may lead to biological changes similar to biological abnormalities underlying other mental disorders.

While different substances produce a variety of different neurobiological effects depending on the specific substance used, “common neurobiological pathways operat[e] across” these differing substances. Brady & Sinha take note of several common pathways including alterations in dopamine activity in the nucleus accumbens (involved in reinforcement...
for almost all psychoactive substances), activation of corticotropin-releasing factor (CRF) and the hypothalamic-pituitary-adrenal (HPA) axis during use (related to the stress response), and changes to the CRF/HPA, as well as the noradrenergic, systems during withdrawal. These common pathways may help to explain a lack of symptom-specific substance use as well as play a role in other mental illnesses.

V. ETIOLOGICAL THEORIES OF DUAL DIAGNOSIS AND CRIMINALITY

Many different etiological theories of dual diagnosis have been proposed, and the above list is not exhaustive. Etiological theories of dual diagnosis are not mutually exclusive. Therefore, the cause of an individual’s co-occurring substance use disorder and other mental illness could be explained by any one etiological theory or combination thereof. Furthermore, associations between and mechanisms of co-occurrence of substance use disorders and other mental illnesses may vary depending on the specific mental illness at issue. However, while these theories explain possible mechanisms for the co-occurrence of substance use disorders and other mental disorders, they do not offer any explanation for the relationship between criminality and dual diagnosis.

Modestin & Wuermle (2005) propose that substance abuse increases the likelihood of criminal behavior in persons with serious mental illness. Their sample consisted of patients at the Psychiatric University Hospital of Berne and included 282 males with schizophrenia and 261

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65 Id.
males with affective disorders. Patients with no comorbid substance abuse did not differ significantly from their counterparts in the general population in terms of criminal history record and number of offenses. However, comorbid substance abuse increased the likelihood that the patient had a criminal record compared to individuals without such comorbidity. In fact, “The proportion of patients with major mental disorder who had a criminal record was almost twice as high in the case of comorbid substance abuse (50% vs. 26%).” The researchers further postulate that comorbid substance abuse may contribute to an individual engaging in criminal behavior at an earlier age as well to an increased risk of recidivism.

It is interesting to note that Modestin & Wuermle found that comorbid substance abuse was associated mainly with an increased number of drug and traffic law violations. Many of the traffic law violations likely involved the use of one of more substances, for example, driving while intoxicated (DWI). That comorbid substance use disorder may mainly contribute to an increased frequency of drug and drug-related crimes could have many implications for drug policy and sentencing. For example, treatment of dual diagnosis as opposed to incarceration for relatively minor, non-violent crimes may not only improve the well-being of the offender, but reduce future similar crimes. Further exploration is needed, however, of the relationship between dual diagnosis and specific crimes.

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67 Id. at 25-26 (The disorders were classified according to the DSM-III-R. Thus, “affective disorders” included those with bipolar disorder in addition to unipolar major depression and unipolar minor/intermittent depression, and criteria for substance abuse rather than substance use disorder, which subsumes substance abuse, was used.)
68 Id. at 26
69 Id. at 28
70 Id.
71 Id.; see also Ruiz et al., supra note 6, at 81-82
72 Modestin & Wuermle, supra note 64, at 28
Substance use may also increase the likelihood that an individual with a comorbid mental disorder will engage in criminal behavior due to the interaction of the substance’s disinhibitory effects and the individual’s susceptibility to impulsivity. Individuals with personality disorders and psychotic disorders may be particularly prone to impulsivity. If a relationship between criminality, dual diagnosis, and impulsivity exists we would expect to find a greater risk of criminal behavior in individuals dually diagnosed with substance use disorder and mental disorders that have a stronger association with impulsivity as opposed to those with a weaker association. Future research should explore the relationship between specific mental disorders of dually diagnosed individuals and criminality. It should also inquire into the difference in criminal offending and recidivism between dually diagnosed individuals with disorders strongly associated with impulsivity, such as bipolar disorder, and individuals with disorders that are less commonly associated with impulsivity, such as depression.

Mueser et al. (2006) posit that in individuals with comorbid substance use disorder and antisocial personality disorder (ASPD), criminal behavior may more likely be attributed to the early onset of full ASPD, which requires a diagnosis of previous childhood conduct disorder (CD), than to the effects of substance use. In other words, full ASPD may be an independent risk factor for criminality. Thus, full ASPD may increase an individual’s vulnerability to both substance use disorder and criminality.

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75 Id.
Similarly, Putkonen, Kotilainen, Joyal, & Tiihonen (2004) found a strong association between ASPD and homicide. However, their study looked at ASPD only in the context of both substance use disorder and other major mental disorders such as schizophrenia and schizoaffective disorder. The researchers did not look at ASPD independently or only with comorbid substance use disorder. Further, not all individuals with a mental disorder who commit crimes have antisocial personality disorder. Thus, this theory could account for only a portion of criminal offenders. Findings are similar in the case of bipolar disorder. For example, Fazel et al. (2010) found that bipolar disorder independently increases the risk for violent crime, and that such risk is further elevated by comorbid substance use disorder.

VI. Conclusion

The etiology of the relationship between dual diagnosis and criminality is unclear. The foregoing studies and analyses tend to suggest that a comorbid substance use disorder independently increases the risk that an affected individual will engage in criminal behavior, and possibly with a greater frequency and at a younger age, than those with no mental illness or mental illness alone. Further research is greatly needed, however, to explore the etiology of not just dual diagnosis, but dual diagnosis and criminal behavior. Future studies should look at

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77 Id.
79 Id. at 1325
the association between specific mental illnesses, involved substances, and type and number of crimes committed. Future research should also expand sample populations to criminal offenders who are not incarcerated.

Furthermore, there are many other theories that could explain the relationship between dual diagnosis and criminality. For example, perhaps a common factor exists among the mental illness, substance use disorder, and criminality that accounts, at least in part, for their cooccurrence. Thus far, criminality has been looked at as a result or outcome related to dual diagnosis. However, perhaps underlying criminality, or vulnerabilities associated with criminality such as impaired decision-making and deficient impulse control, increases an individual’s vulnerability to dual diagnosis. These and other hypotheses should be explored in order to better understand the relationship between dual diagnosis and criminality. A better understanding of this relationship will help to guide policy, legal reform, and sentencing decisions that can provide a great benefit to both the individual offender and to society.

Untreated dual diagnosis among criminal offenders poses a daunting obstacle to society in the form of a significantly higher risk of premature death upon release, increased and more serious crime, recidivism, and the high financial cost to society of long or repeated incarceration. Treatment options while incarcerated are limited and often not easily

accessible due to strict eligibility requirements and limited space. A greater emphasis on treatment when sentencing an offender is imperative to tackling the consequences of untreated dual diagnosis, as is the expansion of treatment options in order to accommodate the high rate of comorbidity in criminal offenders. This can be accomplished only with a better understanding of the etiological underpinnings of criminality and dual diagnosis.

83 Id.