

# Outcomes of Offenders With Co-Occurring Substance Use Disorders and Mental Disorders

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**Objective:** Whether a diagnosis of a mental disorder contributes to the risk of poorer correctional outcomes is controversial. This study aimed to clarify the extent to which mental and substance use disorders individually and in combination contribute to correctional outcomes in order to determine optimal treatment and promote public safety.

**Methods:** Differences were examined between four groups of federal offenders in Canada (N=715): those with a mental disorder only, those with a substance use disorder only, those with co-occurring mental and substance use disorders, and those with no disorder. Groups were compared on profiles, criminal histories, charges while incarcerated (institutional charges), and reconvictions after release from incarceration by using chi-square tests and Cox regression analyses that controlled for risk factors.

**Results:** Of the four groups, those with co-occurring disorders had the most substantial criminal histories and the highest rates of institutional charges, transfers to segregation while incarcerated, and reconvictions. The group with only mental disorders had outcomes intermediate between the groups with only substance use disorders and the group with neither type of disorder.

**Conclusions:** Having a substance use disorder appeared to be the key factor contributing to poorer correctional outcomes for offenders with mental disorders. Psychiatric services in correctional facilities must screen for substance use disorders and, if they are present, ensure provision of treatment to improve quality of life for this population and promote public safety.

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The term “co-occurring disorder” describes a condition in which a person is diagnosed as having both a substance use disorder and a mental disorder (1). Although individual experiences vary, substance use disorders, mental disorders, and co-occurring disorders have the potential to impede individuals’ ability to perform a variety of daily tasks, develop healthy relationships, and lead productive lives (2,3). Evidence suggests that co-occurring disorders put people at increased risk of suicide, homelessness, family conflict, social marginalization, violent and disruptive behavior, victimization, general medical problems, and criminal involvement (3). Because there are elevated rates of both substance use disorders and mental disorders in correctional populations (4–6), rates of co-occurring disorders are expected to be higher among offenders than in the general population. Furthermore, interventions targeting substance use disorders and mental disorders as separate problems may not be adequate (7). An integrated approach that treats the substance use disorder, the mental disorder, and the interaction between the two is the recommended best practice (1,7,8).

Despite the negative impact of mental illness on people’s lives, some research suggests that it may not have a strong effect on correctional outcomes. For instance, a

Canadian study found that offenders with and without severe mental disorders had similar rates of institutional misconduct and a similar volume of criminal history; however, on release, offenders with mental disorders were less likely than offenders without mental health disorders to return to custody with a new offense or a new violent offense (9). In contrast, a more recent study found that Canadian offenders with mental disorders had poorer outcomes than those without mental disorders (10). Differences in outcomes between the two studies could be attributable to the relative contribution of substance use problems in these samples.

A clear understanding of the impact of co-occurring disorders on correctional outcomes is necessary to plan for appropriate treatment and supervision strategies focused on public safety. This study compared offenders with co-occurring disorders with offenders with substance use disorders only, offenders with mental disorders only, and offenders with neither a substance use disorder nor a mental disorder. Differences in their profiles, criminal histories, and outcomes in prison and after release were examined. We hypothesized that offenders with co-occurring disorders would have the poorest outcomes among the groups.

## METHODS

### Participants

The sample included 715 offenders (683 men and 32 women) serving sentences of at least two years under the jurisdiction of the Correctional Service Canada (CSC). In this group, 116 offenders (16%) had co-occurring disorders, 269 (38%) had only substance use disorders, 50 (7%) had only mental disorders, and 280 (39%) had neither type of disorder. All offenders provided informed consent to participate in any assessments and for use of anonymized data in aggregate form for research purposes.

Offenders were identified among consecutive admissions over a 14-month period to the Pacific region of CSC (N=440) and through participation in CSC's Community Mental Health Initiative (N=119). In addition, 156 offenders admitted to CSC during the same period as those in the Community Mental Health Initiative were randomly selected from the national population of offenders and assigned to the appropriate study group. The mean  $\pm$  SD age of the sample was 35  $\pm$  9 years. Approximately 70% (N=497) self-identified as white, 18% (N=126) as indigenous, and 13% (N=92) as from another racial-ethnic group.

### Procedure

Offender files were coded for evidence that a psychiatric diagnosis had been conferred by a registered psychiatrist or psychologist. Offenders with disputed diagnoses were not included. File review from the Community Mental Health Initiative evaluation was completed by one researcher, who developed the coding manual. For the rest of the sample, the same researcher trained a team of coders. Interrater reliability was conducted for 29 files, resulting in an agreement rate of 93% ( $\kappa=.76$ ).

Mental disorder was operationalized as a diagnosis of a *DSM-IV* axis I disorder. A moderate to severe rating on either the Alcohol Dependence Scale (ADS) (11) or the Drug Abuse Screening Test (DAST) (12) defined a substance use disorder. ADS and DAST scores at this level have good concordance with diagnoses of alcohol dependence and drug use disorders, respectively (13,14). The study groups included the following four groups: offenders with co-occurring disorders (both a substance use disorder and a mental disorder as defined above), offenders with a substance use disorder but no other mental disorder, offenders with a mental disorder and a rating of no or low problems on both the ADS and DAST, and offenders with neither a substance use nor a mental disorder. Offenders with antisocial personality disorder could have been included in any of the four groups. Offenders with other personality disorders, acquired brain injury, organic brain dysfunction, developmental disabilities, or intellectual impairments were excluded from the study if they did not also have an axis I mental disorder or substance use disorder.

In both the group with a mental disorder only and the group with co-occurring disorders, the most common

diagnoses (depression, bipolar, and anxiety disorders and schizophrenia) had a similar distribution. However, offenders in the co-occurring disorders group were significantly more likely than those in the group with only mental disorders to have more than one of the four diagnoses in addition to a substance use disorder ( $\chi^2=4.01$ ,  $df=1$ ,  $p=.05$ ,  $\phi=.16$ ). Offenders with brain injury or developmental disabilities represented 1.4% of the sample and were present in only two groups: the group with co-occurring disorders and the group with only mental disorders.

### Measures

Demographic information, static and dynamic risk factors, substance abuse assessment scores, and institutional outcomes were extracted from the offenders' records in the electronic database. Institutional outcomes included serious institutional charges (such as assault or possession of contraband) and placements in administrative segregation. Offenders may be admitted to administrative segregation involuntarily, when their actions jeopardize safety and security in the penitentiary, or voluntarily, typically when their own safety is in jeopardy. Although there is a correlation between institutional charges and segregation placements, segregation is rarely used for disciplinary purposes in the Canadian federal correctional system.

Outcomes after release were coded from Canadian Police Information Centre files, a national database of all offenses committed in Canada. Dates of reconviction for any type of offense and reconviction for a violent offense were recorded. Offenses coded as violent included assault, robbery, sexual offenses, homicide, and attempted homicide.

Static and dynamic criminal risk variables were drawn from the Offender Intake Assessment (OIA), a comprehensive evaluation conducted by parole officers for all incoming federal offenders and based on a structured interview complemented by file review. The static risk factors assessment of the OIA, which considers indicators of youth and adult offenses and offense severity, results in a rating of low, moderate, or high static risk (15). The Dynamic Factors Identification and Analysis-Revised (DFIA-R) component of the OIA assesses seven domains of dynamic risk factors contributing to the offender's crimes. Each domain comprises multiple indicators assessed as present or not present. The DFIA-R yields ratings of no, low, moderate, or high dynamic risk (or criminogenic need) for the substance abuse and personal emotional domains. The other five domains include an "asset" rating. In this study, moderate or high ratings were combined. On the basis of the domain assessments, an overall dynamic risk rating of low, medium, or high is determined (15).

Substance abuse is further assessed at intake through the ADS (11) and the DAST (12). Although ADS and DAST results are correlated with the DFIA-R substance abuse domain, ADS and DAST results were used to determine group

**TABLE 1. Overall static and dynamic criminogenic factor ratings in a sample of 715 federal offenders in Canada, by study group**

Factor	Co-occurring disorders (N=116)		Substance use disorders (N=269)		Mental disorders (N=50)		No disorders (N=280)		Cramér's V
	N	%	N	%	N	%	N	%	
Overall risk									.20**
Static risk									
High	56	48	113	42	16	32	82	30	
Moderate	49	42	120	45	27	54	99	36	
Low	11	10	35	13	7	14	98	35	
Dynamic risk									.25**
High	88	76	153	57	24	48	101	36	
Moderate	25	22	93	35	19	38	95	34	
Low	3	3	22	8	7	14	83	30	
Dynamic risk domain <sup>a</sup>									
Employment	76	66	192	72	26	52	155	56	.16**
Family-marital	61	53	137	52	26	52	111	40	.12*
Associates	70	60	230	87	24	48	206	74	.27**
Attitudes	65	56	215	81	28	56	206	74	.22**
Community functioning	54	47	152	57	22	44	101	31	.18**
Personal-emotional	112	97	244	92	48	96	229	82	.19**
Substance abuse	113	97	262	97	33	66	149	53	.53**

<sup>a</sup> Ratings of moderate or high risk  
\*p<.05, \*\*p<.001

membership because they are empirically linked to a DSM diagnosis of a substance use disorder.

**Analyses**

Chi-square tests with Cramér's V effect sizes were used to compare groups. Cramér's V values less than .2 indicate weak associations, and values up to .4 are considered to indicate moderate associations (16). Rates of events per offender person-year (OPY) of observation were calculated for institutional charges and for admissions to segregation by dividing the total number of events in a group by the total amount of time at risk. The difference between two rates was tested by calculating a rate ratio (dividing one rate by the other) and calculating a confidence interval around the rate ratio.

Cox regression analyses were conducted to predict re-offending. Both the time to an event and the proportion of a group experiencing an event were considered in the hazard ratio reported by these analyses. Cox regression also allowed other key variables to be statistically controlled. Risk factors that may have mediated the relationship between the study groups and recidivism were entered into a forward-stepwise Cox regression with a .1 removal criterion. The following potential mediators were identified: static criminal risk rating; age at release; release type; sentence length; and associates, attitudes, employment, community functioning, and family-marital dynamic risk domains. Overall ratings of dynamic factors and the personal-emotional and substance abuse dynamic factors domains were not included as covariates because they are directly related to the defining characteristics of the study groups. In this way, a parsimonious survival model was built by using the risk factors with strong empirically supported relationships with

recidivism. The study group variables were then entered into the model.

**RESULTS**

**Offender Risk Profiles**

Results presented in Table 1 show that the proportion of offenders with high ratings for overall static and dynamic risk was largest in the group with co-occurring disorders, followed by the group with substance use disorders. The Cramér's V effect sizes indicate moderate effects. Among the four groups, the group with substance use disorders had the highest ratings (moderate or high) for several of the dynamic risk domains.

Of note, more than half of the offenders in the group

with mental disorders and the group with no disorders had moderate or high ratings in the substance abuse domain, even though the ADS and the DAST did not indicate alcohol dependence or serious drug abuse for these groups. Therefore, these two groups were not entirely without a history of substance use problems, and they may have differed from the other two groups only in the degree to which they had such problems. In addition, the group with only substance use disorders and the group with no disorders had higher ratings than the other two groups in the areas of associates and attitudes, which suggests a more pronounced antisocial orientation.

As shown in Table 2, the group with co-occurring disorders and the group with substance use disorders had higher rates of previous involvement in youth and adult courts, compared with the other two groups, which explains their higher overall static risk ratings. The rates of violent offenses confirm the higher risk ratings for the group with co-occurring disorders and the intermediate risk ratings for the group with mental disorders. Robbery was the most common offense for the group with co-occurring disorders and the group with substance use disorders. For the group with mental disorders, sexual offenses were the most common. For the group with no disorders, drug and property offenses were the most common.

**Institutional Outcomes**

Institutional charges were rare, but the calculated rate of serious charges was three times higher for the group with co-occurring disorders than for the group with no disorders (Table 3). The rates for the group with substance use disorders and the group with mental disorders were also

significantly higher than for the group with no disorders. Of the four groups, the group with co-occurring disorders had the highest rates of placement in both types of segregation; however, these rates were not significantly greater than the rates for the group with substance use disorders and the group with mental disorders. The group with no disorders was the least likely of the groups to be admitted to voluntary segregation.

### Release Outcomes

Table 4 presents the survival analysis, by study group, predicting reconviction after release from incarceration. The groups reliably differed in the hazard of reconviction ( $\chi^2=14.19$ ,  $df=3$ ,  $p=.003$ ). The hazard for the group with co-occurring disorders was more than twice that for the group with no disorders. In addition, the hazard for the group with substance use disorders was also significantly higher than for the group with no disorders. For the group with mental disorders, the hazard of reconviction was not significantly higher than for the group with no disorders.

A Cox regression analysis controlling for mediating risk variables was tested next. The final model and the associated hazard ratios are shown in Table 5. The model was significant ( $\chi^2=59.52$ ,  $df=7$ ,  $p<.001$ ). The risk covariates, in particular the static risk rating, associates risk rating, and sentence length, partially mediated the relationship between the study groups and the hazard of recidivism. The hazard ratios for the group with co-occurring disorders and the group with substance use disorders, compared with the group with no disorders, decreased when the risk factors were included in the model, and the difference between the substance use disorders group and the group with no disorders became nonsignificant. However, even when these variables were controlled, the group with co-occurring disorders remained significantly more likely to be reconvicted compared with the group with no disorders.

## DISCUSSION AND CONCLUSIONS

Rates of co-occurring substance use disorders and mental disorders are significantly higher in correctional populations than in the general population. A recent survey of male offenders entering the Canadian federal correctional system found that 38% had co-occurring disorders, excluding antisocial personality disorders (4), compared with the latest estimate of less than 2% for the general Canadian

**TABLE 2. Criminal histories of a sample of 715 federal offenders in Canada, by study group**

Variable	Co-occurring disorders (N=116)		Substance use disorders (N=269)		Mental disorders (N=50)		No disorders (N=280)		Cramér's V
	N	%	N	%	N	%	N	%	
Youth court involvement	52	48	134	58	18	37	75	30	.24**
Prior adult court involvement	103	95	214	92	35	71	189	77	.24**
Major offense									
Violent	85	73	156	58	37	74	115	42	.25**
Nonviolent	31	27	112	42	13	26	162	59	
Offense type									.26**
Homicide	4	3	15	6	3	6	24	9	
Sexual offense	5	4	14	5	11	22	26	9	
Robbery	55	47	87	33	8	16	29	11	
Assault	14	12	24	9	9	18	13	5	
Other violent offense	7	6	16	6	6	12	23	8	
Drug offense	4	3	29	11	0	—	67	24	
Property offense	20	17	64	24	6	12	59	21	
Other nonviolent offense	7	6	19	7	7	14	36	13	

\*\* $p<.001$

population, which was based on the 2002 Canadian Community Health Survey (17). Understanding the implications of these elevated rates is therefore critically important to correctional agencies and the mental health professionals who treat offenders.

The results indicate that offenders with co-occurring disorders posed a greater risk of criminal behavior than did the other groups. Their history of greater involvement in violent offenses and their higher rates of serious institutional charges and of recidivism on release suggest that they require the most intensive interventions and closest supervision of the four groups. Furthermore, the impact of

**TABLE 3. Rates of institutional charges and transfer to segregation in a sample of 715 federal offenders in Canada, by study group**

Variable	Rate per OPY <sup>a</sup>	95% CI
Serious institutional charge		
Co-occurring disorders <sup>b</sup>	.88	.75–1.03
Substance use disorders <sup>c</sup>	.59	.51–.67
Mental disorders <sup>c</sup>	.45	.31–.61
No disorders <sup>d</sup>	.27	.22–.33
Voluntary segregation		
Co-occurring disorders <sup>b</sup>	.19	.13–.27
Substance use disorders <sup>b</sup>	.12	.09–.17
Mental disorders <sup>b</sup>	.16	.08–.28
No disorders <sup>c</sup>	.06	.03–.09
Involuntary segregation		
Co-occurring disorders <sup>b</sup>	.47	.38–.59
Substance use disorders <sup>b</sup>	.40	.34–.47
Mental disorders <sup>b,c</sup>	.33	.21–.47
No disorders <sup>c</sup>	.27	.22–.33

<sup>a</sup> Rates of events per offender person-year of observation were calculated for institutional charges and for admissions to segregation by dividing the total number of events in a group by the total amount of time at risk.

<sup>b–d</sup> Matching superscripts for institutional charges and each type of segregation indicate nonsignificant differences between the groups.

**TABLE 4. Hazard ratios (HRs) of time to reconviction of any type in a sample of 715 federal offenders in Canada, by study group**

Group <sup>a</sup>	HR	$\chi^2$ <sup>b</sup>	p
Co-occurring disorders	2.26	11.84	<.001
Substance use disorders	1.83	8.13	.004
Mental disorders	1.39	.92	ns

<sup>a</sup> Reference: group with no disorders

<sup>b</sup> df=1

co-occurring disorders remained even after the analysis controlled for other risk factors, illustrating the deleterious effect of having a substance use disorder, as measured by standardized tools. Offenders in the group with no disorders were not necessarily free of substance use. A substantial number also had substance use problems, but their degree of misuse was not as marked as in the other groups.

The mental disorders group had recidivism rates close to that of the group with no disorders. This result is consistent with some research that has found that a diagnosis of an axis I mental disorder may, on its own, not contribute importantly to general or violent recidivism (18–20). However, when offenders with mental disorders also experience problems with substance use—especially when they have a personality disorder—their outcomes are much poorer. For example, an important U.S. study found poorer social and correctional outcomes for offenders with dual diagnoses compared with offenders with serious mental disorders who did not have substance use problems (21). Fazel and colleagues’ (22,23) work showed that individuals with a serious mental disorder were at increased risk of violence; however, the findings indicated that most of the increased risk was due to substance abuse. These authors found that individuals with comorbid disorders had violent outcomes at about the same rate as those with substance use disorders alone. A recent Canadian meta-analysis also highlighted the important association of substance abuse with criminal recidivism among offenders with a mental disorder (18) and noted the puzzling neglect of this key treatment target in services provided to this population.

An important limitation of this study was that the allocation of offenders to groups on the basis of file review could

**TABLE 5. Proportional hazards regression model of variables as predictors of time to reconviction of any type in a sample of 715 federal offenders in Canada**

Variable	HR <sup>a</sup>	$\chi^2$ <sup>b</sup>	p
Group (reference: no disorders)			
Co-occurring disorders	1.86	6.39	.01
Substance use disorders	1.31	1.54	ns
Mental disorders	1.42	1.00	ns
Overall static risk (reference: low risk)	1.91	24.56	<.001
Associates domain (reference: asset or no risk)	1.73	5.28	.02
Age at release (years)	.98	2.99	ns
Sentence length (years)	1.05	5.01	.03

<sup>a</sup> Hazard ratio

<sup>b</sup> df=1

have assigned offenders to the group with no disorders if they had an undiagnosed disorder, which would have attenuated the differences between the groups. The fact that we found a significant effect even with the methods used in this study provides further evidence that there is a true difference between groups. Nevertheless, a preferred methodology would require that diagnoses be derived from clinical interviews with all incoming offenders. Furthermore, it could be argued that identifying a large proportion of the sample from a single region reduced the generalizability of results to the national population. Previous research, however, established the similarity of offenders from the Pacific region and the general population of offenders on key variables (24). In addition, because the focus of the study was on outcomes of offenders with co-occurring disorders, potentially differing rates of disorders across regions should not have affected the associations between the disorders and the correctional outcomes examined.

Future research should examine how outcomes of offenders with co-occurring disorders or with substance use disorders alone differ by type of substance abuse. Groups may differ by whether they have alcohol or drug problems and by specific drug of choice. Research should also clarify whether the type of diagnosis is associated with outcome. The number of offenders in the mental disorders group was low, which did not allow for a breakdown by type of diagnosis.

The results indicate that in a correctional sample of serious offenders, substance use problems exerted a greater influence on many outcomes than did a diagnosis of a mental disorder alone. It should be noted, however, that relatively few offenders in the sample had a mental disorder alone and that co-occurring disorders were more common. Poorer results for offenders with substance use disorders and those with co-occurring disorders may be linked to a higher prevalence of symptoms of antisocial personality disorder; such symptoms are more frequently noted among persons with serious substance use problems.

Results showed that criminal risk factors that were entered in our models predicted recidivism irrespective of whether offenders had a mental disorder, a substance use disorder, or co-occurring disorders. Outcomes were poorest for the group with co-occurring disorders, even when other risk factors were considered, which suggests that having a mental disorder augments the criminogenic effects of having a substance use disorder. Screening for substance use disorders is an accepted standard of care for individuals with mental disorders (25). It is important for forensic and clinical psychiatrists involved in assessing risk among offenders and providing services to offenders with mental disorders to determine offenders’ level of substance use problems and for correctional agencies to ensure the provision of integrated interventions to address the complex mental health needs and criminogenic risk factors of offenders. Such an approach is likely not only to improve the quality of life of these vulnerable individuals but also to reduce their risk of returning to correctional custody.

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