



Cost attributable to Fetal Alcohol Spectrum Disorder in the Canadian correctional system



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ABSTRACT

Prenatal alcohol exposure is the leading identifiable cause of intellectual disability in the Western world and may result in Fetal Alcohol Spectrum Disorder (FASD). Individuals with FASD have a higher risk of being involved in the legal system, either as offenders or as victims. Therefore, the aim of the current study was to estimate the direct cost for youths (12–17 years old) and adults (18 + years old) with FASD to the Canadian correctional system in 2011/2012. The prevalence of FASD in the Canadian correctional system, obtained from the current epidemiological literature, was applied to the average number of youths and adults in the correctional system in 2011/2012. The average daily cost for corrections was then applied to the estimated number of youths and adults with FASD in custody. The cost of corrections among youths with FASD in Canada in 2011/2012 was calculated to be approximately \$17.5 M Canadian dollars (CND; \$13.6 M CND for males and \$3.8 M CND for females) and among adults with FASD was estimated to be about \$356.2 M CND (\$140 M CND for provincial and territorial custody and \$216.2 M CND for federal custody). The study findings emphasize the need to raise awareness regarding the prevalence of FASD in the correctional system. It is crucial to incorporate FASD screening and intervention strategies as early as possible in the criminal justice process.

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1. Introduction

Despite public health prevention efforts, the prevalence of drinking during pregnancy remains high around the world. For instance, the prevalence of drinking alcohol during pregnancy among the general population has been reported to be: 14% in Canada (PHAC, 2005a), 30% in the United States (Ethen et al., 2009), 33% in the United Kingdom (Dex & Joshi, 2005), 83% in Russia (Kurianova, Bolotnikova, & Udodova, 2006), and 89% in Ireland (Donnelly et al., 2008). Alarming-ly, the prevalence of binge drinking (which is the most harmful pattern of consumption) during pregnancy has been reported to be: 7.4% in Russia (Kristijanson, Wilsnack, Zvartau, Tsoy, & Novikov, 2007), 8.3% in the United States (Ethen et al., 2009), and 9.5% in Sweden

(Magnusson, Göransson, & Heilig, 2005). Moreover, the prevalence of alcohol consumption and binge drinking has been reported to be much higher among high-risk women (Jagodzinski & Fleming, 2007; Kelly et al., 2011; Muckle et al., 2011).

Prenatal alcohol exposure significantly increases the risk of adverse health outcomes for the infant, including Fetal Alcohol Spectrum Disorder (FASD). FASD is a non-diagnostic umbrella term that covers several alcohol-related diagnoses, including: Fetal Alcohol Syndrome (FAS), Partial FAS (pFAS), Alcohol-Related Neurodevelopmental Disorder (ARND), and Alcohol-related Birth Defects (Chudley et al., 2005; Stratton, Howe, & Battaglia, 1996). The unifying outcome for FASD is congenital damage to the central nervous system, which is variably associated with a wide range of disadvantageous outcomes.

The consequential neuropsychological impairments often result in increased risk for multiple adverse health and social consequences over the course of development. Most affected individuals require a wide range of assistance from multiple service systems, including health care, community organizations, remedial education, and others. In addition, individuals with FASD have an increased risk of developing secondary disabilities, such as mental health problems, trouble with the law, school drop-outs, unemployment, homelessness, and/or alcohol

Abbreviations: ARND, Alcohol-Related Neurodevelopmental Disorder; FAE, Fetal Alcohol Effects; FAS, Fetal Alcohol Syndrome; FASD, Fetal Alcohol Spectrum Disorder; IAU, inpatient assessment unit; pFAS, Partial Fetal Alcohol Syndrome.

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and other drug problems (Streissguth et al., 2004). When combined with the person's primary deficits, these secondary disabilities increase the complexity of care and result in significant social and economic costs to society (Abel & Sokol, 1987; Harwood, 2000; Legge, Roberts, & Butler, 2001; Lupton, Burd, & Harwood, 2004; PHAC, 2003, 2005b; Popova, Stade, Bekmuradov, Lange, & Rehm, 2011b, 2012a,b,b, 2014a, b; Popova, Lange, Burd, Shield, & Rehm, 2014b; Popova, Lange, Burd, Urbanoski, & Rehm, 2013b; Popova et al., 2013a; Popova, Stade, Lange, & Rehm, 2012b; Popova, Lange, Burd, & Rehm, 2012a, 2014a; Stade et al., 2009).

The connection between FASD and involvement with the juvenile/criminal justice system has not yet been rigorously studied. However, it is a well-known fact that individuals with FASD experience a wide range of primary and secondary disabilities, which may increase the risk of involvement with the legal system, either as offenders or victims (LaDue, 1993; LaDue & Dunne, 1997; Olson, Streissguth, Bookstein, Barr, & Sampson, 1994; Streissguth, LaDue, & Randels, 1988). As a consequence of organic brain damage due to prenatal alcohol exposure, individuals with FASD experience cognitive and behavioral problems, inhibition, poor judgment, and gullibility, as well as mental illness, substance abuse and dependence, unemployment, housing instability, and poverty (LaDue, 1993; LaDue & Dunne, 1997; Olson et al., 1994; Streissguth et al., 1988, 2004).

Further, the reported high prevalence of individuals with FASD within criminal justice systems supports the link between FASD and criminality (Fast, Conry, & Looock, 1999; MacPherson & Chudley, 2007; Murphy, Chittenden, & The McGeary Centre Society, 2005; Streissguth & Kanter, 1997). It has been reported that among a sample of 253 adolescents and adults (12 to 51 years old) with FASD, 60% reported having ever been in trouble with the law in their lifetime, and 35% reported having ever been incarcerated for a crime (Streissguth et al., 2004). The most frequent category of law violations was reported to be crimes against persons (45%), which included shoplifting or theft (36%), assault (17%), burglary (15%), and domestic violence (15%; Streissguth et al., 2004). The authors of the current study recently estimated that youths with FASD in Canada are 19 times more likely to be incarcerated than youths without FASD (Lange, Rehm, Bekmuradov, Mihic, & Popova, 2012; Popova, Lange, Mihic, Bekmuradov, & Rehm, 2011a).

There are only a few studies in Canada and the USA that have attempted to estimate the overall cost associated with FASD (no studies exist for any other country; Popova et al., 2011b, 2012b). In the existing cost analyses (Abel & Sokol, 1987, 1991a,b; Harwood, 2000, 2003; Harwood & Napolitano, 1985; Harwood, Napolitano, & Kristiansen, 1984; Harwood, Fountain, & Livermore, 1998; Rice, 1993; Rice, Kelman, & Miller, 1990, 1991; Weeks, 1989), the cost to correctional systems has not been included. As a result, the existing cost estimates for FASD are likely to be underestimated (Fast & Conry, 2009; Lupton et al., 2004).

The primary reason for not including the cost of law enforcement associated with individuals with FASD in previous Canadian studies is that there are no official FASD-specific data collected or reported in Canada on the prevalence of FASD in the criminal justice system or the associated cost (either by Statistics Canada or any other organization). A further challenge is that there are no widely used or standardized screening and diagnostic tools to identify the number of individuals with FASD within the justice system, along with the added difficulty of assessing adults for FASD (Boland, Chudley, & Grant, 2002; Fast & Conry, 2004). However, there are a few quick and easy to administer screening tools that have been developed and validated in this population, including the FASD checklist (Burd, Klug, Li, Kerbeshian, & Martsof, 2010) and the Asante Centre for Fetal Alcohol Syndrome Probation Officer Screening & Referral Form (The Asante Centre for Fetal Alcohol Syndrome, 2010).

The current study is part of a large economic project that is working towards estimating the overall burden and cost associated with FASD in Canada (Popova et al., 2012a, 2013a,b, 2014a,b). Until now, an

estimation of the direct cost of corrections associated with individuals with FASD has not yet been undertaken for Canada, or for any other country.

2. Method

The burden and cost of corrections associated with individuals with FAS, as the most severe form of FASD, were estimated separately. However, it is important to note that the figures presented for FASD are inclusive of those for FAS.

2.1. Youths and adults with FAS and FASD in custody of the criminal justice system in Canada in 2011/2012

In order to estimate the number of youths and adults with FAS and FASD in custody in Canada in 2011/2012, the prevalence of youths and adults with FAS and FASD in the criminal justice system, obtained from a review of the available Canadian literature (Popova et al., 2011a; Table 1), was applied to the average number of youths and adults in custody in 2011/2012 (Statistics Canada, 2013a,b,c).

The number of adults with FAS and FASD in custody was then estimated separately for provincial and territorial custody (by province and territory) and federal custody. However, given that youth offenders do not get admitted to federal custody, the number of youths with FAS and FASD in custody was estimated for in provincial and territorial custody only.

2.2. Youths and adults with FAS and FASD in custody by province/territory

The number of youths and adults with FAS and FASD by province and territory was estimated based on the reported overall distribution of offenders by provincial and territorial correctional services in 2011/2012 (Statistics Canada, 2013a,c).

2.3. Youths and adults with FAS and FASD in custody by sex

In order to estimate the number of youths and adults with FAS and FASD in custody by sex, a male-to-female ratio of 78% to 22% among youths and 89% to 11% among adults was applied to the number of youths and adults with FAS and FASD in custody, respectively (Canadian Centre for Justice Statistics, 2012a,b).

2.4. Cost of corrections

The Canadian Centre for Justice Statistics (2012a) reports that on average the daily cost in 2010/2011 to imprison an inmate was \$171 and \$357 for provincial and territorial custody and federal custody, respectively. Provincial and territorial cost estimates did not include data from the Yukon and Nunavut. Federal costs are higher than provincial and territorial costs due to the higher levels of security required at these institutions, as well as long-term specialized programming that is offered (Johnson, 2004).

Given that 2011/2012 cost data were not available, the 2010/2011 cost figures were adjusted for inflation using the inflation calculator of the Bank of Canada (<http://www.bankofcanada.ca/rates/related/inflation-calculator/>). Therefore, the cost to imprison an inmate was estimated to be \$172 per day (about \$62,930 per year) and \$360 per day (about \$131,382 per year) for provincial and territorial custody and federal custody, respectively. The assumption that youths and adults were in custody for one year was made.

All cost figures are presented in Canadian dollars.

3. Results

According to Statistics Canada, the average number of individuals in custody on any given day in 2011/2012 in Canada was 39,087 adults

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