Mental health needs, substance use patterns, and risk of reincarceration among adults admitted to provincial prisons in British Columbia, Canada

by

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Abstract

People with mental health needs and substance use disorders (MHN/SUD) are overrepresented in all levels of the criminal justice system, including prisons. Diversion options for people with MHN/SUD are limited, and reentry supports after release from prison are inadequate. Few Canadian studies have examined MHN/SUD in custodial settings, and none have examined the relationship between MHN/SUD and reincarceration using a population-based prison sample.

In this thesis I use administrative data from the government authority responsible for provincial adult prisons in British Columbia (BC Corrections). Specifically, I use mental health intake screening data linked to records of custodial admissions and releases to examine: (1) the prevalence of mental health needs, substance use disorders, and co-occurring disorders (COD) among people admitted to custody over a 9-year period; (2) the relationship between MHN/SUD profile and time to reincarceration; and finally (3) the relationship between specific substance use profiles and frequency of reincarceration.

I found that the proportion of people admitted to custody with COD increased by 17 percentage points from 2009-2017. Methamphetamine use disorder increased nearly five-fold from 6% to 29%, and heroin use disorder increased from 11% to 26%. Examining the relationship between MHN/SUD and time to reincarceration among people admitted to custody between 2012 and 2014, I found that people with COD returned to custody in the shortest period, followed closely by those with SUD only. After 3 years, 72% of those with COD returned to custody, compared to only 44% of those with no disorder. Examining substance-specific drug use patterns, I found that people who used methamphetamine were at high risk of multiple incarceration events, and at highest risk when used in combination with heroin.

Addressing the needs of people with complex clinical MHN/SUD profiles (including housing, social support, and high-quality MHN/SUD treatment) are required in the community to prevent further criminalization marginalized subgroups.

Keywords: Mental illness; Substance use disorder; Co-occurring disorder; Prison; Screening; Mental health treatment

Dedication

In memory of Dr. Elliot Goldner

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My pre-PhD journey began with my work at the Centre for Applied Research in Mental Health and Addiction. It was in my role as the Research Program Manager, under the directorship of Dr Elliot Goldner, that I learned about my personal strengths and opportunities for growth, solidified my passion for applied research, and clarified my values. Elliot provided the right combination of autonomy and support for me to grow and fail forward. I resisted the idea of doing a PhD, but Elliot gradually persuaded me that it would help me reach my fullest potential as a scientist. Of course, he was right.

It was thanks to Elliot that I met some of the most wonderful people who remain dear friends – Dr Iva Cheung, Corinne Tallon, Dr Jill Murphy, Caroline Mousseau, and Wayne Jones. Elliot is deeply missed by all of us. Rebecca Zappelli is among this group but deserves notable mention. Rebecca – you are my ride or die, my Emerald co-captain, the brilliant operational brains behind our projects, my most loyal confidant, and my best friend. Your humour (while mostly self-deprecating or overtly morbid, in typical Australian fashion) got us through the darkest days. Love you to the moon, mon ami.

I was fortunate to have *four* incredible women make up my main support team throughout my PhD. My first tribute goes to my senior supervisor Dr Tonia Nicholls. Tonia and I had crossed paths, but we didn't know each other well when I requested a coffee chat shortly after Elliot died. At the time, 3 months into the program, I was unsure whether to continue. Tonia held safe space for my grief while gently encouraging me to stay the course and offering to supervise me. It was clear that she fiercely believed in me. Over the next 4 years, Tonia provided an excellent training environment, access to international collaborations, leadership on many successful funding competitions, KT opportunities, countless reference letters (often with little advance notice because I am notoriously disorganized), timely and extensive feedback on my work, and most importantly, kindness and generosity.

Having decided to do an epidemiology project for my PhD with little formal training in epi, I figured it would be helpful to recruit *two* people to share the methods load. Thanks to Elliot, I knew two wonderful scholars at FHS with the relevant expertise, both of whom enthusiastically agreed to join my committee. Dr Ruth Lavergne and Dr Hasina Samji worked together to design a training program, giving their time generously to help me upskill. I am particularly indebted to Ruth, my co-supervisor, who spent countless hours on Zoom calls/responding to email queries while I stumbled my way through learning R code, survival analyses, negative binomial regression, etc. Together, we conducted a methodologically rigorous study that I am proud of. Thank you both for taking a chance on me.

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List of Acronyms

APD	antisocial personality disorder
BC	British Columbia
BCCDC	British Columbia Centre for Disease Control
BPRS	Brief Psychiatric Rating Scale
CCRA	Corrections and Conditional Release Act
CDSA	Controlled Drugs and Substances Act
CIDI-A	Composite International Diagnostic Interview - Automated
CJS	criminal justice system
CJSI	criminal justice system involvement
COD	co-occurring disorder
DSM-5	Diagnostic and Statistical Manual of Mental Disorders (fifth edition)
DSM-III	Diagnostic and Statistical Manual of Mental Disorders (third edition)
DSM-III-R	Diagnostic and Statistical Manual of Mental Disorders (third edition, revised)
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders (fourth edition)
DSM-IV-TR	Diagnostic and Statistical Manual of Mental Disorders (fourth edition, text revision)
ICD	International Statistical Classification of Diseases and Related Health Problems
IT	integrated treatment
JSAT	Jail Screening Assessment Tool
MHN	mental health needs
MHN/SUD	mental health needs and/or substance use disorder
MPSSG	Ministry of Public Safety and Solicitor General
MSP	Medical Services Plan
NIMH-DIS	National Institute of Mental Health Diagnostic Interview Schedule
OCI	Officer of the Correctional Investigator
SCID	Structured Clinical Interview for DSM-IV

SMI	serious mental illness
SUD	substance use disorder
UN	United Nations
US	United States

Preface

This dissertation is the culmination of a four-year project with several phases of work including an in-depth literature review, data access requests and protocols, data cleaning, statistical analyses, and manuscript writing (processes were iterative, and not always in that order). This dissertation is my original, unpublished work. I wrote the first complete draft of the manuscript, and I am responsible for the study designs, data cleaning and management, and all statistical analyses. Drs Ruth Lavergne and Tonia Nicholls (supervisors) were thoroughly involved in all stages of the work including study design and analytic decisions, data interpretation, and manuscript development. Drs Hasina Samji and Sheri Fabian (committee members) provided input on the analyses, overall content, and contributed to manuscript revisions. I received harmonized ethics approval from UBC Behavioral Research Ethics Board and Simon Fraser University Research Ethics Board (certificate number H17-02653).

Chapter 1. Introduction

The global prison population exceeds 11 million people and is growing at a rate in excess of population growth (Walmsley, 2016). People with mental illness are dramatically overrepresented in all levels of the criminal justice systems (CJS), including jails and prisons (Chang, Lichtenstein, Larsson, & Fazel, 2015b; Fazel & Danesh, 2002; Fazel & Seewald, 2012). Indeed, Fellner (2006) and others have observed that the number of incarcerated people with serious mental illness has grown so dramatically in the US that prisons may be the largest mental health providers in the country. Prisons are not the preferred setting for the treatment of chronic or acute mental illness and thus, people with mental health issues should be diverted whenever possible to mental health services before reaching the prison gate (World Health Organization, 2008). Many people who enter prison have a history of adversity in childhood, victimization across the lifespan and face associated complex and persistent mental health implications (e.g., mental disorders, substance use disorders, as well as physical health comorbidities) and socio-structural challenges such as poverty, systemic racism, unemployment, and homelessness (Rich et al., 2014).

Despite the high prevalence of mental illness and increased risk of adverse health and social outcomes among those with criminal justice system involvement, few services exist in prisons and the community to identify and prevent people with mental illness from entering or remaining in the CJS (Nicholls et al., 2018; Ogloff, Davis, & Somers, 2004). Cycles of short prison stays (i.e., the "revolving door" of incarceration) are costly both for the individual and society, contributing to health deterioration and homelessness, and are more common among people with psychiatric disorders (Baillargeon, Binswanger, Penn, Williams, & Murray, 2009; Haimowitz, 2004). Re-entry planning and attachment to community-based resources after prison are essential to improving mental health outcomes and keeping people out of custody (SAMHSA, 2017). Yet, re-entry is the least well-developed aspect of the correctional services planning (Nicholls et al., 2018). More than ten years ago, the World Health Organization (2008, p. 5) called on all

countries to focus greater attention on the mental health of people in custodial settings, and emphasized that prison health is public health:

> The mental health of prisoners cannot be left as an issue only for prison authorities; it impacts on all of society…it is in the best interest of society that a prisoner's health needs are met, that the prisoner is adequately prepared for resettlement and that the causes of re-offending are addressed.

The mental health of people in prisons has been made a matter of strategic importance in jurisdictions round the world, including Canada – it is a priority area for the Mental Health Commission of Canada (2012) and the Correctional Service of Canada (2012, 2013), and an area of focus for recommendations made by the Office of the Correctional Investigator (Sapers, 2011, 2016; Zinger & Talisman, 2020). Despite considerable policy attention, Canadian research in this area remains limited. Most of the existing literature related to mental illness among people in prison (including clinical factors associated with reoffending) comes from the United States and Australasia. Given the variability in legislation, philosophical paradigms, health care and justice systems, and politics affecting sentencing practices, it is unknown whether extant literature are transferable to the Canadian context.

Prison-based research present unique challenges – people in prison are deemed vulnerable, the environment is tightly regulated and monitored, and research projects require buy-in and support from correctional authorities who gatekeep access to data and participants (National Institute of Justice, 2012). That said, correctional facilities administrators have become more receptive to research collaborations in recent years and prison is now recognized as an important site for public health research (Apa et al., 2012). Electronic medical records have not been implemented in corrections in several Canadian jurisdictions which presents a challenge for reliability of data and feasibility of data access. Given that services in correctional facilities in Canada are largely delivered by government authorities, the lack of health-related data on Canadians in custody is particularly striking (Kouyoumdjian, Schuler, Matheson, & Hwang, 2016). At the federal level, limited information about health care needs and access has been presented in annual reports produced by the Correctional Investigator of Canada since 2009 (Government of Canada, n.d.). Systematic research that examines people incarcerated in

both provincial and federal prisons is needed, given the populations may differ in relevant ways (e.g., criminal history; index offence).

Many of the foundational Canadian studies on mental illness prevalence in prisons were conducted in the province of British Columbia (BC, where this study is based) in the 1990s and early 2000s and a lot has changed since then. For the last six years, BC has been the epicentre of an overdose crisis, due primarily to fentanyl contamination in the drug supply (Karamouzian et al., 2020). Since 2015, fatal overdose has been BC's leading cause of unnatural death with over 7600 deaths due to illicit drug toxicity from 2015-2021 (BC Coroners Service, 2021). In addition to changing substance use patterns, national survey data has shown broadly worsening mental health across the US and Canada in the general population, with significant increases in depression, anxiety, suicidal ideation, and suicide attempts since the early 2000s (Chiu, Amartey, Wang, Vigod, & Kurdyak, 2020; Duffy, Twenge, & Joiner, 2019; Weinberger et al., 2018; Wiens et al., 2020). Experiencing incarceration can be particularly damaging for people with mental illness, and prison can cause and/or exacerbate pre-existing problems. Incarceration can serve to interrupt mental health care treatment (Prins, 2014) increase the risk of injury and mortality post-release (Binswanger et al., 2007), and induce post-traumatic stress reactions, particularly among those with a history of solitary confinement (Hagan et al., 2018).

Given the changes in mental illness in the general community and adverse outcomes for people who go to prison, more recent data and research on the mental health needs and substance use patterns of people who are incarcerated are urgently needed. A clear understanding of the relationship between mental illness and criminal justice outcomes is necessary to plan for appropriate prevention, treatment, and support strategies (Wilton & Stewart, 2017).

Thesis overview

This research uses a 9-year population-level cohort of people admitted to provincial prisons in BC, Canada, to examine mental health needs and substance use disorders

(MHN/SUD)[1] among people who experience incarceration; one of the first studies of its kind to do so in Canada. In this thesis I present three distinct studies, in which I examine: changes in the annual prevalence of people presenting with MHN/SUD among people admitted to provincial prisons over time (Chapter 4); the relationship between MHN/SUD and time to reincarceration (Chapter 5); and the relationship between specific drug-use profiles and frequency of (re)incarceration (Chapter 6). Research questions and hypotheses are outlined in Table 1.1. I begin with a literature review (Chapter 2) and details of the data sources and methods applicable to all three studies (Chapter 3). I present the three studies in Chapters 4 through 6. In Chapter 7, I discuss strengths and limitations of the overall body of work, the significance of the findings, and implications for policy and practice.

A note on language and definitions

The language used to describe mental illnesses is not consistent in the literature and has changed considerably over time, alongside advancements in scientific developments in the field of psychiatry. For example, the Diagnostic and Statistical Manual of Mental Disorders (DSM), a handbook produced by the American Psychiatric Association (APA, n.d.), has been updated seven times since it was first published in 1952. A global disease classification framework, the International Statistical Classification of Diseases and Related Health Problems (ICD) (World Health Organization, n.d.) dates back to 1893 and has been through ten major revisions (the 11th version will come into effect in January 2022). The ICD includes 'mental and behavioral disorders' alongside all other diagnostic entities in health care and is currently maintained by the World Health Organization the directing and coordinating authority for health within the United Nations System.

In Chapter 3, I clearly define the diagnostic categories used in my studies, and that language remains consistent throughout. However, readers will see variability in the literature review sections which reflects differences in the time periods in which the studies were conducted as well as author discretion. For example, the criteria and terminology used to describe substance use disorders has changed throughout the

[1] Term described in more detail in Chapter 3.

evolution of the DSM: alcoholism and drug addiction (DSM I); substance abuse and substance dependence (DSM II); and substance-related addictive disorders (DSM-5) (Robinson & Adinoff, 2016). I generally keep the study descriptions consistent with the language used by the authors, but in several cases additional footnotes detail methodological information and psychiatric disorder definitions. *Mental illness* is used to refer broadly and collectively to all diagnosable mental disorders (implying the "existence of a clinically recognizable set of symptoms or behaviour associated in most cases with distress and with interference with personal functions") (World Health Organization, 1992, p. 11) including substance use disorders. *Mental disorder* is used more narrowly to refer to non-substance-related mental disorders.

Table 1.1. Research aims and hypotheses

Research aims	Hypotheses
Chapter 4	
A1: To estimate the prevalence of mental health needs (MHN), substance use disorder (SUD), and co-occurring disorder (COD) among people admitted to prison in BC and examine if/how the prevalence has changed over a nine-year time period.	Prevalence of MHN, SUD and COD will increase over the study time period.
A2: To compare the drug use patterns among people with SUD and COD.	People with COD will be more likely than those with SUD to use methamphetamine, heroin, and to report polysubstance use and injection drug use.
Chapter 5	
A3: To examine the association between mental illness (MHN, SUD, COD, none) and time to reincarceration.	SUD and COD will be significantly and positively associated with reincarceration even after controlling for covariates. MHN alone will not be significantly related to reincarceration in the adjusted model. People with COD will remain in the community for the shortest length of time before being returned to custody.
A4: To describe the profiles of people with MHN, SUD, and COD in terms of sociodemographic, clinical, and criminal justice characteristics.	People with MHN, SUD, and COD will have significantly higher prevalence of socioeconomic deprivation, comorbid health conditions, and criminogenic risk factors compared to people with no MHN/SUD. People with COD will have the highest prevalence of poor health, social, and criminogenic risk factors out of the four diagnostic groups.
Chapter 6	
A5: To examine the relationship between specific SUD profiles and frequency of incarceration.	Methamphetamine and heroin use disorders will be positively associated with incidence of incarceration compared to those with no substance use disorders. Marijuana, alcohol, cocaine, and other drug use disorders will not be significantly associated with incarceration frequency after controlling for covariates.

Chapter 2. Background

This chapter summarizes some of the leading literature related to the research questions outlined in Chapter 1. I begin with an overview of what is known about the prevalence of mental illness in criminal justice systems across several jurisdictions and competing explanations for the elevated rates of mental illness among correctional populations compared to the general population. I examine the evidence on the relationships between mental illness and crime (broadly, although some studies focus specifically on violence). In the third section, I focus on co-occurring disorders (COD)[2] with respect to prevalence, risk factors, adverse outcomes, treatment challenges, and evidence gaps. Finally, I discuss mental health screening and the legislative framework for mental health care in prisons in Canada. Some critical components of the correctional health care continuum, including for instance, best practices in mental health treatment within prisons, are not addressed here because they are beyond the scope of this thesis.

2.1. Prevalence of mental illness in correctional populations

There is considerable variability in prevalence estimates for mental illness in correctional populations which is partly due to variations in foci, methodology, and contexts across studies. Key methodological differences include selection of measurement tools for mental illness (e.g., DSM, ICD, semi-structured instruments) and sources of data for ascertaining criminal justice involvement (e.g., administrative health and justice data, self-report, and/or risk assessment instruments administered in criminal justice settings). There are also differences in the way that mental illness is defined. For instance, some studies examine only serious mental illness (SMI, e.g., Steadman, 2009; Teplin, 1994) which usually include a set of disorders that lead to severe functional impairment, such as bipolar disorder, schizophrenia, and major depressive disorders (National Institute of Mental Health, n.d.). Other studies employ broader definitions, using instruments that measure the presence of psychiatric *symptoms* rather than professional clinical diagnoses

[2] In this thesis, co-occurring disorders will be used to refer to the presence of both non-substance-related mental disorder(s) **and** substance use disorder(s).

(e.g., Roesch, 1995); others use history of psychiatric hospitalization and/or use of psychotropic medication as a *proxy* for mental illness (e.g., Ditton, 1999; James & Glaze, 2006). Some studies disaggregate substance use disorders (SUD) from non-substance-related mental disorder, while others combine them. Correctional samples also differ (e.g., community supervision vs. custody; remanded vs. sentenced; jail vs. prison).

Nonetheless, estimates of mental disorders in correctional populations exist in several countries. This overview summarizes the results of a nonsystematic focused literature review. A focused literature review involves the knowledgeable selection of high-quality articles and is meant to be informative (rather than all encompassing). Importantly, I did not perform a formal quality assessment and I did not limit to most current because I wanted to highlight the foundational and seminal work (which is now outdated). Some articles are presented with the goal of illustrating the range and variability in the methodology and therefore may not represent the highest quality. I identified literature using combinations of search terms related to mental disorder, substance use, and prison through PubMed[3] and in an *ad hoc* fashion by hand-searching grey literature such as national and international health organizations, government webpages (Canada and the US only), and Google Scholar.

In the following section, I discuss the prevalence of mental illness among people who go to prison, including methodological considerations. I begin by presenting the results of four highly cited systematic reviews. Next, I present some selected studies (which are generally well-cited and/or methodologically rigorous) from Canada, the US, and Australasia. While there is some variability between these jurisdictions in terms of legislation and sentencing policies and practices, these is overlap in the organization of their custodial systems (e.g., provincial/state jails, federal prisons) and diagnostic language/tools to ascertain diagnoses (e.g., DSM, ICD, validated semi-structured instruments).

[3] Search terms: [Title/Abstract] (prison* OR jail* OR gaol OR correctional) AND (mental* OR substance OR comorbid* OR co-occur* OR dual diagnos* OR psychiatr*)

2.1.1. Mental disorders and substance use disorders in prison populations

Some of the most well-known systematic reviews and meta-analyses in this area were conducted by Seena Fazel and his colleagues. A systematic review of 62 surveys from 12 countries (N = 22,790 prisoners) found that around 4% of prisoners had a psychotic illness, 10–12% had major depression, and 65% of the men and 42% of the women had personality disorders (Fazel & Danesh, 2002). In an updated systematic review including 33,588 prisoners in 24 countries, Fazel and Seewald (2012) identified studies where clinical examination or semi-structured interviews were used to make DSM or ICD diagnoses of mental disorders. They found a pooled prevalence of psychosis of 3.6% in males and 3.9% in females, and a pooled prevalence of major depression of 10.2% in males and 14.1% in females.

Fazel led similar reviews focusing specifically on substance use disorders in prisons. A systematic review of 13 studies, including 7563 people in prison from four countries, concluded that the prevalence of alcohol dependence for men in prison ranged from 18-30% and 10-24% for women (Fazel, Bains, & Doll, 2006). The prevalence of abuse and dependence of all other drugs ranged from 10-48% in men and 30-60% in women (Fazel et al., 2006). An updated review of 24 studies (including 18,388 prisoners across 10 countries) found 12-month pooled prevalence estimates of drug use disorder was 30% for men and 51% for women entering prison (Fazel, Yoon, & Hayes, 2017). Results from the four studies are summarized in Table 2.1.

Table 2.1. Prevalence of psychiatric diagnoses from systematic reviews

Disorder	Men (%)	Women (%)
Psychotic illness	4	4
Major depression	10	14
Alcohol dependence	18-30	10-24
Drug dependence	10-48	30-60

Source: adapted from table in Fazel, Hayes, Bartellas, Clerici, and Trestman (2016)

Importantly, the authors included data from several decades, from different prison populations, across different countries. All four reviews included studies dating back to 1966. Laws and policies, civil commitment criteria, prevalence of mental illness,

criminalization of drugs, clinical examination guidelines, diagnostic tools, and validated questionnaires would be expected to change considerably during the study period. For example, five versions of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) alone were produced in this timeframe. The data should be interpreted with this consideration in mind.

US prevalence studies

Some of the most rigorous and foundational data produced on the prevalence of mental disorder in US jails were collected by Teplin, Abram and McClelland in the 1990s in Cook County, Illinois. The researchers used the National Institute of Mental Health Diagnostic Interview Schedule (NIMH-DIS) with stratified random samples of people awaiting trial in the Cook County Corrections Department. Among men in custody (n = 728), Teplin (1994) found that 6% had a current severe disorder[4] other than antisocial personality disorder (APD), nearly 50% had APD, and 29% had substance use disorder or dependence. Among women, using the same methodology (n = 1272), Abram, Teplin, and McClelland (2003) found that 12.4% had a severe mental disorder[4]. These studies have some notable strengths – current and lifetime estimates were investigated separately; and APD and substance use disorder were considered separately from other disorders. Importantly, antisocial personality disorder often represents a psychiatric label for criminal behaviours[5], and there are unique confounders in applying criteria for personality disorder in prisons (Rotter, Way, Steinbacher, Sawyer, & Smith, 2002). For example, characteristics such as suspiciousness, hostility, and social withdrawal (traits which may contribute to an APD diagnoses) may represent adaptive patterns of behavior within a prison context. Substance use also need to be examined separately from non-substance related mental disorder because drug prohibition and the war on drugs create differential risk conditions for marginalization and criminal justice system involvement.

[4] Defined as schizophrenia, manic episode, major depressive episode.

[5] Antisocial personality disorder (ASPD or APD) is a personality disorder characterized by a long-term pattern of disregard for, or violation of, the rights of others. One of the seven sub-features of APD in DSM-V is: *Failure to obey laws and norms by engaging in behavior which results in criminal arrest or would warrant criminal arrest.*

Jacques Baillargeon et al. (2000), were among the first to study disease prevalence in prison using a population-level sample of people and standardized clinical codes. The cohort included 170,215 people who were incarcerated between 1997 and 1998 in Texas. They examined diagnoses of all medical conditions at prison intake or subsequent medical encounters with a physician or mid-level practitioner, classified using ICD-10 codes. Results showed that 3.9% had affective disorders, 3.0% had schizophrenia, and 10.8% had any mental disorder (Baillargeon 2000). Findings are similar to Teplin (1994), who reported estimates of 3.9% for major depression and 2.0% for schizophrenia within a sample of 728 men incarcerated in Illinois.

Two reports by the Bureau of Justice Statistics in the US, both of which use self-report information from the *Survey of Inmates in State and Federal Correctional Facilities* and the *Survey of Inmates in Local Jails* to estimate prevalence, have been collectively cited over 3000 times according to Google Scholar. Ditton (1999) found that 16.2% of people in state prison, 7.4% of people in federal prison, and 16.3% of people in jail had a "mental or emotional condition," determined by self-reported receipt of mental health services, psychiatric medication and/or admission to a hospital for psychiatric reasons. Using different criteria and updated versions of both surveys, James and Glaze (2006) concluded that those in local jail had the highest prevalence of at least one mental health problem[6] (64%) compared to 56% in state prisons, and 45% in federal prisons, with higher rates among women compared to men. The difference between the estimates is illustrative of how changing the criteria for measuring mental illness may dramatically alter the results. By limiting the definition to those who had received services, medication, or hospitalization in Ditton (1999), the prevalence estimate was far lower than in the James and Glaze (2006) study, where the definition was expanded to include diagnoses and symptoms.

In 2004, the *Survey of Inmates in State and Federal Correctional Facilities* in the US included measures of drug abuse or dependence for the first time (as defined by DSM-IV). Using these data, Mumola and Karberg (2006) found that 53% of people in state and

[6] Defined in two ways: recent history of clinical diagnosis or treatment by a mental health professional or symptoms of a mental disorder based on criteria specified in the DSM-IV.

45% of people in federal prison met the criteria for drug abuse or dependence. Finally, a recent Bureau of Justice Statistics report found that 37% of people in prison and 44% of people in jail in the US had a lifetime prevalence of mental disorder[7] (Bronson & Berzofsky, 2017).

Steadman et al. (2009) estimated the prevalence of serious mental illness[8] in two jails in Maryland and three jails in New York during two time periods (2002-3 and 2005-6). Data from the Brief Jail Mental Health Screen were collected for all people during the data collection phases and a portion of those were selected through systematic sampling for administration of the Structured Clinical Interview for DSM-IV (SCID). The final weighted prevalence rates of current serious mental illness were 14.5% for men and 31.0% for women across jails and study phases (Steadman et al., 2009). A more recent US meta-analysis including 28 studies was conducted in 2014 and found predictable heterogeneity in the reported prevalence of serious mental illness in state prisons, with major depression ranging from 9-29%, bipolar disorder from 6-16%, and schizophrenia from 2-7% (Prins, 2014). The studies presented here are not a comprehensive set but represent the seminal bodies of work and the evolution of approaches to studying prevalence of mental illness in prison in the US.

Australasian prevalence studies

Several studies have also examined the prevalence of mental health problems among people incarcerated in Australasia. Brinded et al. (2001) conducted a study with all women (remanded and sentenced), all men on remand, and a randomly selected cohort of 18% of sentenced men in New Zealand prisons. The authors do not discuss the reasons for this sampling frame although it could perhaps be assumed that women were

[7] Based on the question, "Have you ever been told by a mental health professional, such as a psychiatrist or psychologist, that you had (1) manic depression, bipolar disorder, or mania; (2) a depressive disorder; (3) schizophrenia or another psychotic disorder; (4) post-traumatic stress disorder; (5) another anxiety disorder, such as panic disorder or obsessive compulsive disorder; (6) a personality disorder, such as antisocial or borderline personality; or (7) a mental or emotional condition other than those listed above?"

[8] Serious mental illness was defined as the presence of one or more of the following diagnoses in the past month: major depressive disorder; depressive disorder not otherwise specified; bipolar disorder I, II, and not otherwise specified; schizophrenia spectrum disorder; schizoaffective disorder; schizophreniform disorder; brief psychotic disorder; delusional disorder; and psychotic disorder not otherwise specified.

oversampled and grouped due to the small number of women in custody. The authors used the Composite International Diagnostic Interview - Automated (CIDI-A) to ascertain DSM-IV diagnoses and the Personality Disorder Questionnaire to identify personality disorder. The lifetime prevalence of schizophrenia disorders was 8.5% for women, 7.9% for remanded men and 6.6% for sentenced men. The prevalence of major depression in the last month was at least two-fold higher than in the general community and the highest among women (11.1% of women compared to 5.9% of sentenced men, and 10.7% of remanded men). They also found elevated rates of bipolar disorder, post-traumatic stress disorder, obsessive compulsive disorder, and drug use dependence (Brinded et al., 2001). The study concluded that for men, the differences between remanded and sentenced men were significant. For example, the male remand population had twice the rate of major depression and PTSD compared to sentenced men. This stratification was not available for the female cohort and the implications were not discussed by the authors.

Butler et al. (2005) examined mental illness in two prisons in New South Wales: new receptions to the corrections system and people who were sentenced. Nine-hundred and fifty-three new receptions[9] and 579 sentenced people were screened using a modified version of CIDI-A (for mental disorders excluding substance use). Overall, 43% had at least one of the following diagnoses: psychosis, anxiety disorder, or affective disorder. Post-traumatic stress disorder was the most common: 26% of receptions and 21% of those who were sentenced met the criteria for PTSD. Nine percent of all people in prison had experience psychotic symptoms in the previous 12 months and was more common among receptions than those were sentenced (12% vs. 5%).

In contrast to studies which use routine screening data only, those in the sentenced group in the Butler et al. (2005) study were recruited into the *NSW Inmate Health Survey*. There were some important demographic differences between participants and non-participants which were acknowledged in the study (e.g., proportions of Indigenous people differed).

[9] Receptions are those who had been either remanded into custody pending a court appearance or sentence; sentenced prisoners were those that were already serving a sentence at the time of the study (Butler et al, 2005, p. 408).

Despite some of the methodological limitations, the study makes a novel contribution to the literature by comparing new receptions with people who were sentenced; the study highlights the increased vulnerability of people are newly sentenced or on remand awaiting sentencing.

The *Health of Australia's Prisoners* is a government report series which publishes statistics from the National Prisoner Health Data Collection (NPHDC), the main source of national data about the health of people in prison in Australia. People who enter prison, are discharged, and visit prison clinics in 62 prisons across Australia, are invited to participate in data collection voluntarily. Among the 803 people who completed the entrants form in 2018, 40% of people who entered prison self-reported a previous diagnosis of a mental health condition including drug use disorder (Government of Australia, 2019). Women were more likely to report taking medication for a mental health condition (40% compared to 21% of men).

Reinforcing findings from the US, Australasian studies have demonstrated consistently higher prevalence of mental illness among people in prison compared to the general population, and within prisons, higher rates of mental illness among women and people on remand. Prevalence of mental illness in Australian prisons appear similar to comparable international estimates. In the final prevalence section, I will discuss and compare select Canadian studies.

Canadian studies

Some of the highest rates of mental disorder in custodial populations globally have been found in Canada. Two major studies were conducted with remand prisoners in British Columbia and Alberta. Roesch (1995) found that 85.9% of new admissions (n = 790) to Vancouver Pre-Trial Services had a substance use disorder, 15.6% had a major mental disorder[10] and 93.6% had any disorder. In the same year, Arboleda-Florez et al. (1995) conducted a study of mental illness prevalence using the SCID and a random sample of

[10] Major mental disorder was defined as severe cognitive impairment, schizophrenic disorders and/or major affective disorders.

1151 people admitted to the Calgary Remand Centre. One-month prevalence of mental disorder was found to be 60.7% overall, and substance abuse disorder was most common (47.2% of males and 38.7% of females).

The variations in the rates between the two studies can be explained by the differences in the definition of mental disorder. Roesch (1995) defined any disorder as those with one or more hits on the Brief Psychiatric Rating Scale (BPRS), the Referral Decision Scale (RDS) and the Diagnostic Profile (DP). Importantly, the BPRS measures *symptoms* and *behaviours* and may not reflect a definitive underlying disorder. In contrast, Arboleda-Florez et al. (1995) used the standard SCID which measured DSM criteria, making it more comparable to other studies in the literature. These foundational studies are now outdated and to my knowledge, no comparable provincial-level prevalence studies have been conducted in Canada.

More recent prevalence studies have been conducted on federal prison samples. Beaudette and Stewart (2016) examined the prevalence rates of major mental disorders among newly admitted men entering the federal correctional system in Canada using the SCID-I and SCID-II (n =1110). The most common disorders were current alcohol and substance abuse or dependence (49.6%), antisocial personality disorder (44.1%), and anxiety disorders (29.5%). Eighty-one percent (81%) of the sample had a lifetime prevalence of at least one mental disorder and 73% had a current disorder (in the past month). In comparison, results of the 2012 Canadian Community Health Survey – Mental Health (CCHS – MH) showed that 4.4% of the general community population met the criteria for a substance use disorder and 5.4% for a mood disorder in the previous 12 months (Pearson, Janz, & Ali, 2015). The prevalence of any mental or substance use disorder was 10% and 33% for past-year and lifetime, respectively. Consistent with the international literature, the general population prevalence is markedly lower than prison population prevalence.

The Office of the Correctional Investigator (OCI) in Canada found that between 1998 and 2007, the proportion of people in federal custody with significant, identified mental health needs had more than doubled (Sapers, 2011). Significant need was defined as

having had at least one mental health treatment-oriented service or stay in a treatment centre during the previous six months. This is the first Canadian study that noted an increase in prevalence in prison over a period of time (most studies are cross-sectional at a single time point). It was noted in the 2015-16 *Annual Report of the OCI* that 46% of women and 26% of men in federal Canadian prisons have an active psychotropic medication prescription, the most common being antidepressant (Sapers, 2016). The annual reports of the OCI are summary/plain language reports, which are accessible to a lay audience but lacking in detailed methodological information.

While there is a great deal of variability with respect to measures used, population and sampling approaches in the prison, considerable research demonstrates that the prevalence of mental illness among people who experience incarceration is greater than those who do not[11], by orders of magnitude. There is a glaring gap in updated empirical evidence regarding the prevalence and profiles of people who are incarcerated, particularly in the Canadian context. Below, we briefly summarize what is known about the cost of CJSI among people with mental illness, further reinforcing the rationale to better address unmet need.

2.1.2. The financial cost of criminal justice system involvement among people with mental and substance use disorders

People with mental illness may cycle through mental health and justice services, at enormous financial cost. A report examining prison health care costs in 44 US states from 2007-2011 found that mental health and substance use care accounted for approximately 1/5th of the expenditures (Pew Charitable Trusts, 2014). A Swedish study found that individual health care costs in prisons are driven by psychiatric conditions including schizophrenia, drug abuse, neurotic and personality disorders, and people with complex co-morbid health needs account for disproportionate expenditure (Moschetti et al., 2018).

[11] A detailed description of prevalence data in community samples is beyond the scope of this paper, but a summary of estimates (US data) is provided in Table 2.2.

Detailed data on mental health care expenditures in Canadian prisons does not appear to be publicly available.

Swanson et al. (2013) matched administrative records for adults who received mental health and substance use services (n = 25,133) with state Medicaid, judicial, correctional and public safety records in Connecticut. They found that the group with justice-involvement incurred approximately double the costs of those with no involvement ($48,980 vs. $24,728). In a study of post-hospitalization arrests in Florida, Van Dorn et al. (2013) compared service system costs for individuals with and without CJSI. The authors used claims data for prescriptions and treatments to describe patterns and costs of outpatient services between 2005 and 2012 for 4056 adult Florida Medicaid enrolees with schizophrenia or bipolar disorder after discharge from a hospitalization. Criminal justice and health system costs were significantly higher for the justice-involved group ($94,771 ± $106,890) than for the group with no CJSI ($68,348 ± $100,700). The costs were lower for the group with no arrests even when they used more outpatient health services (Van Dorn et al., 2013).

Another US study estimated that criminal justice encounters may comprise 6-11% of the annual per-patient direct costs associated with schizophrenia (Ascher-Svanum, Nyhuis, Faries, Ball, & Kinon, 2010). The authors found that those who had CJS encounters were less adherent to antipsychotic medication, and more likely to have comorbid substance use. In 2002, non-health related law enforcement costs associated with schizophrenia in the US were estimated to be $2.64 billion. A study in Alberta Canada looking at the system-wide justice costs, determined that mental illness added approximately $160 million to CJS costs in 2010/11 (13.5% of the entire CJS expenditure) and the greatest additional costs were associated with hospitalizations (Jacobs et al., 2016).

For individuals who have serious mental illness, stable supervised housing and effective treatment of substance use disorder can help reduce their involvement in the CJS and thus the associated costs (Clark, Ricketts, & McHugo, 1999; Salem et al., 2015). It is important that we achieve a better understanding of CJSI among people with mental illness to reduce crime, decrease costs, and increase positive health and social outcomes.

The period of admission to custody is widely regarded as an excellent (albeit unfortunate) opportunity to provide services to people who otherwise do not generally have positive, trusting, or consistent contacts with treatment providers (e.g., people with MHN/SUD, and experiencing structural disadvantage and marginalization).

A subgroup of people with particularly high-cost burden is those with co-occurring disorders (COD). Although people with COD are more likely to drop out of traditional outpatient treatment, their total system costs are higher than for those with a single disorder because they are more frequent users of costly acute-care services such as emergency departments (Butler, Love, Young, & Kinner, 2020; Drake, 1998). In the following section, we discuss this COD subgroup in more detail – including prevalence, health and social profiles, and COD treatment challenges.

2.2. Co-occurring mental disorder and substance use disorders

2.2.1. Prevalence of COD in prison populations

It is widely agreed that psychiatric comorbidity (i.e., the presence of two or more illnesses) is the rule rather than the exception among people in the criminal justice system (Kinner, 2006; Ogloff, Davis, Rivers, & Ross, 2006; Young et al., 2018). In the following section, I discuss what is known about the prevalence of COD in prisons.

Firstly, it is worth noting that there is no consensus or a uniform classification system for this subpopulation; terms used to describe the co-occurrence of mental illness and substance use disorder have included mentally ill chemically addicted (MICA) (Kloss & Lisman, 2003), substance abusing mentally ill (SAMI) (Brown & Backer, 1988), chemically abusing mentally ill (CAMI) (Sacks, Sacks, De Leon, Bernhardt, & Staines, 1997), co-occurring addictive mental disorders (COAMD) (Osher & Drake, 1996), and more commonly, co-occurring disorders, comorbidity, and dual diagnoses (SAMHSA, 2015). In this thesis, the term co-occurring disorders (COD) describes the co-occurrence of substance use disorder or dependency and one or more non-substance-related mental disorders. Below I present some estimates of COD prevalence in prisons in Canada and the US.

The most robust data on COD in prisons are principally from US-based studies. Abram and Teplin (1991) examined the co-occurrence of alcohol and drug abuse/dependence among men (n = 728) with serious mental illness (SMI) in prison. SMI was ascertained using the NIMH-DIS and included schizophrenia, mania, and major affective disorders. They found that 84.8% of those with any SMI had co-occurring alcohol use disorder and 57.9% had co-occurring drug use disorder. In a study of 1,272 females arrested and awaiting trial in Cook County using the same diagnostic tools described above, Abram et al. (2003) found that nearly three-quarters (72%) of people with SMI also had a substance use disorder. In the total sample, women with SMI were 1.5 – 4.9 times as likely as women with no SMI to have substance use disorders. The percentages of the sample that developed the mental disorder before or after the substance use disorder were roughly equal (43.4% and 46.0%, respectively). Using a much smaller sample (n = 190) of men entering prison via Washington State Corrections Reception Centre and the same diagnostic tools as the aforementioned studies, Chiles et al. (1990) found that 84% of those with a mental disorder[12] also had a diagnosis of alcohol of drug abuse or dependence.

In the same decade, Swartz and Lurigio (1999) studied a sample of 204 people in pre-trail jail receiving drug treatment in Chicago. They found that 49% of the group with substance dependence also had at least one additional psychiatric disorder using DSM-III-R criteria. Consistent with the academic studies, a Bureau of Justice Statistics report (James & Glaze, 2006, for detailed methodology see previous reference in 'US studies' section) found that among people in jail who had a mental health problem, 63% were drug dependent and 53% were alcohol dependent. Osher et al. (2012) compiled estimated proportions of adults in the US with mental disorder, substance abuse and dependence, and COD from a variety of sources (Table 2.2). More recently, Al-Rousan et al. (2017) conducted a cross-sectional study of people in prison (n = 8574) using Iowa Department of Corrections health records to ascertain diagnoses (ICD-9 and DSM codes). Consistent

[12] DSM-III-R axis I or axis II diagnoses

with previous studies, they found that 54% of those with SMI and 49% of those with any mental disorder had a co-occurring substance use disorder.

Table 2.2. Estimated prevalence of COD in US adults

	General population	Prisons	Jails
Serious mental illness (SMI)	5%	16%	17%
Substance use disorders	16%	53%	68%
COD when SMI is diagnosed	25%	59%	72%

Source: adapted from table in Osher et al. (2012)

Very few Canadian studies have examined COD in custodial settings. In an early study of 650 male inmates in Quebec, Côté and Hodgins (1990) used the Diagnostic Interview Schedule (DSM-III criteria) to ascertain diagnoses. They found that among people diagnosed with a SMI[5] only 1.8% had SMI alone (i.e., no co-occurring antisocial personality disorder, or substance abuse/dependence). Furthermore, 55% of those with schizophrenia, 65% of those with bipolar disorder, and 44% of those with major depression received *three or more* additional diagnoses. A more recent study of men entering federal custody over a 6-month period (n = 1110) using the SCID-I and SCID-II found that 38% met the criteria for both a current mental disorder and substance use disorder (Beaudette & Stewart, 2016). Also using the SCID-I and SCID-II, a study of 154 women entering federal custody in 2016 found that 79% had any disorder, and two-thirds had symptoms consistent with COD (Brown et al., 2018) – indicating much higher prevalence among women compared to their male counterparts in federal custody.

In the province of BC, Rezansoff and colleagues (2013) examined psychiatric diagnoses in a sample of people who were convicted of a criminal offence (n = 31,014) using linked health and justice data (via the BC Inter-Ministry Research Initiative). The study included people who were convicted between April 2005 and March 2007 (sample included those with community based and custodial sentences) and health data were retrieved for the five years preceding the offence. COD was ascertained using medical records with ICD-9 codes for both mental disorder and substance use disorders. They found that 23% of the sample had COD. The medical data were restricted to Medical Services Plan (MSP)

records, which includes services delivered by physicians and psychiatrists. People diagnosed in acute-care settings such as emergency departments or in-patient hospitalizations were not included, so this is likely an underestimate of the true prevalence of COD among people with CJSI in BC.

Despite methodological variability and study limitations, it is fairly well-established that the rate of COD is disproportionately higher in custodial settings than in the general community, across jurisdictions. In the next section, I discuss COD within the broader social and criminological context. COD is considered a risk factor for criminal behaviour, recidivism, and adverse health and social outcomes after release from prison. However, the relationship(s) between COD and crime are complex and under-researched. Below I provide an overview of what is known about COD as a risk factor for crime and/or violence (as well as risk factors *for developing* COD), ending with a discussion of treatment practices and challenges specific to this subpopulation.

2.2.2. Relationship between COD, incarceration risk, and post-release outcomes

The few studies that have examined the relationship between COD and incarceration have found a consistently significant positive association. Using a national representative sample of state prisoners in the US (n = 12, 504) Wood and Buttaro (2013) found that people with COD were more likely than those without to be both victims *and* perpetrators of assault while in custody. They were also more likely to be injured because of the assault and more likely to be charged with and convicted for assaulting other prisoners or staff. People with COD also remain in prison longer than those without, and are more likely to return to custody within one year compared to those with a substance use or mental disorder alone (Messina, Burdon, Hagopian, & Prendergast, 2004).

Wilson et al. (2011) examined recidivism[13] patterns in a large US urban jail system over a 4-year period (n = 24, 290). Using linked Medicaid and jail data, people with serious

[13] Recidivism refers broadly to repeat offending and is often measured by rearrest, reconviction and/or return to custody.

mental illness[14] and substance use disorders were identified using Medicaid claims data. They compared four groups: those with no disorder, mental disorder only, substance disorder only, and COD. They found that people with COD had the highest number of readmissions to jail, with 68% returning to jail at least once in the 4 years (compared to 50% of the mental illness only group). Using this same cohort data, Wilson et al. (2014) found that after release from prison, people with COD spent the shortest time in the community before returning to prison.

In another US study, Baillargeon et al. (2010) conducted a retrospective cohort study of all people (n = 61,248) incarcerated in one of 116 Texas Department of Criminal Justice (TDCJ) prison facilities between September 2006 and August 2007. They found that compared to people with a substance use disorder alone, those with COD were significantly more likely to have experienced multiple incarcerations over a 6-year follow-up period (OR = 2.3, for ≥4 reincarceration events). Similar findings have been produced in Canada. In BC, Rezansoff et al. (2013) looked at psychiatric diagnoses in a provincial prison sample (n = 31,014) using linked administrative health and justice data. They found that those with COD (23% of the sample) had significantly higher odds of recidivism (OR = 2.08) and multiple convictions (OR = 1.93). Overall, the evidence demonstrates that people with COD have consistently worse criminal justice outcomes compared to their counterparts with no mental illness or illness within a single disorder group (i.e., substance use disorders OR non-substance-related mental disorders).

In addition to increased re/offending risk, people with COD appear to be at elevated risk of adverse health and social outcomes *after release from prison*. Some of the major barriers faced by all people released from prison include trouble accessing employment due to having a criminal record, a lack of affordable housing and transportation, and coordination/navigation of government supports and community-based services. People with COD face the *triple stigma* of having mental disorder, substance use disorder, and criminal justice involvement (Hartwell, 2004). Upon release, people with COD may not have immediate access to psychotropic medications that stabilized them in custody, and if

[14] Defined as schizophrenia spectrum disorders and major affective disorders using DSM-IV codes 295 and 296.

sobriety was achieved, this will be challenged through multiple stressors that increase risk of drug use relapse (Chandler, Fletcher, & Volkow, 2009). Because people with COD may not be the preferred candidates for rehabilitation programs or residential facilities, they are more likely to be treatment non-compliant (Hartwell, 2004; Owen, Fischer, Booth, & Cuffel, 1996).

In a representative sample of people released from prison in Queensland, Australia (n = 1325), Young et al. (2018) studied rates of injury post-release using linked criminal justice data and administrative health records. They found that those with COD had approximately three times the rate of injury resulting in hospital contact after release from prison when compared with adults without a mental disorder. Using the same cohort, Butler et al. (2020) found that having COD was a significant predictor of frequent contact[15] with the emergency department after release (RRR= 2.54, p<.001).

2.2.3. Health and social profiles of people with COD

For most people who experience incarceration, their mental health issues began well before their prison sentence. As such, it is important to understand the needs of people with COD in the *general community* in order to better address them at a population level, with the goal of preventing involvement with the criminal justice system wherever possible. Here I briefly document that health and social profiles of people with COD.

Studies have shown that people with COD in the community have elevated rates of treatment noncompliance (Owen et al., 1996), homelessness, hospitalization, injection drug use, medical comorbidity including HIV and other sexually transmitted and blood-borne illnesses (Abroms & Sher, 2016; Dixon, 1999); and suicide (Abroms & Sher, 2016; Carrà, Bartoli, Crocamo, Brady, & Clerici, 2014; Gates, Turney, Ferguson, Walker, & Staples-Horne, 2017; Oquendo et al., 2010; Schaffer, Sinyor, Reis, Goldstein, & Levitt, 2014). Costa et al. (2015) conducted a systematic review of 42 studies on suicide risk among people with bipolar disorder and found that COD was associated with elevated risk of suicide as well as other unnatural deaths. Rush and Koegl (2008) collected data

[15] Frequent attenders were defined as those who had ≥4 visits within any 12-month period post-release.

from a large sample of cases (n = 9839) from tertiary, outpatient, and community-based mental health programs in Ontario, Canada and found that COD is associated with overall health problem severity, low education, lack of employment, history of legal problems, and antisocial and challenging behaviour. Many of the correlates of COD (such a low education, homelessness, and unemployment) have been shown to elevate risk of crime and therefore would be good intervention targets for reducing criminal involvement among people with COD.

Traditional community-based treatments often fail to meet the needs of people with COD, and people with COD are less likely than their counterparts to access specialty MHN/SUD treatment at all. Watkins et al. (2001) sought to describe the use of mental health and substance abuse care among adults in the US with probable COD, using data from the national *Healthcare for Communities Survey*. They found that 72% of those with COD did not receive any specialty treatment in the previous 12-months and only 8% received both specialty mental health and substance use treatment. A Canadian study found that 51% of those with COD in the community had perceived unmet need for mental health care in the past year compared to 13% of those with SUD alone and 21% with mental disorder alone (Urbanoski, Cairney, Bassani, & Rush, 2008).

The next section outlines some of the challenges associated with meetings the needs of people with COD and best practices in COD treatment. Challenges that are specific to prison-based treatment are out of scope for this thesis, although some of the challenges with treating COD more generally would apply to both community and custodial settings. While the thesis focuses on reincarceration outcomes rather than health outcomes, evidence suggests that appropriate mental health and substance use treatment in combination with other social supports, has the potential to improve offending outcomes (this will be discussed further in section 2.3).

2.2.4. Best practices and challenges in treatment of COD

Despite the well-documented risk factors for poor health, criminogenic, and social outcomes for people with COD, there is a dearth of literature on effective treatment modalities for this subgroup. In a review of the literature evaluating models of

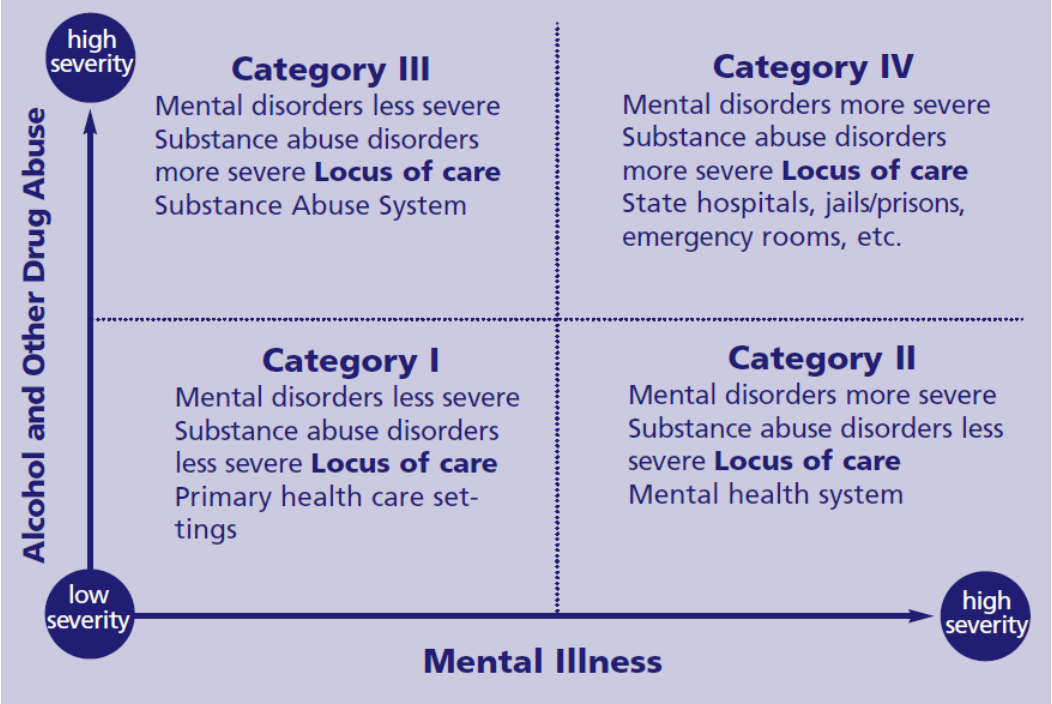
community care for patients with mental illness, Mueser et al. (1998) found that only six of the controlled studies measured changes in substance use, and only two focused any attention exclusively on patients with COD. Historically, mental disorder and substance abuse have been treated in separate service systems with differing and sometimes contradictory philosophical orientations (Bride, MacMaster, & Webb-Robins, 2006). Research has also reflected this separation of mental disorder and substance use seen in service provision. Mueser, Bellack, and Blanchard (1992, p. 853) remarked, "these two groups [mental health and substance use] have worked independently in separate programs, published in different journals, and received research funds from separate agencies." This entrenched separation has been especially problematic for treatment of COD and has stymied rigorous research into best practices.

Three prominent treatment models are discussed in the literature: sequential, parallel, and integrated. Traditional sequential services refer to a model where a client is treated for one disorder and then later referred to other services for treatment of the other disorder. In parallel treatment models, both disorders are treated concurrently, but through different service providers (Donald, Dower, & Kavanagh, 2005). In integrated treatment (IT) models, the mental disorder and substance use disorder are treated simultaneously, and the treatment is tailored for the presence of comorbidity and complexity. The clinicians involved in treatment are cross-trained and teams are often multidisciplinary and co-located. A key benefit is that the client does not need to navigate two separate treatment programs, and it encourages collaboration between service providers and barriers to information sharing (Kavanagh et al., 2000). Donald et al. (2005) indicated that parallel treatment can work well in situations where the clinicians work closely together, and the treatment takes account of the comorbidity. They also caution that specialization of COD service in the form of IT centres may further exclude patients in need because of the creation of yet another set of exclusion criterion (e.g., the presence and severity of the comorbidity). More research is needed to understand the types of COD that are best treated with single disorder interventions and those that require integrated mental health and substance abuse treatment.

Drake (1998) conducted a review of ten studies of comprehensive, integrated COD programs and found that overall, especially when delivered for 18 months or longer, they resulted in reductions in substance use, reductions in hospital use, and improvements in other outcomes such as increased medication compliance. The research comparing sequential, parallel, and integrated approaches is equivocal and methodologically flawed (Bride et al., 2006). But, Bride et al. (2006, p. 54) pointed out that "even in the absence of unambiguous evidence that IT approaches for people with COD is more effective than non-integrated approaches, compelling arguments in favour of implementing IT do exist" (e.g., system efficiency, easier for client to navigate, etc.). Systemic difficulties related to the organizing, governance, and financing of IT models has led to delays in the development and implementation of IT in most jurisdictions (SAMHSA, 2005).

While best practices have not yet been determined, some broadly accepted principles of good practice in COD care are available, for example, cohesive social support alongside clinical treatment, gradual/staged and long-term treatment options, and interventions matched to level of need (Department of Health, 2009). SAMHSA (2005) developed the *Level of care quadrants* (Figure 2.1) which is a conceptual framework that classified settings within which COD are treated. Accordingly, the severity of client needs, diagnosis, symptoms, and impairments determine level of care placement. The report acknowledges that there is currently no locus of responsibility for COD within the healthcare system, and the lack of coordination means that neither clients nor service providers move easily across service settings.

Figure 2.1 Level of care quadrants



Source: SAMHSA (2005)

2.3. The relationship between mental illness and criminal justice system involvement

This section examines the evolution of competing explanations for CJSI among people with mental illness. Most people with mental illness do not engage in crime or violence, and they are significantly more likely to be the *victim* of a crime than people without mental illness (Maniglio, 2009; Sells, Rowe, Fisk, & Davidson, 2003). That said, it is important to understand which symptoms, individual and situational factors, and circumstances may increase (or decrease) the risk of crime among people with mental illness. Below, I discuss deinstitutionalization and transinstitutionalization, the criminalization hypothesis, the criminality perspective, and moderators which have been shown to affect the relationship between mental illness and crime.

2.3.1. Deinstitutionalization and transinstitutionalization

The proportion of people with mental illness in correctional populations became a serious policy concern when successive governments began to downsize and close major

psychiatric institutions (Corrado, Cohen, Hart, & Roesch, 2000; Livingston, Nicholls, & Brink, 2011). Psychiatric deinstitutionalization refers to a process of shifting mental health care from institutional care to community-based outpatient settings. The shift took place primarily in high-income, Western nations that had experienced a preceding period of building psychiatric hospitals (Hudson, 2016). Reasons for this movement include awareness of inhumane conditions in some psychiatric hospitals, advances in psychotropic medications, changes in societal attitudes towards mental illness and cost-shifting incentives (Kim, 2014). The policy of deinstitutionalization was not implemented consistently across geographical areas, and the policy did not characterize the conditions under which full implementation would exist (Bachrach, 1996; Mechanic, 1986; Mechanic & Rochefort, 1990).

This process, beginning in the 1960s, is arguably associated with the substantial increase in people with mental illness residing in urban locations that make them highly susceptible to monitoring and criminal justice contact (Corrado et al., 2000). Significant problems were produced by early reform efforts where the reduction in inpatient beds outpaced the expansion of community-based services and supports (Livingston et al., 2011). The influx of people with mental illness into the CJS as a direct result of deinstitutionalization has been labelled *transinstitutionalization*. Although many people continue to revolve in and out of general hospitals and psychiatric units, their stays are often short, treatment is intermittent, and they are frequently released without adequate after-care or follow-up support (Hiday & Burns, 2010; Markowitz, 2006; Salisbury & Thornicroft, 2016). It is estimated that the rate of psychiatric beds per 1000 population in Canada decreased from 3.5 to 1.0 between 1965 and 1981[16] (Sealy & Whitehead, 2004).

Studies in North America and Europe have revealed a relationship between decreased inpatient psychiatric service capacity and growth in the number of forensic patients (Medford-Davis & Beall, 2017; Schanda, Stompe, & Ortwein-Swoboda, 2009). Citing increased incarceration in Canada and the US between 1940 and 1955 alongside decreases in hospitalizations, Ogloff (2002) remarked that “there is little doubt that some

[16] More recent data do not appear to be publicly available.

people who might otherwise be detained in psychiatric hospitals are making their way into the criminal justice system" (p. 5). Strikingly similar trends with respect to the inverse relationship between the number of psychiatric hospital beds and the number of people in prison, have also been found in the United Kingdom (Gunn, 2000).

However, a systematic review of almost 200 cohort studies involving deinstitutionalized patients found no evidence of the transfer of patients to homelessness or the criminal justice system (Winkler et al., 2016). Winkler and colleagues explain that population-level studies assume that people who are homeless or in prison with a history of psychiatric treatment would not be homeless or in prison under the older institutional model of care. Critics of the transinstitutionalization theory suggest that formerly institutionalized individuals and currently incarcerated people with mental illness are distinct populations, and other factors such as the war on drugs, increased poverty, lack of affordable housing, budget cuts to health and social services, and labour market changes, are better explanations for the influx of people with mental illness into prisons and jails (Prins, 2011; Winkler et al., 2016). Critics further argue that the increase in persons with mental illness living in the community does not sufficiently explain their disproportionate representation in the criminal justice system (Livingston et al., 2011; Ogloff et al., 2006).

The deinstitutionalization movement has resulted in some positive changes for people living with mental illness, including increases in reported life satisfaction, independent living, and productive employment (Warner, 1995). But people with economic privilege and those with less severe disorders may have benefited preferentially from this model shift, leaving people with SMI and/or socioeconomic deprivation with inadequate services (Lamb & Weinberger, 2005). Marginalized populations, such as people who are homeless and facing other structural barriers, are "alternately and repeatedly routed between the mental health and criminal justice systems" (Slovenko, 2003, p. 641). The criminalization of people with SMI could be reduced by expanding the range of treatment options, including 24-hour intensive, highly structured, inpatient care for the small subset of people with mental illness who cannot be sufficiently supported in low- or medium-intensity care settings (Lamb & Weinberger, 2005).

2.3.2. The criminalization hypothesis

The *criminalization hypothesis* asserts that people with mental illness are more likely to be involved in the CJS than their counterparts holding all else constant, because manifestations of mental illness are, themselves, criminalized. The term was coined by Abramson (1972) to characterize the disproportionate number of people with mental illness entering the CJS on misdemeanor crimes. Lamb and Weinberger (1998) suggested that people with mental illness are being "arrested for minor acts that are, in fact, manifestations of their illness, lack of treatment, and the lack of structure in their lives" (p. 485).

A literal interpretation of the criminalization hypothesis implies at least two possibilities: (1) people with mental illness are arrested because of their psychiatric symptoms; (2) symptoms of mental illness motivate or cause behaviours that bring people with mental illness into contact with the CJS. The hypothesis is supported by studies which demonstrate that for at least some people, psychiatric symptoms are associated with criminal behaviour. Clinical factors which have been associated with violence and crime include: nature and severity of psychiatric symptoms (Brennan, Mednick, & Hodgins, 2000; Wallace, Mullen, & Burgess, 2004); medication non-compliance (Swanson, Swartz, Elbogen, & Van Dorn, 2004; Swartz et al., 1998), co-occurring substance use disorders (Junginger, Claypoole, Laygo, & Crisanti, 2006; Tiihonen, Isohanni, Rasanen, Koiranen, & Moring, 1997), co-occurring personality disorders (Fridell, Hesse, Jæger, & Kühlhorn, 2008), and previous psychiatric hospitalizations (Fazel, Grann, Carlström, Lichtenstein, & Långström, 2009; Webb et al., 2017).

Importantly, studies that control for antisocial personality disorder (APD) and problematic substance use, have found that both factors explain most of the association between mental illness and CJSI (Hiday & Burns, 2010). Furthermore, critics have asserted that the term 'criminalization' implies that law enforcement officials inappropriately target people with mental illness. With respect to encounters with people with mental illness, police spend a great deal of time brokering impermanent solutions to chronic vulnerability (Wood, Watson, & Fulambarker, 2017). While arrests are not

overly common, laws that target people who are impoverished (e.g., anti-homeless laws) produce various forms of police interactions that have detrimental impacts on people who are poor. Move-along orders, citations, no-go zones, and destruction of property, systematically limit people's access to services, housing, and jobs, while deepening vulnerability and health inequities (Herring, Yarbrough, & Marie Alatorre, 2019). The criminalization of poverty cannot be entirely separated from the criminalization of mental illness given the elevated rates of mental illness among people living in poverty.

A study in direct support of the criminalization hypothesis was conducted in 1984 by Linda Teplin. Using data from patrol officers' encounters with 506 suspects in Chicago, Teplin (1984) found that the rate of arrest for those with mental disorder was 47% compared to 28% of those without. Based on these findings, Teplin (1984) concluded that police disproportionally use arrest to resolve encounters with people with mental disorder. This study has been criticized for not including any statistical controls for legal factors and other variables known to influence police behaviour (Engel & Silver, 2001). Engel and Silver (2001) conducted a similar study but controlled for a variety of factors (including suspect characteristics/demeanor, relationship between victim and perpetrator, and other situational and legal variables) and found *no support* for a relationship between mental illness[17] and arrest. Other individual and environmental characteristics, such as intoxication, presence of a weapon, and noncompliance, predicted arrest in their study. However, this study was based on *police perceptions* of mental illness, which are conditioned by an individual's beliefs, knowledge, and cultural norms. The difference in how mental illness was defined may help explain the variation between study findings. Importantly, decision to arrest (the primary outcome in Teplin (1994) and Engel and Silver (2001) studies) ought not be the only outcome of interest to researchers and policy makers. As previously mentioned, laws that fall short of arrest may still produce a wide

[17] Based on field observers' perceptions. For example, observers were instructed to code suspects as having mental disorder if they appeared unable to perceive situations as a reasonable person would or to control their emotions and actions.

range of consequences including exacerbating poverty and health inequality among marginalized groups.

The criminalization hypothesis provides a narrow explanation of the relationship between mental illness and crime, and perhaps "minimizes the complex clinical, criminogenic, substance use, and social services needs of people with serious mental illness (Bonfine, Wilson, & Munetz, 2019, p. 355)." Critics of the criminalization hypothesis have formed other explanations and theories for the overrepresentation of mental illness in the CJS, and some of these are explored in the next section.

2.3.3. The criminality perspective

An alternative to the criminalization hypothesis is the *criminality perspective*. This perspective proposes that factors predictive of CJSI among people with mental illness are the same as those without, but people with mental illness have disproportionately more of those risk factors (and often, more severe forms of those risk factors). Junginger et al. (2006) recommended that without evidence that psychiatric symptoms are directly associated with behaviour causing arrest and incarceration, "the criminalization hypothesis should be reconsidered in favor of more powerful risk factors for crime that are inherent in social settings occupied by persons with serious mental illness" (p. 882). In other words, the social, economic, and environmental conditions in which a person lives, better predict CJSI than the presence of a mental disorder. This perspective is supported by studies which have shown mental disorder is not a significant predictor of criminal recidivism when other risk factors are considered. A US study by Wilson et al. (2011) comparing recidivism rates for people with different psychiatric diagnoses, found that people with serious mental illness were significantly *less* likely to return to prison than people with no disorder.[18]

To examine predictors of recidivism among people with mental disorders, Bonta, Law and Hanson (1998) conducted a meta-analysis of 58 studies reporting on 64 unique samples. Effect sizes were calculated for 35 predictors of general recidivism and 27

[18] The Wilson et al. (2011) study is described in section 1.3.1.

predictors of violent recidivism. They found that clinical psychopathological variables were either unrelated or *inversely* related to recidivism. It appears that the major risk factors for recidivism are the same for people with and without mental disorder (e.g., criminal history, substance abuse, antisocial personality, and family dysfunction) (Bonta & Andrews, 2007; Bonta et al., 1998). An updated meta-analysis was conducted on the same topic using 126 studies reporting on 96 unique samples. The previous finding was replicated: having a mental disorder, including a psychotic disorder, was not more predictive of recidivism than not having a mental disorder (Bonta, Blais, & Wilson, 2014).

Elevated rates of homelessness and other general risk factors among people with mental illness and substance use disorders are thought to contribute to higher rates of arrest (La Vigne, Davies, Palmer, & Halberstadt, 2002; Osher, 2013). In a matched sample of people on parole, Skeem et al. (2014) found that people with and without mental illness were equally likely to be arrested, but the people with mental illness were more likely to be returned to custody, suggesting that social support and supervision disparities may contribute to parole failure for people with mental illness. Other studies have found that receipt of mental health services post-release has been associated with *greater* likelihood of being returned to jail or prison (Domino et al., 2019; Draine & Solomon, 2001; Solomon, Draine, & Marcus, 2002). As such, linkages to community-based services that are not designed to respond to the needs of people with CJSI, may increase rather than reduce risk of future detention through heightened monitoring (Draine & Solomon, 1999). While they present evidence in support of the criminality perspective, these studies also demonstrate that supervision "failures" may reflect that people with mental illness are more likely to be *caught* for criminal behaviour or breaches of conditions due to differential forms of surveillance.

The debates between the criminality and criminalization hypotheses are hardly settled. What is clear from the evolution of work in this area, is the importance of carefully identifying the factors that increase risk of both mental illness and CJSI and using a well-controlled model to isolate the association of mental illness in predictive models examining risk of CJSI. Rather than asking if mental illness causes crime, we should ask

which *symptoms* in combination with which *individual and situational factors* have been shown to elevate the risk of crime. There is some evidence for typologies or moderators which encourage a more nuanced understanding of the relationship between crime and mental illness. Two relationship moderators that will be discussed here include: age of onset of criminal behaviour (early vs. late), and specific symptoms such as psychosis.

2.3.4. Mental illness and crime relationship: moderators and mediators

The extent to which the association between mental illness and crime is mediated by other factors or is direct, depends on a range of moderators,[19] and there is considerable controversy around how to interpret the associations (Elbogen & Johnson, 2009). Typologies (or subgroups) of people with mental illness and CJSI have been described based on the age of onset of illness and criminal contact (Simpson, Grimbos, Chan, & Penney, 2015). A theoretical perspective proposed by Hodgins (1995) is the *early and late starter model*, which hypothesized that early starters display a stable pattern of antisocial behaviour at a young age, prior to the onset of mental illness. Alternatively, late starters begin offending only in adulthood at the time when their psychiatric symptoms are present. The model suggests that mental illness may be an important risk factor for criminality for those individuals whose criminality occurs around or after the onset of mental illness. In cases where criminality precedes illness, the traditional criminogenic factors such as history of crime and antisocial cognition will be more important than clinical symptoms.

Studies have found that early starters have more exposure to criminogenic risk factors and are more likely to reoffend, have comorbid substance use disorders, have a personality disorder, and display more violence – they tend to become more entrenched in a criminal lifestyle (Crocker, Martin, Leclair, Nicholls, & Seto, 2018; Mathieu & Côté, 2009; Silver, 2006). For example, in a sample of 1800 forensic patients from three Canadian provinces, Crocker et al. (2018) found that adolescent starters (CJSI prior to onset of mental illness; pre-illness) were more likely than later starters (CJSI after onset

[19] A moderator affects the strength and direction of a relationship between variables. This is distinct from a relationship mediator which explain the process through which two variables are related.

of illness; post-illness) to have a comorbid substance use disorder (OR=1.63), personality disorder (OR=2.33), and previous charges (IRR=3.31).[20] Skeem, Manchak, and Peterson (2011) suggest a conceptual framework for integrating the moderated mediation effect of mental illness on criminal behaviour, emphasizing that whether the effect is mediated or direct varies across subgroups, but the relationship will be indirect for the *vast majority* of people who offend. Among a small subset of people who begin offending after the onset of mental illness, their mental illness may play a stronger causal role in their offending.

People with mental illness do not form a homogenous group with respect to risk of CJSI. Scholars have suggested that specific clinical symptoms may be associated with crime and violence and studies should account for this. Paranoid delusions have been linked to violence, especially in cases where an individual feels threatened that their self-control is being invaded (McGuire, 2015); this pattern has been described as *threat-control-override* (TCO) symptoms. Accordingly, perceived threat of harm combined with the perception that one's thoughts are being controlled by external forces may be associated with aggression, where non-threatening delusions may not. Early studies demonstrated empirical support for the link between TCO symptoms and violence (Link & Stueve, 1994; Swanson, Borum, Swartz, & Monahan, 1996).

However, the presence and strength of the association has been challenged. Using data from the *MacArthur Violence Risk Assessment Study*, Appelbaum et al. (2000) found that in a group of patients discharged from acute psychiatric facilities, the presence of TCO delusions did not prospectively predict higher rates of violence within one year of follow-up. Using the same data, Teasdale, Silver, and Monahan (2006) concluded that men are significantly more likely to engage in violence during TCO delusions, whereas women are significantly *less* likely to engage in violence. Steadman et al. (1998) examined the nature and timing of violence among 1136 patients with mental disorders released from three acute-care inpatient facilities in the US. They found that co-occurring substance use

[20] Reference category was younger post-illness starters. Crocker et al. expanded the Hodgins model to 5 categories including: adolescent pre-illness starters (<18), adult pre-illness starters (18+), younger post-illness starters (<35), older post-illness starters (35+), and first presenters (crime and mental illness occurred simultaneously). For more information, see Crocker et al. 2018.

was an important factor in violence risk among people with psychotic disorders, and no significant difference was found for violence between patients without symptoms of substance abuse and the comparison group living in the same neighbourhood. The authors conclude that the prevalence of community violence by people with acute psychiatric symptoms varies considerably according to diagnosis and, particularly, co-occurring substance abuse diagnosis.

Sample composition is an important confounder in studies which examine the relationship between psychosis and violence. Mental illness appears to be a risk factor among the general population but when the sample is the CJS population, the relationship is weakened or no longer significant. For example, Douglas, Guy, and Hart (2009) conducted a meta-analysis of 204 studies based on 166 independent datasets and found a strong association between psychosis and violence in community samples (OR=3.46) but this was no longer meaningful in correctional samples (OR=1.27) or forensic psychiatric samples (OR= 0.91). The other strong moderator was comparison group: when compared to people with other mental disorders (excluding psychosis), the odds of violence were slightly higher for people with psychosis (OR=1.51), but the odds ratio was substantially higher when the comparison group was people with no identified mental disorder (OR= 3.68). Bonta et al. (2014) found no relationship between psychosis and recidivism and concluded that "although there are certainly cases when a crime is committed during a psychotic state, the presence of psychosis does not appear to be a useful predictor of recidivism. The reasons for this may be because psychosis is transitory… and amenable to treatment" (p. 285).

A recent review found that while severe violence is rare and the absolute numbers are small, the relative risk of violence is clearly demonstrated for people with individual psychiatric disorders (odds ranging from 2-4 after adjustment for confounding), and rates are highest among people with schizophrenia spectrum, substance use, and personality disorders (Whiting, Lichtenstein, & Fazel, 2021). A longitudinal study of 47,326 people in prison in Sweden, found that hazard of violent offending increased in stepwise pattern with the *number* of diagnosed psychiatric disorders and substance use disorders, and bipolar disorder had the strongest effects (Chang, Larsson, Lichtenstein, & Fazel, 2015a).

In sum, mental illness appears to be directly related to crime in only a *small* minority of cases. But symptoms and clinical impairment can complicate correctional treatment, and the treatment of mental illness can help in efforts to reduce offending. While mental illness does not appear to be a strong risk factor, it is nonetheless a *responsivity* factor - many illnesses cause functional impairments which can significantly affect a person's response to interventions targeting criminogenic needs (Osher et al., 2012). For example, a person with untreated major depression may not benefit from an intervention to treat antisocial cognition until their clinical symptoms are addressed. Standard treatment approaches for mental illness alone are unlikely to prevent crime because they do not target issues related to criminality such as criminal attitudes (Morgan, Kroner, Mills, Bauer, & Serna, 2014). Skeem et al. (2014) recommended that mental health services and correctional services work synergistically to improve overall functioning. For example, speciality parole/probation with small case loads and expertise in working with people with mental illness, shows promise for improving clinical and criminal outcomes (Skeem, Encandela, & Louden, 2003; Skeem & Louden, 2006). While the relationship between mental illness and recidivism is largely indirect, both mental health needs and criminogenic needs are important targets for risk reduction and enhanced outcomes.

2.3.5. Preventing recidivism - models of assessment and treatment

One model which has strong empirical support is the risk-needs-responsivity (RNR) model of correctional assessment and treatment. The RNR model has three main principles: (1) assessing risk; (2) addressing criminogenic needs; and (3) providing treatment aligned with individual learning styles, abilities, motivation, and personal strengths (Andrews, 2012). A key strategy to preventing criminal recidivism involves the accurate assessment of one's risk of reoffending, and appropriate response to that risk. Risk assessment involves measuring *risk factors* and *protective factors.* Risk factors are characteristics which are associated with a higher likelihood of negative outcomes, while protective factors are associated with a lower likelihood of negative outcomes or reduction in the risk factor's impact (SAMHSA, 2018).

Correctional programs which adhere to RNR principles have demonstrated decreased levels of recidivism and a variety of criminal behaviour (Dyck, Campbell, & Wershler, 2018; Luong & Wormith, 2011; Stewart, Gabora, Kropp, & Lee, 2014; Vitopoulos, Peterson-Badali, & Skilling, 2012). Notably, this model reflects *criminogenic* needs, which are "dynamic attributes of the offender and their circumstances that, when changed, are associated with changes in the chances of recidivism" (Andrews, Bonta, & Hoge, 1990, p. 31). The main criminogenic needs according to Bonta and Andrews (2007) are summarized in Table 2.3. People who are at higher risk (i.e., have more criminogenic needs) and will require more intensive interventions than those with lower risk.

Table 2.3. Major criminogenic needs according to RNR model

Major risk/ need factor	**Indicators**	**Intervention goals**
Antisocial personality pattern	Impulsive, adventurous pleasure seeking, restlessly aggressive and irritable	Build self-management skills, teach anger management
Procriminal attitudes	Rationalizations for crime, negative attitudes towards the law	Counter rationalizations with prosocial attitudes; build up a prosocial identity
Social supports for crime	Criminal friends, isolation from prosocial others	Replace criminal friends and associates with prosocial friends and associates
Substance abuse	Abuse of alcohol and/or drugs	Reduce substance abuse, enhance alternatives to substance use
Family/marital relationships	Inappropriate parental monitoring and disciplining, poor family relationships	Teaching parenting skills, enhance warmth and caring
School/work	Poor performance, low levels of satisfactions	Enhance work/study skills, nurture interpersonal relationships within the context of work and school

Prosocial recreational activities	Lack of involvement in prosocial recreational/leisure activities	Encourage participation in prosocial recreational activities, teach prosocial hobbies and sports

Source: adapted from Bonta & Andrews (2007)

A key aspect of the RNR model is the use of risk assessment measures such as the Level of Service/Case Management Inventory (LS/CMI) which is designed to assist with the management, supervision, and case planning for people who offend. Olver, Stockdale, and Wormith (2014) conducted a meta-analysis of the LS scales using 128 studies comprising 151 independent samples and a total sample of 137,931 offenders. They found strong support for the predictive accuracy of the LS scales and their criminogenic needs domain (based on RNR), and the largest effect sizes were found in Canadian samples.

While the LS/CMI model was not designed for people with mental illness, it has been shown that general risk factors can be reliably measured and have predictive validity within this group as well as those without mental illness. For example, Skeem et al. (2014) matched a sample of 221 people with and without mental illness recently released to parole in the US and then followed them for one year. They found that in addition to factors which are unique to mental illness, people with mental illness had more *general risk factors* for recidivism. Furthermore, the general risk factors (such as poorly structured leisure time) predicted recidivism whereas the clinical factors associated with mental illness did not. In other words, mental illness did not moderate or alter the predictive validity of the LS/CMI for recidivism outcomes. Given the robust scientific support for the RNR risk factors, the model helped inform variable selection for the multivariate models included in this thesis.

2.4. Mental health screening in prisons

Consistent with international data on people in prison, a review of studies from 1993-2014 found that Canadians in custody have poor health across a range of health status indicators (Kouyoumdjian et al., 2016). Prior to being admitted to prison people with mental health needs, and in particular those with COD, have lower levels of health

services use compared to their counterparts with no CJSI (Farrell et al., 2006). For instance, a Canadian study of primary care experiences among people in a provincial correctional facility (n = 125) found that in the 12 months prior to incarceration, 32% did not have a family doctor and 48% had unmet health needs (Green, Foran, & Kouyoumdjian, 2016). The percentage of reported unmet need among people in prison is notably higher than the 11.2% of Canadians in the general community who reported having unmet healthcare needs in 2014 *Canadian Community Health Survey* (Statistics Canada, 2016). Given the prevalence of unmet health needs among people who experience incarceration, screening *every person* admitted to prison is considered best practice and a key component of correctional health care (Nicholls et al., 2018). Mental health screening generally involves using a validated tool to identify indicators for the presence of mental illness, substance use, behavioural challenges, or other problems (Nicholls et al., 2018) that reflect a need for treatment, special placement, referral or supervision (SAMHSA, 2015). Screening should be conducted as early as possible so that results can inform the need for further assessment and diagnosis (National Institute on Drug Abuse, 2006). Given that provincial prison stays are generally short, screening and assessment information should be used to refer and link people to appropriate community-based resources (SAMHSA, 2015). In order for the value of mental health screening to be realized or maximized, the screening process must be accurate, appropriate follow-up and treatment must be provided, and treatment must meet peoples' needs (Martin et al., 2018). Due to the rapid churn of people through prisons, valid and efficient screening is critical for improving health outcomes and allocating scarce resources.

A systematic review published in 2013 found that the most promising tools for mental health screening in prison include the Brief Jail Mental Health Screen (BJMHS), the Correctional Mental Health Screen for Men (CMHS-M), the Correctional Mental Health Screen for Women (CMHS-W), the England Mental Health Screen (EMHS) and the Jail Screening Assessment Tool (JSAT) (Martin, Colman, Simpson, & McKenzie, 2013). Screening performance may be affected by factors such as sex, race/ethnicity/culture, custodial setting, and staff qualifications/training (Martin et al., 2013). While these instruments have been used consistently for correctional management decisions and

referral pathways, there is untapped potential for routinely collected screening data to be used for research and evidence-informed correctional health policy.

In the final section of Chapter 2, I briefly consider the framework that establishes Canada's legal obligations to provide care to people with mental illness who experience incarceration.

2.5. Legislative framework for mental health care service provision in Canadian corrections

Canada is party to a number of international treaties and conventions that are directly relevant to the mental health of individuals who are detained. For instance, the UN *Standard Minimum Rules for the Treatment of Prisoners*, which incorporate basic standards with respect to the provision of mental health services, was officially endorsed by Canada in 1975 (UN General Assembly, 2016). Canada has also ratified the UN *Convention on the Rights of Persons with Disabilities* which underscores the right to the highest standard of mental and physical health, and the right to freedom from discrimination in the delivery of health services based on mental disability (UN General Assembly, 2007).

While the *Canada Health Act* sets the standard for health across most Canadian populations, people sentenced to federal custody are expressly excluded from the definition of "insured person"[21] under the *Canada Health Act* (1985) . Standards for health care in federal custody are defined in the federal *Corrections and Conditional Release Act (CCRA).* Section 86 of the CCRA states that the Correctional Service of Canada will provide every person with:

(a) essential health care; and
(b) reasonable access to non-essential mental health care that will contribute to the inmate's rehabilitation and successful reintegration into the community.
(2) The provision of health care under subsection (1) shall conform to professionally accepted standards.

[21] "Persons excluded under the Act include serving members of the Canadian Forces and inmates of federal penitentiaries."

The CCRA does not specify the meaning of *essential health care* and there are no clear national standards for making the determination of whether *professionally accepted standards* are met in any given situation (Verdun-Jones & Butler, 2016). In the absence of clearly articulated national standards, acceptable standards depend on the expert evidence and on medical consensus about the best treatment modalities at any given time.

Health is a matter that falls within the exclusive jurisdiction of the provinces, under section 92(7) of the *Constitution Act*. Provincial and territorial governments are, therefore, responsible for the management, organization, and delivery of health services to their residents. At the provincial/territorial level, there are laws, policies and manuals that guide the delivery of health care services in provincial custody and community corrections (e.g., Health Care Services Manual - Adult Custody Division, Corrections Branch (BC Ministry of Justice, 2002)). In Canada, the responsibility for the delivery of health services in custody varies across provinces (Kouyoumdjian et al., 2016). In Nova Scotia, Alberta, and British Columbia, health services are delivered by the government authority responsible for health and in all other provinces, they are delivered by the provincial correctional authority. Prior to October 2017, health services in BC provincial correctional facilities were contracted out to a private company. Implementing consistent standards across Canada will remain challenged by the legislative realities of distributed authority for correctional services under the *Constitution Act* (Livingston, Weaver, Hall, & Verdun-Jones, 2008). There are few judicial decisions clarifying the right to mental health treatment in custody in Canada (Verdun-Jones & Butler, 2016).

Chapter 3. Data sources and measures

To meet my research objectives described in Chapter 1, I used a unique administrative data source – intake screening records from BC provincial prisons. In this Chapter, I provide information about the data, including access processes, detailed data descriptions, data cleaning, and operational definitions that are common across the three studies. While the three studies answer distinct questions using different analytic approaches, they all rely on the same dataset. Details about the analytical approaches are provided within Chapters 4-6.

3.1. Study setting

In Canada, people who are sentenced to less than two years or are detained while waiting to be sentenced (i.e., remanded) serve time in provincial facilities (jails, referred to as correctional facilities[22] in Canada). BC Corrections is the provincial government entity responsible for the management of all adults sentenced to provincial custody or community supervision. The agency provides secure custody for people who are accused and awaiting trial or sentencing (i.e., on remand), people serving a sentence of less than two years, people on bail or serving a community sentence (e.g., probation, conditional sentence order), and people detained under the authority of the Canada Border Services Agency (BC Ministry of Public Safety and Solicitor General, 2017).

BC Corrections manages ten adult correctional facilities throughout the province:

1. Alouette Correctional Centre for Women
2. Ford Mountain Correctional Centre
3. Fraser Regional Correctional Centre
4. Kamloops Regional Correctional Centre
5. Nanaimo Correctional Centre

[22] Throughout the dissertation I use "prison" rather than "correctional facility" because this is more consistent with language used internationally.

6. North Fraser Pretrial Centre
7. Okanagan Correctional Centre
8. Prince George Regional Correctional Centre
9. Surrey Pretrial Services Centre
10. Vancouver Island Regional Correctional Centre

Figure 3.1. Map of BC Corrections facilities
Source: BC Ministry of Public Safety and Solicitor General (2017)

As of 2017, BC Corrections had a budget of $245 million; 2,259 staff members; and was responsible for the supervision of more than 25,000 people throughout the province (BC Ministry of Public Safety and Solicitor General, 2017). The Provincial Health Services Authority (PHSA) partners with BC Corrections to provide health and mental health services to people in provincial custody. BC is the only province with a Director of Mental Health Services in corrections, and each prison has a mental health professional who coordinates services for people with mental illness; a mental health liaison officer; and mental health screening within 24 hours of admission (Government of BC, n.d.).

3.2. Data access

In October 2017, I submitted an External Research Proposal to BC Corrections, requesting access to screening, assessment, and criminal justice information for *every adult* admitted to a provincial correctional facility in BC from 2008-2017. The proposal was approved in November 2017 by the BC Corrections Branch, Strategic Operations Performance, Research and Evaluation Unit and by the University of British Columbia/Simon Fraser University Harmonized Research Ethics in June 2018 (H17-02653). I helped prepare and finalize a Research Agreement with the Corrections Branch of MPSSG, which was signed by the Assistant Deputy Minister in July 2018. Data were provided in three separate cuts between January and August 2019.

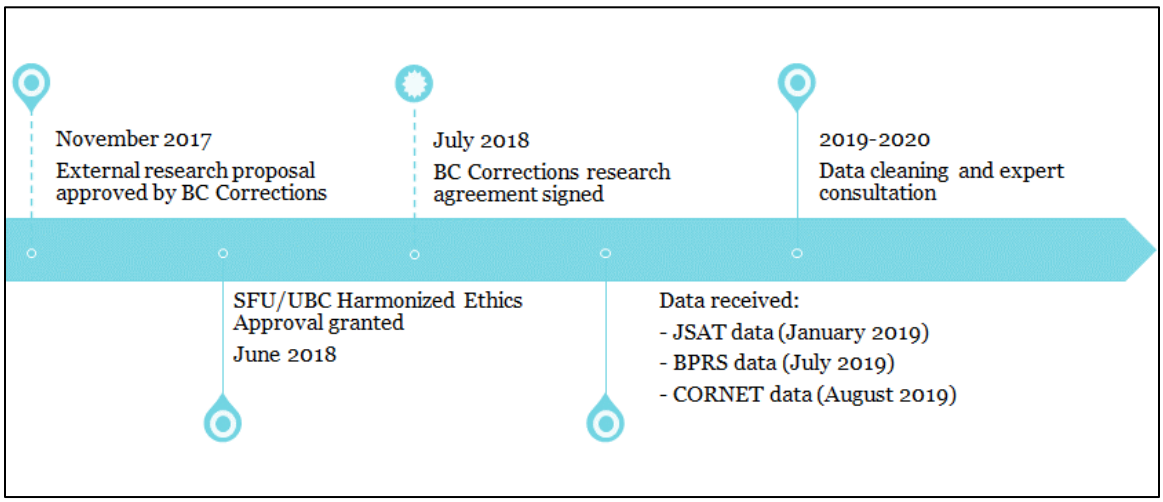


Figure 3.2. Data access & preparation timeline

3.3. Data sources

Population characteristics, mental health needs, and substance use disorders

The primary data source for mental health intake information in BC Corrections is the *Jail Screening Assessment Tool* (JSAT, Nicholls, Roesch, Olley, Ogloff, & Hemphill, 2005). The JSAT is a validated (Martin et al., 2013) structured professional judgment tool which takes approximately 20 minutes to complete. The JSAT interview solicits information pertaining to the individual's past and present: (1) sociodemographic characteristics and (2) social background; (3) present legal circumstances, criminal justice and violence history; (4) history of mental disorders and mental health treatment; (5) substance use; (6) past and present suicide and self-harm issues; and (7) acute psychiatric symptoms, using a modified version of Brief Psychiatric Rating Scale (BPRS, Overall & Gorham, 1962). The JSAT has been recorded electronically since 2008 in BC and both the measurement tool and training to use it has remained consistent throughout the study period. Trained mental health screeners complete the JSAT interview during every prison admission, such that individuals with multiple incarcerations will have multiple JSAT records. The interview is generally conducted by people with relevant university degrees (e.g., Bachelor's/Master's degrees in psychology, criminology, social work) who have completed a one-day workshop on the administration of the JSAT. Consistent with the JSAT manual (Nicholls et al., 2005), and general screening guidelines (e.g., National Commission on Correctional Health Care (Gibson & Phillips, 2016)) the interviews are conducted upon admission, preferably prior to placement on a unit, but at a minimum within 24 hours of reception to a facility. These data are entered into an electronic medical record housed on the Primary Assessment and Care (PAC) databases of the Ministry of Justice Corrections Branch.

A validation study used dichotomized information from the Mental Health Status and Management Recommendations section of the JSAT and assessed agreement with the SCID (Gagnon, 2009). The study found that the JSAT had good specificity (.703, 95% CI ± .087) and sensitivity (.725, 95% CI ± .085) for mental disorder broadly defined.

Criminal justice contacts

Criminal justice information for each client were obtained from BC Correction's CORNET system. CORNET is the corrections branch electronic platform used for the administration of offender sentences and supervising people according to terms set in court. It contains detailed information about people admitted to BC prisons including offences, admissions and releases, court documents, sentences, risk and needs assessments, security classifications and victim information (Office of the Auditor General of British Columbia, 2008). CORNET is the primary repository for all data relating to a person's involvement with the BC Corrections system.

The file that I was provided from the CORNET record contains what is called 'movement' data (i.e., movement of the client through the correctional system) for every person who had an incarceration during our study period. Variables included: movement type (admission or release); movement reason (e.g., sentence end, new sentence, etc.); direction (in/out); facility name (to/from); custody description (Correctional Services Canada, remand, provincially sentenced); and community description (e.g., parole, bail order, probation order).

BC corrections, a provincial entity, is responsible for those sentenced to two years or less, and Correctional Services of Canada, via the federal government, is responsible for those sentenced to 2 years or more. The provincial centres are also responsible for people on pre-trial, bail and remand, so clients who go on to be sentenced to *federal* custody are still captured in my sample at admission. However, I did not have access to release dates for people who were sentenced to federal custody, so I needed to exclude people who received federal sentences from the time to event analyses. More details about exclusion criteria are provided in the relevant chapters/limitations sections. Many people will cycle between the provincial and federal systems and so it is unfortunate that the systems operate as completely separate entities and client data are not held in a common database.

On October 1, 2017, responsibility for the delivery of health services in BC Corrections changed from the Ministry of Public Safety and Solicitor General to the Ministry of Health (via the Provincial Health Services Authority). This province-wide change is expected to have important impacts on policy, processes, and client outcomes. At the

time of the data access request, outstanding questions related to data ownership after the transfer date remained. As such, I chose a right censor date of September 30, 2017, to ensure consistency within the dataset and expedient access to the data.

3.4. Data cleaning & linkage

Our dataset included all JSAT records from January 1, 2008, to September 30, 2017; this reflected 166,439 records (i.e., distinct admissions, but not necessarily distinct people) across 167 variables. Dealing with missingness was not straightforward because most variables in the JSAT will be left BLANK unless there is a positive indication. To get a sense of data missingness, I made a list of all of the binary variables where either a "Yes" or "No" answer was expected, and where BLANK would therefore be considered missing. I used the visdat package in R to view missingness and found that for the Surrey Pretrial Centre, missingness in the 'Social Background' section of the JSAT was between 60-65% for all of the variables in the year 2008 (and Surrey Pretrial admissions accounted for one quarter of the total admissions in BC that year). There was also substantial missingness in other sections for the Surrey Pretrial Centre (e.g., 25% in mental health issues (Y/N), 25% in placement recommendations (Y/N)). When I broke it down further by month and found that this issue appeared to be resolved in November 2008 (where % missing fell to < 2%). Other facilities had high levels missingness (5-18%) in the 'Social Background' section in 2008 as well but it was more sporadic across variables. After consultation with leadership in research and administration at BC Corrections I was advised that this could be related to some glitch in the transition from paper form data collection to the electronic system which occurred in that year. I thus made the decision to exclude that year of data in its entirety for my analyses.

The dataset with the calendar date range January 1, 2009, to September 30, 2017, included 148,383 records (i.e., separate contacts or admissions to a correctional centre, again these could be the same person). Records with missing age and/or sex were removed (n = 18). If two records had the same client ID and date of admission, the record with the *most* missing data was removed (keeping only one record per person on any given day, n = 177). Although rare, this situation could be the result of the screener

needing to conduct the interview in multiple sittings (for example, if the client was experiencing high distress or deterioration).

The JSAT is generally conducted for all admissions to custody which includes transfers from other facilities, transfers/returns from hospital, and intermittent moves. Because I was interested only in *new* admissions, I used the CORNET records to verify the admission type. First, the JSAT file needed to be linked with the CORNET records. The JSAT and the CORNET datasets both contain unique Client Identification Numbers (IDs). Both datasets may contain multiple records for each Client ID and to verify the admission type, I matched the JSAT to a corresponding CORNET record. The records could not be matched deterministically using the date because, although every effort is made to complete the intake interview as soon as possible, and prior to placement on a unit, the JSAT is not always conducted on the date of admission. The JSAT is generally conducted within 24 hours of admission, which means that in some cases, the JSAT screening date would fall on the calendar day immediately following the date of admission. If a person is not well or stable enough to complete the interview, it may not be feasible to conduct it within the first 24 hours. The admission files were linked using a date range (date of admission + 2 days). JSAT records without a corresponding CORNET record for a new admission within two days of admission were excluded (n = 6699). See Figure 3.3 for details.

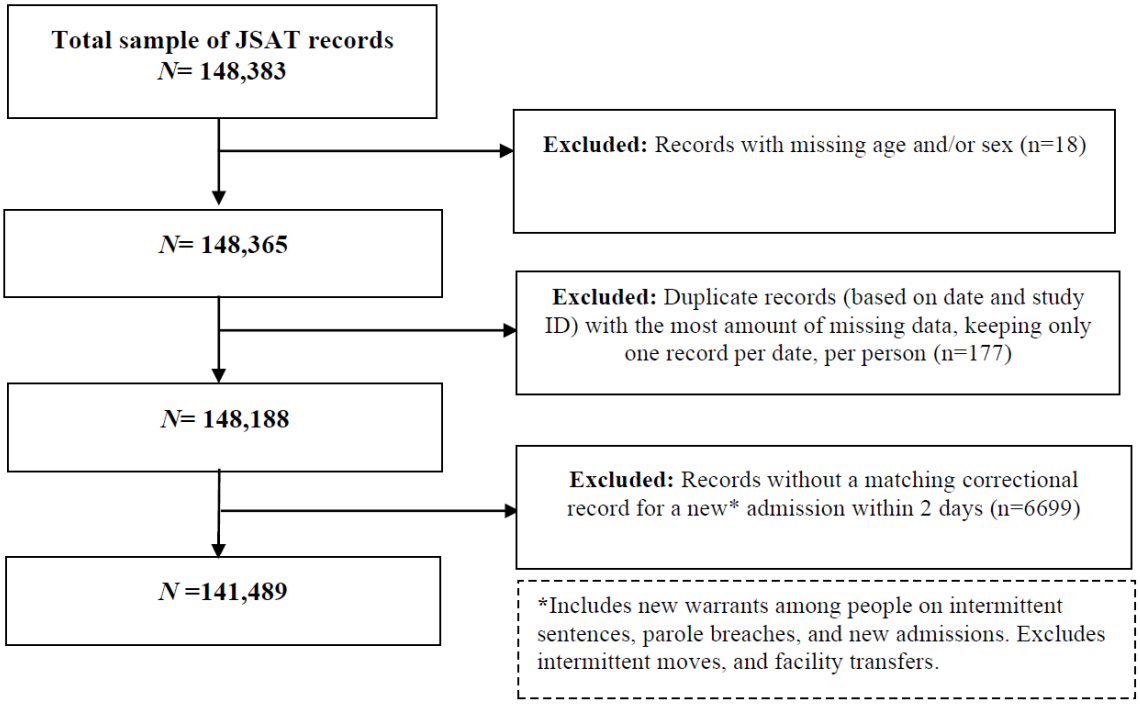


Figure 3.3. Flowchart of data preparation and final JSAT cohort

3.5. Defining MHN/SUD diagnostic categories

Following a protocol established by Wilson (2011), four mutually exclusive diagnostic categories were developed using the JSAT screener: mental health needs (MHN), substance use disorder (SUD), co-occurring disorder (COD) and no disorder (no MHN or SUD). Given that MHN/SUD are changeable conditions, each JSAT *record* is associated with a diagnostic category, which means that the category assigned to an individual can change over time if they have multiple records. The diagnostic criteria were operationalized in consultation with Dr. Maureen Olley, registered forensic psychologist, co-author of the JSAT, and Director of Mental Health Services for BC Corrections. Three sections of the JSAT were used to ascertain MHN/SUD diagnoses: 'Mental Health Treatment', 'Mental Health Issues', and 'Substance Use' which are provided in Figure 3.4. See Appendix A for more details from the JSAT Guidelines for Screening.

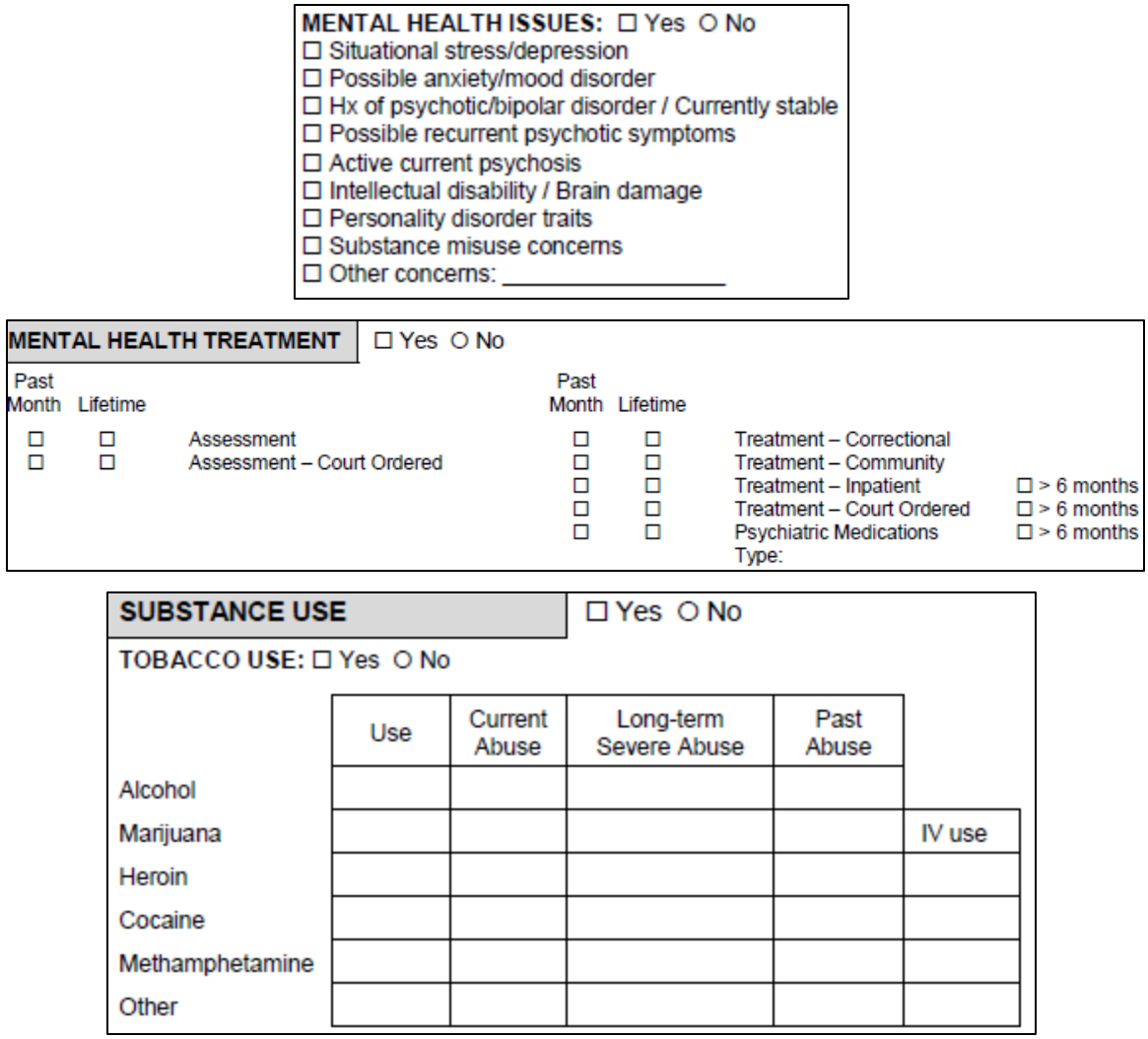


Figure 3.4. JSAT sections used to ascertain MHN/SUD diagnoses

Mental health needs. The MHN definition included a combination of reported history of mental health treatment and needs identified within the 'Mental Health Treatment' and 'Management Recommendations' sections of the JSAT. I categorized records into the MHN group if any of the eight criteria in Table 3.1 were met.

Substance use disorder. I categorized records into the SUD group if current abuse and/or long-term severe abuse in any of the six drug categories - alcohol, heroin, cocaine, methamphetamine, marijuana, and other drugs - were positively indicated.

Co-occurring disorder. A record was coded as COD if *both* the MHN and SUD criteria were met on that record.

These diagnostic definitions remain consistent throughout the thesis chapters. Other variables included in descriptive analyses or regression models are described within each section.

Table 3.1. Criteria for mental health needs classification

	Criteria	Relevant JSAT Section(s)
1.	Possible mood/anxiety disorder (history and/or current symptoms) **AND** Mental health treatment (any, lifetime)	Mental Health Treatment **AND** Management Recommendations
2.	History of psychotic/bipolar disorder (currently stable, may be maintained on medication)	Management Recommendations
3.	Possible recurrent psychosis (history of psychotic illness and evidence of current symptoms)	Management Recommendations
4.	Active current psychosis (suffering from severe mental illness, symptoms present)	Management Recommendations
5.	Other mental health concerns **AND** Mental health treatment (any, lifetime)	Mental Health Treatment **AND** Management Recommendations
6.	Past month mental health treatment, including court-ordered, in custody or in the community, and/or psychotropic medication use	Mental Health Treatment
7.	Past-month inpatient psychiatric hospitalization	Mental Health Treatment
8.	Current certification under the *Mental Health Act* or on Extended Leave*	N/A

Note: British Columbia's Mental Health Act allows people who are certified to receive treatment for a mental disorder involuntarily. The criteria for certification stipulate that the person requires care to prevent deterioration to protect themselves or others. Extended Leave allows an individual to reside in the community (with conditions) while they are certified. This information is collected by BC Corrections but is not included on the standard JSAT form.

Chapter 4. Trends in prevalence of mental health needs and substance use among people who experience incarceration

4.1. Background

People with mental health needs and substance use disorders (MHN/SUD) are overrepresented in the carceral system, and this appears to be a global phenomenon. Systematic reviews have established elevated rates of major depression, psychosis (Fazel & Danesh, 2002; Fazel & Seewald, 2012), and substance use disorders (Fazel et al., 2006; Fazel et al., 2017) in prisons compared to the general population. In the US, prevalence estimates of mental illness in prison range from three to twelve times higher than in community samples (Prins, 2014). People with mental health needs are held in prison longer than those without despite being charged with similar offences and substance use is strongly associated with being repeatedly incarcerated (Wilson et al., 2014). The elevated prevalence of MHN/SUD in prison has been variously attributed to the 'war on drugs', deinstitutionalization, the criminalization of mental illness, and insufficient community-based mental health resources (Bradley-Engen, Cuddeback, Gayman, Morrissey, & Mancuso, 2010; Ogloff, 2002).

There is good reason to believe the prevalence of MHN/SUD may be changing within prison populations. The international prison population grew by 20% between 2002 and 2020 (Penal Reform International, 2020), and the US accounts for much of that growth, reporting a 500% increase in the prison population over forty years (The Sentencing Project, 2020). This massive growth has been attributed to increasingly harsh sanctions and sentencing law rather than increases in crime (Carson, 2020). The ethnic, gender, and age distributions of people in US and Canadian federal prisons have also changed dramatically (Correctional Service Canada, 2018; Diamond, Wang, Holzer Iii, Thomas, & Cruser, 2001). The prevalence of people with MHN/SUD in prison could be expected to vary among countries alongside changes in social norms, law enforcement policies, and political contexts (Ulmer, 2019). For example, while methamphetamine and heroin use has increased sharply among marginalized groups in the community throughout

North America (BC Centre for Disease Control, 2018), drug-related offences in Canada have decreased by 27% from 2008-2017 (Jesseman & Payer, 2018). In contrast, incarceration for drug offences in the US increased from 40,900 in 1980 to 452,964 in 2017; this massive growth has been attributed to increasingly harsh sanctions for illegal drug offenses rather than to increases in drug use (Carson, 2020). These contrasting trends may reflect differences between Canada and the US in police practices including de-prioritizing the enforcement of simple drug possession.

MHN/SUD prevalence has also changed at the population-level. For example, national survey data has shown broadly worsening mental health across the US and Canada, with significant increases in depression, anxiety, suicidal ideation, and suicide attempts since the early 2000s (Chiu et al., 2020; Duffy et al., 2019; Weinberger et al., 2018; Wiens et al., 2020). Since 2016, North America has experienced unprecedented substance-related deaths due primarily to fentanyl contamination in the drug supply (Karamouzian et al., 2020). Given the changes in prison admission rates and the prevalence of MHN/SUD, as well as the adverse health impacts associated with criminal justice system involvement, it is imperative that we have updated and reliable monitoring of MHN/SUD among people who experience incarceration.

While the health of people in prisons is an under-researched area generally, *trends* in MHN/SUD prevalence are particularly understudied. Most prison-based prevalence studies use a point-in-time cross-sectional study design and thus are not able to inform trends over time (e.g., Geitona & Milioni, 2016; Hassan et al., 2016; Larney, Topp, Indig, O'Driscoll, & Greenberg, 2012). When combining prevalence estimates from different sources over time it is difficult to determine if more people are being detected through changes to intake screening, or because the true prevalence of MHN/SUD among people in prison is increasing (Alexander, Jeffry, & Steven, 2013). Only one study has examined changing prevalence over time within a cohort of adults in prison. Bradley-Engen et al. (2010) examined trends in serious mental disorders (major depression, bipolar, and psychotic disorders) and co-occurring disorders in Washington State prisons from 1998 to 2006. Given substantial changes in the epidemiology of MHN/SUD in North America since this study was published, more recent data are needed.

The current study addresses this gap by examining trends in the prevalence of MHN/SUD among all adults who experienced at least one incarceration in a BC provincial prison over a 9-year period. In addition, I examine the differences in drug use profiles among people with co-occurring disorders (COD) compared to people with SUD alone.

4.2. Methods

Data sources

The primary data source for this study is the *Jail Screening Assessment Tool* (JSAT) (Nicholls et al., 2005). This tool is used in all facilities operated by BC corrections for the collection of mental health intake information. The JSAT is a validated, detailed screener for mental health and management needs that has been recorded electronically since 2008 and has remained consistent throughout the study period. Trained staff administer the JSAT interview during every prison admission, such that individuals with multiple incarcerations will have multiple JSAT records. The intake interviewer enters the data into an electronic medical record housed on the Primary Assessment and Care (PAC) databases of the Ministry of Justice Corrections Branch.

Criminal justice information for each client was obtained from BC Correction's CORNET (Corrections Operations Network). CORNET is the corrections branch electronic platform used for documenting and recording the sentences and supervision of offenders and it is the primary repository for all data relating to an individual's involvement with the BC Corrections system. The CORNET data were requested from BC Corrections and were used to verify the dates of admission to and release from custody, admission, and release codes (e.g., released to bail, sentence end, etc.), and custody status (e.g., remand, sentenced). More information about the JSAT and CORNET data, and the linkage strategy, can be found in section 3.3 of this thesis.

Sample

JSAT and CORNET records were obtained for every client admitted to a provincial prison in BC between January 1, 2009, and September 30, 2017. See section 3.4 for more information about data linkage and exclusions.

To avoid artificially inflating the prevalence estimates for MHN/SUD, I allowed for each person to enter the sample only once per year for this study. When a person had more than one admission in the year, the readmissions were excluded, keeping only the first record.

A total of 148,383 JSAT records were completed between January 1, 2009, and September 30, 2017. Of those, 141,489 (95%) had a corresponding CORNET record for a new admission within the 2 days prior. After removing re-admissions within each calendar year, the total count was 91,938 admissions and 47,117 individuals.

Measures

Ascertaining MHN/SUD

I created four mutually exclusive categories for MHN/SUD: mental health needs only (MHN), substance use disorder only (SUD), co-occurring disorders (COD), and no disorder (no MHN or SUD). The MHN definition included a combination of reported history of mental health treatment and mental health needs identified within the 'Mental Health Treatment' and 'Management Recommendations' sections of the JSAT. I coded a record as MHN if any of the eight criteria in Table 3.1 were met. I coded a record as SUD if current abuse or long-term severe abuse in any of the six JSAT drug categories - alcohol, heroin, cocaine, methamphetamine, marijuana, and other drugs - was positively indicated. I coded a record as COD if *both* the MHN and SUD criteria were met on the same record.

Sociodemographic variables

Sociodemographic variables included: age; sex (male or female)[23]; Indigenous status; education (less than high school; high school; and university/vocational); a measure for homelessness or unstable housing, whereby anyone who reported being (1) homeless or (2) living in a hotel or with friends (not paying rent) at the time of admission were coded as 'Y' and other responses as 'N'; and receiving social assistance or disability payments (Y/N).

Drug use patterns

I created an overall measure for substance use disorder by drug type, whereby current abuse or long-term severe abuse for each drug type was coded as 1 (otherwise 0). This measure reflects drug use meeting the criteria for a current disorder (i.e., excludes recreational use and past use). I created a measure of polysubstance abuse by summing across the six drug category columns, then coding the results into a dichotomous measure: <2 and ≥2 drug types. Finally, I included a measure of injection drug use, for any drug, over the lifetime (Y/N).

Analyses

I calculated the period prevalence of each measure using the count of unique individuals admitted within the year as the denominator. Although the frequencies are admissions based, they represent an unduplicated count of people admitted in that calendar year. I examined differences per calendar year between 2009 and 2017 using Pearson's chi-square test for categorical variables and Welch two-sample *t*-test for continuous variables. In large samples (such as this) *p*-values quickly go to zero and therefore, conclusions based on significance alone are meaningless unless interpreted in light of the magnitude of the effect size (Mingfeng, Henry, & Galit, 2013). I calculated the effect sizes to examine the substantive significance, or the strength of the associations using Cramer's *V (φ)* for the chi-squared estimates, and Cohen's *d* for the t-test. Cramer's *V* of .10 provides a good minimum threshold for suggesting there is a substantive relationship between two variables; a result of .2-.3 is considered moderately strong, and ≥.3 is

[23] Only the binary option of Male or Female is provided on the JSAT form. This reflects self-reported sex.

considered strong (Marchant-Shapiro, 2015). The conventional frame of reference for Cohen's *d* is that .2, .5 and .8 correspond to small, moderate, and strong effect sizes, respectively. All analyses were performed in R version 3.6.1 using dplyr, ggplot2, rcompanion, and rstatix packages (R Development Core Team, 2020).

After interpreting the trend analyses, post hoc analyses were conducted to examine whether drug types used among people with SUD and COD differ. Given the dramatic shifts over time in both COD and drug use patterns, I restricted the post hoc analyses to the final year of data, as it is the most current and policy relevant. I used Chi-square tests to examine the differences in drug use patterns among people with COD and SUD and calculated the effect sizes using Cramer's *V*. Statistical significance was defined at the 5% level.

4.3. Results

Changes in the profile of people admitted in 2009 and 2017 were statistically significant for all variables, except sex (Table 2). A moderately strong effect was found for changes in MHN/SUD status (Cramer's $V = .24$), and changes in heroin use disorder (Cramer's $V=.20$), and a strong effect was found for changes in methamphetamine use disorder (Cramer's $V = .31$). All other effect sizes were small (Table 4.1).

The MHN/SUD profile of the population changed considerably between 2009 and 2017. Of note, the proportion of people admitted who were categorized as having no disorders fell from 38.9% to 25.4%. In addition, the proportion of people with COD more than doubled (from 14.5% to 32.0%). The proportion of people reporting mental health needs alone also rose from 9.9% to 14.8% but has remained stable since 2013. Finally, the proportion of people with SUD alone dropped from 36.7% to 27.9% (Figure 4.1).

With respect to SUD specifically, the proportion of people reporting alcohol use disorder decreased slightly from 25.6% to 20.5%. The proportion of people identified as having a cocaine use disorder also decreased by 11.9%. In contrast, the proportion of people with heroin use disorder and methamphetamine use disorder rose from 10.8% to 25.8% and 6.4% to 29.4%, respectively (Figure 4.2).

People with COD were significantly more likely than those with SUD alone to report using methamphetamine ($p < 0.001$), marijuana ($p = 0.03$), and cocaine ($p = 0.02$). However, the only drug that was substantively different between the two diagnostic groups, according to the effect size estimates, was methamphetamine (Cramer's $V = .12$, visual representation provided in Figure 4.3). The COD group was also significantly more likely to inject drugs, and to report polysubstance abuse ($p < 0.001$) (Table 4.2).

4.4. Discussion

Using a 9-year, population-level cohort, I found that the proportion of people entering prisons with any MHN/SUD has been steadily rising, driven largely by a marked 17% increase in COD. Approximately one-third (32%) of people admitted to custody in 2017 met the criteria for COD, making them the *highest proportion* of people admitted that year out of all the diagnostic subgroups, followed by people with SUD alone. The prevalence of COD in the community is considerably lower; national estimates in Canada and the US range from 2-4% (Rush et al., 2008; Substance Abuse and Mental Health Services Administration, 2020). The elevated and increasing rate of COD is of particular concern given that comorbidity tends to result in worse health and criminal justice outcomes than any single condition alone (Butler et al., 2020; Wilson et al., 2014; Young et al., 2018).

The 359% increase in methamphetamine use disorder in our sample made it the *most used* drug by 2017 among those with SUD, surpassing both alcohol and marijuana. This increase is consistent with community studies, which show that the availability of, and harms associated with, methamphetamine have been increasing globally, with the highest prevalence in North America (United Nations, 2019). The BC Centre for Disease Control (BCCDC) found a 22 percentage point increase in methamphetamine use among harm reduction clients between 2015 and 2018 (BC Centre for Disease Control, 2018). Data from the 2015-2018 National Survey on Drug Use and Health in the US also confirmed increases in methamphetamine use among those who use other drugs (Palamar, Han, & Keyes, 2020). MHN/SUD needs among people who enter prison gives us a glimpse into unmet needs within the community. The increase in high-risk drug use among this group

is particularly concerning in light of the fact that incarceration increases the risk of drug toxicity poisoning after release (Binswanger et al., 2012; Binswanger et al., 2007; Gan et al., 2021).

We cannot ascertain the cause of these trends with the study data, but availability and adequacy of care provided in the community may be relevant factors. Treatment services often lack sufficient expertise and resources to treat COD, and sequential or parallel MHN/SUD treatment has generally been shown to have poor outcomes (Mangrum, Spence, & Lopez, 2006). Historically, MHN and SUD have been treated in separate service systems with differing and sometimes contradictory philosophical orientations (Bride et al., 2006). An integrated treatment approach was developed in the late 1980s in the US (Wüsthoff, Waal, & Gråwe, 2014), but the evidence in favour of the integrated model compared to other treatment modalities remains equivocal (Donald et al., 2005). That said, integrated primary care models for people with high severity disorders may improve symptoms, patient satisfaction, and posttreatment MHN/SUD outcomes (Mertens, Flisher, Satre, & Weisner, 2008; National Treatment Strategy Working Group, 2008; Sterling & Weisner, 2005). More research is needed to understand the types of COD that can be treated effectively with single disorder interventions and those that require integrated mental health and substance abuse treatment (Donald et al., 2005), but evidence suggests that clients have the best chance of success if their MHN and SUD are treated at the same time in a coordinated way (Skinner, O'Grady, Bartha, & Barker, 2010).

Studies in several jurisdictions have found high levels of unmet need among people with COD. The 2008 National Survey on Drug Use and Health revealed that over half of the people with COD in the US reported not receiving any form of MHN/SUD care in the previous year (Han, Compton, Blanco, & Colpe, 2017). Similarly, a Canadian study found that 51% of those with COD in the community had perceived unmet need for mental health care in the past year compared to 13% of those with SUD alone and 21% with mental disorder alone (Urbanoski et al., 2008). The steadily increasing incarceration rate among this subgroup is evidence that overall, people with COD are not receiving appropriate treatment and support in the community.

A relationship between the increase in COD diagnoses and the changes in drug use patterns may exist, given the significant differences found in the post hoc analyses between people with SUD and COD alone. A strong relationship between COD, methamphetamine, and injection drug use has been found in prior research. Studies show that psychiatric symptoms are common among methamphetamine users, including hallucinations and paranoid delusions, anxiety, and mood disturbances (Zweben et al., 2004) which may be related to the effect of methamphetamines on inflammatory pathways in the brain (Papageorgiou, Raza, Fraser, Nurgali, & Apostolopoulos, 2019). Psychiatric comorbidity among people who use methamphetamine is associated with poor treatment outcomes, substance use relapse, and adverse social outcomes such as unemployment and unstable housing (Glasner-Edwards et al., 2009; McKetin et al., 2018).

Polysubstance abuse was reported by over one-third of our sample in 2017 with the highest rates among people with COD. Research in Canada and the US has found that the opioid crisis includes multiple substances and polysubstance use contributes significantly to morbidity and mortality among people who use drugs (Public Health Agency of Canada, 2017). Trends in drug use may be changing in the context of a fentanyl-contaminated drug supply and an increase in people consuming fentanyl by choice (Karamouzian et al., 2020).

Strengths & Limitations

To my knowledge, this is the first study globally to examine prevalence trends in the adult prison population using the four MHN/SUD classifications and the first study in Canada to examine prevalence trends over time in MHN/SUD using a population-level prison sample. While SUD prevalence among people in prison have been routinely estimated, the richness and specificity of our substance use data represent a novel contribution to the literature. Because the JSAT coding form and training has remained consistent throughout the study period, I am confident that my estimates reflect true changes in prevalence over time.

The primary limitation of our methods reflects the reliance on a single administrative data source that draws upon self-report information and was not collected with the study purpose in mind. My definition of COD reflects presentations of both current SUD and MHN symptoms *at the same time*, so this proportion may be an underestimate of the true prevalence of COD in the population.

Conclusions

Most people admitted to prison have complex, multi-faceted health problems that began prior to their incarceration. Systems that meet the needs of people with complex mental health issues require meaningful collaboration between health, judicial, and legislative authorities. Overall, this study provides robust evidence of steadily increasing COD and high-risk drug use among people who experience incarceration in BC. In Chapters 5 and 6, I explore the relationship between these profiles and reincarceration patterns.

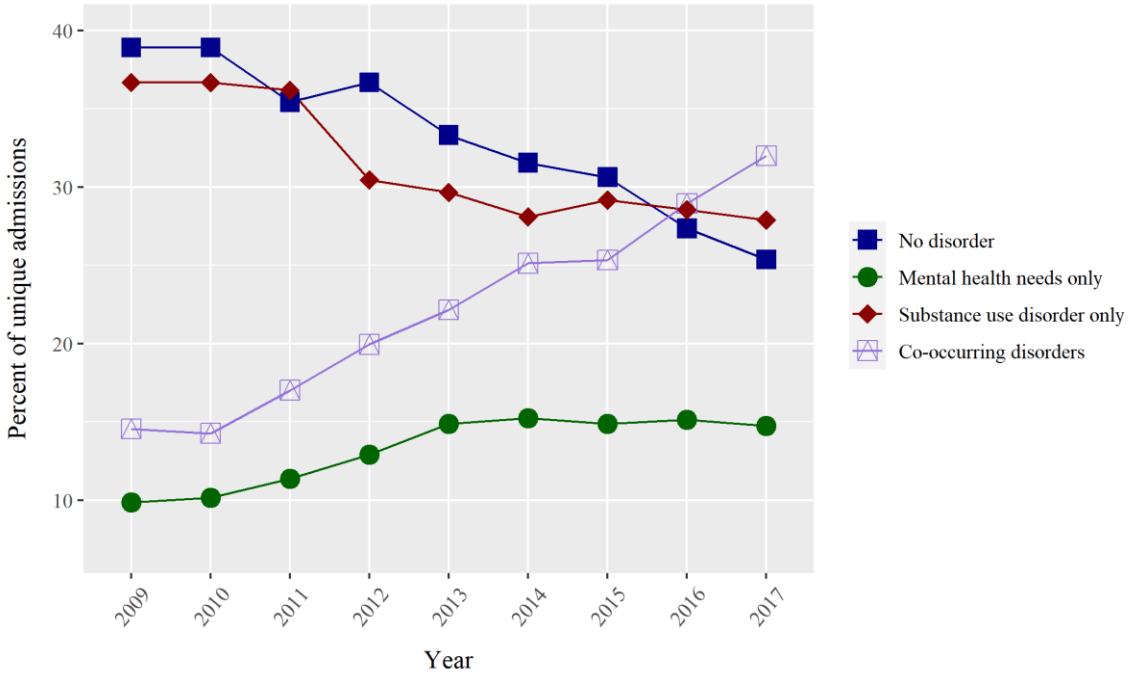


Figure 4.1. MHN/SUD diagnoses among people admitted to prison

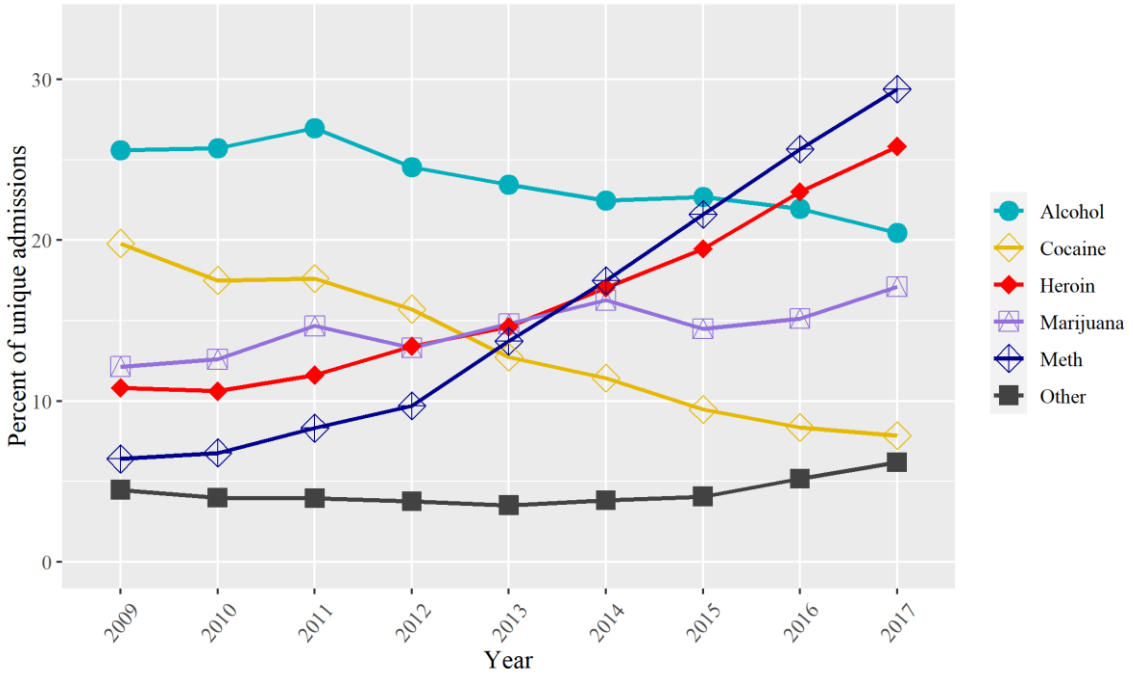


Figure 4.2. Drug types used among people with SUD who are admitted to prison

Table 4.1. Profile of people admitted to custody in 2009 and 2017

	2009		2017			
	N	%	*N*	%	φ_c	*p*
	10928	100%	7900	100%		
Female	1227	11.2%	834	10.6%	0.01	0.15
Indigenous	2707	24.8%	2361	29.9%	0.06	<.001
Age (mean ± SD)	34.4 ± 10.6		35.9 ± 10.9		0.14[a]	<.001
Homeless or unstable housing	1890	17.3%	1826	23.1%	0.07	<.001
Receiving social assistance or disability payments	3569	32.7%	2953	37.4%	0.05	<.001
Education					0.04	<.001
Less than high school	4784	43.8%	3163	40.0%		
High school	3547	32.5%	2595	32.8%		
University/vocational	2597	23.8%	2142	27.1%		
MHN/SUD diagnosis category					0.24	<.001
None	4251	38.9%	2004	25.4%		
MHN only	1079	9.9%	1166	14.8%		
SUD only	4008	36.7%	2203	27.9%		
COD	1590	14.5%	2527	32.0%		
Any MHN/SUD	6677	61.1%	5896	74.6%	0.14	<.001
Drug use patterns						
Alcohol	2799	25.6%	1617	20.5%	0.06	<.001
Marijuana	1327	12.1%	1352	17.1%	0.07	<.001
Heroin	1184	10.8%	2041	25.8%	0.20	<.001
Methamphetamine	700	6.4%	2322	29.4%	0.31	<.001
Cocaine	2164	19.8%	621	7.9%	0.17	<.001
Other	490	4.5%	490	6.2%	0.04	<.001
Injection drug use, lifetime	1034	9.5%	1280	16.2%	0.10	<.001
Polysubstance abuse (≥2 drug categories)	2192	20.1%	2495	31.6%	0.13	<.001

[a]Cohen's *d*

Table 4.2. Differences in drug use profiles among people with COD and SUD in 2017

Drug Use Categories	**COD**	**SUD**		

	N	%	*N*	%	φ_c	*p*
	2527	100%	2203	100%		
Alcohol	852	34%	765	35%	0.01	0.48
Marijuana	756	30%	596	27%	0.03	0.03
Heroin	1099	43%	942	43%	0.01	0.63
Methamphetamine	1384	55%	938	43%	0.12	<0.001
Cocaine	359	14%	262	12%	0.03	0.02
Other	283	11%	207	9%	0.03	0.05
Injection drug use	677	27%	464	21%	0.07	<0.001
Polysubstance abuse	1428	57%	1067	48%	0.08	<0.001
Number of drug types Mean ± SD	2.9 ± 0.99		2.7 ± .86		0.20[a]	<0.001

COD=co-occurring disorder, SUD= substance use disorder alone

[a]Cohen's *d*

*Percentages reflect within group percentage (by column); each drug is analyzed separately as they are not mutually exclusive and therefore do not add up to 100%

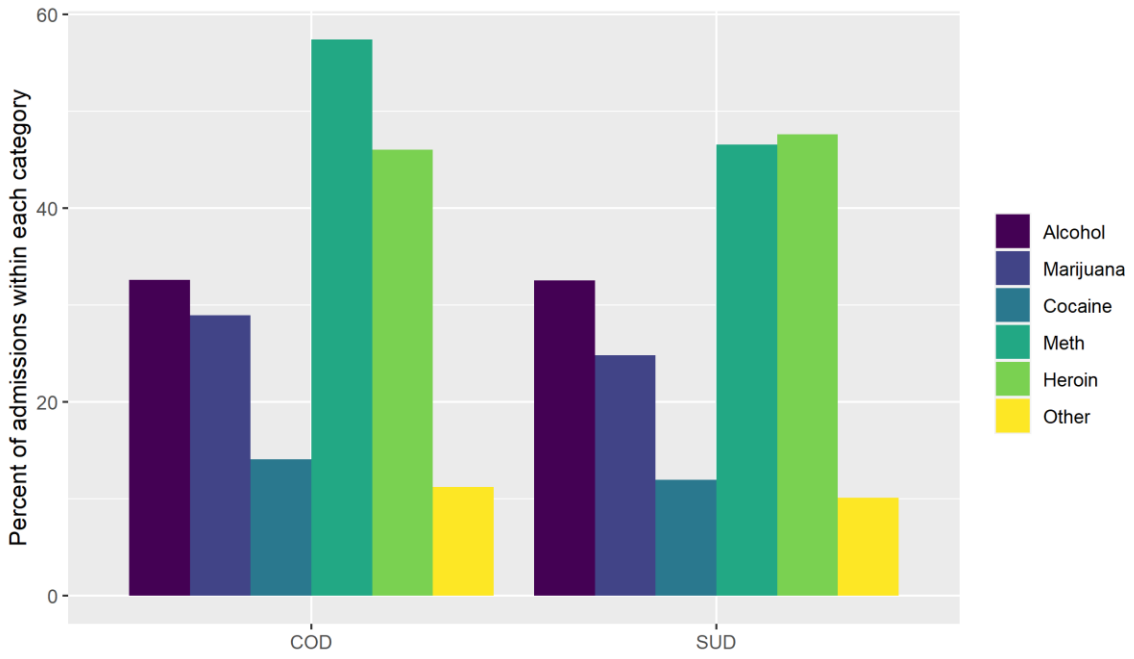


Figure 4.3. Drug types used by people with COD and SUD in 2017

*COD= co-occurring disorder, SUD= substance use disorder alone

Chapter 5. Examining the association between mental health status and time to reincarceration

5.1. Background

Studies have found that people with mental illness are disproportionately represented in prisons (Fazel et al., 2016; Ogloff et al., 2006; Steadman et al., 2009). Despite the high level of mental health-related needs, disorders are frequently underdiagnosed and undertreated among people who experience incarceration (Fazel et al., 2016). Given routine screening at intake prison provides an opportunity to identify people with unmet health needs, provision of treatment and supports could improve health and wellbeing, and break cycles of criminal justice system involvement (CJSI). Unfortunately, few services exist in prisons and the community to identify and prevent people with mental illness from entering the CJS or reoffending and remaining entangled in the CJS (Nicholls et al., 2018; Ogloff et al., 2004). Researchers in several jurisdictions have investigated whether psychiatric diagnoses are associated with repeat offending or recidivism (Baillargeon et al., 2010; Wilson et al., 2014; Wilson et al., 2011), but strong conclusions are limited by variability in methods including differences in measures used, definitions of mental illness, and sampling approaches.

Recidivism, broadly defined as reengaging in criminal behaviour after receiving a prior sanction or intervention, is typically measured by rearrest, incurring new charges, a reconviction, and/or return to prison (King & Elderbroom, 2014). Rates of recidivism are used worldwide as a measure of the effectiveness of criminal sanctions, prisons, and offender management programs. Recidivism is common – a recent systematic review including 25 countries found that 2-years post-conviction the rate of re-arrest is between 26% and 60% (Yukhnenko, Sridhar, & Fazel, 2019). Estimates show that the 2-year reconviction rate in the province of BC is at least 50% for those released from provincial custody (BC Justice and Public Safety Council, 2017). A study found that 37% of those with a jail sentence of 6 or more months and 23% of those with a community sentence in Ontario, were reconvicted within 2 years (Ontario Ministry of the Solicitor General, 2019).

Reincarceration or reconviction are considered superior measures of recidivism compared to re-arrest because they require a plea or finding of guilt in court, thus minimizing the likelihood that someone will be falsely counted as having re-offended (Government of Canada, 2003). Although reincarceration as a measure of recidivism may not capture lower-level offenses, it is also an important measure, because there are well known adverse impacts that are specific to *custodial* sentences. For example, mental health problems may be exacerbated or caused by conditions of confinement including lack of purposeful activity, overcrowding, exposure to violence, and separation from family (De Viggiani, 2007). Upon re-entry into the community, people face increased risk of preventable injury and death, with the highest risk period being the days and weeks immediately following release (Gan et al., 2021; Young et al., 2018; Zlodre & Fazel, 2012). It is also important to investigate which factors (beyond crime severity) are related to receiving a custodial rather than a community sentence, as this may help identify barriers to reintegration for certain subgroups, and biased practices within the criminal justice system.

It is largely accepted that under *certain circumstances* mental illness may contribute to risk of offending and recidivism. Studies in this area have used disparate definitions of mental illness and recidivism (Kopak, Guston, Maness, & Hoffmann, 2019). Nonetheless, studies have confirmed that substance use disorder is a robust predictor of reconviction (Rezansoff et al., 2013) and reincarceration (Wilson et al., 2014; Wilson et al., 2011). Research on the relationship between mental illness and reoffending has also concluded that adults who present with mental illness are more likely to be reincarcerated, reconvicted, and remain in custody for longer periods of time than their counterparts without mental illness (Messina et al., 2004; Rezansoff et al., 2013). However, some studies that have focused more narrowly on serious mental illness (SMI) and controlled for a variety of criminogenic risk factors have found no relationship or an *inverse* relationship between SMI[24] and recidivism (Bonta et al., 2014; Bonta et al., 1998; Wilson et al., 2014).

[24] Includes a set of disorders that lead to severe functional impairment, such as bipolar disorder, schizophrenia, and major depressive disorders.

Importantly, broad categories of mental disorder and substance use disorder represent groups of heterogeneous conditions. However, they remain useful in the context of criminal justice planning and policy because they reflect the organization of diversion programs, treatment, and transition services (Rezansoff et al., 2013).

COD and recidivism

A small number of studies have confirmed a positive association between COD and recidivism. Wilson et al. (2011) examined recidivism patterns in a large US urban jail system over a 4-year period (n = 24,290). Using linked Medicaid claims and jail data, they compared four groups: those with no disorder, SMI only, SUD only, and COD. They found that people with COD had the highest number of readmissions to jail, with 68% returning to prison at least once in the 4-year follow-up (compared to 50% of the mental illness only group). Using this same cohort data, Wilson et al. (2014) found that after release from prison, people with COD spent the shortest amount of time in the community before being returned to prison. Baillargeon et al. (2010) conducted a retrospective cohort study of all people (n = 61,248) incarcerated in a Texas prison. They found that compared to those with SUD alone, people with COD were significantly more likely to have experienced multiple reincarceration events over a 6-year follow-up period (OR = 2.3, for ≥4 reincarceration events). There is a dearth of evidence about the association between COD and time to reincarceration in the Canadian context.

Research aims and contribution of the current study

In this study, I examine the relationship between psychiatric condition (mental health needs only (MHN), SUD only, and COD) and time to reincarceration using a multiyear follow-up period. I hypothesized that reincarceration would be weakly associated with MHN only and strongly associated SUD and COD, with the COD group being at higher risk than any other group. I expected that people with COD would have shorter time to reincarceration compared to people with SUD or MHN needs alone.

This study adds to the small but growing body of evidence documenting the relationship between COD and reincarceration. While a handful of studies have examined the

proportion of people who reoffend across diagnostic groups, I am aware of only two studies that have looked at whether COD is predictive of *time to recidivism* (Wilson et al. (2014) in the US and Rezansoff et al. (2013) in BC, Canada; described in the previous section). The timing of justice system re-engagement is key to understanding the processes underlying the effects of criminal sanctions and interventions and for identifying the highest risk periods for targeted prevention.

5.2. Methods

Data Sources

The primary data source for this study is the *Jail Screening Assessment Tool* (JSAT) (Nicholls et al., 2005) and the data were obtained from BC Corrections Research Branch. This tool is used in all facilities operated by BC Corrections for the collection of mental health intake information. The JSAT is a validated, detailed screener for mental health and management needs that has been recorded electronically since 2008 and has remained consistent throughout the study period. Trained intake screeners complete the JSAT interview during every prison admission, such that individuals with multiple incarcerations will have multiple JSAT records. These data are entered into an electronic medical record housed on the Primary Assessment and Care (PAC) databases of the Ministry of Justice Corrections Branch.

Criminal justice information for each client was obtained from BC Correction's CORNET (Corrections Operations Network). CORNET is the corrections branch electronic platform used for the administration of sentences and supervision of offenders and it is the primary repository for all data relating to an individual's involvement with the BC Corrections system. The CORNET data were linked with the JSAT data via unique BC Corrections client IDs. More information about the JSAT and CORNET data, and the linkage strategy, can be found in section 3.3 of this thesis. The CORNET data in our dataset includes dates of admission and release; the movement reason (e.g., sentence end, new sentence, breach, etc.); direction (in/out); facility name (to/from); custody description (Correctional Services Canada, remand, provincial sentence); and community

sentence description (e.g., parole, bail order, probation order). Dates of death that occur while a person is under BC Correction's supervision are included in the movement file.

Sample

This retrospective cohort study includes every adult who was: (1) released from a BC correctional facility; (2) had taken part in a JSAT interview upon admission; and (3) were released to the *community* (i.e., not to transferred to another institution, to federal custody), between October 1, 2012, and September 30, 2014 (*N*= 13,887). If an individual had more than one release, the baseline incarceration was their *first* release during this time period. The follow-up period was three years from the baseline release date.

Measures

Baseline Measures

Self-report sociodemographic measures used in this study include: sex, age, Indigenous status, marital status, homelessness/unstable housing, employment, on disability/social assistance, education level, and family support. Measures of clinical complexity included intellectual disability/head injury, severe personality disorder, psychiatric symptoms (as measured by the Brief Psychiatric Rating Scale (BPRS) score[25]), and past suicide attempts. Criminal justice variables included incarceration in the previous year, custody status, and length of the stay for the index incarceration period. Further details about all baseline measures can be found in Table 5.1. These listed measures are well-known predictors of recidivism (informed by the literature, e.g., RNR model, James Bonta et al. (2014)) and/or are independently associated with MHN/SUD and are therefore potential confounders in the relationship between MHN/SUD and reincarceration.

Ascertaining the exposure: MHN/SUD diagnoses

[25] Created by adding scores across all BPRS items for a total score. A score of ≥4 suggests the presence of two symptoms, the presence of one symptom with the possible presence of three symptoms, or the possible presence of four symptoms (as suggested by Gagnon (2009)).

I created four mutually exclusive categories for MHN/SUD: mental health needs only (MH), substance use disorder only (SUD), co-occurring disorders (COD), and no disorder (no MHN or SUD) (see Chapter 3 for further details). The MHN definition included a combination of reported history of mental health treatment and mental health needs identified within the 'Mental Health Treatment' and 'Management Recommendations' sections of the JSAT. I coded a record as MHN if any of the eight criteria in Table 3.1 were met. I coded a record as SUD if current abuse or long-term severe abuse in any of the six JSAT drug categories - alcohol, heroin, cocaine, methamphetamine, marijuana, and other drugs - was positively indicated. I coded a record as COD if *both* the MHN and SUD criteria were met on the same record.

Ascertaining the outcome: reincarceration

The primary outcome measure was time to first reincarceration event after the baseline release. The reincarceration outcome was determined using the date of first reincarceration recorded in criminal justice data from the BC CORNET database. Participant observation time was censored at date of death or 3-years after the baseline release date (i.e., there was no record of reincarceration), whichever came first. The 3-year follow up was calculated from each individual's release date. I ran sub-analyses looking at time to any BC Corrections re-engagement (including reincarceration and reconvictions with community sentences) to test if there were any differences in the risk patterns.

Analyses

I calculated proportions (for categorical variables) and means (for continuous variables) for baseline measures, stratified by MHN/SUD diagnostic group. I used Pearson's chi-square tests for categorical variables and Welch ANOVA for continuous variables to examine differences in baseline sociodemographic, clinical, and criminal justice characteristics between the four diagnostic groups. I calculated effect sizes to examine the substantive significance using Cramer's *V (φ)* for the chi-squared estimates, and eta squared (η^2) for the Welch ANOVA estimates. Cramer's *V* of .10 provides a good minimum threshold for suggesting there is a substantive relationship between two

variables; a result of .2-.3 is considered moderately strong, and ≥.3 is considered strong (Marchant-Shapiro, 2015). General benchmarks for interpreting eta squared are: 0.01 = small effect, 0.06= medium effect, 0.14= large effect (Cohen, 1988). I compared the proportion of people reconvicted and reincarcerated by diagnostic group using Pearson's chi squared tests.

I compared the proportion of people reconvicted and reincarcerated by diagnostic group using Pearson's chi squared tests. Then I used the Bonferroni correction to adjust the p-value for six pair-wise comparisons (COD x SUD, SUD x MHN, MHN x COD, None x SUD, None x COD, None x MHN). The Bonferroni correction controls the number of false positives arising in a family of variables by using a probability threshold of alpha/ number of hypotheses for each observation within the family.

I used the Kaplan-Meier method to conduct survival analyses looking at number of days to reincarceration, also stratified by diagnostic group. The Kaplan-Meier survival curve is defined as the probability of surviving (i.e., the absence of the outcome of interest) in a given length of time while considering time in many small intervals (Stel, Dekker, Tripepi, Zoccali, & Jager, 2011). In this case, survival refers to community tenure before a reincarceration event. I fitted a Cox proportional hazards model – a multivariable approach for time-to-event regression analyses – to examine the association between MHN/SUD diagnostic group and risk of reincarceration. The proportional hazards assumption (necessary for the Cox model) was confirmed by visual inspection of the Kaplan-Meier model. Alpha level .05 was used for all statistical tests. All analyses were performed in R version 3.6.1 using dplyr, ggplot2, survival and survminer packages (R Development Core Team, 2020).All baseline variables are potential confounders in the relationship between MHN/SUD diagnostic group and reincarceration and were considered for inclusion in the multivariable Cox model. I created a correlation matrix on all baseline variables and, as would be expected, found a high correlation between employment and being on social assistance (Pearson's correlation 0.45). I chose to only include employment in the multivariable model.

5.3. Results

Descriptive results

The cohort included 13,887 people released from custody between October 1, 2012, and September 30, 2014. Females accounted for 12% of the individuals present in the cohort, and 21% of people self-identified as Indigenous. Nearly 40% of people reported being on government assistance and 42% had less than a high school education. The mean age was 36 (SD ±10.9, range 18-90 years). With respect to diagnostic groups, 3032 (22%) had COD, 4131 (30%) had SUD only, 1948 (14%) had MHN only, and 4776 (34%) had no disorder.

Cohort characteristics at baseline (i.e., the JSAT completed upon index admission) are summarized in Table 5.2. All variables except for length of stay varied significantly by diagnostic group (p<0.001), with varying effect sizes. Moderate associations were found for social assistance/disability, ID/head injury, suicide attempts and psychiatric symptoms.

Almost half of those with COD (47%) and exactly half of those with SUD had not completed high school (compared to 35% with MHN only, and 34% with no disorder). Over half (60%) of people in the COD group reported being on some form of government assistance (compared to 41% with SUD only, 47% with MHN only, and 19% with no disorder). The people in the COD group also were the least likely to report frequent family support, stable housing, or employment (either full-time or part-time) and more likely to identify as female. The percentage of people with COD who reported being unemployed at admission was 78%, compared to 45% of those with no disorder. People with COD were the most likely to have been incarcerated in the last year (31%). The vast majority of both the COD and SUD group were on remand (83% and 82% respectively, compared to 75% of MHN only and 62% of people in the no disorder group). In terms of clinical complexity, people with COD were the most likely to have ID/head injury, past suicide attempts and psychiatric symptoms. The MHN only group had the highest prevalence of severe personality disorder traits but was comparable to the COD group (6.4% compared to 5.6%).

Recidivism: Reconviction and Reincarceration

Of the 13,887 people in the sample, 59% (*N*=8176) were reincarcerated within three years. Of those with at least one reincarceration, 27% had COD (*N*=2191), 35% (*N*=2865) had SUD only, 26% (*N*= 2106) had no disorder, and 13% (*N*=1014) had no disorder. The Kaplan-Meier curve for reincarceration is displayed in Figure 5.1 and for any reconviction in Figure 5.2. The results of both Kaplan-Meier models are summarized in Table 5.3. People with COD had the shortest median survival time to reincarceration or any reconviction (220 days, and 72 days respectively). However, in both cases the confidence intervals overlap between the COD and SUD groups, indicating that they are not statistically different. The median survival time for people with MHN only was significantly longer (904 days). Patterns between reincarceration and reconviction are similar, but with shorter time in the community before the first event, and more overlap between the diagnostic groups in the immediate post-release period.

The proportion of people with any reincarceration or reconviction by diagnostic group is summarized in Table 5.4. Eighty-six percent of people with COD and 83% of people with SUD alone had a reconviction within 3 years (the difference between SUD and COD groups was not significant after I applied the Bonferroni correction to threshold of p=.008). Both the COD and SUD groups were significantly more likely to be reincarcerated, or to be reconvicted at all, compared to those with no disorder or MHN alone (p<.001).

In the unadjusted model, being female and having a university education were negatively associated with reincarceration. Reincarceration was more common in younger age groups – being 45 years of age or older was significantly protective against reincarceration. Indigenous identity, unemployment, homelessness, lacking family support, ID/brain injury, severe personality disorder traits, previous incarceration, psychiatric symptoms, and any MHN/SUD were all significantly associated with reincarceration. Unadjusted and adjusted cox regression analyses are displayed in Table 5.5. The most important predictor of reincarceration was COD (aHR[26]=1.82, 95% CI

[26] Adjusted hazard ratio

1.70-1.94) followed closely by SUD alone (aHR = 1.71, 95% CI 1.62-1.82). MHN alone remained significant in the adjusted model but with an aHR of 1.17 (95% CI 1.08-1.26), risk of reincarceration among this group was significantly lower than either COD or SUD alone. A visual representation of selected aHR results is provided in Figure 5.3.

5.4. Discussion

As hypothesized, COD and SUD alone were positively and significantly associated with reincarceration and had the shortest time in the community before experiencing a reincarceration event. MHN alone was associated with slightly elevated risk of reincarceration compared to people with no disorder. Those with no disorder had the lowest risk of reincarceration, with the median survival time extending beyond the 3-year post-release period. The COD group had the highest proportion of people experiencing at least one reincarceration or recidivism event during follow-up. My findings are consistent with previous studies that have found differential risk of recidivism (including reincarceration) between people with MHN, SUD, and COD. This study adds to the evidence that the excess risk of recidivism associated with psychiatric disorders is largely driven by co-occurring substance use, but some non-substance related mental health needs contribute to elevated risk of reincarceration. While the relationship between MHN/SUD status and time to reincarceration remained significant in the adjusted model, the aHRs were dramatically attenuated, which is consistent with the criminality perspective discussed in Chapter 2. The social, economic, and environmental conditions in which a person lives, remain important predictors of reincarceration among people with and without MHN/SUD.

Two other large-scale studies (Wilson et al. (2014); Rezansoff et al. (2013)), which examined recidivism risk among similar diagnostic groups, found that people with mental disorder alone were at *lowest* risk of recidivism whereas I found that those with *no disorder* were at lowest risk. The differential results likely reflect the differences in our definitions and coding of mental disorder. Wilson (2014) and Rezansoff (2013) included only formally diagnosed mental disorder from linked medical records which means they were able to access a diagnosis and/or treatment in the community (those who had a

diagnosable condition but had not accessed community care, would not be counted). In addition, Wilson (2014) only included people with serious mental illness (SMI).

Overall, people with COD had higher rates of socioeconomic, clinical, and criminal justice-related risk factors, compared to those in the one disorder group or people in the no disorder group. Specifically, people in the COD group were the most likely to report less than high school education, higher rates of unemployment, being on social assistance, lacking family support, and homelessness/unstable housing. In terms of clinical complexity, people with COD had the highest prevalence of past suicide attempts, psychiatric symptoms, and ID/head injury. These findings are consistent with prior research that has shown that people with COD face even greater challenges than people with mental or substance use disorders alone, including poorer overall health, history of suicide attempts, high unemployment, homelessness, and less family support (Dickey & Azeni, 1996; Dickey, Normand, Weiss, Drake, & Azeni, 2002; Haverfield, Ilgen, Schmidt, Shelley, & Timko, 2019; Rush & Koegl, 2008; Watkins et al., 2004). Previous research has demonstrated that people with COD face barriers to accessing treatment, and often, treatment options are not well-suited to meet their needs, to an even greater extent than people with MD or SUD needs in isolation. For example, a national US study found that 72% people with COD in the general population had not received any specialty mental health or substance use services in the previous 12 months (Watkins et al., 2001). Similarly, a national Canadian study found that 51% of those with COD in the community had perceived unmet need for mental health care in the past year compared to 13% of those with SUD alone and 21% with mental disorder alone (Urbanoski et al., 2008).

Indigenous people make up approximately 6% of the population in BC (Statistics Canada, 2017), but 21% of the cohort in my study. As seen in Table 4.1, the proportion increased to 30% in the final year of our dataset. The proportion of Indigenous people in prison has also steadily increased at the federal level, surpassing 30% as of January 2020 (Office of the Correctional Investigator, 2020). Marshall (2015, p. 11) explains how drug policies intersect with social inequities in the colonial context in Canada:

Indigenous peoples in Canada have been socially positioned for involvement with illicit substances and markets through racist social, historical, and legal practices, creating the conditions for problematic drug use, high surveillance, and criminal justice system encounters related to illicit drug offences.

While many of the factors affecting Indigenous over-representation reside outside of the criminal justice system (e.g., social determinants of health), correctional systems make their own unique and measurable contribution to this tragic trend, and they need to work closely with Indigenous leaders and other sectors to close the gap.

The study lends support to previous evidence around the exceptional degree of risk for offending associated with substance use disorders. Importantly, most drug use is *criminalized* and the 'war on drugs' has involved increasingly punitive sanctions for drug-related crimes, including simple possession (Wood, Werb, Marshall, Montaner, & Kerr, 2009). Despite recommendations in 1969 that Canada move gradually away from criminal sanctions for drug use (Bennett, 1974), Canada continued a thoroughly prohibitionist approach, as reflected in the 1997 *Controlled Drugs and Substances Act (CDSA)*. Between 2010 and 2019, over 233,000 offences were recorded under the CDSA (i.e., possession, trafficking, importation/exportation, and production) in the province of BC (BC Ministry of Public Safety and Solicitor General, 2019). People with SUD suffer grave consequences from drug criminalization, including a highly toxic illicit drug supply, increased risk of blood borne virus transmission, stigma, and harms associated with having a criminal record such as increased barriers to employment, housing, and education (Félix & Portugal, 2016). Compared to people with mental disorder, people with SUD are more likely to be blamed and judged for behaviour that may be both a symptom of their condition (e.g., relapse to drug use) and a risk factor for reincarceration (e.g., conditions of parole/probation often include abstaining from drugs).

Strengths and limitations

This study is the first of its kind in Canada to examine the impact of MHN/SUD on time to reincarceration using a population-based sample. Most studies to date have relied on

linked administrative health data to ascertain diagnoses and as a result are typically limited to basic demographic variables. The current study uses universal prison intake screening information, potentially capturing people who may not have a formal diagnosis recorded in a health database either because they have not sought treatment and/or faced barriers to accessing treatment. Because the primary data source is a detailed screening instrument containing rich sociodemographic and clinical information, I can include variables in the model that are known predictors of reincarceration – allowing me to isolate the independent effect of COD on reincarceration more confidently than other studies available in the literature (Rezansoff et al., 2013; Wilson et al., 2014; Wilson et al., 2011).

The study also has some notable limitations. My definition of COD reflects presentations of both current SUD and MHN symptoms *at the same time*, so this proportion may be an underestimate of the true prevalence of COD in the population. I excluded baseline incarcerations that resulted in a federal incarceration since I did not have release dates for federal sentences. My data did not include any information on geographic destination at the point of release so potential loss to follow up could not be completely assessed. I also could not control for all deaths, which means that I may have underestimated the role of MHN/SUD on reincarceration, and specific MHN/SUD subgroups are likely to be differentially affected by this limitation. For example, a recent BC-based study found that people with previous incarceration history were more than 4 times more likely to die from overdose than those who had never experienced incarceration (Gan et al., 2021), demonstrating that there may be shared mechanisms which elevate risk of both death and reincarceration. Finally, the statistical model excludes some risk factors for both MHN/SUD and reincarceration that were unavailable in our dataset (for e.g., pro-criminal attitudes, criminal peers).

Conclusions

The opportunity to provide meaningful health-related interventions in provincial prisons (in BC), is very limited. In my cohort, the median length of stay for the index incarceration was only 12 days (mean 74 days) and nearly three quarters of the cohort

were on remand. However, incarceration provides an opportunity (however regrettable) to identify undiagnosed and/or untreated unmet MHN/SUD needs and connect people directly to community-based resources. Unfortunately, SUD treatment service availability and quality varies considerably across BC; overall lack of leadership on policies and standards for SUD treatment exists (Turpel-Laford, 2016); and many residential programs are not equipped to meet the needs of people with comorbid, complex mental health issues (Centre for Applied Research in Mental Health & Addiction, 2017). Furthermore, MHN/SUD treatment alone is unlikely to reduce recidivism risk for the majority of people who experience incarceration. Most people are not at risk because they have MHN/SUD per se, but because they disproportionately experience key risk factors for CJSI such as low education, unemployment, lack of prosocial peers/activities (Bonta et al., 1998, 2014; Skeem et al., 2011, 2014). Therefore, correctional, health, and social services must work synergistically to address reincarnation, with particular attention paid to people with complex MH/SUD needs.

Table 5.1. Description of baseline measures

Variable (Type)	Description
Sociodemographic	
Age (3-level categorical)	Age in years (18-29, 30-44, 45+)
Female (Binary)	Female self-reported sex (vs. male)
Indigenous (Binary)	Indigenous as defined by BC Corrections (includes Aboriginal, First Nations, Inuit, Metis, and Native)
Marital status (Binary)	Married or in a common-law relationship at baseline (vs. single, divorced, widowed, no response)
Employment (3-level categorical)	Full time employment (and/or full-time student); part-time employment (and/or part time student); unemployed (and not a student)
Education (3-level categorical)	Less than high school; high school completed; university/vocational
On social support/disability (Binary)	Person reported receiving financial support from the government for social assistance (welfare) and/or disability
Family support (Binary)	Binary: person responded Yes to "frequent family support" (vs. some or none)
Clinical complexity	
Suicide attempt (Binary)	Any previous suicide attempt (in community or custody), any method
Severe personality disorder (Binary)	Client displays personality disorder traits that place them at an elevated risk for violence to self or others (see JSAT guide for further information)
Intellectual disability/head injury (Binary)	Individuals presenting with clear deficiencies in cognitive functioning, very awkward or socially inappropriate, or with ID documentation on their file/ Self-reported significant head injury *Coded as Yes if ID and/or head injury were confirmed*
Psychiatric symptoms (Binary)	BPRS score ≥ 4 (vs. <4). Created by adding scores across all BPRS items for a total score. A score of ≥4 suggests the presence of two symptoms, the presence of one symptom with the possible presence of three symptoms, or the possible presence of four symptoms (as suggested by Gagnon (2009)).
Criminal justice	
Length of stay (Binary)	Length <30 days for baseline incarceration
Previous incarceration (Binary)	Incarcerated within the previous year of the baseline incarceration

Custody status (3-level categorical)	Custody status: sentenced, remand, immigration

Table 5.2. Cohort characteristics at baseline stratified by psychiatric diagnoses

Variables	**Total**		**No disorder**		**COD**		**SUD only**		**MHN only**			
	N	%	*N*	%	*N*	%	*N*	%	*N*	%	φ_c	*p*
	13887	100.0	4776	34.4	3032	21.8	4131	29.7	1948	14.0		
Sociodemographic												
Age (range 18-88)												
Mean ± SD	36.1 ± 10.9		37.4 ± 11.5		35.2 ± 10.2		34.8 ± 9.6		37.7 ± 12.1		0.01[a]	<.001
Female	1620	11.7	319	6.7	531	17.5	524	12.7	246	12.6	0.13	<.001
Indigenous	2901	20.9	1015	21.3	918	30.3	1511	36.6	371	19.0	0.16	<.001
Employment Status												
-Unemployed	8548	61.6	2156	45.1	2367	78.1	2753	66.6	1272	65.3	0.19	<.001
-FT Employed or FT Student	4291	30.9	2237	46.8	492	16.2	1050	25.4	512	26.3		
-PT Employed or PT Student	1048	7.5	383	8.0	173	5.7	328	7.9	164	8.4		
Education												
-Less than high school	5789	41.7	1621	33.9	1430	47.2	2064	50.0	674	34.6	0.12	<.001
-High school completed	4430	31.9	1583	33.1	896	29.6	1315	31.8	636	32.6		
-University/vocational	3668	26.4	1572	32.9	706	23.3	752	18.2	638	32.8		
Social assistance/ disability support	5300	38.2	885	18.5	1815	59.9	1684	40.8	916	47.0	0.32	<.001

Married or common law	3181	22.9	1359	28.5	577	19.0	846	20.5	399	20.5	0.10	<.001
Family Support												
-Some or none	6196	44.6	1822	38.1	1598	52.7	1903	46.1	873	44.8	0.11	<.001
-Frequent	7691	55.4	2954	61.9	1434	47.3	2228	53.9	1075	55.2		
Homeless/unstable housing	2045	14.7	381	8.0	677	22.3	746	18.1	241	12.4	0.16	<.001
Clinical complexity												
Intellectual disability/head injury	4273	30.8	972	20.4	1387	45.7	1150	27.8	764	39.2	0.22	<.001
Severe personality disorder traits	461	3.3	71	1.5	169	5.6	97	2.3	124	6.4	0.11	<.001
Past suicide attempts	3271	23.6	449	9.4	1341	44.2	824	19.9	659	33.8	0.32	<.001
BPRS[b] score ≥4	2024	14.6	317	6.6	796	26.3	510	12.3	401	20.6	0.22	<.001
Criminal justice												
Length of stay												
Mean ± SD	38.9 ± 67.7		37.9 ± 69.5		39.8 ± 64.2		39.1 ± 67.8		39.5 ± 68.7		0.00[a]	0.63
Median	12		9		15		13		12			
Custody status description												
-Remand	10265	73.9	2935	61.5	2507	82.7	3365	81.5	1458	74.8	0.19	<.001

-Sentenced	2901	20.9	1254	26.3	509	16.8	731	17.7	407	20.9		
-Immigration	704	5.1	577	12.1	14	0.5	31	0.8	82	4.2		
Incarcerated in the previous year	3129	22.5	676	14.2	927	30.6	1077	26.1	449	23.0	0.16	<.001

[a]eta squared
[b]BRPS= Brief Psychiatric Rating Scale

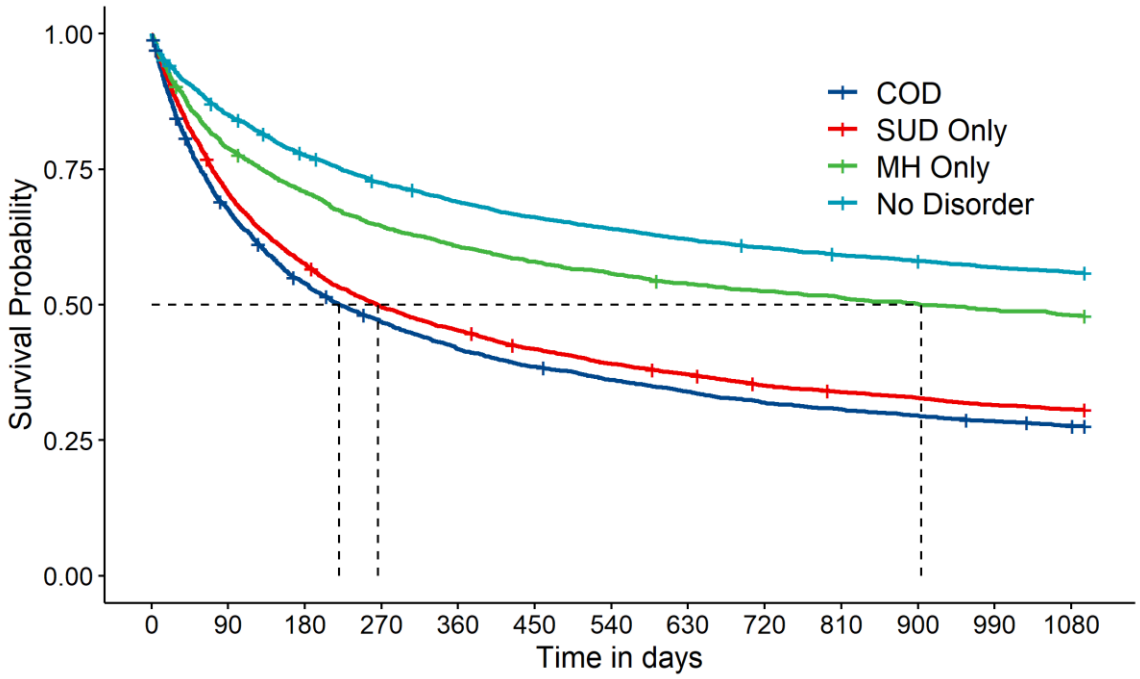


Figure 5.1. Survival curve for time to reincarceration by diagnostic group

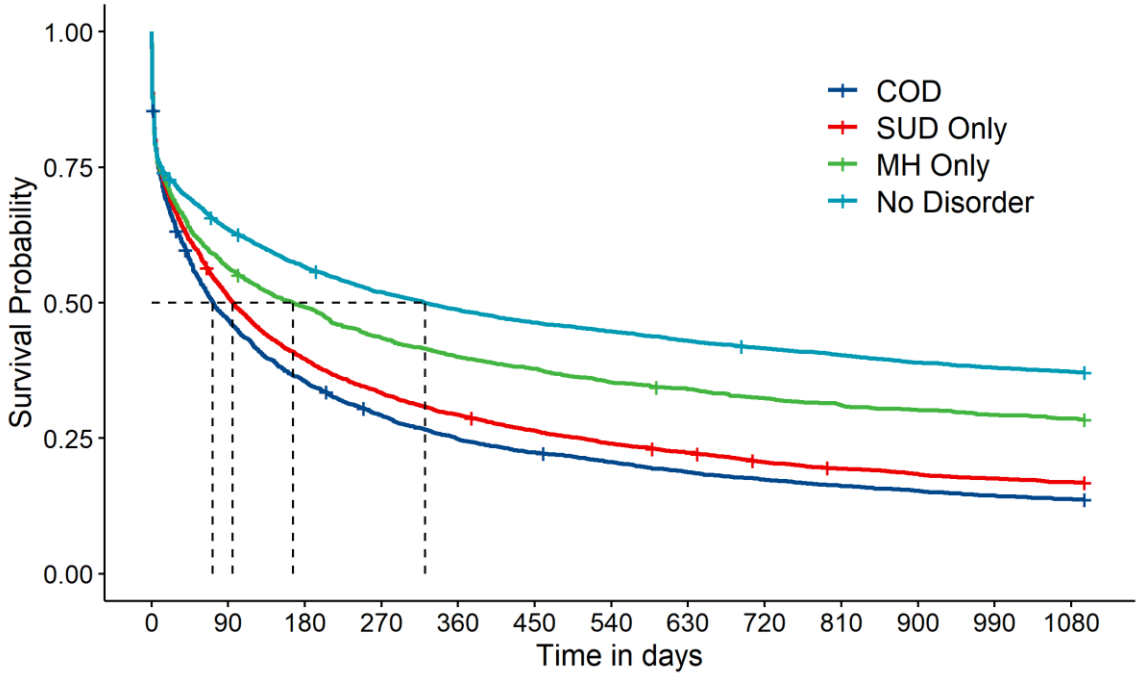


Figure 5.2. Survival curve for time to any reconviction by diagnostic group

Table 5.3. Kaplan-Meier results (median days to reincarceration and 95% confidence intervals) for time to reincarceration and any reconviction

	Days to reincarceration (median)	95% CI	Days to any reconviction (median)	95% CI
COD	220	202 -248	72	65-81
SUD only	266	244-293	95	88-104
MHN only	904	743 - NA	166	134-202
No disorder	NA*	NA – NA*	321	285-363

*NA means that more than 50% survived beyond the end of the 3-year period. The NA for upper limit of the CI means that the CI extends beyond the end date of the 3-year post-release period.

Table 5.4. Number and percent of people reincarcerated and reconvicted by diagnostic group

	Total in sample *N* (%)	Reincarcerated within 3 years *N* (%)	Any reconviction within 3 years *N* (%)
COD	3032 (100%)	2191 (72%)	2613 (86%)
SUD only	4131 (100%)	2865 (69%)	3435 (83%)
MHN only	1948 (100%)	1014 (52%)	1394 (72%)
No disorder	4776 (100%)	2106 (44%)	2999 (63%)

Separate chi-square analyses were conducted for reincarceration and reconviction, and all 2x2 comparisons were significant at the level of <.001 except for COD x SUD: p= 0.02 for reconviction, p=.06 for reincarceration, neither of which is significant with Bonferroni adjusted p-value of .008.

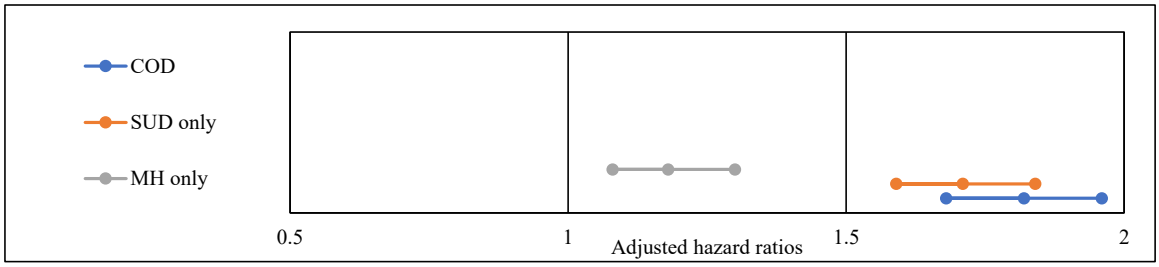
Table 5.5. Unadjusted and adjusted hazard ratios (and 95% confidence intervals) examining the association between diagnostic group at baseline and reincarceration

	Unadjusted HR	95% CI	*p*	Adjusted HR	95% CI	*p*
Diagnostic Group						
No disorder	Ref			Ref		
MHN only	1.28	(1.19, 1.39)	<.001	1.17	(1.08, 1.26)	<.001
SUD only	2.05	(1.94, 2.17)	<.001	1.71	(1.62, 1.82)	<.001
COD	2.26	(2.13, 2.40)	<.001	1.82	(1.70, 1.94)	<.001
Covariates						
Socio-demographic						
Age						
18-29	Ref			Ref		
30-44	0.93	(0.89, 0.98)	.003	0.96	(0.91, 1.01)	0.10
≥45	0.65	(0.61, 0.69)	<.001	0.70	(0.66, 0.75)	<.001

Female	0.90	(0.84, 0.97)	<.001	0.72	(0.67, 0.77)	<.001
Indigenous	1.43	(1.37, 1.50)	<.001	1.22	(1.16, 1.28)	<.001
Employment Status						
-Full Employed or FT Student	Ref			Ref		
-Unemployed	1.62	(1.54, 1.70)	<.001	1.31	(1.24, 1.38)	<.001
-PT Employed or PT Student	1.36	(1.24, 1.45)	<.001	1.21	(1.10, 1.32)	<.001
Education						
-High school completed	Ref			Ref		
-Less than high school	1.14	(1.08, 1.20)	<.001	1.00	(0.95, 1.05)	0.93
-University/ vocational	0.77	(0.72, 0.81)	<.001	0.87	(0.82, 0.92)	<.001
Married or common law	0.79	(0.75, 0.84)	<.001	0.94	(0.89, 0.99)	0.02
Family Support						
-Frequent	Ref			Ref		
-Some or none	1.19	(1.14, 1.24)	<.001	1.10	(1.05, 1.15)	<.001
Homeless /unstable housing	1.46	(1.38, 1.55)	<.001	1.15	(1.08, 1.22)	<.001
Clinical complexity						
ID/head injury	1.27	(1.22, 1.33)	<.001	1.09	(1.04, 1.14)	<.001
Severe personality disorder traits	1.36	(1.22, 1.53)	<.001	1.15	(1.02, 1.29)	0.02
Past suicide attempts	1.28	(1.22, 1.34)	<.001	1.00	(0.94, 1.05)	0.90
BPRS score ≥4	1.14	(1.07, 1.21)	<.001	1.01	(0.95, 1.07)	0.80
Criminal justice						

Length of stay <30 days	1.01	(0.96, 1.05)	0.76	1.09	(1.04, 1.14)	<.001
Incarcerated in the previous year	1.90	(1.81, 2.00)	<.001	1.61	(1.53, 1.69)	<.001

Figure 5.3. Forest plot of select aHR for reincarceration risk



1= no association

Chapter 6. Relationship between substance use disorders and frequency of incarceration

6.1. Background

Substance use disorder (SUD) is very common among people with criminal justice system involvement (Fazel et al., 2017). A recent review of 24 studies found 12-month pooled prevalence estimates of drug use disorder was 30% for men and 51% for women entering prison (Fazel et al., 2017). Substance misuse is one of the strongest predictors of recidivism (Chang et al., 2015b; Fazel et al., 2017) and presents a uniquely difficult challenge for correctional institutions that are not equipped or designed to meet the needs of people with SUD. Among people released from prison, resuming drug use and reoffending is common in the initial post-release period, particularly in the context of poor social support, financial insecurity, and unstable housing (Binswanger et al., 2012). An Australian study found that people released from prison are at 22 times higher risk of overdose compared to the general population (Forsyth, Carroll, Lennox, & Kinner, 2018). Psychiatric comorbidity is common among people in prison who use substances, as is suicidal ideation, cognitive problems, hallucinations, and violence (Hakansson, Schlyter, & Berglund, 2011). Psychiatric comorbidity among people who use methamphetamine is associated poor treatment outcomes, substance use relapse, and adverse social outcomes, such as unemployment and unstable housing (Glasner-Edwards et al., 2009; McKetin et al., 2018).

Although the role of SUD in offending broadly has been clearly demonstrated in prior research, only a handful of studies have examined the association between recidivism and specific *substance types.* The relationship between specific substances and crime is exceedingly complex and moderated by a host of factors in the individual and the environment; while associations have been documented, causal linkages can rarely be established (Boles & Miotto, 2003). Nonetheless, research on differential risk associated with specific substances remains a worthwhile pursuit. A nuanced understanding of the relationship between drugs and crime is critical for developing appropriate interventions and improving prevention.

In a cohort of people in prison in Sweden, Håkansson and Berglund (2012) found that recidivism was positively associated with amphetamine and heroin use, and negatively associated with opioids (other than heroin), and with hallucinogenic drugs. Some scholars have hypothesized that methamphetamine may have a particularly destabilizing effect and may precipitate or exacerbate symptoms of mental illness. Methamphetamine is a powerful psychostimulant which has high dependence liability (especially crystalline methamphetamine), long duration of action compared to other drugs, and can be used by smoking, snorting, injecting, and swallowing (McKetin et al., 2018). Methamphetamine is synthetically derived and relatively easy to manufacture using rudimentary laboratory equipment (Nordahl, Salo, & Leamon, 2003). Many of the adverse effects of methamphetamine are related to long-term use driven by dependence (McKetin, Kelly, & McLaren, 2006). Chronic use of methamphetamine has been associated with psychosis (Farrell et al., 2002), severe paranoia, hallucinations and delusions of persecution, anxiety, cognitive impairment (Nordahl et al., 2003; Zweben et al., 2004), depression, insomnia, malnutrition, and poor physical health (Greenwell & Brecht, 2003). Methamphetamine has also been associated with increased aggression and violence, the odds of which are dramatically increased by comorbid psychotic symptoms (McKetin et al., 2014).

Research shows that people who are dependent on heroin are disproportionately involved in criminal activity (Bennett, Holloway, & Farrington, 2008). Heroin use has been causally associated with primarily acquisitive crime (e.g., property crime), rather than aggression and violence (Office of the National Drug Control Policy, 2013). Where heroin has been associated with violence, the effect does not appear to be independent of concurrent use of other drugs, such as alcohol. Opioids in general are not known to produce pharmacological violence, but *withdrawal* may cause agitation, aggression, irritability, and defensive responses to provocation (Schifano et al., 2020).

Several studies have focused on the association between alcohol and violence/aggression rather than crime more generally (Bradford, Greenberg, & Motayne, 1992; Zhang, Wieczorek, & Welte, 1997). The most common and direct link has been through acute alcohol intoxication. Using a sample of 14,000 people in state prison and 4000 in federal

prison via the Survey of Inmates of State and Federal Correctional Facilities, Felson and Staff (2010) sought to isolate the effects of alcohol intoxication on violent crime. Variables such as history of criminal activity, alcohol use within the last year, location of the offense, and intoxication of the victim were used as statistical controls. They found that intoxicated individuals were far more likely to commit sexual assault, physical assault, and homicide compared to other crime (such as property crime). Importantly, this study did not compare people who were intoxicated to people who were not intoxicated – it looked at the relationship between different crime types among people who were intoxicated. There is a dearth of literature examining the relationships between specific drug types and reincarceration within well-controlled models.

The goal of the current study is to examine the association between different substance use types and frequency of incarceration, among a large cohort of people admitted to provincial prison in BC over a nine-year period. In Chapter 5 I looked at time to first reincarceration event which provided important information about high-risk periods post-release from prison across diagnostic subgroups. Here, I focus on *frequency* of incarceration – this analysis provides additional valuable information about which SUD subgroups are most likely to experience costly, disruptive, and damaging cycles of incarceration.

6.2. Methods

Data Sources

The primary data source for this study is the *Jail Screening Assessment Tool* (JSAT) (Nicholls et al., 2005) which was obtained from the BC Corrections Research Branch. This tool is used in all 10 provincial correctional facilities operated by BC Corrections for the collection of mental health intake information. The JSAT is a validated, detailed screener for mental health and management needs that has been recorded electronically since 2008 and has remained consistent throughout the study period. Mental health screeners complete the JSAT interview during every prison admission, such that individuals with multiple incarcerations will have multiple JSAT records. These data are

entered directly into an electronic medical record housed on the Primary Assessment and Care (PAC) databases of the Ministry of Justice Corrections Branch.

Criminal justice information for each client was obtained from BC Correction's CORNET (Corrections Operations Network). CORNET is the Corrections Branch electronic platform used for the administration of sentences and supervision and it is the primary repository for all data relating to an individual's involvement with the BC Corrections system. The CORNET data were linked with the JSAT data via unique BC Corrections client ID. The CORNET data in my dataset includes dates of admission and release; the movement reason (e.g., sentence end, new sentence, breach, etc.); direction (in/out); facility name (to/from); custody description (Correctional Services Canada, remand, provincial sentence); and community description (e.g., parole, bail order, probation order). Dates of death that occur while a person is under BC Correction's supervision are included in the CORNET file. More information about the JSAT and CORNET data, and the linkage strategy, can be found in section 3.3 of this thesis.

Sample

JSAT and CORNET records were obtained for every client released from a provincial prison in BC between January 1, 2009, and January 1, 2017. See section 3.4 for information about exclusions. The total sample for this study included 37,820 people.

Measures

Baseline Measures

Self-report sociodemographic variables used in this study include: sex, age, Indigenous status, marital status, homelessness/unstable housing, employment, education level, and family support. Clinical complexity and mental health related variables include intellectual disability/head injury, severe personality disorder, possible mood/anxiety disorder, and serious mental health needs. Criminal justice variables include length of the stay <30 days for the index incarceration. Further details about all baseline measures can be found in Table 6.1.

Ascertaining the exposure: substance use disorder by drug type

I coded a record as SUD if current abuse or long-term severe abuse in any of the six JSAT drug categories was positively indicated: alcohol, heroin, cocaine, methamphetamine, marijuana, and/or other drugs. For this analysis, I created a mutually exclusive variable for drug type, ordered by diminishing drug severity based on previous literature on the relationship between specific substances and recidivism (Håkansson & Berglund, 2012). Given the substantial overlap in heroin and methamphetamine use, I replicated the approach by Håkansson and Berglund (2012) and created a group for methamphetamine *and* heroin use disorder, as well as methamphetamine and heroin use disorder alone (or in combination with other drugs). The ordered list is as follows: methamphetamine & heroin, methamphetamine (no heroin), heroin (no methamphetamine), cocaine, alcohol, other drugs, marijuana.

Ascertaining the outcome: frequency of reincarceration

Prison admissions were identified using the linked JSAT and CORNET data (see Section 3.4 for more details). This study only includes new incarcerations for which there was a corresponding JSAT screening record. However, I have considerable confidence that this accounts for virtually all admissions. After the cohort was created, I calculated the number of admission records per person and saved this as the outcome variable. An individual's first record in my database was considered their baseline index offence and I counted forward from baseline to determine frequency.

Analyses

To calculate rates of incarceration I created an exposure (or offset) variable for per-person time at risk, which is an estimate of an individual's total days in the community during the study period. I calculated the number of total days from first release to the end of the study period. I right censored for death (if the person died while under BC Correction's supervision) and for federal incarceration. Then, I subtracted total days incarcerated from total days in the study to get each individual's person-time at risk in the

community. If a client's baseline release was to federal custody or to immigration detention, they were removed from the sample.

Three percent of the sample had one or more missing release dates (this includes people who have likely not been released by the end of the study period) which are needed to calculate days incarcerated. For missing releases, I imputed the release date using the median length of stay for the full sample. If a person had another incarceration event that was within fewer days than the median imputation, I used the day prior to the next incarceration event. If an imputed release date went beyond the last day of the study period (September 30, 2017), it was replaced with the study end date. Incarceration rates (IR) by drug type were calculated by dividing incarceration count by person-time at risk. Sensitivity analyses were also performed whereby all records with a missing release date were dropped rather than imputed, and only complete cases were used. The results were not meaningfully different from the imputed analyses.

I estimated the relationship between SUD (by drug type) and frequency of reincarceration using negative binomial regression. The reincarceration count data for this study are over-dispersed (variance/mean is 4.79) and thus, negative binomial is more appropriate than Poisson regression, which assumes that variance is equal to the mean. The multivariable analyses include adjustment for all baseline covariates which include well-known risk factors for incarceration and SUD. I report rate ratios and 95% confidence intervals.

Alpha level .05 was used for all statistical tests. All analyses were performed in R version 3.6.1 using dplyr, ggplot2, MASS, aod, and rstatix packages (R Development Core Team, 2020).

6.3. Results

Descriptive data from the baseline JSAT are summarized in Table 6.2. The total sample included 37,820 people. Roughly 13% of the cohort was female and 25% identified as Indigenous. Over half (57%) were unemployed and nearly 40% reported not completing high school. Forty-six percent reported a substance use disorder, with the most common

being alcohol use disorder (17%). All other drug categories were each reportedly used among 1-8% of the cohort. Six percent had methamphetamine use disorder, 8% had heroin use disorder, and 4% had *both*. The majority of baseline incarcerations (70%) were less than 30 days.

As shown by the incidence rates (IR) and incidence rate ratios (RR), all drug categories were related to increased rate of incarceration, but to varying degrees (Table 6.3 and Table 6.4). Methamphetamine and heroin use together had the highest incidence rate (IR = 2.6 per 1000 person days) followed by methamphetamine/no heroin (IR = 2.1 per 1000 person days) and heroin/no methamphetamine (IR = 1.8 per 1000 person days).

The top three predictors of incarceration by drug type were methamphetamine and heroin (aRR[27] = 2.75 95% CI: 2.50-3.03), meth/no heroin (aRR = 2.31 95% CI: 2.15-2.49), and heroin/no meth (aRR = 2.13 95% CI: 2.00- 2.28). Alcohol and marijuana had the lowest RR compared to other drug types. Severe mental illness, ID/head injury, younger age, and possible anxiety/depression were also significantly associated with incarceration rate. Being married, employed, university educated, older, and having frequent family support, were protective against reincarceration.

6.4. Discussion

My results showed that methamphetamine and heroin (especially when used in combination) significantly increase the risk of incarceration. Even after adjustment for covariates, those who use methamphetamine had an incarceration rate that was more than double the rate of those do not have SUD. These findings are consistent with other studies that have found similar associations (Håkansson & Berglund, 2012). More than 9% of the prison cohort for this study had a methamphetamine use disorder which is highly elevated in comparison to the general population. In 2018, ~0.2% of the general population in Canada reported using methamphetamine; thus, the rate of dependence is likely even lower (Canadian Centre on Substance Abuse, 2018).

[27] Adjusted rate ratio

I found that heroin use (in combination with methamphetamine and without methamphetamine) was also positively and strongly associated with reincarceration - which is consistent with previous studies (Håkansson & Berglund, 2012; Pierce et al., 2017). More than 10% of the prison cohort in my study had a heroin use disorder. I was unable to locate an accurate estimate of heroin use disorder among the general Canadian population as a comparison, but the Canadian Centre on Substance Use and Addiction (2020) reported that 12% of the population filled an opioid prescription in 2017 (this does not account for illicit drug purchasing) and 3% reported using them for non-medical purposes. Heroin use carries a high burden of disease, and dependence on heroin results in average of four decades of lost life (Darke et al., 2016). For the past several years, fatal overdose has been BC's leading cause of unnatural death with over 7600 deaths due to illicit drug toxicity from 2015-2021 (BC Coroners Service, 2021). As can be seen by the high rates of socioeconomic deprivation among this cohort, criminal justice involvement and incarceration is perhaps a *proxy* for mental health needs and substance use disorders that are evidenced by social marginalization and disadvantage. Given the drug toxicity crises and elevated risk of both mortality and costly cycles of reincarceration, this subgroup warrants urgent policy attention and action.

I found that marijuana and alcohol use disorders were strongly associated with reincarceration, but the RRs were far lower than for the other drug categories. This finding is inconsistent with other studies that have found no significant relationship. For example, in a study of reincarceration among people with serious mental illness (SMI) released from prison in Ontario, Jones, Mantesch, Gerritsen, and Simpson (2021) also found that stimulants (crack cocaine and methamphetamine) were strongly associated with reincarceration, while cannabis and alcohol were not. Håkansson and Berglund (2012) also found that marijuana and alcohol use among people in prison were not associated with reincarceration rates after adjustment for other criminogenic risk factors. However, there are important methodological differences between my study and the ones presented here. I restricted my drug use categories to those that met the threshold for *disordered* use which may represent a higher level of severity than measures used in other studies. Also, my cohort was restricted to people in provincial prisons which means that the majority of people will have lower-severity offences (the exception would be

people held on remand for serious crimes, waiting for trial or sentencing). Finally, the JSAT only includes one category for cocaine so I could not distinguish between crack cocaine from intranasal cocaine, which may have differential risk profiles (Fagan, 1993). Importantly, differential risk is unlikely to be caused by crack cocaine itself – it probably reflects elevated risk of participation in violent criminal activity associated with crack dealing and purchasing (Fagan, 1993). While the relationship between all drug categories and reincarceration remained significant in the adjusted model, the aRRs were dramatically attenuated, which is consistent with the criminality perspective discussed in Chapter 2. The social, economic, and environmental conditions in which a person lives, remain important predictors of reincarceration among people with and without MHN/SUD.

The relationship between substance use and crime is complex and there have been various explanatory models discussed in the literature: drug use causes crime (forward causation); crime causes drug use (reverse causation); and the drug crime relationship can be explained by other factors (confounding) (Bennett et al., 2008; Pierce et al., 2017). A comprehensive description of these models is beyond the scope of this paper. What is important for my purposes is that these results demonstrate that substance use needs are a key component of crime prevention and crime desistance efforts. Given that SUD is a strong predictor of reincarceration, it follows that high-quality substance use treatment has the potential to dramatically reduce crime, and the number of people churning through provincial prisons. Longitudinal studies on drug treatment programs in the US provide strong evidence that substance use treatment and aftercare programs post-release from prison can reduce recidivism and increase prosocial behaviour (Mears, Winterfield, Hunsaker, Moore, & White, 2003).

Strengths and limitations

This study makes an important contribution to the literature on the relationship between various substance use disorders and reincarceration; this is the first study of its kind in Canada. My study sample included every individual who was incarcerated over a nine-year period in BC permitting ample opportunity to study patterns of reoffending over

time. The detailed social and sociodemographic variables provided by the JSAT gave me the unique ability to control for a robust set of criminogenic risk factors in the adjusted analyses. The substance use section of the JSAT provided a detailed SUD profile – allowing me to confidently ascertain *current disordered use* which was important for the research aims and interpretation of the findings.

The study also has some notable limitations. I used baseline JSAT measures for my exposure variables (i.e., the first record an individual had in my dataset). Given that I look at reincarcerations over a long period of time (~9 years), it is impossible to know whether the baseline drug use is driving future reincarceration. SUD is a changeable condition and use of drugs type may also change alongside the availability and price of drugs. If for example someone uses cocaine for 5 years and then switches to a methamphetamine because it is cheaper and easier to access, the current drug use rather than history of cocaine may be the most relevant consideration for incarceration. This limitation is most relevant to the people who entered the cohort early because there is more opportunity for their SUD status and use patterns to change.

I excluded people released to federal incarceration since I could not determine person-time at risk for that group. My data did not include any information on geographic destination at the point of release so potential loss to follow up could not be assessed. I also could not control for death, and so person-time at risk is possibly inflated, which would result in a conservative incidence estimate (i.e., an underestimate). A recent BC-based study found that people with previous incarceration history were more than 4 times more likely to die from overdose than those who had never experienced incarceration (Gan et al., 2021), demonstrating that there may be shared mechanisms which elevate risk of both death and reincarceration. Finally, the statistical model may still exclude unmeasured risk factors for both SUD and reincarceration. The use of substances occurs in environmental, social, situational and cultural contexts that affect potential for criminality (Boles & Miotto, 2003) and some important factors are inevitably missing from my model.

Directions for future research

People who are caught and convicted of crime are not necessarily representative of all individuals committing crime. Acute intoxication from alcohol or other drugs may increase probability of arrest, and this is especially true for people who are marginalized and using substances in areas that make them highly visible to police. People with chronic substance use issues may be treated differently by police and courts, but this has not been studied empirically (Leidenfrost, Leonard, & Antonius, 2017). More research is needed to understand the *mechanisms* mediating the relationship between specific substances and crime. In addition to the contextual factors, more research is needed to examine the genetic and psychosocial vulnerabilities among people who use substances and have CJSI. Previous work has found that some offence types (e.g., property, acquisitive crime) may be related to poverty, substance use, and marginalization (Pierce et al., 2017). Future work should look more specifically at the relationship between specific drugs and different types of crime within the context of systems level factors (e.g., drug policy) and individual risk factors. The relevance of factors such as age of drug initiation and gender should be explored in future drug and crime research.

Table 6.1. Description of baseline measures

Variable (Type)	Description
Sociodemographic	
Age (3-level categorical)	Age in years (18-29, 30-44, 45+)
Female (Binary)	Female self-reported sex (vs. male)
Indigenous (Binary)	Indigenous as defined by BC Corrections (includes Aboriginal, First Nations, Inuit, Metis, and Native)
Marital status (Binary)	Married or in a common-law relationship at baseline (vs. single, divorced, widowed, no response)
Employment (3-level categorical)	Full time employment (and/or full-time student); part-time employment (and/or part time student); unemployed (and not a student)
Education (3-level categorical)	Less than high school; high school completed; university/vocational
Family support (Binary)	Person reported "frequent family support" (vs. some or none)
Clinical complexity and mental health	
Severe personality disorder (Binary)	Client displays personality disorder traits that place them at an elevated risk for violence to self or others (see JSAT guide for further information)
Intellectual disability/head injury (Binary)	Individuals presenting with clear deficiencies in cognitive functioning, very awkward or socially inappropriate, or with ID documentation on their file/ Self-reported significant head injury *Coded as Yes if ID and/or head injury were confirmed*
Serious mental health needs (Binary)	History of psychotic/bipolar disorder; Possible recurrent psychosis; Active current psychosis; Past-month inpatient psychiatric hospitalization; and/or Current certification under the *Mental Health Act*
Possible mood/ anxiety disorder (Binary)	History of mood/anxiety disorders and/or current symptoms
Criminal justice	
Length of stay (Binary)	Length <30 days for baseline incarceration
Drugs	
Substance use disorder by drug type (8-level categorical)	Ordered according to diminishing severity: Meth + Heroin, Meth, Heroin, Cocaine, Alcohol, Other, Marijuana, None

Table 6.2. Characteristics of people admitted to provincial prisons 2009 - 2017

	Total		**No drugs**		**Meth & Heroin**		**Meth**		**Heroin**		**Cocaine**		**Alcohol**		**Marijuana**		**Other**	
	N	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%
	37820	100.0	19194	50.8	1312	3.5	2211	5.8	2843	7.5	2997	7.9	6573	17.4	2351	6.2	339	0.9
Sociodemographic																		
Age (Mean ± SD)	35.03 ± 11.5		35.8 ± 12.1		30.8 ± 8.3		31.1 ± 8.9		33.6 ± 9.0		35.7 ± 9.8		36.3 ± 12.1		30.1 ± 10.4		32.9 ± 10.3	
Female	4783	12.6	1734	9.0	412	31.4	520	23.5	732	25.7	539	18.0	620	9.4	149	6.3	77	22.7
Indigenous	9553	25.3	3770	19.6	340	25.9	527	23.8	614	21.6	835	27.9	2736	41.6	668	28.4	63	18.6
Married or common law	9064	24.0	5136	26.8	203	15.5	379	17.1	522	18.4	510	17.0	1721	26.2	506	21.5	87	25.7
Employment																		
-FT Employed or FT Student	13303	35.2	8388	43.7	153	11.7	364	16.5	469	16.5	663	22.1	2348	35.7	834	35.5	84	24.8
-Unemployed	21568	57.0	9241	48.1	1098	83.7	1694	76.6	2196	77.2	2150	71.7	3682	56.0	1292	55.0	215	63.4
-PT Employed or PT Student	2949	7.8	1565	8.2	61	4.6	153	6.9	178	6.3	184	6.1	543	8.3	225	9.6	40	11.8
Education																		
-High school completed	12346	32.6	6385	33.3	390	29.7	686	31.0	1037	36.5	993	33.1	1970	30.0	766	32.6	119	35.1
-Less than high school	15189	40.2	6522	34.0	660	50.3	1089	49.3	1226	43.1	1376	45.9	3071	46.7	1089	46.3	156	46.0
-University/vocational	10285	27.2	6287	32.8	262	20.0	436	19.7	580	20.4	628	21.0	1532	23.3	496	21.1	64	18.9
Family Support																		
-Some or none	16957	44.8	7711	40.2	796	60.7	1253	56.7	1619	56.9	1558	52.0	2866	43.6	987	42.0	167	49.3
-Frequent	20863	55.2	11483	59.8	516	39.3	958	43.3	1224	43.1	1439	48.0	3707	56.4	1364	58.0	172	50.7
Homeless/unstable housing	5400	14.3	1687	8.8	455	34.7	619	28.0	771	27.1	716	23.9	829	12.6	276	11.7	47	13.9
Clinical complexity and mental health																		

ID/head injury	9334	24.7	4134	21.5	300	22.9	585	26.5	546	19.2	848	28.3	2025	30.8	805	34.2	91	26.8
Severe personality disorder traits	1085	2.9	494	2.6	64	4.9	98	4.4	72	2.5	93	3.1	162	2.5	87	3.7	15	4.4
Depression/anxiety	6174	16.3	2622	13.7	365	27.8	504	22.8	472	16.6	532	17.8	1190	18.1	432	18.4	57	16.8
Severe mental disorder	3963	10.5	1711	8.9	239	18.2	419	19.0	292	10.3	417	13.9	570	8.7	282	12.0	33	9.7
Criminal justice involvement																		
Length of stay <30 days	26313	69.6	13542	70.6	986	75.2	1554	70.3	2029	71.4	1872	62.5	4562	69.4	1544	65.7	224	66.1

Table 6.3. Reincarceration incidence rates by drug type (per 1000 person days)

Drug Type	IR per year
None	0.81
Meth & Heroin	2.57
Meth	2.09
Heroin	1.80
Cocaine	1.68
Alcohol	1.27
Marijuana	1.18
Other	1.21

Table 6.4. Rate ratios (and 95% confidence intervals) for the association between the type of drug used and subsequent reincarceration frequency

Sample Characteristics	RR	95% CI	*p*	Adjusted RR	95% CI	*p*
Substance Use Disorder - Drug Type						
None	Ref			Ref		
Methamphetamine & Heroin	3.49	(3.18, 3.85)	<.001	2.75	(2.50, 3.03)	<.001
Methamphetamine	2.88	(2.67, 3.11)	<.001	2.31	(2.15, 2.49)	<.001
Heroin	2.38	(2.23, 2.55)	<.001	2.13	(2.00, 2.28)	<.001
Cocaine	2.03	(1.90, 2.70)	<.001	1.78	(1.67, 1.89)	<.001
Alcohol	1.53	(1.46, 1.61)	<.001	1.36	(1.30, 1.43)	<.001
Marijuana	1.42	(1.32, 1.54)	<.001	1.48	(1.24, 1.77)	<.001
Other	1.52	(1.26, 1.84)	<.001	1.17	(1.08, 1.26)	<.001
Sociodemographic						
Age						
18-29	Ref			Ref		
30-44	0.72	(0.69, 0.75)	<.001	0.78	(0.75, 0.81)	<.001

≥45	0.41	(0.39, 0.43)	<.001	0.48	(0.46, 0.51)	<.001
Female	0.74	(0.70, 0.79)	<.001	0.52	(0.49, 0.54)	<.001
Indigenous	1.55	(1.48, 1.61)	<.001	1.46	(1.40, 1.52)	<.001
Married or common law	0.67	(0.64, 0.70)	<.001	0.85	(0.82, 0.89)	<.001
Employment Status						
-Full time (FT) Employed or FT Student	Ref			Ref		
-Unemployed	1.85	(1.78, 1.92)	<.001	1.43	(1.37, 1.49)	<.001
-Part-time (PT) Employed or PT Student	1.53	(1.42, 1.64)	<.001	1.27	(1.19, 1.36)	<.001
Education						
-High school completed	Ref			Ref		
-Less than high school	1.16	(1.11, 1.21)	<.001	1.01	(0.97, 1.05)	0.69
-University/vocational	0.68	(0.65, 0.71)	<.001	0.84	(0.80, 0.88)	<.001
Family Support						
-Some or none	Ref			Ref		
-Frequent	0.78	(0.75, 0.81)	<.001	0.86	(0.83, 0.89)	<.001
Homeless/unstable housing	1.72	(1.64, 1.81)	<.001	1.22	(1.16, 1.29)	<.001
Clinical complexity and mental health						
ID/head injury	1.13	(1.08, 1.18)	<.001	1.07	(1.03, 1.12)	<.001
Severe personality disorder traits	1.33	(1.2, 1.49)	<.001	1.20	(1.08, 1.33)	<.001
Depression/anxiety	1.05	(1.0, 1.11)	0.03	1.03	(0.98, 1.08)	0.18

Severe mental disorder	1.40	(1.32, 1.48)	<.001	1.24	(1.17, 1.31)	<.001
Criminal justice						
Length of stay <30 days	1.01	(0.97, 1.05)	0.01	1.04	(1.00, 1.08)	0.58

Chapter 7. Conclusions

My dissertation research used a population-level sample of people admitted to prison in BC over a 9-year period to examine MHN/SUD prevalence and changes over time; to paint a comprehensive picture of the demographic, socioeconomic, and clinical characteristics of the population; and to study the relationship between MHN/SUD and reincarceration, including time to reincarceration, and frequency of incarceration. Below I summarize the main findings, discuss the overall strengths and limitations of this work, provide directions for future research, and close with implications for policy and practice.

What we know from previous Canadian studies

I am aware of one reincarceration study (Jones et al., 2021) in which the authors used JSAT data to ascertain mental disorder and SUD among a sample of people in jail in Ontario, Canada. That study was limited in that it focused on only a subset of people with SMI who were referred to a Forensic Early Intervention Service (FEIS) team over a two-year period, and they only measured readmission to the two jails where the FEIS program operates. In BC, Rezansoff et al. (2013) looked at psychiatric diagnoses including COD in a large provincial prison sample using linked administrative health and justice data. The authors only included people who were provincially *sentenced,* and medical data used to ascertain psychiatric diagnoses were restricted to Medical Services Plan records, which only includes services delivered by physicians and psychiatrists. Both of these studies made important contributions to the very limited Canadian research that has examined the relationship between MHN/SUD and crime among people in the CJSI.

The contribution of this work to the Canadian evidence base

My dissertation uses a population-level dataset spanning nearly a decade, filling gaps in the existing literature. I found that the proportion of people entering prisons with any MHN/SUD rose steadily between 2009 and 2017, driven largely by a marked 17.5% increase in COD. One-third of people admitted to custody in 2017 met the criteria for COD, making them the *highest proportion* of people admitted that year out of all the diagnostic subgroups, followed by people with SUD alone (they represented the *lowest*

proportion in 2009). When comparing drug use among people with COD and those with SUD alone, people with COD were significantly more likely to use methamphetamine, marijuana, and cocaine. The elevated and increasing rate of COD is of particular concern given that comorbidity tends to result in worse health and criminal justice outcomes than any single condition alone (Butler et al., 2020; Wilson et al., 2014; Young et al., 2018). While the reasons for these trends cannot be discerned from the available data, they may reflect a lack of availability and adequacy of care for people with COD in the community. These findings are consistent with Canadian studies that have shown a disproportionately high level of unmet need for health care (including specialized services) among people with COD when compared to people with a single disorder (Urbanoski et al., 2008).

I also found that people with COD had higher rates of socioeconomic, clinical, and criminal justice-related risk factors, compared to those in the one MHN/SUD disorder group or people in the no disorder group. These findings are consistent with prior research showing that people with COD face greater challenges than people with single MHN/SUD alone, including poorer overall health, history of suicide attempts, high unemployment, homelessness, and less family support (Dickey & Azeni, 1996; Dickey et al., 2002; Haverfield et al., 2019; Rush & Koegl, 2008; Watkins et al., 2004). My study confirms what has been demonstrated elsewhere – ***people with COD are a highly marginalized group, and the system is failing to meet their needs.***

In terms of the association between MHN/SUD and reincarceration, I found that a majority of people with COD and SUD (72% and 69% respectively) were reincarcerated within three years of release from their baseline incarceration. People with COD had the shortest median time in community before reincarceration or any reconviction, but the results were not significantly different from those with SUD alone. Even after adjustment for potential confounders, the most important predictor of reincarceration in the Cox model was COD followed closely by SUD alone. MHN alone remained significant but the risk of reincarceration among this group was significantly lower than either COD or SUD alone. These results are largely consistent with previous literature which has found that people with COD are at disproportionately high risk of being returned to prison (Wilson, 2014). The excess risk of recidivism associated with psychiatric disorders is

largely driven by co-occurring substance use, but some non-substance related mental health needs remain important risk factors for reincarceration (the MHN group remained at higher risk than the no disorder group).

Finally, I demonstrated that SUDs (based on drug type) are not equal when it comes to frequency of reincarceration. In the (un)adjusted negative binomial regression models, the top three predictors of incarceration by drug type were methamphetamine and heroin (together), methamphetamine/no heroin, and heroin/no methamphetamine. Alcohol and marijuana had the lowest rate ratio compared to other drug types. My findings are consistent with other studies that have found a strong positive association between certain drug categories (methamphetamine, heroin) and reincarceration. My findings diverge from the results of other studies that have found that marijuana and alcohol use among people in prison were not associated with reincarceration after adjustment for other criminogenic risk factors (Håkansson & Berglund, 2012), whereas I found that they remained strongly associated. One reason could be that my threshold for inclusion was *disordered* use, which may reflect a level of severity that is not equivalent to other studies.

Together, these findings add meaningfully to the body of evidence related to the prevalence of MHN/SUD and the relationship between MHN/SUD and readmission to prison. The findings have relevance provincially, nationally, and internationally. Next, I present the strengths and limitations of the dissertation.

7.1. Strengths and limitations

To my knowledge, this is the first study of its kind in BC, and Canada more broadly. Although other scholars have studied MHN/SUD-related questions using samples of people with a history of incarceration, I am the first to use prison screening/intake data for this purpose. I accessed self-report data pertaining to both acute and lifetime history of mental health needs and substance use as opposed to relying on diagnosis from health records as in previous studies, which is known to underestimate both categories of MHN and SUD, particularly in marginalized populations such as people in prisons. Therefore,

this study likely presents a more accurate picture of prevalence of MHN/SUD and estimate of the association with reoffending and reincarceration because the data do not require that people have accessed previous services from a doctor.

My study sample included every individual who was incarcerated over a nine-year period and thus can be appropriately described as a population-level dataset. The study used rich, detailed, reliable, individual-level data that have never been used to study the prison population in BC and is unique (inter)nationally. I spent a great deal of time learning about the JSAT and operationalizing the research questions and diagnostic categories in close collaboration with the lead authors of the JSAT, BC Corrections clinical experts who provide direct care, and my supervisory committee. The detailed substance use, social, and sociodemographic variables provided by the JSAT gave us the unique ability to control for a robust set of criminogenic risk factors in our regression analyses, and to provide detailed profiles of people who experience incarceration in BC.

Previous work has demonstrated that not all diagnostic categories of mental disorder are equally associated with recidivism. For example, using the JSAT to study reincarceration among 4704 people in Ontario, Jones et al. (2021) found that schizophrenia spectrum/bipolar affective disorder was significantly associated with recidivism, but depression/anxiety was not. For certain, the four diagnostic categories used in this study each comprise *heterogenous* conditions. Future work is required to tease out the differential risk associated with specific combinations of psychiatric symptoms/diagnoses and drug types. The results also need to be interpreted with an understanding of the multitudinous factors (many of which exist outside of the individual, i.e., systems-level factors) that are involved in custodial sentencing policy and practices. Sentencing decisions are associated with individual characteristics, police, and court discretion, sentencing policy and extra-legal factors, as well as social inequity, and political contexts, which change across time and place. Furthermore, the dataset only includes follow-up information for those who return to prison (i.e., people with multiple JSAT records), and therefore I cannot compare the longitudinal characteristics of those who are reincarcerated to those who are not over time.

Limitations of the JSAT as the primary data source

The JSAT is a screener used for placement, referral, management, and recommendations. The assessments are not conducted by clinicians or coded using standardized clinical measures (e.g., the SCID), and as such the results do not reflect ICD, DSM codes/official diagnostic categories, thereby limiting the comparability of the findings with other studies (for e.g., Wilson (2011, 2014); Rezansoff (2013); Baillargeon (2010); Beaudette & Stuart (2016)). My study combines a group of proxy measures to broadly capture "mental health needs" that may not necessarily reflect confirmed diagnoses. The JSAT relies primarily on self-reported information that is subject to bias (e.g., social desirability, recall). However, studies with marginalized populations show that self-report measures are highly reliable and valid, particularly for healthcare use, drug use, and history of offending (Carroll, Sutherland, Kemp-Casey, & Kinner, 2016; Emmert, Carlock, Lizotte, & Krohn, 2015; Nieves, Draine, & Solomon, 2000; Somers et al., 2016).

The intake screening data do not provide details about the services received during a stay in custody, or the continuity of those services after release into the community. For instance, while I can ascertain that an individual was assessed and received a referral for a mental health service at the time of admission, I cannot verify the dose, quality, or type of treatment provided. There are also additional well-known predictors of crime (such as procriminal attitudes, antisocial personality, criminal friends, poor family relationships) that I could not include in my models (RNR model, Bonta et al. (2014)). As such, the adjusted models in my thesis may still exclude unmeasured risk factors. The information may also be biased because people with MHN/SUD may be under more intensive forms of surveillance and therefore are more likely to be subject to criminal justice contact and receive custodial sentences (i.e., when they reoffend, they may be more likely than counterparts to be *caught*) (Skeem et al., 2003; Skeem & Louden, 2006).

I also could not control for all deaths because my data are not linked to the provincial Vital Statistics database that stores death records. I censored for deaths that occurred while the individual was still under the purview of BC Corrections, since that information

was included in the data provided. Binswanger et al. (2007) explained that incarceration may *increase* risk of overdose death upon release because a period of relative abstinence during incarceration may lead to diminished physiological tolerance to drugs. The elevated risk of mortality post-release may be of particular concern in BC, which has been the epicenter of an overdose epidemic for over five years. Given the overlap in risk of overdose and risk of incarceration, some of our estimates may be conservative (e.g., for drug types such as heroin, which has been strongly linked to overdose risk). My data did not include any information on geographic destination at the point of release so potential loss to follow up if people moved to other jurisdictions could not be assessed. Finally, I had to exclude federal incarcerations from the regression analyses because once someone is transferred to federal custody, they are lost to follow-up. It is possible that those who commit more serious offences (and are therefore sentenced to federal custody) have a different MHN/SUD profile and so our findings are only generalizable to those who are sentenced to provincial custody.

Directions for future research

Given the extent of unmet need, and the elevated adverse outcomes experienced by people with COD, we need an innovative approach to understanding, researching, and treating subgroups of people with complex MHN/SUD. *Syndemics* is a conceptual framework for understanding diseases or health conditions that are exacerbated by the social, economic, and environmental landscape in which a population lives. The hallmark of a syndemic is "the presence of two or more diseases that adversely interact with each other, negatively affecting the mutual course of each disease trajectory… which are made more deleterious by experienced inequities" (The Lancet, 2017, p. 881). The burden attributable to health risks in combination exceed the sum of the disease burden of health risk when considered separately - this is the *synergism* (Singer, Bulled, Ostrach, & Mendenhall, 2017). The syndemics lens may provide a useful framework for studying COD because it encourages the integration of the biopsychosocial and contextual vulnerabilities people face. It is likely that mental disorder, substance use, and both individual-level and structural vulnerabilities, all interact in a synergistic fashion, increasing disease burden and risk of poor outcomes. Data from multiple levels of

analysis should be mobilized to explore syndemic effects, changing the focus from how individual-level outcomes can be solely explained by individual-level covariates, incorporating environmental factors and social contexts.

Future studies looking at recidivism risk among people with MHN/SUD ought to include data on transition planning, employment assistance, housing, social supports, health services use - all of which may be important and modifiable factors in their risk of being returned to custody. Data related to the full prison-community-continuum (admission to prison, prison sentence, and transition back to community) are needed to identify the critical gaps, opportunities for intervention, and best practices in meeting the needs of people with complex health conditions. People with MHN/SUD are a subgroup with distinct conditions, varying in severity, acuity, functional impairment, and risk of adverse outcomes.

More large-scale investigation is needed into how the heterogeneous expression of MHN/SUD (including different drug types) interacts with reincarceration and the effects of prison- and community-based interventions and improving health, social and criminogenic outcomes. Improving access to prison health services data, ensuring quality and consistency of electronic reporting within prison, and streamlining access for research purposes, will aid in these goals. Integrating criminal justice data (including arrests, court, and prison data) into linked administrative data platforms (e.g., Population Data BC) offers the potential to study trajectories of marginalized populations across government sectors, overcoming some of the challenges associated with longitudinal studies that require follow up and participant retention. In addition, qualitative and mixed methods studies that center the voices of people with lived experience of MHN/SUD and the criminal justice system are needed to gain a deeper understanding of their unique experiences and needs.

7.2. Implications for policy and practice

Approximately 11 million people are in prison on any given day worldwide, and more than 30 million people pass through prisons each year (Walmsley, 2016). The WHO

Statement on Prisons and Mental Health (2008) has recommended urgent and comprehensive action on the part of wider public health systems, advocating against the criminalization of people with MHN/SUD and acknowledging that prisons are not the appropriate context for the treatment of people with acute or major mental illness. Many people who experience incarceration have complex health needs including MHN/SUD, and most will return to prison. My study demonstrated that people with COD, SUD and to a lesser extent, MHN, are disproportionately more likely to return compared to people with no disorder. Some people may experience short-term improvements in their health during incarceration but given the high risk of adverse outcomes upon release as well as the lack of adequate transition planning and continuity of health care, the net effect of incarceration is likely to be health depleting (Justice Health Unit, 2019). My study shows that the prevalence of people with COD in prison in BC has steadily and sharply increased over time. Every effort should be made to *prevent* people with complex MHN/SUD from ever ending up in prison by ensuring that people have individual and structural supports, as well as access to high quality mental health and substance use care.

Equivalence of health care, a principle that has been cited by the World Health Organization, stipulates that people in prisons are entitled to quality of care that is equivalent to care provided in the general community (World Health Organization, 2013). However, this right is rarely realized in prisons, where health care services, and in particular the provision of mental health care, are typically inadequate (Niveau, 2007). Furthermore, equivalence is challenging to achieve due to high levels of morbidity, severity and complexity of illness, and problematic service integration between health and justice services (Exworthy, Samele, Urquía, & Forrester, 2012). Scholars and activists have suggested that an *outcomes-driven* approach is more appropriate, since achieving equivalence in health outcomes between people who do and do not experience incarceration requires that the availability, accessibility, and quality of services in prisons go *beyond* what is found in the general community (Till, Forrester, & Exworthy, 2014). The STAIR model is one way of describing the essential requirements of service provision in custodial settings: **S**creening, **T**riage, **A**ssessment, **I**ntervention, and **R**e-integration (Forrester et al., 2018). Implementation and evaluation of these elements

remains relatively understudied, but promising practices at each stage are emerging (Nicholls et al., 2018).

There is a significant cost to leaving the problem of overrepresentation of people with MHN/SUD in prisons unaddressed. While detailed data on mental health care expenditures in Canadian prisons do not appear to be publicly available, other jurisdictions have shown that individual health care costs in prison are driven by psychiatric disorders (Moschetti et al., 2018; Pew Charitable Trusts, 2014). A study looking at the system-wide justice costs in Alberta Canada, determined that mental illness added approximately $160 million to CJS costs in 2010/11 (13.5% of the entire CJS expenditure) and the greatest additional costs were associated with hospitalizations (Jacobs et al., 2016). Justice system involvement often affects housing, employment, community ties, and relationship stability over the life-course, and these challenges are exacerbated for people with mental illness (Draine, Salzer, Culhane, & Hadley, 2002; Mallik-Kane & Visher, 2008; Wolff, 2005). People with COD and CJSI face the "triple stigma" of having mental disorder, SUD, and incarceration history (Hartwell, 2004).

Research demonstrates that correctional programming should consider a person's criminogenic risk and their degree of clinical impairment. Unfortunately, siloed government departments across key service sectors are a major barrier to the meaningful partnership and shared outcomes measures for people who experience incarceration. Until service systems are adjusted and enhanced to meets the needs of people complex MHN/SUD and COD, we will likely continue to see differentially worse health and criminal justice outcomes for people with COD. The goals of prison mental health treatment are often oriented towards security, management, and safety, rather than reducing mental illness symptoms and suffering (Cloyes, Wong, Latimer, & Abarca, 2010). Lack of adequate care in custody is compounded by the fact that nearly everyone who enters prison is released to the community, where the adequacy of care for complex mental health needs is also a problem (Urbanoski et al., 2008). Wilson (2014) called for "greater creativity and innovation" to protect this vulnerable subgroup from the cruel experience of frequent detention. This same creativity needs to be applied more generally to ensuring that people have the basics required to lead healthy, fulfilling lives.

My findings demonstrate that a majority of people admitted to prison have complex, multifaceted health problems that began before their incarceration, replicating findings from other jurisdictions such as the US and Australia (Forsyth et al., 2018; SAMHSA, 2005). Significant challenges exist in achieving rehabilitation because many are without stable housing, education, and gainful employment. My study showed that in 2017, nearly one-quarter of people admitted to prison were homeless or precariously housed and 40% had less than high school education. Among people with COD, socioeconomic challenges are particularly prevalent – for example, 78% of people with COD reported being unemployed, 60% on some form of social assistance, and 47% had less than high school education. The extent to which poor access to quality health care in the community is contributing to the elevated and increasing prevalence of MHN/SUD in prisons in BC is unclear. It is important that the health of people in prisons be seen within the broader context of society, including MHN/SUD stigma, the criminalization of poverty, the 'war on drugs', systemic and structural racism, and cultural and socio-economic deprivation.

Given that nearly everyone who enters prison is released, often after a very short stay, we should remain critical of the perceived overall public safety benefit of incarceration. Incarceration fundamentally disrupts the lives of people who have often been failed by other social and health service systems prior to the CJSI. My findings underscore that incarceration serves to exacerbate social exclusion and marginalization faced by people with MHN/SUD. Major structural change is required to address the social determinants of health and crime. Early intervention is required to prevent/treat childhood abuse and neglect – helping to break intergenerational cycles of disadvantage that predict drug use and criminality. Using the criminal justice system as a temporary "solution" for issues that are fundamentally related to chronic, structural vulnerability, is comprehensively failing.

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Appendix

JSAT Coding Guide

The following experts are taken directly from the *JSAT Screening Assessment Tool (JSAT): Guidelines for Mental Health Screening in Jails* with permission from the authors (Nicholls et al., 2005). The manual provides a reference for intake interviewers conducting mental health screening.

The guidelines note that it is preferable that mental health evaluations reflect information gathered from *multiple sources wherever possible.* As such, screeners may refer to files from previous admissions and other supplemental information. Also, screeners are asked to *err on the side of caution* in the case of contradictory information, so it is likely that the rate of false positives will exceed the rate of false negatives.

The interview questions are not necessarily asked in the order shown here, and some have sub-questions and additional prompts which can be found in the guide. I have provided only the content which is directly relevant to the diagnostic categories used in my research.

Mental Health Needs

Coding Mental Health:

Correctional: The inmate saw a psychologist/psychiatrist(s) while incarcerated or was under a court order to attend forensic outpatient services or to attend sessions with a psychologist/psychiatrist in the community (e.g., while on probation or parole).

Community: The inmate saw a mental health professional for treatment on an outpatient basis or was prescribed mediation on an outpatient basis when *not* under court order for treatment.

Inpatient: The inmate was an inpatient in a mental health facility/psychiatric ward when *not* under court order.

Court-ordered inpatient: The inmate was remanded/sentenced to an inpatient mental health facility (e.g., Forensic Psychiatric Hospital).

Psychiatric medications: The inmate was prescribed psychiatric medications.

Mental Health Issues:

Possible anxiety/mood: Inmates who have a history of mood disturbances (e.g., major depression, dysthymia, mania) and/or who currently appear to have symptoms of anxiety or mood disorder (e.g., depression, hypomania) would be classified in this category.

History of psychotic disorder/bipolar disorder/currently stable: These inmates have a history of psychotic illness or mood disorder characterized by thought disorders, delusions, hallucinations, or profound abnormalities of mood. However, at the time of admission that inmate is considered stable and presents with no evidence of prominent delusions, hallucinations, disorganized speech, euphoria, or depression. The inmate may report being maintained on medication.

Possible recurrent psychotic symptoms: These inmates have a history of psychotic illness characterized by disorganized speech, thought, disorders, delusions, or hallucinations. At the time of admission, there is possible/partial evidence the inmate is experiencing psychotic symptoms, is decompensating, or is unstable. For instance, the inmate may deny unusual perceptual experiences, but appears to be attending to hallucinations.

Active current psychosis: These inmates suffer from severe psychotic illnesses characterized by disorganized speech, bizarre behaviors, delusions, hallucinations, or profound abnormalities of mood (i.e., out of touch with reality). At the time of admission, these inmates may report paranoia, odd or unusual thoughts, visual and/or auditory hallucinations.

Substance Use Disorder

Intake interviewers should be familiar with the criteria for substance abuse and substance dependence (DSM-IV-TR, APA, 2000).

Coding Substance Use:

ALCOHOL

Current Abuse: A maladaptive pattern of drinking that results in repeated and significant adverse consequences. Inmate has experienced impairment or distress due to recurrent failure to fulfill *role obligations*; use in physically *dangerous circumstances*; substance related *legal problems*; and/or significant *social or personal problems* (APA, 2000). These inmates generally do not exhibit significant withdrawal symptoms or compulsive behavior related to obtaining and using alcohol.

Long-Term Severe Abuse: Compulsive use and associated problems. Inmate fails to abstain from alcohol despite experiencing significant psychological or physical impairment or distress (e.g., depression, blackouts, liver damage). Inmate reports compulsive alcohol ingestion despite experiencing related cognitive, behavioral, and physiological problems. Symptoms may include: 1) Tolerance – a need for increased amounts to achieve desired effect or diminished effect with the same amount, or 2) Withdrawal – symptoms may include sleep problems, sweating, anxiety, nausea, hallucinations. The inmate reports the pattern of use has been sustained for at least 12 months (APA, 2000).

DRUGS

Indicate: Marijuana, Heroin, Cocaine, Methamphetamine, and note any other drugs, medications or inhalants

Abuse: Inmate reported use of drugs or misuse or medications or inhalants that results in repeated and significant adverse consequences. Inmate has experienced impairment or distress as evidenced by a failure to fulfill *role obligations*; use in physically *dangerous circumstances*; substance related *legal problems*; and/or significant *social or personal problems* (APA, 2000). These inmates generally do not exhibit significant withdrawal

symptoms or compulsive behavior related to obtaining and using alcohol. These inmates generally do not exhibit significant withdrawal symptoms or compulsive behavior related to obtaining and using the drug(s).

Long-term Severe Abuse: Inmates has experienced adverse psychological, physical, and/or social effects resulting from *compulsive* drugs use or misuse of medication(s) and/or inhalant(s). The inmate may report difficulty resisting temptations to use the drug(s) when available, gross neglect of responsibilities, or spending considerable time and money obtaining and using the drug(s). The inmate may have experienced physiological dependence including *tolerance and/or withdrawal* and using drugs to avoid withdrawal symptoms. Inmate reports the pattern of use has been sustained for at least 12 months (APA, 2000).