

**Intersecting Risk Factors:  
Diagnosed Alcohol Dependence and Criminal  
Sentencing in British Columbia's Aboriginal  
Populations**

**by**

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## **Abstract**

Alcohol use is commonly reported as a short-term criminal risk factor; however there is minimal research on long-term effects of alcohol misuse on crime. Canadian Aboriginal offenders exhibit both disproportionate crime and alcohol disorder prevalence. This thesis examines the impact of diagnosed alcohol dependence on Aboriginal ethnicity and criminal sentencing in British Columbia (BC). An administrative linkage database was used to develop a retrospective cohort of 77719 offenders sentenced through BC courts from 2001-2010. A coefficient difference mediation analysis was used to evaluate the mediating effect of alcohol dependence. Adjustment for alcohol dependence rate resulted in a small and statistically insignificant change in the sentencing rate (2%, 95% Confidence Interval: -13%, 14%). This study demonstrates that alcohol dependence does not have a mediating effect on sentencing rate among BC offenders. Nonetheless, the prevalence of alcohol dependence suggests that alcohol misuse is an important health policy target among offenders.

**Keywords:** Alcohol Disorders; Epidemiology; Aboriginal Peoples; Offending; Mediation Analysis; Mental Health

*I dedicate this thesis to my Grandmother, my Great-Grandmother and my Great-great-Grandmother. They faced impossible challenges because of the stigma surrounding mental health and the overt racism inflicted on Indigenous peoples throughout Canadian history. I hope this research and work like it helps to prevent others from suffering like them.*

## **Acknowledgements**

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## List of Acronyms

BC	British Columbia
CI	Confidence Interval
ICD-9	International Classification of Disease, 9 <sup>th</sup> Revision
MSP	Medical Service Plan
RNA	Risk Needs Assessment
RR	Rate Ratio
SFU	Simon Fraser University

## Glossary

Aboriginal	Offenders who self-identify within the criminal justice database as First Nations, Inuit, Métis or Aboriginal.
Alcohol Dependence	Medical service plan and ICD-9 code '303' – alcohol dependence syndrome
Drug Dependence	Medical service plan and ICD-9 code '304' – drug dependence
First Nations	Offenders who self-identify within the criminal justice database as First Nations.
Mental Illness	Medical service plan and ICD-9 codes: '290' – senile and presenile organic psychotic conditions '293' – transient organic psychotic conditions '294' – other organic psychotic conditions (chronic) '295' – schizophrenic psychoses '296' – affective psychoses '297' – paranoid states '298' – other nonorganic psychoses '299' – psychoses with origin specific to childhood '300' – neurotic disorders '301' – personality disorders '302' – sexual deviations and disorders '306' – physiological malfunction arising from mental factors '307' – special symptoms or syndromes not elsewhere classified '308' – acute reaction to stress '309' – adjustment reaction '310' – specific nonpsychotic mental disorders following organic brain damage '311' – depressive disorder, not elsewhere classified '312' – disturbance of conduct not elsewhere classified '313' – disturbance of emotions specific to childhood and adolescence '314' – hyperkinetic syndrome of childhood '315' – specific delays in development '316' – psychic factors associated with diseases classified elsewhere '317' – mild mental retardation '318' – other specified mental retardation '319' – unspecified mental retardation

Métis

Offenders who self-identify within the criminal justice database as Métis. Historically Métis includes individuals of a common, mixed Aboriginal and non-Aboriginal ethnic background.

## **Preface**

This thesis represents original work conducted by E. Rempel, including the design and conduct of the statistical analysis. Ethical approval for this analysis was provided by the Simon Fraser University Research Ethics Board via the Inter-Ministry Research Board. All supervisors contributed to the work through a review of the manuscript and developing the study methods. A version of this study is under review for publication; see (Rempel, Somers, Calvert, & McCandless, 2015). Versions of Table 3-1, Table 3-3 and Table 3-5, as well as portions of the text in Chapters 1, 2, 3, 4, and 6 were used with permission from Rempel et al. (2015), of whom I am the corresponding author.

# Chapter 1.

## Introduction

The relationship between alcohol use and crime is well documented at both the individual and population level (Dietze et al., 2013; Lundholm, Haggård, Möller, Hallqvist, & Thiblin, 2013; Martin, 2001; McLelland & Teplin, 2001; Palk, Davey, & Freeman, 2007). However, the impact of alcohol dependence on crime is poorly understood. Alcohol consumption is associated with decreased risk perception and increased aggression, resulting in a higher likelihood of criminal behaviour (Martin, 2001; Vaughn, DeLisi, Beaver, Perron, & Abdon, 2012). In an examination of United States police-citizen interactions, 34% of interactions involved alcohol (McLelland & Teplin, 2001). These effects are, however, temporary and the long-term effects of problematic alcohol use are not commonly examined as a primary outcome for associations with crime. Despite this, substance use disorders, primarily alcohol dependence, represent the greatest proportion of mental disorders among offenders (van der Put, Creemers, & Hoeve, 2014; Wormith & McKeague, 1996). Alcohol and drug use was the most common mental health diagnosis, nearly a third of all diagnoses, among probationers and parolees in a study from Ontario, Canada (Wormith & McKeague, 1996). Alcohol use is often connected to other mental health disorders as well, 47.4% of male patients at a US forensic psychiatric hospital had a history of alcohol abuse. 22% of the patients exhibited alcohol abuse prior to age 19 years (Lumsden, Hadfield, Littler, & Howard, 2005). Of even greater concern, problematic alcohol use is consistently reported as a major issue contributing to criminal behaviour among Indigenous offenders worldwide (Weatherburn & Snowball, 2008; Wood & Hays, 2014; Yessine & Bonta, 2009).

## **1.1. Aboriginal Crime and Alcohol Use**

Aboriginal Canadians, including First Nations, Métis, and Inuit, are overrepresented in Canada's justice system at both the provincial and federal level (Kendall, 2013; Roberts & Melchers, 2003). Although crime rates have decreased over the past three decades, rates among Aboriginal offenders have decreased at a slower rate than non-Aboriginal offenders (Perreault, 2009; Roberts & Melchers, 2003). There is a persistent racial disparity in crime rates in Canada (Roberts & Melchers, 2003; Yessine & Bonta, 2009). This association mirrors trends among Black offenders in the United States, Indigenous offenders in Australia and New Zealand, as well as other populations composed of individuals at social, economic and health disadvantage (Brame, Bushway, Paternoster, & Turner, 2014; Weatherburn, 2008; Weatherburn & Snowball, 2008).

From a population health perspective, these excess crime rates can cause substantial harm to overall wellbeing. Offender populations typically experience many negative health outcomes including higher mortality and greater burdens of chronic disease (Binswanger et al., 2007; Herbert, Plugge, Foster, & Doll, 2012; Kendall, 2013). As well offenders tend to engage in riskier behaviours like increased substance and alcohol use once released from custody (Vaughn et al., 2012). Increased alcohol use, in particular, is a major concern among Aboriginal populations in Canada. Alcohol consumption is self-reported as the greatest health concern among First Nations communities (Neubold, 1998). Concerns around excessive alcohol and substance use have been documented in Aboriginal populations across North America (Davison, Ford, Peters, & Hawe, 2011; Ehlers, Gizer, Gilder, Ellingson, & Yehuda, 2013; French, 2004; Rawana & Ames, 2012; Wardman & Quantz, 2005). Although most authors discuss the high prevalence of alcohol use, there is variation in alcohol consumption among subgroups. Rawana and Ames (2012) report that off-reserve Aboriginal youth use alcohol at normative rates. Conversely, in a qualitative examination of binge drinking among Aboriginal Canadians, participants described their drinking behaviours as being a social norm (Wardman & Quantz, 2005).

Alcohol use is a multifaceted issue that may affect different subgroups of Aboriginal peoples in different ways. For this reason it is important to examine alcohol dependence both within Aboriginal groups and in special groups like offenders. Both crime and alcohol dependence rates in Aboriginal communities are a complex result of historical and modern traumas as well as social and physical environment (Adelson, 2005; Ehlers et al., 2013; Evans-Campbell, 2008). As Romanow (2002) in his report on the health of Canadians describes the issues:

Studies show that young Aboriginals are more often exposed to problems such as alcohol abuse and drug addiction than other Canadians of the same age. Combined with pervasive poverty, persistent racism, and a legacy of colonialism, Aboriginal peoples have been caught in a cycle that has been perpetuated across generations. (Romanow, 2002, p. 218)

This has contributed to an average five to six-year disparity in life expectancy between Aboriginal and non-Aboriginal Canadians (Statistics Canada, 2014).

Despite the clear relationship between alcohol use and crime (Dietze et al., 2013; Lundholm et al., 2013; Martin, 2001; McLelland & Teplin, 2001; Palk et al., 2007), few researchers have examined associations between alcohol dependence and crime among Canadian Aboriginal populations. Persistent stereotypes like the 'drunken Indian' serve to reinforce public perception of alcohol use as a major contributor to crime in Aboriginal populations (Feldstein, Venner, & May, 2006; Holmes & Antell, 2001; Razack, 2013), however there is little empirical evidence on this relationship. Aboriginal Canadians provide an important study population for the alcohol dependence and crime relationship, both in an investigative sense as well as a potential target for policy interventions.

## **1.2. Métis versus Aboriginal Research**

Aboriginal is a broad ethnic category, which includes individuals of mixed historical backgrounds and varying social and physical environments (Adelson, 2005). A severely neglected aspect of Aboriginal health research is Métis health experiences. Métis people are historically of mixed European and Aboriginal descent, as well as one of three distinct Aboriginal groups in Canada (Andersen, 2008; Government of Canada,

2013). The number of people identifying as Métis has risen sharply over the past two decades, which may be due to inconsistencies in both categorizing Métis people and in how people see their own identity (Andersen, 2008). Few studies include Métis people within broader Aboriginal categories and even fewer include separate analyses (Kumar, Wesche, & McGuire, 2012). Métis people represent 30% of the Aboriginal population in BC. As of 2006 this included 59445 people (BC Stats, 2006b). Yet they represent nearly none of current research on ethnic inequalities in health across Canada. There are especially strong shortcomings in the field of Métis research on violence and crime. A recent literature review on Métis health research revealed only two studies on Métis-inclusive crime, both published nearly 20 years ago (Kumar et al., 2012). The only known study to contrast the experiences of alcohol abuse among First Nations, Métis and non-Aboriginal individuals was a descriptive analysis written in 1995. The authors found that both Métis and First Nations offenders scored higher on a severity of alcohol abuse scale than Caucasian offenders (Weekes, Morison, Millson, & Fetting, 1995).

The logical question to ask is whether Métis life experiences are likely to differ from other Aboriginal peoples. Does it matter that a Métis category is not included if they experience the same social, physical and psychological pressures as most other Aboriginal individuals? Although this is difficult to answer because of limited research, arguably there should be strong differences (Kumar et al., 2012). Historically, Métis communities have not shared the same political issues as First Nations peoples. Until 1982, Métis people were not recognized as Aboriginal under the Canadian Constitution (Government of Canada, 2013). This precluded Métis peoples from laws related to treaty negotiations, reservation lands and residential schools (Andersen, 2008). Métis people have not historically lived on reservations and thus may not experience common issues on these lands related to poor housing and limited access to health services (Adelson, 2005). This alone would suggest a vast potential for differences between the experiences of a First Nations' individual who may live on a reserve and a Métis individual. The unique social history of Métis people, being both Aboriginal and yet not politically considered as such, should result in meaningful variations in health compared to all other Canadians.

There are similarities between Métis and Aboriginal people that merit consideration. Census data suggest that Métis people, like First Nations, have poorer health than the average Canadian. According to the Canadian Community Health Survey, 75% of non-Aboriginal Canadians report very good or excellent mental health (Statistics Canada, 2014). In contrast, 67% of Métis and 66% of First Nations off-reserve participants report the same. Similarly for physical health, the differences are 64%, 50% and 54% for non-Aboriginal, First Nations' off reserve and Métis participants respectively. There is a pattern of poorer health amongst Aboriginal groups regardless of status (Statistics Canada, 2014). There are, however, potential differences in the magnitude of poor health between different groups. Métis peoples, and offenders in particular, could have worse health than non-Aboriginal groups but not as poor as among First Nations. These differences in poor health outcomes, along with the unique political and social environment of Métis people support desperately needed research into the health and criminality of this group. This is particularly true in research on crime and alcohol disorders.

### **1.3. The Relationship Between Alcohol Use Disorders and Crime**

There are three predominant explanations for the relationship between offending, subsequent contact with the justice system and alcohol use disorders (Mulvey et al., 2006; Parker & Auerhahn, 1998). The first, a causative model, suggests that alcohol disorders are directly related to a higher likelihood of crime over an individual's life course. The biological and/or social causative mechanisms have not been sufficiently investigated, however the short-term impacts of alcohol use likely factor in to this theory. Mulvey et al. (2006) found that alcohol use, unlike other drugs, predicted next day violence but this association was weak. Lumsden et al.'s (2005) study also supports this theory, as nearly one in four of their psychiatric patients exhibited alcohol abuse prior to 19 years of age. However, Reynolds, Tartar, Kirisci & Clark (2011) found that frequency of drinking was not associated with violent recidivism among a sample of youth offenders in Canada.

Kerner, Weitekamp, Stelly & Thomas (1997) suggest several possible alternative explanations, one main theory being that alcohol use is associated with a deviant lifestyle, thus alcohol misuse forms part of the criminal identity and environment. Therefore criminals are more likely to develop alcohol use disorders after initial contact with the justice system. This is also a causative theory but suggests that crime causes alcohol abuse. Baltieri (2014) found that alcohol use problems tended to precede rather than follow first crime among a sample of female prisoners in São Paulo, Brazil. D. Weatherburn (2008) found among Indigenous Australian offenders, alcohol abuse compared to other demographic and social variables had the strongest correlation with arrest.

A final explanation of the alcohol disorders and crime relationship is shared risk factors. Both criminal behaviour and alcohol use disorders peak at similar ages and are associated with social disadvantage. Therefore most of the relationship between the two could be spurious (Mulvey et al., 2006; Skeem, Manchak, & Peterson, 2011; Yessine & Bonta, 2009). Adequate adjustment for social, health and genetic factors, under this explanation, would remove the statistical association between alcohol disorders and crime. Research on a New Zealand birth cohort found the alcohol disorder and crime association persisted, after adjustment for demographic and social variables, although this relationship was restricted to assault in the later study (Boden, Fergusson, & Horwood, 2013; Fergusson & Horwood, 2000). Conversely Håkansson & Berglund (2012) found that binge drinking was negatively associated with reoffending among prisoners with substance use disorders. There is no clear single explanation that describes the alcohol dependence and crime relationship. The inconsistency between definitions of alcohol abuse likely factors in to these inconsistencies. For example Håkansson & Berglund (2012) discuss binge drinking, while Reynolds et al. (2011) study frequency of drinking. Other authors like Fergusson & Horwood (2000) examined alcohol disorders through validated interview instruments. Further research is needed to understand how alcohol dependence and crime are associated, particularly for effective corrections and public health interventions.

## **1.4. Aim and Objectives**

The main objective was to describe and examine the impact of diagnosed alcohol dependence on the relationship between Aboriginal ethnicity and crime in British Columbia (BC), Canada. This was the first study to evaluate this relationship among Aboriginal offenders in Canada, addressing the substantial gap in knowledge about the interaction of alcohol dependence and crime both in general and among Indigenous populations. This was also the first study to compare crime statistics of Métis and First Nations offenders in the context of mental health needs. A large cohort of offenders from BC was examined using government-sourced administrative data (McCandless, Stewart, Rempel, Venners, & Somers, 2014; Rezansoff, Moniruzzaman, Gress, & Somers, 2013; Somers, Currie, Moniruzzaman, Eiboff, & Patterson, 2011).

The first objective was to contrast sociodemographic and alcohol dependence characteristics of BC's Aboriginal and non-Aboriginal offender populations in a descriptive analysis. This included examining the variations within the Aboriginal cohort, e.g. between Métis and First Nations individuals. The second objective was to examine the effect of diagnosed alcohol dependence on the association between Aboriginal ethnicity and sentencing rate among offenders in BC using a mediation analysis. The third objective was to further examine associations between ethnicity and alcohol dependence among offenders using regression analyses. The hypothesis was that diagnosed alcohol dependence would be a partial mediator of the relationship between Aboriginal ethnicity and criminal sentencing.

## **Chapter 2. Methods**

### **2.1. Sample and Data Sources**

A retrospective longitudinal offender cohort was developed using the Inter-Ministry Database (IMDb), an administrative linkage database of social, health and justice system data from all individuals sentenced between 1997 and the present through courts in BC, Canada (McCandless et al., 2014; Rezansoff et al., 2013; Somers et al., 2011). Cohort inclusion criteria were having at least one sentence from April 1, 2001 to thirty days prior to April 1, 2010 and being over 15 years of age. Seventeen individuals were removed for having unreported gender. Individuals were followed until their date of death or study end on April 1, 2010. The final sample included 77719 individuals. Analyses were completed using SASv9.3 and R (R Development Core Team, 2004). Ethical approval for this study was provided by the Simon Fraser University Research Ethics Board.

### **2.2. Variables and Measures**

#### **2.2.1. Criminal justice variables**

Criminal justice variables were obtained from the BC Ministry of Justice. Sentencing rate was measured by calculating the total number of sentences including first offense divided by years of follow-up time. For example if an offender had four sentences in two years, then their sentencing rate would be  $4/2$ , which equals two sentences per year. Sentencing indicates a convicted offense and includes individuals sentenced to custody or the community. Sentencing rate represents an estimate of severity of offending. A higher rate of sentencing indicates greater interaction with the justice system. Additional variables available for analysis included the first offense

sentence type (custody versus community) and crime type (violent, non-violent or drugs and alcohol related).

### **2.2.2. Health variables**

Health data were sourced from the Provincial Medical Service Plan (MSP) Database, while hospitalisation records were extracted from the BC Discharge Abstract Database. Alcohol dependence was measured as a rate, based on MSP transactions. It was defined as total number of physician diagnosed ICD-9 coded MSP records for alcohol dependence divided by years of follow-up time. For example, if an offender had four MSP records over two years, then the calculated alcohol dependence rate would be two events per year. Similarly to sentencing rate, higher alcohol dependence rates indicate a higher number of doctor-patient interactions for alcohol dependence. Baseline health variables (mental disorder, alcohol dependence and drug dependence) included individuals who had at least one MSP record for each health characteristic (based on ICD-9 classifications of disease) two years prior to first offense. Health variables over follow-up were defined in the same way as the baseline variables. Alcohol dependence in follow-up was a dichotomous variable used only for Table 3-1 and Table 3-2. Hospitalisation was defined as at least one hospitalisation record two years prior to cohort entry. Mortality data were obtained from the BC Vital Statistics Agency. The specific ICD-9 codes for each health variable are defined in the List of Figures.

### **2.2.3. Demographic variables**

Demographic variables, including self-reported gender, age in years and education status were obtained from Ministry of Justice data at the date of first sentence. Aboriginal status was self-reported. Due to the nature of administrative data, we are unable to specify if the gender variable represents self-reported gender, a social construct, or self-reported sex, a biological construct. We refer to this variable as gender with this limitation noted. Individuals were divided into four groups including Aboriginal (including First Nations, Métis, Inuit and other unspecified Aboriginal), Caucasian, Other Ethnicity (including Black, Hispanic and Asian) and Unknown Ethnicity for the initial analysis. Subsequent analyses included separate Aboriginal groups, e.g. First Nations,

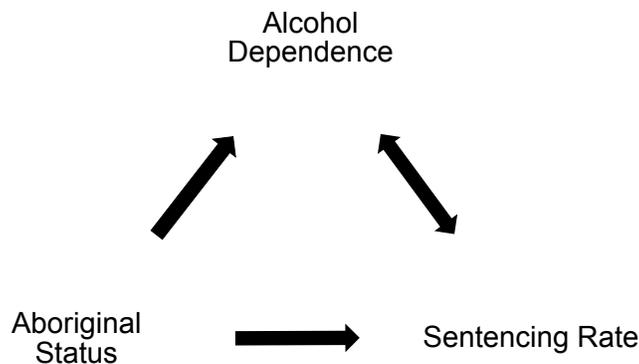
Métis, and Other. Social assistance variables, from BC Ministry of Social Development records, included crisis grant, disability grant and months of income assistance. Crisis grant was defined as at least one transaction for financial assistance related to a crisis grant two years prior to cohort entry. Disability grant was defined as at least one transaction for financial assistance related to a disability two years prior to cohort entry. Months of income assistance was calculated as the total months of income assistance in the two years prior to cohort entry.

## 2.3. Statistical Analysis

### 2.3.1. Cohort description

All variables were stratified by ethnicity and differences were reported across these ethnic groups in a descriptive analysis. This included a separate descriptive analysis for the 11001 Aboriginal offenders, stratified by Aboriginal status. Categorical variables were reported as a percentage and continuous variables as a mean with standard deviation. Health variables were reported both in the two years prior to cohort entry and over follow-up. The relative percentage of Aboriginal to non-Aboriginal offenders in the sample and BC population was compared using a pie chart, offenders with an unknown ethnicity were not included in this chart.

**Figure 2-1 Directed acyclic graph for the relationship between Aboriginal status, sentencing rate and alcohol dependence in the BC offender population.**



### 2.3.2. Mediation analysis

The mediating effect of alcohol dependence on the relationship between ethnicity and sentencing rate was examined using a coefficient difference mediation analysis (MacKinnon, Fairchild, & Fritz, 2007). Due to the count nature of the sentencing and MSP data, Poisson-based models were developed for the outcome variable sentencing rate. Sentencing rate models revealed over-dispersion of the data (high  $\kappa$  dispersion parameters); therefore negative binomial regression was used in lieu of Poisson regression (Elhai, Calhoun, & Ford, 2008).

*Figure 2-1* is a directed acyclic graph of the theoretical mediating relationship of alcohol dependence on Aboriginal status and sentencing rate. In this diagram, Aboriginal status is associated both with alcohol dependence and sentencing rate under the assumption that part of the relationship between status and sentencing is explained by alcohol dependence. A bi-directional arrow was used to represent the sentencing and alcohol dependence relationship. This indicates the uncertainty in the nature of this relationship as outlined in *Chapter 1, section 1.3*. Although alcohol dependence is likely to impact sentencing, sentencing also has the potential to affect alcohol dependence.

Three models were developed for the mediation analysis. Model 1 was univariate analyses of sentencing rate regressed on ethnicity with no adjustment for other factors. Model 2 was a multivariable analysis of sentencing rate regressed on ethnicity and adjusted for demographic, health, social and justice system variables *not including alcohol dependence rate*. Model 3 was identical to Model 2 but additionally *included alcohol dependence rate* in the multivariable model for the sentencing rate. The rationale for the mediation analysis is to examine whether a third variable explains part or all of the relationship between two other variables. The essential approach is to look at the relationship between Aboriginal status and offending either with or without controlling for alcohol dependence. The key question in a mediation analysis is whether the inclusion of alcohol in the model (e.g. Model 3 rather than Model 2) has an effect on the relationship between ethnicity and offending. This is similar in rationale to testing for confounding in multivariable models, except the mediating variable or confounder is not a nuisance variable but the key variable of interest.

Variable inclusion in multivariable models required statistical significance in univariate analysis or expert knowledge that the covariate was associated with sentencing and ethnicity. In addition, model effectiveness was compared by examining the Akaike Information Criterion (AIC). Level of statistical significance was set at  $\alpha=0.05$ . The percent change in the coefficient for Aboriginal status was calculated between all models. The following formula  $\frac{RR_{Model\ 1}-RR_{Model\ 2}}{RR_{Model\ 1}-1} \times 100$  was used where RR is the rate ratio. 95% confidence intervals for the percent change in coefficients were developed using the Bootstrap method.

A secondary mediation analysis was performed among the sub-cohort of 11001 Aboriginal offenders, where sentencing rate was regressed on Aboriginal status rather than ethnicity (e.g. Métis versus First Nations). This analysis assessed whether there were differences in the effect of alcohol disorders on sentencing between Métis and First Nations offender. Model 1, 2 and 3 were identical to those in the previous mediation analysis, with the exception of the Ethnicity category. Model selection processes were the same as in the previous mediation analysis.

### **2.3.3. Alcohol dependence model**

The final objective of this thesis was to examine the determinants of alcohol dependence, particularly the associations between ethnicity and alcohol dependence among offenders. Accordingly, a model for alcohol dependence rate was also developed. All variables were regressed in univariate and multivariable negative binomial regression models with the outcome alcohol dependence rate to examine associations between Aboriginal status and alcohol dependence. Model selection processes were the same as the mediation models.

## **Chapter 3. Results**

### **3.1. Participant Characteristics**

*Table 3-1* summarizes the cohort characteristics. A greater percentage of the Aboriginal group was female, under 25 and less educated compared to the other ethnic groups. As well, the Aboriginal group had the highest rate of offending (1.46 sentences per year), as well as the highest percentage of offenders with alcohol dependence at baseline (8.46%). Excluding individuals with Unknown ethnicity, the Other ethnicity group had the lowest sentencing rate and the lowest percentage of individuals with any mental disorder or alcohol dependence both at baseline and over follow-up. The Aboriginal group had a lower percentage of offenders with a mental disorder at baseline (24.20%) compared to Caucasian offenders (32.62%), but a higher percentage than the Other ethnicity group (20.75%). Over follow-up, these relationships persisted. All groups exhibited an increase in the percentage of mental disorder diagnoses and substance use disorders including alcohol dependence after first offense. The Unknown group exhibited the highest percentage of female offenders (32.5%); as well 91.4% of the sample had unknown or no education. Most of the health variable percentages were similar to the Other group. The Unknown group also had the lowest sentencing rate (0.92 sentences per year), least amount of average follow-up (2.89 years) and a high percentage of non-violent offenses (65.6%).

**Table 3-1 Demographic, social assistance, health, and criminal justice characteristics by ethnicity of 77719 offenders sentenced through British Columbian courts from 2001 to 2010.**

	Ethnicity			
	Aboriginal <sup>a</sup>	Caucasian	Other <sup>b</sup>	Unknown
Population Size (n)	11001	47616	11418	7684
Demographic Variables				
% Female	27.1	17.5	12.7	32.5
Age in Years				
% Under 25	41.3	29.6	30.1	38.4
% 25 - 40	37.5	37.0	41.3	32.7
% Over 40	21.2	33.4	28.6	28.9
Education				
% Grade 9 or Less	20.2	9.76	9.88	0.98
% Above Grade 9	74.6	82.9	74.3	7.61
% Unknown/None	5.18	7.29	15.8	91.4
Social Assistance Variables <sup>c</sup>				
% Crisis Grant	18.3	14.2	5.54	7.30
% Disability Grant	6.04	6.59	2.77	4.59
Income Assistance Months Mean (SD)	4.64 (7.91)	3.91 (7.51)	1.74 (5.37)	2.08 (5.94)
Health Variables Prior to Cohort Entry <sup>c,d</sup>				
% Mental Disorder	24.2	32.6	20.8	25.4
% Drug Dependence	9.67	12.0	5.36	5.18
% Alcohol Dependence	8.46	5.88	3.59	2.76
% Hospitalised	23.8	20.3	12.5	16.1
Health Variables in Follow-Up <sup>d</sup>				
% Mental Disorder	31.6	38.8	26.5	25.1
% Drug Dependence <sup>e</sup>	15.7	17.0	7.51	5.22
% Alcohol Dependence	13.0	8.61	5.18	2.62
Criminal Justice System Variables				
Initial Offense Category				
% Violent	38.2	30.1	31.6	20.8
% Non-violent	50.6	53.9	45.9	65.6
% Drug and Alcohol Related	11.2	16.0	22.5	13.7
Initial Sentence				
% Probation or Other	85.5	87.4	86.7	97.9

% Custody	14.5	12.6	13.3	2.06
Mean Sentencing Rate Per Year (SD)	1.46 (2.83)	1.12 (2.34)	0.98 (2.13)	0.92 (1.65)
Mean Follow-Up in Years (SD)	4.25 (2.54)	4.40 (2.49)	4.21 (2.49)	2.89 (1.76)

<sup>a</sup> Includes individuals who self-identify as Aboriginal, Inuit, First Nations or Métis.

<sup>b</sup> Includes individuals who self-identify as Black, Hispanic, East Indian or Asian.

<sup>c</sup> Within two years preceding cohort entry.

<sup>d</sup> Based on MSP records using ICD-9 codes.

<sup>e</sup> Excluding alcohol dependence.

Separation of the Aboriginal group (*Table 3-2*) shows several within-group variations between Métis, First Nations and Other Aboriginal offenders. The Métis and First Nations groups have similar percentages of offenders who are under 25, female and grade nine or less educated. Prior to cohort entry, the Métis group had a higher percentage of diagnosis with mental disorder (28.9%) and drug dependence (14.1%), but lower percentage of alcohol dependence (5.54%) and hospitalisations (20.4%). In follow-up the gaps in health diagnoses between Métis and First Nations offenders remained. The First Nations group had a 13.1% higher percentage of initial violent offenses but a 5.6% higher percentage of probation sentences. The Métis group had the second highest mean sentencing rate (1.92 sentences per year) in the data set. The Other Aboriginal group had the highest sentencing rate (2.15 sentences per year). The Other Aboriginal group exhibited lower percentages of drug dependence (11.1%), alcohol dependence (8.46%) and mental disorder (24.2%) diagnoses over follow-up. They were the only group to show a decrease in all three categories over follow-up.

**Table 3-2 Demographic, social assistance, health, and criminal justice characteristics by Aboriginal status of 11001 Aboriginal offenders sentenced through British Columbian courts from 2001 to 2010.**

	Aboriginal Status		
	First Nations	Métis	Other Aboriginal <sup>a</sup>
Population Size (n)	8961	1083	957
Demographic Variables			
% Female	26.8	24.8	32.7
Age in Years			
% Under 25	41.0	41.9	43.2
% 25 - 40	37.5	36.2	39.0
% Over 40	21.5	21.9	17.9
Education			
% Grade 9 or Less	21.1	17.0	15.6
% Above Grade 9	74.1	79.8	74.0
% Unknown/None	4.85	3.23	10.4
Social Assistance Variables <sup>b</sup>			
% Crisis Grant	17.8	21.3	19.2
% Disability Grant	5.67	8.13	7.21
Income Assistance Months Mean (SD)	4.59 (7.89)	5.40 (8.40)	4.23 (7.52)
Health Variables Prior to Cohort Entry <sup>b,c</sup>			
% Mental Disorder	23.3	28.9	26.9
% Drug Dependence <sup>d</sup>	8.97	14.1	11.2
% Alcohol Dependence	8.82	5.54	8.46
% Hospitalised	24.2	20.4	24.0
Health Variables in Follow-Up <sup>c</sup>			
% Mental Disorder	31.8	36.4	24.2
% Drug Dependence <sup>d</sup>	15.6	20.3	11.1
% Alcohol Dependence	14.0	9.97	7.73
Criminal Justice System Variables			
Initial Offense Category			
% Violent	40.0	26.9	34.1
% Non-violent	48.9	61.2	53.8
% Drug and Alcohol Related	11.1	11.9	12.1
Initial Sentence			
% Probation or Other	86.0	80.4	86.3

% Custody	14.0	19.6	13.7
Mean Sentencing Rate Per Year (SD)	1.33 (2.71)	1.92 (2.99)	2.16 (3.49)
Mean Follow-Up in Years (SD)	4.52 (2.50)	3.70 (2.49)	2.32 (2.01)

<sup>a</sup> Includes individuals who self-identify as Aboriginal, but did not identify as or specify Métis or First Nations.

<sup>b</sup> Within two years preceding cohort entry.

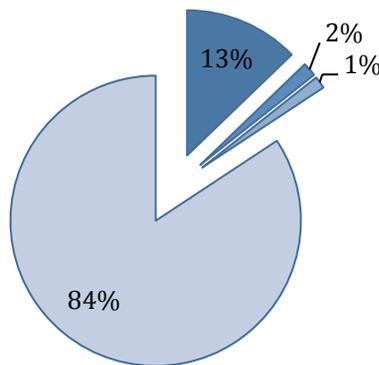
<sup>c</sup> Based on MSP records using ICD-9 codes.

<sup>d</sup> Excluding alcohol dependence.

Figure 3-1 and 3-2 show the extent to which Aboriginal people are overrepresented in the criminal justice system. Specifically, these charts show the relative percentages of the sample and the BC population that were Aboriginal. Individuals with unknown ethnicity were excluded, resulting in 70035 offenders. From the offender sample (Figure 3-1) approximately 16% is Aboriginal, where approximately 2% are Métis and 13% First Nations. Based on data from Canadian census records (Figure 3-2), approximately 4.7% of the BC population is Aboriginal where 3.2% are First Nations and 1.5% Métis (BC Stats, 2006a).

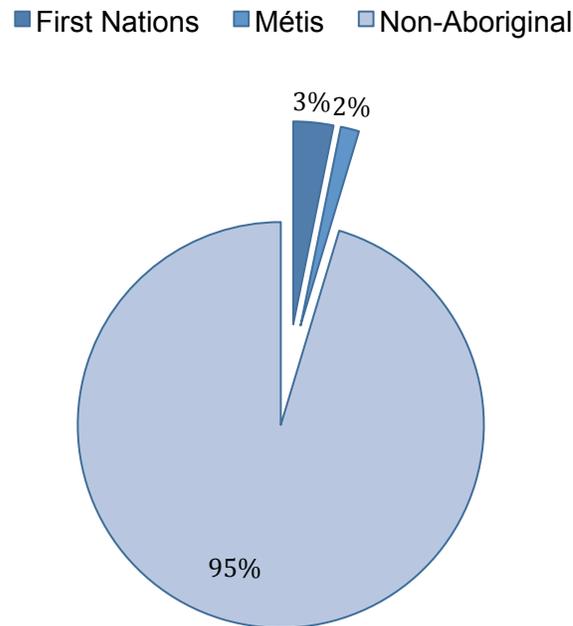
**Figure 3-1 Percentage of 70035 offenders<sup>1</sup> sentenced through British Columbian courts from 2001 to 2010 who self-identify as Aboriginal sentenced.**

■ First Nations ■ Métis  
 ■ Other Aboriginal ■ Non-Aboriginal



<sup>1</sup> Does not include offenders who reported “unknown” ethnicity.

**Figure 3-2 Percentage of British Columbian population who self-identify as Aboriginal, based on 2006 Canadian census.**



Source: (BC Stats, 2006a)

### **3.2. Mediation Analysis**

In univariate analyses (see *Table 3-3*) Aboriginal ethnicity compared to Caucasian ethnicity, was associated with a higher rate of criminal sentencing (Rate Ratio=1.36, 95% CI: 1.33, 1.39). Both the Other (RR=0.78, 95% CI: 0.76, 0.79) and Unknown (RR=0.65, 95% CI: 0.63, 0.67) ethnicity categories exhibited a lower sentencing rate than the Caucasian group. These results were used as a baseline to compare the effects of alcohol dependence in a mediation analysis.

The main purpose of the mediation analysis was to examine whether including alcohol dependence in a multivariable regression analysis, resulted in a change in the association between sentencing rate and Aboriginal status. Model 2 *did not include alcohol dependence*, while Model 3 *did include alcohol dependence*. The coefficients between the two models were compared to see if adjustment for alcohol dependence

resulted in a statistically significant change. Model 2 resulted in a reduction of the association between Aboriginal ethnicity and sentencing rate of 27% (95% CI: 14%, 32%) ( $RR_{unadjusted}=1.36$  versus  $RR_{adjusted}=1.26$ ). This reduction illustrates confounding in the relationship between Aboriginal status and criminal sentencing due to adjustments for social, health and demographic variables. Model 3 was identical to Model 2 except that it also controlled for alcohol dependence rate. After addition of alcohol dependence rate in the model, the effect of Aboriginal ethnicity on sentencing rate compared to Caucasian ethnicity decreased by only 2% (95% CI: -13%,14%). Similarly, there was no significant reduction in sentencing rate for the Other (0%, 95% CI: -19%,17%) or Unknown (0%, 95% CI: -23%, 19%) ethnic groups. To summarize *Table 3-3* demonstrates that adjustment for alcohol dependence has no effect on the rate ratio. Therefore diagnosed alcohol dependence does not play a role in the sentencing differences between these ethnic groups.

**Table 3-3 Coefficient difference mediation analysis results. Rate Ratios (RR) for the association between ethnicity and sentencing rate for 77719 offenders sentenced through British Columbian courts from 2001 to 2010.**

	Model 1 <sup>a</sup> RR (95% CI)	Model 2 <sup>b</sup> RR (95% CI)	Percent Reduction (%) Model 1 versus Model 2 (95% CI)	Model 3 <sup>c</sup> RR (95% CI)	Percent Reduction (%) Model 2 versus Model 3 (95% CI)
Ethnicity					
Caucasian	1.00 (REF)	1.00 (REF)	Reference	1.00 (REF)	Reference
Aboriginal	1.36 (1.33,1.39)	1.26 (1.24,1.29)	27 (14,32)	1.26 (1.23,1.29)	2 (-13,14)
Other	0.78 (0.76,0.79)	0.83 (0.82,0.85)	26 (17,40)	0.83 (0.82,0.85)	0 (-19,17)
Unknown	0.65 (0.63,0.67)	0.77 (0.74,0.80)	34 (28,48)	0.77 (0.74,0.80)	0 (-23,19)

<sup>a</sup> Unadjusted Model.

<sup>b</sup> Adjusted for initial sentence and offense type; age, gender, and education status at time of cohort entry; and hospitalisation, mental disorder, drug dependence, crisis grant, disability grant and months on income assistance two years prior to cohort entry.

<sup>c</sup> Adjusted for all Model 2 variables and alcohol dependence rate.

<sup>d</sup> Includes individuals who self-identify as Aboriginal, Inuit, First Nations, or Métis.

<sup>e</sup> Includes individuals who self-identify as Black, Hispanic, East Indian or Asian.

*Table 3-4* provides the results of the mediation analysis of alcohol dependence rate on the relationship between separate Aboriginal groups and sentencing rate. This

limited the analysis to 11001 Aboriginal offenders. Métis (RR=1.45, 95% CI: 1.35, 1.56) and Other Aboriginal (RR=1.65, 95% CI: 1.53, 1.79) offenders had higher rates of sentencing than the First Nations group. After adjustment for social, health, criminal history and demographic variables, the coefficients in Model 2 exhibited no statistically significant coefficient differences. Although the Métis group had a 25% reduction (95% CI: -4, 43), the confidence interval contained zero. After adjustment for alcohol dependence rate, the coefficients again exhibited no statistically significant difference.

**Table 3-4 Coefficient difference mediation analysis results. Rate Ratios (RR) for the association between Aboriginal status and sentencing rate for 11001 Aboriginal offenders sentenced through British Columbian courts from 2001 to 2010.**

	Model 1 <sup>a</sup> RR (95% CI)	Model 2 <sup>b</sup> RR (95% CI)	Percent Reduction (%) Model 1 versus Model 2 (95% CI)	Model 3 <sup>c</sup> RR (95% CI)	Percent Reduction (%) Model 2 versus Model 3 (95% CI)
Aboriginal Status					
First Nations	1.00 (REF)	1.00 (REF)	Reference	1.00 (REF)	Reference
Métis	1.45 (1.35,1.56)	1.34 (1.25,1.43)	25 (-4,43)	1.34 (1.25,1.43)	-1 (-40,27)
Other Aboriginal	1.65 (1.53,1.79)	1.68 (1.56,1.81)	-4 (-27,16)	1.68 (1.57,1.81)	0 (-23,17)

<sup>a</sup> Unadjusted Model.

<sup>b</sup> Adjusted for initial sentence and offense type; age, gender, and education status at time of cohort entry; and hospitalisation, mental disorder, drug dependence, crisis grant, disability grant and months on income assistance two years prior to cohort entry.

<sup>c</sup> Adjusted for all Model 2 variables and alcohol dependence rate.

### 3.3. Regression Analyses of Alcohol Dependence Rate

The determinants of alcohol dependence diagnosis were examined using a negative binomial multivariable regression model. Ethnic statuses, as well as other demographic, social and criminal variables, were examined for associations with alcohol dependence rate. *Table 3-5* summarises these results. There was a strong association between Aboriginal ethnicity and alcohol dependence in the multivariable model, compared to Caucasian offenders (RR=1.91, 95% CI: 1.72, 2.11), whereas the association in the univariate model was weaker (RR=1.47, 95% CI: 1.32, 1.63). Sentencing rate was also associated with a higher rate of alcohol dependence

(RR=1.13, 95% CI 1.10, 1.15). The strongest characteristics, in multivariable analysis, associated with a higher alcohol dependence rate included having a baseline mental disorder diagnosis (RR=2.43, 95% CI: 2.25, 2.63) and having a baseline drug dependence diagnosis other than alcohol dependence (RR=2.57, 95% CI: 2.31, 2.87). As well offenders over the age of 40, compared to individuals between 25 and 40, were more likely to have a higher alcohol dependence rate (RR=1.73, 94% CI: 1.60, 1.88).

**Table 3-5 Rate Ratios (RR) for the association between participant characteristics and alcohol dependence rate<sup>a</sup> for 77719 offenders sentenced through British Columbian courts from 2001 to 2010.**

	Univariate RR (95% CI)	Multivariable RR (95% CI)
Ethnicity		
Caucasian	1.00	1.00
Aboriginal	1.47 (1.32,1.63)	1.91 (1.72,2.11)
Other	0.70 (0.63,0.78)	0.96 (0.87,1.07)
Unknown	0.44 (0.39,0.52)	0.71 (0.59,0.85)
Baseline Mental Disorder	3.95 (3.66,4.27)	2.43 (2.25,2.63)
Baseline Drug Dependence	4.46 (3.98,5.00)	2.57 (2.31,2.87)
Hospitalised	3.77 (3.45,4.12)	1.92 (1.75,2.09)
Female	1.39 (1.26,1.53)	0.85 (0.78,0.94)
Age in Years		
Under 25	0.48 (0.44,0.53)	0.55 (0.50,0.60)
25 - 40	1.00	1.00
Over 40	1.80 (1.65,1.96)	1.73 (1.60,1.88)
Education		
Grade 9 or Less	1.00	1.00
Grade 9 or Above	0.92 (0.81,1.04)	1.08 (0.97,1.21)
Unknown/None	0.49 (0.42,0.57)	0.72 (0.61,0.86)
Crisis Grant	2.11 (1.89,2.35)	0.95 (0.83,1.08)
Disability Grant	1.95 (1.67,2.28)	0.71 (0.60,0.83)
Months on Income Assistance	1.04 (1.04,1.05)	1.02 (1.01,1.03)
Initial Offense		
Violent	1.01 (0.92,1.10)	1.05 (0.97,1.13)
Non-violent	1.00	1.00
Drug and Alcohol Related	1.23 (1.11,1.37)	1.26 (1.14,1.39)

Initial Sentence Custody (vs. Probation)	0.81 (0.72,0.91)	0.83 (0.74,0.93)
Sentencing Rate	1.10 (1.07,1.13)	1.13 (1.10,1.15)

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<sup>a</sup> Where alcohol dependence rate is defined as number of MSP records for alcohol dependence divided by follow-up time.

<sup>b</sup> Adjusted for all variables.

<sup>c</sup> Includes individuals who self-identify as Aboriginal, Inuit, First Nations or Métis.

<sup>d</sup> includes individuals who self-identify as Black, Hispanic, East Indian or Asian.

<sup>e</sup> Based on MSP service plan records using ICD-9 codes.

<sup>f</sup> Within two years preceding cohort entry.

## **Chapter 4. Discussion**

### **4.1. Cohort Characteristics**

#### **4.1.1. Aboriginal and non-Aboriginal comparisons**

The results of the descriptive analysis are consistent with previous research that reports both a greater extent of criminality among Aboriginal populations, as well as offender populations that are typically younger and more female (Kendall, 2013; Perreault, 2009). Although it is important to note that male offenders still make up the large majority of the Aboriginal group. The Aboriginal group has the highest sentencing rate in *Table 3-1* as well as the greatest percentage of offenders whose initial offense was violent and resulted in a custody sentence. In 2006 Aboriginal peoples represented 4.7% of the BC population (*see Figure 3-2*), a much lower percentage compared to the offender sample (BC Stats, 2006a). This suggests the group is both offending more and being sentenced with more severe crimes. The Aboriginal group also had a higher percentage of individuals in categories typically associated with a lower socioeconomic status such as use of social assistance and lower education. These characteristics partially explain the higher rate of sentencing among Aboriginal offenders, as age and socioeconomic status are commonly associated with criminal behaviour (Skeem et al., 2011; Yessine & Bonta, 2009).

The Aboriginal group had a higher percentage of individuals diagnosed with alcohol dependence both prior to group entry and over follow-up. This indicates a potential ethnic inequity in the percentage of alcohol dependence among offenders. Aboriginal offenders, although exhibiting lower socioeconomic status and higher percentages of alcohol dependence, had a lower percentage of mental disorders than the Caucasian group. Caucasian offenders exhibited an 8% higher percentage of any mental disorder compared to Aboriginal offenders, and a 12% higher percentage compared to the Other ethnic group. Although this indicates a difference in the

distribution of mental disorders among these different ethnicities, it could also be representative of diagnostic bias. Aboriginal offenders could have a higher likelihood of alcohol dependence diagnosis versus another mental disorder, due to an underlying expectation that Aboriginal peoples experience issues with alcohol misuse (Razack, 2013). Doolan et al. (2012) similarly theorise among Australian Aboriginal youth offenders that the higher diagnosis of substance use in this group could be due to a bias within the diagnostic and survey process. This could artificially inflate the differences between non-Aboriginal and Aboriginal offenders diagnosed with alcohol dependence and mental disorders. Future research should examine whether these are genuine variations between the needs of Aboriginal and non-Aboriginal offenders.

Offenders with unknown ethnicity had the lowest sentencing rate in the entire cohort (0.92 sentences per year) and the lowest percentage of alcohol dependence before cohort entry (2.76%). As well nearly the entire sample (97.9%) were sentenced to probation at their first sentence. Although this group was included in the sample to preserve the comprehensiveness of the analysis, the reason for their ethnicity being unlisted is not known. The Unknown group also had 91.4% of the sample listed as having unknown or no education. This group may represent a sample of low risk or non-repeat offenders as evidenced by their low sentencing rate and low percentage of violent offenses (20.8%). Although it is impossible to make definitive inferences about the status of this group, their unknown ethnic status is not independent of their lower risk profile. In the vernacular of missing data theory in biostatistics, we say that the data on race and education is *not missing at random* (Little & Rubin, 2002). Hypothetically, a lower risk offender may have less interaction with the justice system, or have a less comprehensive intake assessment, thus limiting the information in the dataset. However it is likely there are many reasons, both administrative and those related to personal characteristics, for their unknown ethnicity.

#### **4.1.2. First Nations, Métis, and Other Aboriginal comparisons**

The stratification of the Aboriginal group into First Nations, Métis, and Other Aboriginal subgroups (see *Table 3-2*) demonstrated the complexity and differences within the label Aboriginal. Although all groups had a higher percentage of young,

female and less educated offenders compared to the non-Aboriginal groups in *Table 3-1*, there were several key variations. The Métis group had the second highest mean sentencing rate (1.92 sentences per year), the highest sentencing group being Other Aboriginal (2.16 sentences per year). As well the Métis group had the lowest percentage of violent offences, excluding the Unknown category, of any group (26.9%). This result was consistent with Bonta et al. (1997) where Métis offenders had the second highest percentage of previous convictions. Despite this higher sentencing rate, the Métis group was not overrepresented compared to their population percentage in BC. Métis people represent approximately 1.6% of the BC population and represented 1.39% of the offender sample. This is directly in opposition to the First Nations sample that represents 12.8% of offenders but 3.2% of the BC population (BC Stats, 2006a; BC Stats, 2006b). This suggests that the problem of overrepresentation in the BC justice system may be more of a concern for First Nations groups than the Métis population.

Andersen (2008) describes the difficulty and inconsistency in identifying Métis people using census data. Many people may identify as Métis despite their ancestry not being related to a historic Métis community. In this case self-identified ethnicity or race may not appropriately describe the true Métis population. If the census data is considered to somewhat overestimate the Métis population, it may be appropriate within the offender sample to include the Other Aboriginal group within the Métis category. However that only increases the percentage of non-First Nations offenders to 2.9%, only slightly higher than the BC population percentage. In either case Métis offenders have both the highest sentencing rate of any identifiable ethnic group in the sample but without the traditionally intertwined issue of overrepresentation. The difference between Métis and First Nations' sentencing rates is in fact greater than the differences between the Aboriginal group and any other non-Aboriginal group. Recidivism may be a more significant issue for Métis offenders. This suggests a fundamental difference in the offending profiles of Métis and First Nations offenders.

The Métis group had a lower percentage of alcohol dependence (5.54%) than the First Nations group (8.82%). The percentage in the Métis group was similar to the Caucasian group (5.88%). Conversely the Other Aboriginal group had a similar percentage (8.46%) to the First Nations group. The percentages of drug dependence

and mental disorders among Métis offenders were more similar to the Caucasian group than the First Nations group. This suggests that despite having a higher rate of recidivism the Métis group had a similar health profile to the Caucasian sample. This demonstrates the complexity of the Métis ethnic category. The Métis group is unique in several respects; they have similar health needs to the Caucasian group but similar higher offending, age, and education to the Aboriginal group. This potentially supports different programming and policy than what would be provided for an Aboriginal or Caucasian offender. Métis offenders may require different targets for both recidivism prevention and health promotion.

## **4.2. Alcohol Dependence as a Partial Mediator**

The hypothesis that alcohol dependence would statistically account for the relationship between Aboriginal status and sentencing rate was not supported by the mediation analysis results. Adjustment with alcohol dependence resulted in merely a 2% (95% CI: -13%, 14%) reduction for Aboriginal offenders, which was not statistically significant. Gutierrez, Wilson, Rugge and Bonta (2013) found similar results, in their analysis alcohol and drug use was less likely to predict recidivism among Aboriginal offenders compared to non-Aboriginal offenders. They hypothesized this was a result of the high percentage of alcohol dependence among Aboriginal offenders resulting in a 'ceiling effect'. However, the percentage of Aboriginal offenders with alcohol dependence (13.04% in follow-up) makes this explanation unlikely in this analysis. The combined impact of socioeconomic status and demographic factors had a much greater influence on offending than alcohol dependence. There are also other potential mediators for the relationship between Aboriginal status and crime that were beyond the scope of this analysis.

These results align with the shared risk explanation for the alcohol dependence and crime relationship. Alcohol dependence and crime were both more prevalent in the Aboriginal population compared to the Caucasian or Other ethnic groups, but alcohol dependence did not account for the differences in sentencing rate. This would suggest that other factors like age or socioeconomic status are contributing to the increase in both issues in the Aboriginal population, e.g. they share risk factors. These risk factors

could also include societal issues like racism, and historical traumas like residential schooling (Adelson, 2005; Ehlers et al., 2013; Evans-Campbell, 2008). As well as the social disadvantages that have resulted from historical and modern racism including the cycle of both poverty and alcohol abuse in Aboriginal communities (Romanow, 2002). However the increase in the percentage of alcohol dependence over time, in all groups, suggests that there are several intervening explanations at work (Ensor & Godfrey, 1993; Kerner et al., 1997). It is unlikely that shared risk factors alone account for the prevalence of alcohol dependence among offenders. All three theories e.g. crime causing alcohol dependence, alcohol dependence causing crime and shared risk factors, are plausible and likely have some influence on the results of this analysis.

Alcohol dependence was also not a mediating variable for the different sentencing rates within the Aboriginal group. The Métis group had a higher sentencing rate than the First Nations group and adjustment with alcohol dependence resulted in a statistically insignificant -1% (95% CI: -40%, 27%) difference for Métis offenders. Considering that alcohol dependence did not mediate the relationship between Aboriginal status and sentencing, it would be unlikely to do so within the Aboriginal group. As well, the Métis group had a lower prevalence of alcohol dependence both prior to (5.54%) and after cohort entry (9.97%). This explains why the, although not significant, percent reduction between Model 2 and 3 was negative. If alcohol dependence did mediate the relationship between Aboriginal status and crime, it would have been a negative confounder and the Métis and First Nations offenders would have exhibited an even greater disparity in sentencing rate after adjustment.

However, unlike the mediation analysis in *Table 3-3*, the social, demographic and crime variables did not account for the sentencing rate differences within the Aboriginal groups. The percent reduction between Métis and First Nations, or Other Aboriginal and First Nations offenders was not statistically significant between Model 1 and Model 2. Considering the similar age and demographic profiles between the Aboriginal groups this is not entirely unexpected, but suggests that the differences in sentencing between Aboriginal groups are not explained by the variables available within the administrative data. It is possible that risk factors not captured by administrative data could be influencing these sentencing differences. This could include key risk factors for crime

like pro-criminal attitudes, antisocial personality or family stability (Gutierrez et al., 2013; Rugge, 2006). Although it is beyond the scope of this analysis, further research should examine factors that will predict recidivism within Aboriginal groups. Particularly the differences in life experiences of geographically diverse Aboriginal people, who like the Métis offenders, live off reservation. This diversity includes variations in area of residence, culture and broader political differences like self-governance in some reservation lands. In principal the sentencing court location could be used as a proxy for area of residence, however considering that an individual may not be sentenced close to where they reside it would be an unreliable measure of regional variation.

### **4.3. Alcohol Dependence and Ethnicity**

Aboriginal offenders had a 91% overall higher rate of alcohol dependence than Caucasian offenders (RR=1.91, 95% CI: 1.72,2.11). This suggests alcohol dependence is a major health issue for this group. In *Table 3-5*, the multivariable rate ratio exhibited negative confounding, e.g. the univariate coefficient was closer to the null than the multivariate coefficient. As alcohol dependence was more common among older offenders and the Aboriginal group was much younger than the other ethnic groups, age likely biased the relationship between Aboriginal status and alcohol dependence towards the null. Alcohol dependence may not exhibit a mediating effect on sentencing, but it is still highly prevalent among Aboriginal offenders. Nearly one in ten Aboriginal offenders (8.46%) had a diagnosis of alcohol dependence prior to first offense. An even higher percentage of First Nations offenders (14.0%) had a diagnosis over follow-up. These results suggest a strong need for public health programming to counteract alcohol dependence inequities among Aboriginal offenders. As Skeem et al. (2011) note in their systematic analyses of intervention programs for mentally ill offenders, even if a treatment program does not reduce recidivism it is no less valuable for public health.

The problems related to alcohol use are especially troubling for Aboriginal youth, who are not ironically more likely to be offenders. In a national sample of students at American Indian reserve schools, 36.7% reported experiencing drunkenness by 8<sup>th</sup> grade, more than twice the national average of 14.8% (Stanley, Harness, Swaim, & Beauvais, 2014). Among 12<sup>th</sup> grade students, 67.5% reported having previously used

alcohol, less than the national average. The authors argue that this is likely due to either the positive influence of education on cessation of alcohol use or the fact that most students who would have reported alcohol use had dropped out by 12<sup>th</sup> grade (Stanley et al., 2014). Among Indigenous Australian youth offenders, 60.9% are referred to substance use programs compared to 44.1% of non-Indigenous youth offenders (Doolan et al., 2012). These statistics are particularly damning in the context of the Aboriginal group in this analysis, where 20.2% of the group had only an under Grade 9 education, double the percentage of the Caucasian (9.76%) and Other (9.88%) ethnic groups. In either case, if education prevents alcohol abuse or students less likely to abuse alcohol remain in school, the offender sample is at a severe disadvantage.

Spillane et al. (2012) examined the alcohol experiences of 209 First Nations youth who lived on reserve in New Brunswick, Canada. They revealed that problem drinking mediated the relationship between negative urgency, e.g. risk-taking behaviour and negative alcohol experiences among males. They suggest that people who exhibit high risk-taking behaviour, like offenders and male youth, also have negative expectations of alcohol abuse mediated by their own use of alcohol. Applied to the current study, this suggests that Aboriginal offenders are likely already aware of the negative effects of drinking. In an examination of youth offenders, van der Put et al. (2014) found risk and protective factors were less associated with either preventing or exacerbating recidivism for youth with substance use problems.

Not only do Aboriginal youth offenders experience issues with alcohol abuse but also, given the results of Spillane et al. (2012) and van der Put et al. (2014), they are less likely to respond to current treatment strategies. After offenders are already part of the system, it may be too late to target risk factors that influence alcohol disorders and crime. Combined with the mediation results of this analysis, this supports future policy and programming that reduces alcohol disorders prior to first offense. If the goal of alcohol treatment in corrections is preventing further crime or improving the health of offenders, the best target is youth who have yet to experience either problem. Potentially preventing alcohol disorders could prevent crime and vice versa. Targeting the risk factors that influence both problems, like education and socioeconomic status, is

essential to stopping the intergenerational cycle of criminal justice contact and alcohol disorders among Aboriginal populations (Kendall, 2013; Romanow, 2002).

Despite the high rate of alcohol dependence among Aboriginal offenders, these results contradict assumptions that alcohol disorders impact offending differently for Aboriginal offenders compared to other ethnic groups. Stereotypic beliefs that alcohol dependence is a major and unique contributor to the excessive crime rate among Aboriginal offenders are not supported. Alcohol is still prevalent and a serious problem for Aboriginal offenders, but it does not account for the excessive offending in this group. The full explanation for that offending is not available from these results. As discussed in section 4.2, this investigation reveals that other factors like age, socioeconomic status and various historical traumas of offenders likely impact the Aboriginal sentencing rate. These factors possibly stem from the negative impact of historical and modern racism on Aboriginal life (Adelson, 2005; Ehlers et al., 2013; Evans-Campbell, 2008). Further research is needed to examine the context of Aboriginal political history and its effect on crime.

#### **4.4. Strengths and Limitations**

There are several limitations that bear consideration when interpreting the results of this study. An important limitation of administrative databases is relying on predetermined definitions of variables like ethnicity. Although 'Aboriginal' is a commonly used ethnic category, it does not recognize the variation among Canadian Indigenous peoples (Adelson, 2005; Kumar et al., 2012). Research suggests administrative identification of Indigenous status leads to an overestimation of the true Indigenous population. In one study, the relationship between Indigenous status and alcohol dependence was overestimated when administrative classifications were used (Wood & Hays, 2014). A similar result in this analysis would produce an even weaker mediating effect. Although the Aboriginal category is separated into Métis, First Nations and Other Aboriginal, it is not feasible to further separate the categories into on and off-Reserve. Future research should consider the contributions of place of residence as well as Aboriginal status.

Another potential limitation is measurement error of the alcohol dependence variable. Alcohol dependence was measured as the total the number of medical records for alcohol dependence in the MSP database and divided by follow-up time. There is likely to be both over and under reporting of alcohol dependence among offenders. It is impractical to verify accurate diagnoses within the MSP dataset; individuals could be misdiagnosed or undiagnosed if they did not seek care through a BC physician. It is highly likely many offenders who do in fact have alcohol dependence, did not seek treatment. However, the overall relationship between alcohol dependence and ethnicity is similar to other studies of Canadian Indigenous peoples (Neubold, 1998; Razack, 2013; Yessine & Bonta, 2009). This similarity suggests that the effect of misdiagnosis may be minimal. As well alcohol dependence is often a co-occurring issue, e.g. in association with another substance use disorder and/or mental health disorder (Lumsden et al., 2005). We did not model potential multicollinearity between alcohol dependence and other mental health disorders.

Sentencing labeling bias could potentially exaggerate the rate of sentencing among Aboriginal individuals. Aboriginal offenders could be subject to harsher police response or a greater likelihood of police contact resulting in a court appointment, due to their ethnic status (Kendall, 2013). Sentencing, however, represents a criminal justice interaction relatively far along the justice system interaction pathway and should be minimally affected by labeling bias. Finally there were other limitations that merit discussion. This includes several influences on the relationship between alcohol disorders, crime and aboriginal status that were beyond the scope of this analysis. For example the impact of fetal alcohol spectrum disorders among Aboriginal offenders (Bracken, 2008). The zero-truncated nature of the sentencing data was not considered. Negative binomial regression is based on counts including zero, as such the confidence intervals for the effect estimates are less conservative.

A major strength of this analysis is the use of administrative longitudinal data. Offenders were examined over time, allowing for multiple interactions with the health care and justice system. This resulted in a large sample size with substantive accumulation of pre and post-entry information that eliminates both recall and response bias. The data are highly unique, as there is information from multiple sources about the

entire population of offenders in British Columbia. Therefore reliable population level inferences can be made.

The range of demographic information on BC offenders allowed the analysis of a subject rarely discussed in large population research, namely predictors of sentencing among Indigenous groups. Particularly the inclusion of Métis offenders is an urgently needed step towards recognizing the diversity of ethnicities within multicultural regions like British Columbia. In addition, this study is potentially generalizable to other Indigenous offenders across Canada. Although caution is advised around interpreting these results as evidence against or for causation of alcohol disorders on offending, this analysis is a first essential step in understanding the current impact of alcohol disorders on Aboriginal offenders in BC. To the authors' knowledge, this is the first study to examine associations between alcohol dependence and criminal behaviour among BC Aboriginal peoples. As well this is the first time in nearly two decades that the separate experiences of both Métis and First Nations offenders have been considered in the context of crime and alcohol problems. In addition, there is limited knowledge on this subject for Indigenous peoples worldwide, who tend to experience similar states of poor health and elevated criminal behaviour (Weatherburn & Snowball, 2008).

## **Chapter 5. Alcohol and Crime Policy in Canada**

### **5.1. Aboriginal Programming in the Justice System**

One of the primary goals of BC Corrections is “responding to needs of distinct offender groups”, with the ultimate goal of preventing further recidivism (British Columbian Ministry of Public Safety and Solicitor General, 2010, pg. 7). One of these distinct offender groups is Aboriginal peoples. There are several mechanisms through which both the Federal and Provincial criminal justice systems respond to Aboriginal needs. At the federal level this includes sentencing reforms that aim to decrease the number of Aboriginal people in the justice system. This includes reforms to the Criminal Code of Canada, like 718.2(e), where sentencing of Aboriginal offenders is meant to be as minimally coercive as possible (Government of Canada, 1985). Although well intentioned, the law tends to be inconsistently applied and introduces several issues including a lack of consultation with Aboriginal communities surrounding perceptions of justice and the potential to further victimize female offenders (Balfour, 2012). Aboriginal female offenders are often both victims and offenders. They use substances to cope with trauma, which in turn leads them to be classified as offenders (Dell and Kilty, 2013). In this way Dell and Kilty (2013) describe Aboriginal women as being ‘expected offenders’, they are not the traditional perception of the ‘faultless’ victim. Through this paradigm, Aboriginal women are not expected to be victims and their needs as victims are not recognized by the justice system. Sentencing reforms compound these issues by not considering the impact of decreasing abuse sentences, on cases where the victims are Aboriginal women. In addition, recent criminal code reforms, e.g. the Safe Streets and Communities Act, actually counteract the ideal of minimally coercive sentencing by introducing harsher sentencing regulations (Kendall, 2013). As Kendall (2013) discusses, the populations most likely to suffer from these new reforms are Aboriginal offenders, particularly Aboriginal women.

Many federal policies focus on so-called, culturally responsive programs (Murdocca, 2009; Turnbull, 2014). This includes programs within corrections facilities like elder assisted hearings, where elders of Aboriginal communities are meant to provide cultural translation between parole boards and offenders, as well as act as an aide to offenders (Turnbull, 2014). Many authors argue that these programs equate culture or spirituality with Aboriginal identity. This, although responsive to the needs of Aboriginal offenders, places the responsibility of overrepresentation on Aboriginal communities and not necessarily the historical and current actions of government (Dell & Kilty, 2013; Murdocca, 2009; Turnbull, 2014). By focusing on culture, the assumption is that Aboriginal offenders are at a disadvantage because of their spirituality and not due to the impact of the Canadian government. The main theme throughout assessments of Federal justice policies is an inadequate response by the Canadian government to how Aboriginal communities perceive justice. As well that laws and programs while claiming to recognize the unique social and historical context of Aboriginal communities end up doing the opposite. The justice system continues to focus on the individual rather than the societal and historical problems that have resulted in today's overrepresentation of Aboriginal offenders (Balfour, 2012). Policy is generally inadequate and in the case of specialised groups like Métis offenders, nonexistent.

At the provincial level, offenders have access to substance abuse programs, which are twelve session courses to help offenders in the community and corrections facilities cope with substance use disorders. Beyond these courses, corrections facilities offer alcohol and drug counselling to offenders. As well some corrections facilities have Aboriginal Justice Workers and programs to provide specialised assistance for Aboriginal offenders (British Columbia Ministry of Public Safety and Solicitor General, 2010). Although it's difficult to know how effective any of these programs are, they are all rooted in the concept of risk and needs assessments. Under this model, addressing the risk and needs related to criminal behaviour, should help offenders to prevent recidivism. The programs suggested for offenders are recommended by parole and probation officer's assessment of the offender's personal needs (Brown, 2004). Risk assessment, although widely applied, has several areas of concern when considering Aboriginal offenders.

## **5.2. Risk Assessment Policies in the Canadian Justice System**

BC Corrections' case management, policies related to probation and parole, include analyzing an offender's "risk to reoffend and [their] needs related to offending behaviour. This includes using specialized evidence-based assessments to assess offenders" (British Columbia Ministry of Public Safety and Solicitor General, 2010, p. 19). These risk/needs assessments are related to the static and dynamic predictors associated with crime. This can include diverse predictors like criminal history, mental health, antisocial personality, gender and employment (Bonta et al., 1997; Brown, 2004; Gutierrez et al., 2013; Ruge, 2006; Shaw & Hannah-Moffat, 2000). In a study of Canadian parole officer's perceptions of parolee needs, further needs were identified like basic supplies as well as corrections programs like those related to alcohol dependence treatment (Brown, 2004). Treatment for substance abuse is a frequent feature in both the needs and risks for offenders to succeed, and to ultimately not recidivate.

Much research has been conducted both on understanding how these features contribute to crime and how relevant they are in different populations. In Canada the focus has been on the potentially different predictors for Aboriginal versus non-Aboriginal offenders (Bonta et al., 1997; Brown, 2004; Gutierrez et al., 2013; Ruge, 2006; Shaw & Hannah-Moffat, 2000). Risk needs assessment (RNA) instruments are developed on white and male offenders and are generally applied without considering the cultural, historical and social differences between offender groups (Shaw & Hannah-Moffat, 2000). This, as Shaw and Hannah-Moffatt (2000) describe, is meant to create a sense of objectivity in interactions between parole officers and parolees, however it ultimately removes the context related to offender's criminal and personal history. There is a dissonant shift from analyzing what an offender may truly need to what is listed in the assessment forms. Assumedly, part of the reason why Elder-assisted hearings have been introduced is to reapply context in to parole decision making for Aboriginal offenders (Turnbull, 2014).

Ruge (2006) conducted a literature review on all current evidence related to RNA and Aboriginal recidivism. Although that evidence was sparse, they concluded that

substance abuse predicted recidivism well for Aboriginal offenders. As well that the majority of the static and dynamic risk factors related to crime were equally predictive of Aboriginal offending compared to non-Aboriginal offending. However it should be noted their findings were largely based on a single study. As well they only identified six applicable studies, of which the same author wrote three. Bonta et al. (1997), the primary author of those three studies, found that alcohol and drug use predicted recidivism between all Aboriginal and non-Aboriginal groups, but particularly well for Métis offenders. Gutierrez et al. (2013) conducted a similar analysis where they found no difference in the predictive power of alcohol/drugs on violent recidivism between Canadian ethnic groups. As well they found that substance abuse had lower predictive values for recidivism of Aboriginal compared to non-Aboriginal offenders. Unfortunately, as is similar with research on crime and alcohol dependence, these studies are limited and thus inconclusive. Although the ultimate goal of these studies is to determine if RNA instruments are applicable for Aboriginal offenders, they also provide evidence against the idea that alcohol disorders explain the excessive offending among Aboriginal peoples. Alcohol dependence, like in this thesis, is not a unique predictor for recidivism for Aboriginal peoples. Current RNA practices are missing predictors of crime that may be related specifically to Aboriginal peoples, for example Aboriginal views of justice (Shaw & Hannah-Moffat, 2000).

Rugge (2006) also discusses that a greater percentage of Aboriginal offenders are classified as “high risk” offenders, who at that level of classification cannot participate in specialized treatment like healing lodges. These programs are developed specifically for Aboriginal offenders but are unavailable to the offenders presumably in greatest need of them. This again speaks to the lack of context related to RNA instruments, although they may be somewhat predictive of Aboriginal needs, they may not be ideal for identifying how to address those needs. For alcohol dependence this may include considering the special circumstances related to the high intake of alcohol from a young age in many Aboriginal communities (Stanley et al., 2014). The context of why Aboriginal offenders have both a higher percentage of recidivism and alcohol disorders needs to be considered in the evaluation of parolees. Policies related to preventing Aboriginal recidivism are ineffective on several levels. This includes the

aforementioned Canadian cultural responsiveness to crime, as well as how RNA instruments can be used to classify offenders.

Another currently unaddressed area in corrections policy is the special circumstances of diverse Aboriginal groups. Métis and First Nations offenders not only have different historical backgrounds but also exist in very different political and social environments today. As well within First Nations groups, culture is by no means constant (Turnbull, 2014). As targeting culture to prevent Aboriginal recidivism is a key feature of corrections policy, the unique circumstances of different Aboriginal groups must be taken in to context. Policy cannot be effective if the needs of an Aboriginal person living in the Downtown Eastside of Vancouver are considered identical to those of an on reserve Aboriginal offender from rural Manitoba. As the results of this study support, Métis and First Nations offenders exhibit very different sentencing profiles. Culture is likely not the answer to overrepresentation, but if it does help some offenders than the circumstances and variations within Aboriginal groups must be considered.

Although the Canadian Federal and BC Provincial governments have introduced several mechanisms to address Aboriginal overrepresentation and the contribution that alcohol may or may not make to offending, clearly it is not enough. Policies are piecemeal, inconsistently applied and at a core level ineffective. RNA is one area where these issues can be targeted, potentially improving the outcomes of offenders in both recidivism and alcohol dependence. Until that happens, the facts are plain. Aboriginal people are still overrepresented in the Canadian justice system (Kendall, 2013; Roberts & Melchers, 2003). Aboriginal people are still undereducated compared to other ethnic groups in Canada (Balfour, 2012; Kendall, 2013). Aboriginal women are still more likely to be victimized as well as offenders compared to non-Aboriginal women (Balfour, 2012; Dell & Kilty, 2013). No matter what evidence this thesis provides, the action needs to come from planned and comprehensive policies that address the unique health and offending needs of Aboriginal people. This conclusion is echoed in the work and recommendations of Kendall (2013), Rugge (2006), and Dell and Kilty (2013). This includes better treatment for alcohol disorders within a RNA framework, without overemphasizing the role alcohol disorders play in Aboriginal offending. The

government, at every level from police interactions to sentencing to education policies, needs to consider the context of Aboriginal crime and find a solution.

## **Chapter 6. Conclusions**

This study examined whether diagnosed alcohol dependence statistically accounted for the disproportionately higher rate of Aboriginal offending compared to other ethnic groups in BC. The relationship between alcohol disorders and crime is theorized to be either causal or spurious. Under causal models either alcohol disorders cause crime or vice versa. A spurious association exists when shared risk factors cause a high prevalence of both disorders and crime, but alcohol disorders and crime do not necessarily impact each other. Although Aboriginal offenders experienced a higher burden of alcohol dependence as well as poorer social and health characteristics, alcohol dependence exhibited a minimal mediating effect on sentencing rate. This suggests alcohol dependence after first offense does not significantly impact further sentencing compared to other offenders, however problematic alcohol use is still a major public health target for all offenders. The differences between Métis and First Nations offenders were also compared. Métis offenders exhibited a similar prevalence of diagnosed alcohol dependence, both prior to cohort entry and after follow-up, compared to the Caucasian cohort, as well as a similar mental health profile. The Métis and Other Aboriginal group had the highest sentencing rate in the cohort. Alcohol dependence diagnosis was not a mediating factor between the sentencing rate of these groups and their Aboriginal status. Aboriginal and particularly First Nations offenders experienced a far higher rate of alcohol dependence diagnoses than other offenders. These results suggest further need for programming and policy related to alcohol dependence in the justice system and in public health and social arenas. Policies should address the shared risk factors for both alcohol dependence and criminal behavior including demographic characteristics like education and age. Alcohol and crime exhibit a complex relationship that is likely strongly related to common risk factors for both issues.

Current correctional policy includes using substance and alcohol use as both a risk and needs factor for recidivism in RNA. While alcohol use is a strong need for Aboriginal offenders, it is not a unique risk for further recidivism. As well Canadian federal policies currently focus on the “culturally responsive” needs of Aboriginal offenders. However, considering the continuing trends of Aboriginal overrepresentation in the justice system policy is currently inadequate. The short-term impact of alcohol on human behaviour is well documented, but the long-term impact of alcohol dependence and crime is more complicated than a simple causative model. Further research should consider the complex nature of the association between alcohol dependence and crime to inform effective policy and public health programs.

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