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The costs of crime associated with stimulant use in a Canadian setting

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ABSTRACT

Background: Costs attributable to criminal activity are a major component of the economic burden of substance use disorders, yet there is a paucity of empirical evidence on this topic. Our aim was to estimate the costs of crime associated with different forms and intensities of stimulant use.

Methods: Retrospective cohort study, including individuals from three prospective cohorts in Vancouver, Canada, measured biannually (2011–2015), reporting stimulant use at baseline assessment. Monthly crime costs included policing, court, corrections, and criminal victimization (2016 CAD). We estimated monthly crime costs associated with mutually exclusive categories of crack, cocaine, methamphetamine, and polystimulant use, stratified by daily/non-daily use, relative to stimulant abstinence, as well as the independent effects of treatment (opioid agonist (OAT) and other addiction treatment). We used a two-part model, capturing the probability of criminal activity and costs of crime with generalized linear logistic and gamma regression models, respectively, controlling for age, gender, education, homelessness, mental health issues, employment, prior incarceration, alcohol and opioid use.

Results: The study sample included 1599 individuals (median age 39, 65.9% male) assessed over 5299 biannual interviews. Estimates of associated monthly crime costs ranged from $5449 [95% C.I.: $2180, $8719] for non-daily polystimulant use, to $8893 [$4196, $13,589] for daily polystimulant use. Cost differences between daily/non-daily use, injection/non-injection, and stimulant type were not statistically significant. Drug treatment was not associated with lower monthly crime costs in our sample.

Conclusions: Substantial crime-related costs were associated with stimulant use, emphasizing the urgency for development and implementation of efficacious treatment regimens.

1. Introduction

Criminal activity is one of the largest components of the total societal costs attributable to illicit drug use in Canada and around the world. It is estimated that the direct costs (e.g., healthcare, law enforcement) of illicit drug use were as high as $3.57 billion (CAD) in Canada in 2002, with law enforcement costs comprising over 65% (Rehm et al., 2007). Direct costs have been estimated at $52.2 billion (USD) in the United States in 2007, with crime costs accounting for over 69% (National Drug Intelligence Center, 2011). Worldwide, stimulant use disorders are the second most common illicit drug use disorder after opioids, and the majority of the disease burden associated with stimulant use comes from cocaine (crack cocaine and cocaine hydrochloride) and amphetamines (specifically methamphetamine (MA)) (Degenhardt et al., 2014). Globally, MA use is more problematic than cocaine, due to dramatic physiological changes and sensitization in chronic users, as well as significantly higher prevalence beyond North and South America (Degenhardt et al., 2014; Degenhardt et al., 2013). In a literature review of studies estimating the economic benefits of addiction interventions, McCollister and French (2003) found that reductions in crime accounted for more than half of the total economic benefit in the majority of studies. More recent studies for treatment interventions found criminal activity to account for over 75% of accumulated lifetime direct costs for individuals with opioid use disorders (Nosyk et al., 2012), as well as a major component of total costs in other studies (Byford et al., 2013; Dijkgraaf et al., 2005; Zarkin et al., 2005).

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High rates of drug use, particularly stimulants, among criminals have been observed in populations of arrestees and prison inmates (Karberg and James, 2005; ONDCP, 2014), however, the mechanism for the association between stimulant use and criminal activity is multifaceted (Goldstein, 1985). Pharmacological effects of stimulant use are well-known, and there is evidence that the risk of psychotic episodes and aggressive behaviour increases in long-term users of methamphetamine (Harro, 2015), as well as similar neurocognitive problems in chronic cocaine users (Bolla et al., 1998). Furthermore, acute effects of drug use in reducing impulse control have been found to be more pronounced in stimulants than opiates (Badiani et al., 2011). Economic motivation for criminal activity stemming from stimulant use (such as acquisitive crime and other income generating activities) is perhaps the most direct mechanism for this relationship, given the high cost of illicit drugs (Bennett et al., 2008; Hepburn et al., 2016; Wilkins and Sweetsur, 2011).

Despite a large literature on the association between drug use and criminal behaviour, there are few studies examining the effects of stimulant use on criminal activity and associated costs. Flynn et al. (1999) estimated a range of $18,244–$33,609 for yearly costs of crime of among untreated cocaine-dependent individuals, with significantly lower costs during and after treatment. Oser et al. (2011) found that stimulant use was associated with increased criminal activity amongst rural drug users, compared to no stimulant use. Vaughn et al. (2010) found that crack cocaine use was associated with higher odds of violence than powdered cocaine. However, the authors concluded that other heterogeneity in users was largely contributing to these differences. In a systematic review and *meta*-analysis, Bennett et al. (2008) found that the odds of offending was 1.9 times higher for amphetamine users and 6 times higher for crack users, compared to non-drug users.

To date, no effective pharmacological treatments have been identified for stimulant use disorders (Fischer et al., 2015). Contingency management and cognitive behavioural therapies (CM/CBT) have shown efficacy in trial-based settings, particularly short-run CM interventions, in which participants receive a prize or reward for maintaining abstinence (DeFulio et al., 2009; Jaffe et al., 2007; McKay et al., 2010; Rawson et al., 2006; Schumacher et al., 2007; Shoptaw et al., 2005). However, treatment modalities are far from standardized, and treatment utilization and outcomes are not systematically tracked in the province of British Columbia or elsewhere across Canada.

The goal of this study was to test a series of hypotheses about the association between stimulant use and crime costs. First, that stimulant use (stratified by type and use intensity) is positively associated with crime costs, relative to stimulant abstinence; second, that higher frequency of use is associated with higher crime costs within stimulant types; third, that different stimulant types and polystimulant use are associated with different levels of crime costs, holding intensity of use constant; and finally, that injection use is associated with higher crime costs than non-injection use within stimulant types.

2. Methods

2.1. Study sample

Data for this analysis was derived from a series of ongoing open prospective cohort studies, conducted in Vancouver, involving people who use drugs, including the At-Risk Youth Study (ARYS), the AIDS Care Cohort to evaluate Exposure to Survival Services (ACCESS), and the Vancouver Injection Drug Users Study (VIDUS). The VIDUS study follows HIV-negative adults who inject drugs while the ACCESS study follows HIV-positive adults who inject drugs (Strathdee et al., 1997; Wood et al., 2009). ARYS is made up of street-involved youth aged 14–26 who report use of drugs other than, or in addition to, cannabis (Wood et al., 2006a, 2006b). Sampling and follow-up methodologies have been described in previous studies and surveys were structured identically to allow for combined longitudinal analysis (Strathdee et al., 1997; Tyndall et al., 2003; Wood et al., 2006a, 2006b). At baseline and semiannually thereafter, participants completed an interviewer-administered questionnaire and received $30 CAD at each visit. All studies were approved by the University of British Columbia/Providence Health Care Research Ethics Board.

Individuals included in this analysis entered the study between September 2005 and December 2013, and the data were collected from December 2011 to May 2015 to coincide with the inclusion of survey items comprehensively capturing criminal activity. During this period, individuals could have a maximum of seven biannual assessments. All individuals who had completed at least one follow-up interview during this period were eligible for inclusion. In addition, individuals were excluded if they had never reported stimulant use prior to the start of our sample period or at baseline. The reference group for our main analysis was past stimulant users who reported abstinence (no use of any stimulant drugs in the previous six months) at the time of assessment.

2.2. Crime costs

Detailed survey questions included both the type and frequency of criminal acts committed in the past 30 days, categorized as violent offenses (such as assault, murder and weapons offenses), property crimes, drug dealing, sex work, legal status violation, disorderly conduct, and other offenses. Questions also included number of days incarcerated, on parole or under legal supervision in the past 30 days. Costs were assigned to each act by both the type of crime, as well as unit costs for the relevant expenditure categories. Monthly crime costs included all self-reported incidents of criminal activity, regardless of whether or not an individual was arrested for a particular act. Costs were calculated from a societal perspective, and included costs regardless of who incurred them or whether they corresponded directly to budgetary expenditures (Garrison et al., 2010). Total monthly crime costs were the combined costs of incident costs (police response), arrest processing and court costs for the criminal justice system, and criminal victimization (Krebs et al., 2014) (unit costs are presented in Supplementary material). Incident costs were derived from the overall operating budget of the Vancouver Police department, which captured the costs of police response to crime scenes, whether or not an arrest was made (Krebs et al., 2014). Arrest processing and court costs were assigned to acts where an individual reported being arrested, and incarceration costs to days an individual reported being incarcerated or on parole in the previous month (Krebs et al., 2014; Wall et al., 2000). Victimization costs included medical expenses, cash losses and pain-and-suffering based on jury-compensation for victims (McCollister et al., 2010). Victimization costs were applied to violent offenses based on estimates for assaults, and property crimes as a weighted average based on cost estimates for break and enter and theft in McCollister et al. (2010), and the observed proportions of each type of crime in Vancouver, derived from the Vancouver Police Department and Statistics Canada (Krebs et al., 2014; McCollister et al., 2010). Incidents of sex work and drug dealing were only assigned costs if individuals reported being arrested, given that police are likely responding to only a fraction of total incidents (which we define as an individual reporting arrest), and were excluded from victimization costs, given the argument that these activities can be viewed as transactions with no direct costs of victimization (Dijkgraaf et al., 2005; Rajkumar and French, 1997; Zarkin et al., 2012). Monthly crime costs were adjusted to account for the proportion of days incarcerated in the past month.

2.3. Measures

Our primary independent variables were indicators of stimulant use in the past six months, grouped into one of eight mutually exclusive categories (Fig. 1), including any use of powdered cocaine, daily or non-daily use of crack cocaine or methamphetamine, concurrent use of