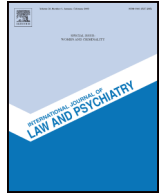


Contents lists available at ScienceDirect

# International Journal of Law and Psychiatry



## Fetal Alcohol Spectrum Disorder and the criminal justice system: A systematic literature review☆



Katherine Flannigan <sup>a,\*</sup>, Jacqueline Pei <sup>a,b</sup>, Michelle Stewart <sup>a,c</sup>, Alexandra Johnson <sup>a,c</sup>

<sup>a</sup> Canada Fetal Alcohol Spectrum Disorder Research Network, PO Box 11364 Wessex PO, Vancouver, BC V5R 0A4, Canada

<sup>b</sup> Department of Educational Psychology, University of Alberta, 6-102 Education North, Edmonton, AB T6G 2G5, Canada

<sup>c</sup> Department of Justice Studies, University of Regina, 3737 Wascana Parkway, Regina, SK S4S 0A2, Canada

### ARTICLE INFO

#### Article history:

Received 28 April 2017

Received in revised form 12 December 2017

Accepted 12 December 2017

Available online xxxx

© 2018 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

### Contents

1.	Introduction . . . . .	42
1.1.	Fetal Alcohol Spectrum Disorder . . . . .	42
1.2.	FASD and the justice system . . . . .	43
2.	Current study . . . . .	43
2.1.	Rationale . . . . .	43
2.2.	Objectives . . . . .	43
3.	Method . . . . .	43
3.1.	Eligibility criteria . . . . .	43
3.2.	Information sources and search terms . . . . .	44
4.	Results . . . . .	44
4.1.	Research findings and synthesis . . . . .	44
4.1.1.	Prevalence, screening, and cost . . . . .	44
4.1.2.	Offender profiles and perspectives . . . . .	48
4.1.3.	FASD knowledge and awareness among justice professionals . . . . .	49
4.1.4.	Impact of FASD in the courtroom . . . . .	49
5.	Discussion . . . . .	50
5.1.	The state of the evidence . . . . .	50
5.2.	Implications for policy, practice, and moving forward . . . . .	50
5.3.	Future research . . . . .	50
6.	Conclusion . . . . .	51
	References . . . . .	51

☆ This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. The authors would like to thank the Canada Fetal Alcohol Spectrum Disorder Research Network and the University of Regina's President's Publication Fund that made it possible to have this article available widely through Open Access.

\* Corresponding author.

E-mail address: [katy.flannigan@canfasd.ca](mailto:katy.flannigan@canfasd.ca) (K. Flannigan).

### 1. Introduction

#### 1.1. Fetal Alcohol Spectrum Disorder

Fetal Alcohol Spectrum Disorder (FASD) is a term used to describe a range of neurodevelopmental deficits that can occur as a result of prenatal alcohol exposure (PAE) (Chudley et al., 2005). Individuals with FASD may

present with a wide range of difficulties including impairments in memory, attention, visual–spatial abilities, executive functioning, processing speed, intelligence, academic achievement, language, and social-emotional and behavioural functioning (Mattson, Crocker, & Nguyen, 2011; Mattson & Riley, 1998; Olson, Feldman, Streissguth, Sampson, & Bookstein, 1998). Prevalence estimates range from 1 to 5% in North America and the Western world (May et al., 2009; Stade et al., 2009), and even higher in other parts of the world (Lange et al., 2017).

FASD is often associated with significant postnatal environmental adversity. For instance, children with FASD and PAE are overrepresented in the foster care system (Lange, Shield, Rehm, & Popova, 2013) and are at risk for living in multiple placements (Smith, Johnson, Pears, Fisher, & DeGarmo, 2007). These children are also at risk for experiencing maltreatment such as physical and sexual abuse, neglect before the age of 6 years (Smith et al., 2007), as well as malnutrition (Fuglestad et al., 2013). Possibly reflecting the dual impact of the cognitive impairment and environmental adversity faced by individuals with FASD, high rates of negative outcomes are reported for this population. Specifically, disruptions in education, substance use problems, inappropriate behaviours, trouble with the law, and incarceration are reported for this population in numbers much greater than typically expected (Streissguth et al., 2004). Individuals with FASD may also experience elevated rates of addiction, difficulty maintaining stable living arrangements and employment, and mental health disorders (Pei, Denys, Hughes, & Rasmussen, 2011; Streissguth, Barr, Kogan, & Bookstein, 1996).

FASD is a lifelong condition, and can have a large economic impact. The estimated cost associated with caring for one individual with FASD across the lifespan is \$1.1 million in Canada (Thanh & Jonsson, 2009), attributable in large part to health and justice system contact (Popova, Lange, Burd, & Rehm, 2016). Although it is believed that intervention research can provide answers for treating specific challenges and ameliorating negative outcomes for individuals with FASD, the literature examining the effectiveness of interventions with this population is limited (Burd, 2007; Premji, Benzies, Serrett, & Hayden, 2007).

## 1.2. FASD and the justice system

Involvement in the criminal justice system has increasingly emerged as a negative outcome for some individuals with FASD, garnering public, policy, and academic attention. To address this issue, several countries have begun to examine ways in which legislation or policy development can be shaped to better respond to this complex group. In 2010 and 2013, the Canadian Bar Association (CBA) passed resolutions calling on all levels of government to “allocate additional resources for alternatives to the current practice of criminalizing individuals with FASD,” (CBA, 2010) and to “improve access to justice” and accommodate FASD (CBA, 2013). The American Bar Association (ABA, 2012) also passed a resolution in 2012 to support the “passage of laws, and adoption of policies at all levels of government” to better address the needs of those with FASD.

A Consensus Development Conference held in Canada in 2013 brought together hundreds of participants and expert witnesses to focus on legal issues associated with FASD. The expert jury heard testimony, deliberated, and generated dozens of recommendations for reforms in policy and practice, and established the consensus that further evidence is needed (Institute of Health Economics, 2013). Efforts to change the Canadian justice system have also been pursued in the form of amending the Criminal Code, although no bills have been successfully passed to date. The most recent, Bill C-235, was introduced in 2016 to establish FASD as a mitigating factor in sentencing and also grant power to judges to order assessments of individuals suspected to have FASD through expedited processes. Extending beyond these initiatives, the Truth and Reconciliation Commission of Canada (2015) released numerous calls to action related to the ongoing impacts of

colonialism and residential schools on Indigenous populations, two of which focused specifically on FASD: one on prevention and the other on justice reform.

## 2. Current study

### 2.1. Rationale

Offenders with FASD and PAE are believed to be overrepresented in correctional settings, however consistent national prevalence rates of FASD in the criminal justice system are currently not available. Research interest has fostered efforts to shape judicial responses, treatment, and policy development to more closely examine this population and to best reflect their needs, but it is not known whether or how strongly interventions and reforms are grounded in empirical evidence. Whether seeking to amend laws or improve our capacity to meet the needs of clients with FASD, one thing is clear: the global interest in addressing the issues of FASD in the justice system is steadily on the rise. With this heightened attention comes further need to understand the existing evidence to support changes in policy and practice, and to have a clear evidence-based platform on which to guide these changes. In the absence of such evidence, it is possible that changes could not only prove to be ineffective, but may even lead to unanticipated negative outcomes.

### 2.2. Objectives

The objective of this article was to provide a systematic global overview of the available evidence relevant to individuals with FASD or PAE who are involved in the criminal justice system. A further aim was to support discussion of ways in which moving forward can incorporate an evidence-based foundation and to demonstrate how evidence in this area might help direct effective programming to best support individuals with FASD, with impacts extending across sectors. The specific goals were to gather, review, and summarize peer-reviewed research; integrate key findings and themes; discuss the implications of research for policy-makers and practitioners; and identify gaps and limitations in the research. Although there are many important issues related to FASD in the broader context of the justice system (e.g., criminalization of drinking during pregnancy, FASD and family law, litigation against liquor companies, etc.), the scope of the current review was limited specifically to evidence about individuals with FASD and PAE engaged in the criminal justice system.

## 3. Method

To conduct this review, we followed the guidelines described by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Moher, Liberati, Tetzlaff, & Altman, 2009), and registered this study with the PROSPERO international prospective register of systematic reviews (CRD42016053827).

### 3.1. Eligibility criteria

Our preliminary review identified articles that included:

1. human research related to FASD or PAE, and
2. research related to formal criminal justice system involvement

Articles were excluded if they focused on the criminalization of drinking during pregnancy, family law, or child welfare/custody. Articles related to delinquent behaviour rather than formal justice involvement were also excluded. Articles were then reviewed in more detail to determine whether they:

3. had undergone formal academic peer review, and
4. offered new empirical data to the state of the evidence.

At this second level of review, we excluded evaluation reports, conference proceedings, case law, grey literature, dissertations and theses, book reviews, commentaries, and editorials.

Throughout the review process, two researchers independently screened titles and abstracts to determine whether articles met all inclusion criteria. Where there was disagreement, full articles were reviewed and discussed with two additional researchers to obtain consensus.

### 3.2. Information sources and search terms

The literature was reviewed between June 2016 and April 2017 through the following databases: CanLII, Canadian Public Policy Collection, Cochrane Database of Systematic Reviews, ERIC, LegalTrac, National Criminal Justice Reference Service Abstracts Database, PsycINFO, PubMed, Sociological Abstracts, Social Services Abstracts, and Web of Science.

Search terms used to identify potential articles included: ["Fetal Alcohol Spectrum Disorder" OR "FASD" OR "Foetal Alcohol Spectrum Disorder" OR "Fetal Alcohol Syndrome" OR "Foetal Alcohol Syndrome" OR "FAS" OR "prenatal alcohol exposure" OR "alcohol related neurodevelopmental disorder" OR "ARND"] AND ["justice" OR "criminal" OR "offender" OR "victim" OR "legal" OR "law" OR "police" OR "judicial" OR "court" OR "sentencing" OR "mitigating" OR "corrections"].

Reference lists were also screened for additional relevant work.

## 4. Results

Our initial search yielded 1855 potential articles. From these results, 214 duplicates were identified and removed. The remaining 1641 articles were screened, and 160 met the preliminary level of inclusion criteria and were reviewed in more detail. Of the 160 articles meeting the first level of inclusion, 139 articles were excluded at the second level. Screening of reference lists and an updated database search yielded 4 more studies. Following all levels of exclusion, a total of 25 articles remained and were included in the final sample. Just over half (13) of the identified studies were conducted in Canada, six were conducted in the US, two in Australia, two globally, one in Brazil, and one in Sweden.

See Fig. 1 for study selection details depicted in the PRISMA flow diagram, and Table 1 for a summary of study details and key findings.

### 4.1. Research findings and synthesis

#### 4.1.1. Prevalence, screening, and cost

The most heavily researched issues to date related to FASD in the criminal justice system are prevalence, screening, and cost. Dating back to seminal work by Streissguth et al. (1996), efforts to capture the rates of legal troubles in FASD have been at the forefront of research initiatives. In the landmark longitudinal research in the US, caregivers of over 400 individuals with FASD (aged 6–51 years) were surveyed on a range of adverse life outcomes, and researchers found that 14% of children

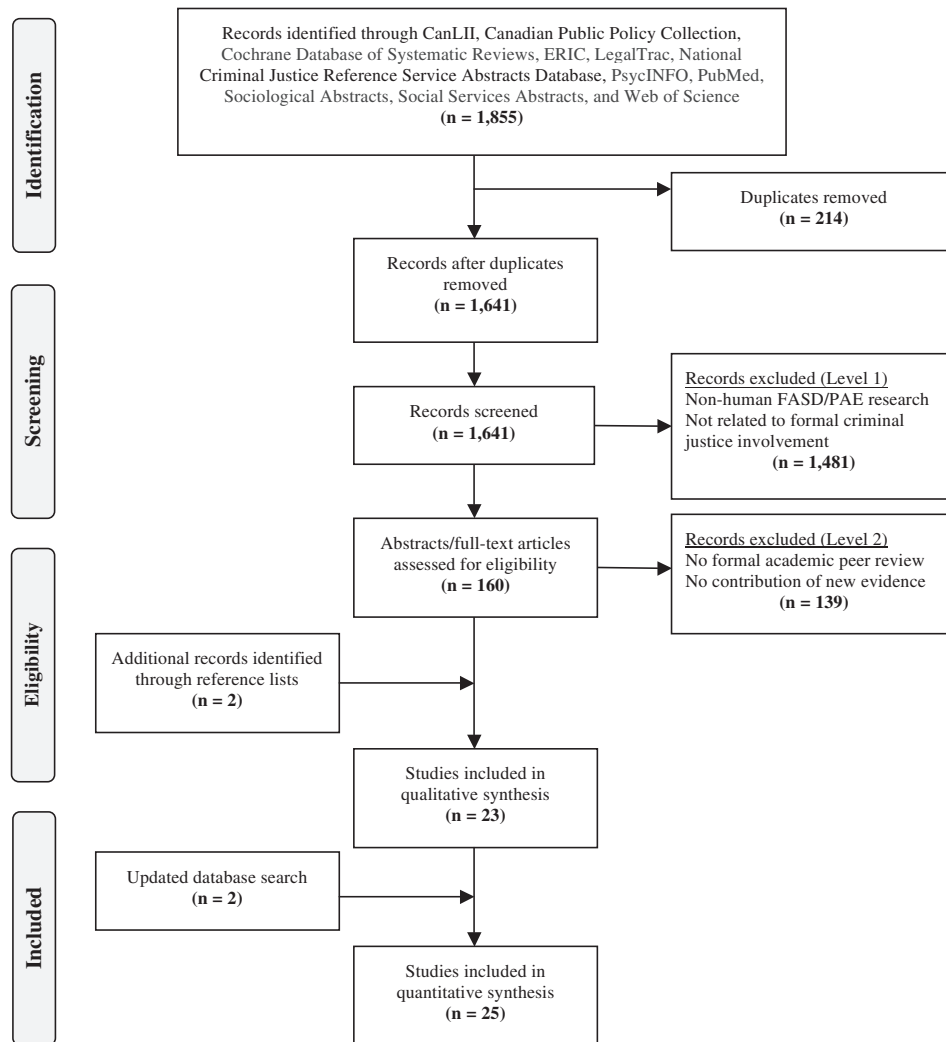


Fig. 1. Study selection PRISMA flow diagram (Moher et al., 2009).

**Table 1**  
Summary of reviewed studies.

Author(s) & date	Country	Study years	Sample size/population	Method	Key findings
<i>Prevalence, screening, and cost</i> Streissguth, Barr, Kogan, and Bookstein (1996) <sup>a</sup>	USA	1992–96	415 individuals with FASD (6–51 years)	Caregiver report	- Trouble with the law was reported in 14% of children and 60% of adolescents/adults - Eligibility for disability services was the strongest protective factor for positive outcomes
Rangmar et al. (2015)	Sweden	2011	79 adults with FAS (18–47 years), 3160 controls	Record-linkage	- No differences in criminal offending were found between FAS and control groups - Conviction rates were lower in the FAS group than in a subgroup of controls placed in state care
Fast, Conry, and Loock (1999)	Canada	1995–96	287 remanded youth (12–18 years)	Inpatient assessment	- 23.3% of youth were diagnosed with alcohol-related disorders
Burd, Selfridge, Klug, and Juelson (2003)	Canada	2001–02	Directors of Corrections from 8 provinces, 3 territories (population estimate of 148,797 inmates)	Survey	- 0.87% of inmates reported to have an FAS diagnosis - No screening programs were identified - Staff reported limited FASD training but strong willingness to learn
Burd, Selfridge, Klug, and Bakko (2004)	USA	2001–02	Directors of Corrections from 42 entities (population estimate of 3.08 million inmates)	Survey	- One inmate reported to have FAS - Very few screening programs and limited access to diagnostic services were reported
Rojas and Gretton (2007)	Canada	1985–2004	359 youth court-ordered for offender treatment (12–18 years)	Client record review	- 11% of youth had confirmed or suspected FASD - Higher rates of FASD were reported in Aboriginal (27%) compared to non-Aboriginal (4%) youth
Popova, Lange, Bekmuradov, Mihic, and Rehm (2011)	Global	2010	6 prevalence studies in youth and adult correctional settings	Systematic literature review	- Research was limited to Canada/US - Prevalence rates were estimated at 0.9 to 23.3% - Canadian data suggested youth with FASD are 19 times more likely than youth without FASD to be incarcerated
Hughes, Clasby, Chitsabesan, and Williams (2016)	Global	2015	4 prevalence studies in youth settings	Systematic literature review	- Research was limited to Canada - Prevalence rates were estimated at 0.9 to 23.3%
Momino et al. (2012)	Brazil	2003–04	262 incarcerated youth, 145 controls (12–21 years)	Medical assessment and maternal questionnaire	- Features of FASD were more common in institutionalized youth than controls, but clinical diagnosis was not possible
Streissguth, Bookstein, Barr, Press, and Sampson (1998)	USA	1994	81 male inmates (12–51 years)	Survey	- Inmates scored lower than an FASD reference group on a screening tool - Higher scores on the tool were associated with higher reported maternal alcohol consumption
Popova, Lange, Burd, and Rehm (2015)	Canada	2011–12	N/A	Cost estimate	- Annual cost of correctional services for youth and adults with FASD in Canada was estimated at \$374 million
Thanh and Jonsson (2015)	Canada	2014	N/A	Literature review and expenditure analysis	- Annual cost of criminal justice in Canada (police, court, and corrections) was estimated at \$1.2 billion - Criminal justice accounted for the greatest proportion of total cost (40%) of FASD
<i>Offender profiles and perspectives</i> Streissguth et al. (1996) <sup>a</sup>	USA	1992–96	~415 individuals with FASD (6–51 years)	Caregiver report	- Most common offense type was crimes against persons - First offense type among participants 12 years and older was shoplifting/theft - Age at first offense was most often 9 to 14 years
Stinson and Robbins (2014)	USA	2014 <sup>b</sup>	235 adult inpatient forensic patients with intellectual disabilities (18–67 years)	Client record review	- Offenders were identified with intellectual disability (cause unknown) (55%), traumatic brain injury (22%), pervasive developmental disability (15%), and FAS (8%) - The FAS group had earlier onset of behaviour problems, and higher rates of impairment, abuse, trauma, and parental substance abuse
McLachlan, Roesch, Viljoen, and Douglas (2014)	Canada	2012	100 young offenders (50 with FASD, 50 without PAE) (12–23 years)	Clinical assessment and database review	- Youth with FASD had significantly higher rates of psycholegal impairment than those in the comparison group
Rogers, McLachlan, and Roesch (2013)	Canada	2012	96 young offenders (47 with FASD, 49 without PAE) (13–23 years)	Survey	- Resilience correlated positively with enculturation and negatively with self-reported offending - No group differences were found in ethnic identity or resilience between youth with and without FASD
Brown, Gudjonsson, and Connor (2011)	USA	2008–09	7 male offenders with FASD (17–53 years)	Forensic assessment	- Participants showed higher suggestibility compared to general population norms - They showed no differences in suggestibility compared to

(continued on next page)

Table 1 (continued)

Author(s) & date	Country	Study years	Sample size/population	Method	Key findings
Currie, Hoy, Legge, Temple, and Tahir (2016)	Canada	2016 <sup>b</sup>	14 adults with FASD (18–41 years), 11 support workers	Semi-structured interview	non-forensic FASD - 8/14 of adults reported criminal history - Justice-involved adults were more likely to use substances and receive diagnosis at later age, and less likely to have FASD-trained support workers and report regular routine, structure, and supervision
Pei, Leung, Jampolsky, and Alsburly (2016)	Canada	2011	9 adults with FASD and criminal justice involvement (24–59 years), 12 justice professionals	Semi-structured interview	- Participants identified risk factors that primed them to enter, and hindered them once involved in justice system - Factors that helped to move participants out of the system were also identified
Tait, Mela, Boothman, and Stoops (2017)	Canada	2017 <sup>b</sup>	2 paroled male offenders with FASD (61 and 66 years)	Case study (interview and photo-voice)	- Participants' lives were characterized by early adversity, trauma, social isolation, instability, and mental illness, but also strength and resilience - A period of stability post-incarceration was followed by gradual withdrawal of supports and eventual deterioration
<i>FASD knowledge and awareness among justice professionals</i>					
Cox, Clairmont, and Cox (2008)	Canada	2005–06	39 justice professionals	Survey	- Participants reported some awareness of FASD, but a desire for more FASD information and training, and access to services
Douglas, Hammill, Russell, and Hall (2012)	Australia	2011	49 members of the judiciary	Survey	- Participants showed some awareness of FASD - They also showed uncertainty about the characteristics and diagnosis of FASD and its relevant to their work, and called for more resources
Mutch, Jones, Bower, and Watkins (2016)	Australia	2012	427 justice professionals	Survey	- Many participants had heard of FASD but were unfamiliar with key features - Most considered FASD to be relevant to their work - Almost all desired more information and resources
Stewart and Glowatski (2014)	Canada	2013	34 police officers	Semi-structured interview	- Participants showed a solid baseline understanding of the causes/consequences of FASD, and some strategies for working with the population - There was also interest in more opportunities for FASD training, education, and information
<i>Impact of FASD in the courtroom</i>					
Douds, Stevens, and Sumner (2013)	USA	Prior to 2011	108 court cases involving evidence related to FASD and PAE	Systematic case law review	- All courts accepted FASD as a relevant issue, particularly in terms of offender capacity - Since 2002, FASD evidence has tended to be considered more heavily, but with more strict and inconsistent interpretation
Chandler (2015)	Canada	2008–12	133 court cases involving neuroscientific evidence	Database review	- FASD and PAE were the most common types of neuroscientific evidence - FASD was framed in some cases as a mitigating factor, but in others as an aggravating factor

<sup>a</sup> This article is summarized under two categories.

<sup>b</sup> Date of data collection was not specified in this article.

(aged 6 to 11 years), 61% of adolescents (aged 12 to 20 years), and 58% of adults (aged 21 to 51 years) were reported to experience trouble with the law, defined as contact with police, authorities, or the judicial system, or history of criminal arrests, charges, and/or convictions (Streissguth et al., 1996). Additionally, 35% of participants 12 years or older had a history of criminal incarceration, with higher rates of trouble with the law among males compared to females across age groups.

A common approach to establishing prevalence rates has been to look within correctional settings. In 1999 Fast, Conry, and Looch examined the prevalence of FASD in a Canadian youth forensic psychiatry inpatient population by evaluating adolescents aged 12 to 18 years ( $n = 287$ ) who had been remanded for psychological or psychiatric assessment between 1995 and 1996. Based on their assessments, the authors reported that 23.3% of youth were diagnosed with an alcohol-related disorder under the FASD umbrella, with 1% of the total study population receiving a diagnosis of Fetal Alcohol Syndrome (FAS), 18.1% diagnosed with partial FAS (pFAS), and 4.2% with alcohol-related neurodevelopmental disorder (ARND) (3 youth had already been diagnosed with FASD prior to the assessment). The authors suggested that these findings provided evidence for the overrepresentation of youth with FASD in the correctional system, and called for increased FASD awareness, recognition, and clinical training among health and justice system professionals.

In 2003, Burd, Selfridge, Klug, and Juelson surveyed Canadian Directors of Corrections using a brief questionnaire designed to elicit information about the total size of the prison population, FAS screening methods, diagnostic resources, staff awareness of FAS, and the number of identified FAS cases. Directors from 11 provinces and territories responded, and only 0.087 of 1000 offenders were reportedly diagnosed with FAS. In the Yukon territory, the prevalence rate was somewhat higher than this average, with 2.6% of offenders reportedly diagnosed with FAS (Burd et al., 2003). Respondents from most jurisdictions reported that access to FAS screening and diagnostic services were limited, and expressed a critical need for enhanced staff training and increased awareness. The same group of researchers conducted a similar study in the US in 2004, surveying Directors of Corrections from 39 states (Burd et al., 2004). Among >3 million inmates in the US system, only one was reportedly diagnosed with FAS. Opportunities for staff training were reported to be even scarcer in this study, and availability of screening and diagnostic services was limited.

In another Canadian study, Rojas and Gretton (2007) explored the backgrounds, offense types, and criminal outcomes of 359 youth (aged 12–18 years) mandated to attend an outpatient sexual offense treatment program. Data on participant histories was obtained through

retrospective file review, and approximately 11% of youth in the study were reportedly diagnosed with, or suspected of having, FAS or Fetal Alcohol Effects (FAE). Youth identified as Aboriginal were significantly more likely to show evidence of FASD (26.9%) than non-Aboriginal youth (4.3%). No analyses were conducted to compare offense types or criminal outcomes of youth with and without FASD.

Popova et al. (2011) conducted a systematic global literature review of published and unpublished research on the prevalence of FASD in correctional settings. The authors reviewed scholarly articles, conference proceedings, unpublished research available in the public domain, government reports, and books. A total of six studies were identified, all conducted in North America (five in Canada and one in the US), using various methodologies and focusing on both youth and adult populations (note that four of these studies are articles discussed in more detail in the current review). The reviewed studies provided prevalence estimates ranging from 0.9% to 23.3%. Due to the limited availability of data in the US, the authors reported that it was not possible to accurately estimate the prevalence of FASD in the US justice population. However, based on existing Canadian data, the authors concluded that youth with FASD are 19 times more likely to be incarcerated in a given year than youth without FASD. Furthermore, they reported that the rate of *undiagnosed* FASD in correctional settings may be substantially higher than already identified, and pointed out the need for more rigorous research with larger sample sizes, participants with confirmed rather than suspected diagnoses, and greater generalizability. In 2016, Hughes, Clasby, Chitsabesan, and Williams, conducted a similar systematic literature review on FASD prevalence in the youth criminal justice system. Most (three of four, all Canadian) of the studies reviewed by these authors overlap with those reviewed by Popova et al. (2011), however one additional non-academic project included in the study indicated that 21% of youth aged 14 to 19 years who were surveyed in custody centers in the province of British Columbia ( $n = 114$ ) self-reported to have been diagnosed with FASD.

Outside of North America, one study was conducted by Brazilian researchers to examine the prevalence of “FAS signs” in a population of 262 institutionalized male young offenders (aged 13 to 21 years) compared to a control group of youth attending local public schools (Momino et al., 2012). Features of FAS were defined as growth deficiency, facial dysmorphology, neurodevelopmental impairment (measured by head circumference and non-verbal intelligence), and PAE. Maternal alcohol consumption was comparable across groups (48.4% in the offender group, 39.9% in the control group), however there were conflicting findings in terms of growth and facial abnormalities, with more evidence of FAS in the offender group for height and inner canthal distance, no group differences in philtrum length, and more evidence of FAS in the control group for palpebral fissures. In terms of neurodevelopmental signs of FAS, head circumference was not significantly different between groups, but the offender group showed significantly lower scores on the non-verbal IQ test. Based on these results, the authors concluded that overall, there was greater evidence of FAS in the institutionalized young offenders than the control group, but clinical diagnosis of specific cases of FAS was not possible.

Other researchers have recently challenged the notion that individuals with FASD may have significantly higher rates of criminal involvement. In their study of 79 Swedish adults (aged 18–47 years) diagnosed with FAS as infants or children, Rangmar et al. (2015) reported a range of significantly poorer psychosocial outcomes in the FAS group that did *not* include criminality (compared to a control group of 3160 adults matched on age, gender, and place of birth). Specifically, despite somewhat higher rates of criminal conviction in the FAS group (28%) than the control group (20%), these differences were not statistically significant. In fact, when compared to a smaller subgroup ( $n = 122$ ) of control participants who had been placed in the care of the state, the FAS group actually had significantly *lower* rates of criminal convictions ( $p < .001$ ). Importantly, the authors emphasized that all of the adults with FAS in this study had been diagnosed at a young age, and

many had received financial support, were connected to social workers, and attained relatively high levels of education, which may have protected against criminal outcomes.

In light of the need to establish more accurate prevalence rates of FASD across settings, there have been some notable efforts to develop methods for screening and identifying FASD, however only one study was identified where researchers empirically evaluated a screening tool in a correctional environment. Streissguth et al. (1998) applied this approach in the US as they developed the Fetal Alcohol Behavior Scale (FABS). As part of the development of this screening tool, the researchers assessed its ability to detect individuals with FASD among a general population of adult inmates aged 12 to 51 years ( $n = 81$ ). Corrections officers and prison counsellors completed the FABS, and their scores were compared to FABS scores from a large FASD reference group as well as self-report information from inmates about whether their biological mothers had histories of alcohol use problems. The overall sample of inmates scored lower on the FABS (indicating lower rates of FASD behaviours) than the FASD reference sample, however inmates receiving the highest scores on the FABS (indicating more FASD behaviours) reported that their biological mothers experienced problems with alcohol. These results suggest that the FABS may have some utility in identifying offenders with “presumed” PAE, but more research is needed to make a stronger link between the FABS and clinical diagnosis of FASD.

At this time, there is no clear consensus around the prevalence rate of FASD within the criminal justice system, in any country, nor are there any validated evidence-based methods for screening offenders for FASD. Although emerging evidence suggests that rates of FASD are high among both youth and adult offenders, this data is far from consistent. Instead, diagnostic challenges, data collection approaches, and geographic factors limit the available evidence. Even more limited is data related to alternative justice responses to offenders with FASD and the number of individuals who may be diverted around the traditional justice system.

Researchers have recently begun to explore the cost of justice involvement in FASD, however inquiry has been limited thus far to the Canadian context. Two studies were undertaken in 2015 to examine this topic, the first of which was published by Popova, Lange, Burd, and Rehm. These researchers estimated the economic impact of FASD on the Canadian correctional system in 2011/2012 based on epidemiologically established FASD prevalence rates as well as the average daily cost of incarceration. They suggested that the overall cost of FASD among youth and adult offender populations is \$374 million, with \$18 million attributable to youth and \$356 million to adult corrections. Thanh and Jonsson (2015) conducted another economic impact study through a review and meta-analysis of the literature, basing their estimates on FASD prevalence rates and research on the costs of crime, including policing, court procedures, corrections, and costs for victims of crime and other third party suffering. The total estimated cost of FASD to the Canadian criminal justice system was \$3.9 billion dollars/year, with \$1.2 billion attributed to police, \$422 million to court, \$486 million to corrections, and the remaining \$1.8 billion to the cost for victims (\$160 million for health care, \$748 million for productivity losses, \$683 million for stolen or damaged property) and third-party sufferers (\$234 million). Considering these numbers in the context of the overall cost of FASD to society, the authors proposed that the criminal justice system accounts for approximately 40% of the total economic impact of FASD in Canada.

Emerging justice cost estimates associated with FASD are clearly alarming, and are contributing to the current interest in this area of inquiry. However, the evidence to date is emergent and geographically limited, and often based on estimation techniques rather than collected data. Although this is a reasonable starting point, further research is needed. One priority for this work will be to balance the “need for numbers” with strengths-based inquiry to avoid perpetuating stigma that can also potentially aggravate risk factors for negative outcomes in this population.

#### 4.1.2. Offender profiles and perspectives

A number of researchers have sought to explore the profiles and perspectives of offenders with FASD to better understand and characterize this population. Although very little research has been conducted to explore the specific nature or pattern of offending behaviour among individuals with FASD, one group of researchers have provided preliminary data in this area. [Streissguth et al. \(1996\)](#) found that among individuals with FASD aged 6 to 51 years ( $n = 407$ – $412$  depending on the age group), crimes against persons (i.e., theft, burglary, assault, and murder) were the most common types of offenses. For individuals 12 years and older ( $n = 151$ ), the type of *first* crime was most often theft or shoplifting. Most first crimes were committed between the ages of 9 and 14 years, and almost all were committed before age 20. Among participants 12 years and older, sentencing outcomes were most often juvenile justice and juvenile detention, and the most common alternative sentencing approaches were probation and community service. Importantly, [Streissguth et al. \(1996\)](#) also explored protective factors, and found that staying in school and absence of substance abuse problems were related to lower rates of trouble with the law for individuals with FASD.

In a broader examination of disability among offenders, [Stinson and Robbins \(2014\)](#) conducted a study with 235 adults (aged 18 to 67 years) in a secure US forensic psychiatric hospital. Participants with intellectual or cognitive disabilities were identified through review of hospital records, and categorized based on diagnosis. Within the study population, 55% were identified with intellectual disability (cause unknown), 22% with traumatic brain injury, 15% with pervasive developmental disability, and 8% with FAS. Compared to other groups of offenders with disabilities, those with FAS experienced an earlier onset of problem behaviours, and higher rates of functional impairment, childhood abuse, maltreatment (especially sexual abuse and victimization), multiple complex traumas, and parental substance abuse.

Two studies were identified in which researchers characterized youth involved in the justice system, both in Canada. [McLachlan et al. \(2014\)](#) compared the psycholegal abilities of young offenders with and without FASD, specifically related to interrogation and adjudication processes. A group of 100 youth (50 with FASD and 50 without), aged 12 to 23 years, were evaluated to determine differences between the two groups, and their understanding of their rights and fitness to stand trial. Compared to young offenders without FASD, those with FASD received their first formal criminal charge earlier. Youth with FASD also displayed substantially greater impairments than youth without FASD in their ability to appreciate and understand their rights related to arrest, interrogation, and court procedures, and significantly poorer ability to adequately communicate with counsel. Interestingly, despite these impairments, youth with FASD rated their understanding and confidence about their rights as similar to the comparison group. Across groups, the researchers found that lower IQ and reading ability were predictors of psycholegal impairment. In conclusion, [McLachlan et al. \(2014\)](#) emphasized the necessity of assessing and supporting these abilities in young offenders. They also noted that not all young offenders with FASD showed psycholegal impairments, highlighting that an individualized approach is warranted when working with all justice-involved youth.

With the same sample of Canadian youth, [Rogers et al. \(2013\)](#) conducted a study to examine and compare self-reported resilience, enculturation, and offense history between young offenders with and without FASD. Across groups, ethnic identity was found to correlate positively with resilience, and there were no group differences with respect to either factor (both groups scored similar to the normative data on these measures). The authors also found a negative correlation between resilience and lifetime self-reported offending across all young offenders, and FASD diagnosis did not moderate this relationship. Although the overall trends in enculturation, resilience, and offense history were similar across groups, the authors noted several relevant group differences. For youth with FASD, cultural and spiritual factors

appeared to be most important to the relationship between enculturation, resilience, and offending, whereas individual-level characteristics and caregiver supports were more relevant for youth without FASD. This study represents an important contribution to the strengths-based FASD literature, and identifies potential targets for building resilience and reducing offending.

In the adult population, [Brown et al. \(2011\)](#) conducted a small pilot study ( $n = 7$ ) in the US to explore interrogative suggestibility among male offenders aged 17 to 53 years who were referred for FASD assessment as part of their criminal proceedings. Performance on a measure of suggestibility was compared to norms established in other countries (UK and Iceland) as well as to scores obtained on the same measure by a small ( $n = 8$ ) non-forensic FASD sample in the US (unpublished study). The forensic FASD population displayed significantly greater suggestibility overall compared to the general norm, though there were fewer group differences when compared to adults without FASD who were court-referred. Moreover, the forensic and non-forensic FASD populations obtained similar suggestibility scores, leading the authors to conclude that the heightened suggestibility apparent in FASD may be an inherent characteristic of the disorder rather than situation-specific. The authors acknowledged the significant limitations of this study, including its small sample size and preliminary nature, but highlighted the potential important implications of this work and the need for further research in the area.

Recent work in Canada has been undertaken to explore the perspectives of adult offenders with FASD in order to better understand what factors might influence long-term outcomes. [Currie et al. \(2016\)](#) interviewed 14 adults with FASD (aged 18–41 years) and their support workers ( $n = 11$ ) to explore what services were being accessed and which were perceived as effective in supporting positive outcomes. Eight of the 14 adults reported justice involvement, which was more likely to occur alongside substance use, lack of access to a support worker trained in FASD, and less daily structure, routine, and supervision. Justice involvement was also more likely for adults diagnosed with FASD later in life: none diagnosed before the age of 8 years were justice-involved, whereas 67% of those diagnosed between the ages of 11 and 18 years, and 80% of those diagnosed after age 20 years were justice-involved. The authors discussed the implications of these findings, emphasizing early diagnosis, help with addictions, enhanced FASD training for caregivers and service providers, consistent structure and supervision, and vocational opportunities as potential avenues for fostering successful outcomes.

[Pei et al. \(2016\)](#) explored the perspectives of another group of Canadian adult offenders with FASD ( $n = 9$ , aged 24–59 years) and FASD service providers ( $n = 12$ ) experienced in working with adults with FASD in conflict with the law. Semi-structured interviews were conducted to identify factors that influence involvement with the justice system. Participants discussed factors that primed individuals to enter the system and hindered them once within the system, which included biological (deficits in verbal ability and decision-making, lack of self-awareness and foresight, inability to self-advocate, and limited understanding of court processes and expectations), psychological (mental illness, addictions, and instability), and social factors (early trauma and adversity, lack of social and community support, poor social skills, inappropriate treatment, and high risk lifestyle). Participants also identified factors that helped them to move beyond the system, such as hope for a better future, willingness to change, and resilience. Based on these findings, the authors made practical recommendations for ameliorating outcomes, including providing access to stable housing, better case management, improved assessment and diagnosis, moving away from punishment to strengths-based approaches, and increasing awareness, education, and training among justice system professionals.

Most recently, Canadian researchers published a case study of two paroled male offenders with FASD and comorbid psychiatric illness, describing their histories and lived experiences ([Tait et al., 2017](#)). Despite that the men achieved some stability post-incarceration, this was short-lived and the lack of adequate support eventually led to deterioration and

breakdown. The authors highlighted the early adversities, complex histories, social alienation, vulnerability, and service gaps that these individuals experienced, and the failure of our current system to prevent these types of experiences and outcomes. They also suggested that the life histories of these individuals may resemble the experiences of other offenders with FASD and comorbid mental illness. Importantly, the authors commented on the notable strength and resilience of these men in overcoming the adversities they faced. Finally, they called for services to continue working towards integration, flexibility, and promptness, and suggested that clinical and mentorship support, as well as prioritization of stable housing, employment opportunities, crisis and relapse prevention, and supervision are critical for this population.

At this time, no unique profile has been established for the offender with FASD. Instead, researchers have reported high levels of adversity and other factors as playing a significant role in elevating risk in any offender. That said, it has begun to emerge that the cognitive impairment and other complex needs associated with FASD, although not clearly associated with risk determination, may have an impact on how the individual engages with the justice system, experiences elevated vulnerability once in the system, and may respond differently to intervention efforts and other supports. An integrated and individualized response to offenders with FASD is indicated, and in particular researchers are pointing to the importance of meeting complex needs and addressing core underlying issues rather than simply applying a punitive approach to criminal actions. More research examining trajectories of individuals with FASD in the justice system is desperately needed to inform next steps. The intersecting and contributing factors for justice involvement must also be attended to, including but not limited to poverty, struggle for housing, racialized practices, and concurrent disabilities or mental health challenges.

#### 4.1.3. FASD knowledge and awareness among justice professionals

Several researchers have explored FASD knowledge and awareness among justice professionals, and the implications of this knowledge on practice. Cox et al. (2008) conducted the first study in this area by surveying a group of Canadian judges and crown prosecutors ( $n = 39$ ). Although 75% of respondents reported having encountered individuals with FASD, only 40% of judges and 26% of prosecutors reported that they were prepared to deal with an individual with FASD in their practice. The majority of judges (74%) called for increased availability of FASD research and information, with 74% requesting a list of diagnosticians for the purpose of referral, 74% desiring better diagnostic information, and 53% seeing value in the establishment of a diagnostic centre. Most (68%) prosecutors also called for more research, almost half (43%) saw value in developing practice guidelines, and many (37%) spoke to the need for increased availability of diagnostic information. Only 8% of participants reportedly knew where they could refer an individual for FASD diagnosis, and only 3% knew where to refer an individual for treatment of FASD-related conditions. The authors concluded that although judges and prosecutors have some knowledge of FASD, there is a substantial desire and need for increased education and training.

Using a survey based on that developed by Cox et al. (2008), Douglas et al. (2012) solicited the views of 49 Australian judiciary members to explore their understanding of FASD and examine how they work with FASD in their judicial role. Most (80%) respondents reported that they had heard of FASD, although none had learned about it through university, 45% had heard of it in the media, 26% from a legal practitioner, 21% through a conference, and 16% from a client or other party to a proceeding. Most (84%) respondents also knew that FASD resulted from PAE, however they had less understanding of the cognitive and physical consequences of the disorder. Most (75%) respondents acknowledged that FASD is important to their judicial work, though 50% also suggested that they had never seen a party or witness with FASD appear before them in court, and 31% noted that they had never suspected an individual before them in court may have an FASD diagnosis. When judges did suspect an individual to have FASD, the most

common reasons were low IQ, low attention, or knowing that the individual's mother struggled with substance use. Very few (18%) judicial members had ever sent an individual for assessment to confirm FASD. Overall, most (85%) participants reported a need for further information, including guidelines on dealing with FASD (85%), information on referring individuals for diagnosis or treatment (77%), more research on FASD (53%), and access to a list of FASD experts (47%).

In another recent Australian study, Mutch et al. (2016) administered an online survey to assess FASD knowledge among 427 justice professionals. Participants represented multiple areas of justice, including judicial officers, lawyers, correctional staff, and police. Most (85%) respondents reported that they had heard of FAS, whereas fewer (60%) had heard of FASD. Half (50%) of the participants reported a basic understanding of the impact of FASD on children and adults with the disorder. Many (45–67%) reported that they had learned of FASD through the media, and other sources of information about FASD were colleagues and pre-sentence reports. Formal education on FASD was most commonly reported among correctional officers (35%) compared to only 8% of the other professions. Most (75–96%) professionals understood that PAE was a key feature of FASD, many (54–80%) recognized the psychological features, and approximately half (42–50%) reported physical features to be a distinguishing factor. Interestingly, few (11–25%) respondents acknowledged that FASD is a permanent disability. Almost all (92–97%) of the judiciary, legal, and corrections participants reported the desire for more information about FASD, whereas only 57% of police officers reported the same need. Many respondents reported that increased knowledge of FASD would assist them in their work, with this sentiment being most common for judicial officers (85%) and least common for legal professionals (52%). Approximately two-thirds (60–67%) of judicial, legal, and correctional participants had previously suspected FASD among their clients, and this was less common for police (43%). Despite these experiences of suspecting FASD, only 27% of judicial officers reported that they would send a client for assessment, and even fewer (0–17%) of the other respondent groups reported this practice, possibly due in part to having no clear mechanism or pathway for referral. Nearly all lawyers and police officers (92–100%) reported that alternative or diversionary practices would benefit individuals with FASD.

Beyond the courtroom, Stewart and Glowatski (2014) conducted semi-structured interviews with 34 front-line police officers to explore their understanding of FASD and related challenges in a Canadian context. The vast majority (97%) of respondents were able to provide a definition of FASD, and participants were also able to articulate potential outcomes associated with PAE and specific behaviours related to these outcomes. Most respondents possessed some knowledge of strategies to work with individuals with FASD, but they reported that this knowledge came primarily from front-line experience or experience outside of their occupation. They reported having received little to no formal FASD training, but expressed interest in accessing more information and training in the area.

Overall, a review of the research to date suggests that despite some level of awareness of the pervasiveness of FASD in correctional, legal, and judicial settings, there appears to be a lack of adequate training and practice guidelines to assist this work. There is a need for increased opportunities for capacity building, access to information and clinical services, and collaboration across disciplines to prepare justice professionals for responding appropriately to individuals with FASD. It will also be critical to consider what information should be provided to professionals, and to ensure that training initiatives are evidence-based and evaluated to support evolution towards guidelines that shape practice in meaningful and effective ways.

#### 4.1.4. Impact of FASD in the courtroom

Douglas et al. (2013) conducted a systematic review of 108 federal cases in the US prior to 2011 (the majority occurred after 2005) in



which a party or witness was reported to have FASD or PAE. Their results indicated that although all courts accepted FASD as relevant, there was disagreement on the persuasive value and effect of evidence of FASD/PAE. FASD was often considered alongside other mental health issues and in relation to claims of diminished capacity, and it was determined in many cases to be relevant but insufficient in and of itself to assert claims of incapacity. Due to inconsistencies across courts, the authors concluded that there is a substantial need for FASD education and awareness among justice professionals.

In the Canadian context, another study was recently conducted by Chandler (2015) to examine how neuroscientific evidence has been used in the criminal justice system, and the impact of neuroscience as evidence on judicial response. The author reviewed case law from 133 cases between 2008 and 2012 in which neuroscientific evidence was considered as it relates to responsibility and risk of recidivism. FASD was identified as one of the three most common types of neuroscientific evidence mentioned. Chandler reported that in some instances, a diagnosis of FASD may mitigate blame-worthiness, but in other cases, judges reasoned that in the absence of a “cure” for FASD, incarceration was required in the interest of protecting the public.

The emerging evidence specific to the impact of FASD in the courtroom is similar to that in other aspects of the criminal justice system. In particular, researchers underscore the uncertainty about the uniqueness or potential profile of FASD, the impact of FASD on criminal risk, and the call for further training and education. Questions regarding the role of FASD in the courtroom are also raised, specifically in terms of allocation of responsibility and treatment implications.

## 5. Discussion

### 5.1. The state of the evidence

The involvement of individuals with FASD in the criminal justice system has garnered high levels of attention and activity in policy and practice circles, yet there is a paucity of available data to inform and direct these activities. Although policy and front-line justice practices seek to be evidence-based, we are confronted with the stern reality that there is limited peer-reviewed research to direct large-scale policy and program changes. Little consensus exists regarding the prevalence of FASD in the criminal justice system, although the general trend indicates that it is likely individuals with FASD are overrepresented. Perhaps more importantly, the emerging literature reveals that individuals with FASD may navigate the criminal justice system differently than those without; they may misunderstand judicial processes and be more vulnerable than other groups of offenders. Additionally, professionals from across justice disciplines acknowledge the importance of FASD and call for more information, training, and access to services to better facilitate their work, however as of yet there is no consensus around how FASD should be considered in the courtroom.

The current review suggests that the majority of research in the field of FASD and criminal justice is preliminary, with studies that lack control groups, are retrospective or cross-sectional in nature, and reliant on self- or other informant- report. Replication and generalizability are limited, as most studies have small sample sizes that are not representative of all offenders with FASD or service providers who engage in this work. Although the existing research represents notable first steps and there is likely new research that will be on the horizon for consideration, more work is needed to build a solid foundation on which to move forward.

It is also important to note that many articles related to FASD in the justice system were identified that fell outside the scope of this review, but represent important contributions to the literature nonetheless. These lines of research are also relevant and important to explore, and

open up different avenues of discussion that may inform policy and practice at various levels.

### 5.2. Implications for policy, practice, and moving forward

Although FASD appears to be overrepresented in the criminal justice system, to date there is no singular profile that differentiates individuals with FASD from those without, particularly pertaining to risk. Moreover, FASD is not the only disability with high prevalence in the justice system. As reported, Stinson and Robbins (2014) identified other populations of incarcerated individuals with disabilities who also struggle with psychopathology, early life adversity, and histories of violence and criminality. This suggests that examination of best practices in justice services may not be diagnostically-derived but rather individually-informed based on risk factors indicative of complex needs and presentation. Additionally, individuals with FASD are an exceptionally heterogeneous group, with varying life experiences, clinical profiles, and levels of functional ability. Because of this variability, a “one size fits all” approach will not likely be appropriate or sufficient for improving outcomes. An alternative approach may be to develop intervention programs for offenders with “cognitive diversity,” which incorporate a high degree of flexibility and are tailored to address the needs of each individual being served. Expanding the framework within which FASD and criminality are considered might also be an effective strategy for improving outcomes, and alternative justice measures such as mental health and wellness courts may be appropriate in some cases. Broadening our lens within the justice system to speak to a new process for working with all individuals with complex needs opens the door for approaches and supports that are responsive to functional needs and individual strengths rather than broadly applied to a diagnosis that does not reflect uniform cognitive functioning.

There may also be potentially damaging consequences of associating FASD with the criminal justice system, which warrants consideration as we pursue best practices. Expectancy around failure could place individuals with FASD on a dejectory towards negative outcomes as soon as we characterize and pinpoint criminality as FASD-specific. Also, in raising a social justice concern about overrepresentation, researchers need to be vigilant to not facilitate causal discussions that can then be mistakenly taken up in criminal justice settings. Specifically, as we see the move towards embedding FASD into legislation and having it serve as a mitigating factor in sentencing, there is a need to be clear that FASD does not *result* in criminality but rather that FASD *might* increase a cluster of risk factors, not the least of which is engagement in the justice system. We must also consider ways of addressing social determinants of health and issues underlying the criminal justice system phenomena, not only for those with FASD but for all groups of marginalized individuals. As the intersection of marginalization that can be experienced by individuals with FASD is considered, robust understandings can emerge and critically inform programs and practices so that individuals may live well-supported and fulfilling lives outside of the justice system.

### 5.3. Future research

One obvious gap in the literature relates to the lack of research on evidence-based justice interventions for offenders with FASD. Despite the emerging evidence that individuals with FASD and PAE may be overrepresented and vulnerable in the justice system, we have a limited understanding, based on the current evidence, of what types of supports might lead to better outcomes. There is no research to explore what forms of intervention may help or harm individuals involved in the system, which hinders our ability to train professionals who are eager to support positive outcomes for this group, or even what training messages and approaches are needed. Further exploration regarding offending profiles and characteristics of individuals with FASD is also

still needed to evaluate the idea that this population is best understood through an individualized approach rather than a uniform FASD lens. Research on the lived experiences of those with FASD could also further delineate the challenges they face, shed more light on how they may navigate the justice system, and inform how we might provide supports and services that best align with these experiences.

Future research might also explore conceptualizations of criminal risk, and how neurocognitive functioning is not often considered, but could – and perhaps should – be emphasized in this context. Questions around whether cognitive impairment should be considered a mitigating or aggravating factor are highly contentious and far from clear, however further research in the area might help to clarify some of these issues. Research on risk may also involve exploration of other predictors of criminality. For instance, some researchers have shown that PAE is associated with higher rates of caregiver-reported delinquency (Roebuck, Mattson, & Riley, 1999), whereas others have reported no such findings (Lynch, Coles, Corley, & Falek, 2003). More work is needed to explore the link between FASD, early delinquency and other potential risk factors, and later legal involvement to identify ways in which we might divert youth away from a pathway into the justice system. There is also a need to investigate the limits and potential of risk measures that are traditionally used in the justice system, but might incidentally negatively impact individuals when the full context is not adequately explored, and where disability may impact the application and interpretation of these tools.

Finally, a critical area that requires consideration is related to prevention of criminal behaviour. This may include work around strengths and resilience, as well as other factors that prevent individuals with FASD from getting into trouble with the law despite characteristics and experiences that may increase their propensity to engage in these behaviours.

## 6. Conclusion

There is an urgent need for a stronger connection between research, practice, and policy as it relates to FASD and the criminal justice system – connection grounded in evidence-based research. There is an eagerness among researchers, service providers, and policy-makers to pursue change to programs, practices, and policies, however this review demonstrates that there is limited empirical evidence to guide this change. The level of engagement between researchers, service providers, and policy-makers demonstrates a commitment to collaboration, and this study highlights the need for increased peer-reviewed publications and future research so that these collaborations can be soundly informed. Concurrently, as advocates seek to mobilize policy-makers to consider key changes to legislation, there is a need for research evidence to support or challenge their assertions. Stated specifically, there are significant risks in developing programs, policy, and training initiatives that are not informed by high quality research. Accordingly, this article highlights the current strengths in the literature while also speaking to the need for increased research and dissemination of existing evidence in order to cohesively and confidently move towards improved outcomes for individuals with FASD.

## References

- American Bar Association (2012). Resolution 112B. Retrieved from [http://www.americanbar.org/content/dam/aba/administrative/mental\\_physical\\_disability/Resolution\\_112B.authcheckdam.pdf](http://www.americanbar.org/content/dam/aba/administrative/mental_physical_disability/Resolution_112B.authcheckdam.pdf).
- Brown, N. N., Gudjonsson, G., & Connor, P. (2011). Suggestibility and Fetal Alcohol Spectrum Disorders: I'll tell you anything you want to hear. *The Journal of Psychiatry & Law*, 39(1), 39–71.
- Burd, L., Selfridge, R., Klug, M., & Bakko, S. (2004). Fetal alcohol syndrome in the United States corrections system. *Addiction Biology*, 9(2), 169–176.
- Burd, L., Selfridge, R., Klug, M., & Juelson, T. (2003). Fetal alcohol syndrome in the Canadian corrections system. *Journal of FAS International*, 1(14), 1–10.
- Burd, L. J. (2007). Interventions in FASD: We must do better. *Child: Care, Health and Development*, 33(4), 398–400.
- Canadian Bar Association (2010). Resolution 10–02-A: Fetal Alcohol Spectrum Disorder in the criminal justice system. Retrieved from <http://www.cba.org/cba/resolutions/pdf/10-02-A.pdf>.
- Canadian Bar Association (2013). Resolution 13–12-A: Accommodating the disability of FASD to improve justice services. Retrieved from <http://www.cba.org/cba/resolutions/pdf/13-12-A.pdf>.
- Chandler, J. A. (2015). The use of neuroscientific evidence in Canadian criminal proceedings. *Journal of Law and the Biosciences*, 2(3), 550–579.
- Chudley, A. E., Conry, J., Cook, J. L., Look, C., Rosales, T., & LeBlanc, N. (2005). Fetal Alcohol Spectrum Disorder: Canadian guidelines for diagnosis. *Canadian Medical Association Journal*, 172(Suppl. 5), S1–S21.
- Cox, L. V., Clairmont, D., & Cox, S. (2008). Knowledge and attitudes of criminal justice professionals in relation to Fetal Alcohol Spectrum Disorder. *The Canadian Journal of Clinical Pharmacology*, 15(2), e306–e313.
- Currie, B. A., Hoy, J., Legge, L., Temple, V. K., & Tahir, M. (2016). Adults with Fetal Alcohol Spectrum Disorder: Factors associated with positive outcomes and contact with the criminal justice system. *Journal of Population Therapeutics and Clinical Pharmacology*, 23(1), e37.
- Douds, A. S., Stevens, H. R., & Sumner, W. E. (2013). Sword or shield? A systematic review of the roles FASD evidence plays in judicial proceedings. *Criminal Justice Policy Review*, 24(4), 492–509.
- Douglas, H., Hammill, J., Russell, E. A., & Hall, W. (2012). Judicial views of Foetal Alcohol Spectrum Disorder in Queensland's criminal justice system. *Journal of Judicial Administration*, 21(3), 178–188.
- Fast, D. K., Conry, J., & Look, C. A. (1999). Identifying fetal alcohol syndrome among youth in the criminal justice system. *Journal of Developmental & Behavioral Pediatrics*, 20(5), 370–372.
- Fuglestad, A. J., Fink, B. A., Eckerle, J. K., Boys, C. J., Hoecker, H. L., Kroupina, M. G., & Wozniak, J. R. (2013). Inadequate intake of nutrients essential for neurodevelopment in children with Fetal Alcohol Spectrum Disorders (FASD). *Neurotoxicology and Teratology*, 39, 128–132.
- Hughes, N., Clabby, B., Chitsabesan, P., & Williams, H. (2016). A systematic review of the prevalence of Foetal Alcohol Syndrome Disorders among young people in the criminal justice system. *Cogent Psychology*, 3. <https://doi.org/10.1080/23311908.2016.1214213>.
- Institute of Health Economics (2013). Consensus statement on legal issues of Fetal Alcohol Spectrum Disorder (FASD). Vol. 5 Retrieved from [http://www.ihe.ca/documents/2013.Consensus\\_Statement\\_Legal\\_Issues\\_FASD.pdf](http://www.ihe.ca/documents/2013.Consensus_Statement_Legal_Issues_FASD.pdf).
- Lange, S., Shield, K., Rehm, J., & Popova, S. (2013). Prevalence of Fetal Alcohol Spectrum Disorders in child care settings: A meta-analysis. *Pediatrics*, 132(4), e980–e995.
- Lange, S., Probst, C., Gmel, G., Rehm, J., Burd, L., & Popova, S. (2017). Global prevalence of Fetal Alcohol Spectrum Disorder among children and youth: A systematic review and meta-analysis. *JAMA Pediatrics*, 171(10), 948–956. <https://doi.org/10.1001/jamapediatrics.2017.1919>.
- Lynch, M. E., Coles, C. D., Corley, T., & Falek, A. (2003). Examining delinquency in adolescents differentially prenatally exposed to alcohol: The role of proximal and distal risk factors. *Journal of Studies on Alcohol*, 64(5), 678–686.
- Mattson, S. N., Crocker, N., & Nguyen, T. T. (2011). Fetal Alcohol Spectrum Disorders: Neuropsychological and behavioral features. *Neuropsychology Review*, 21(2), 81–101.
- Mattson, S. N., & Riley, E. P. (1998). A review of the neurobehavioral deficits in children with Fetal Alcohol Syndrome or prenatal exposure to alcohol. *Alcoholism: Clinical and Experimental Research*, 22(2), 279–294.
- May, P. A., Gossage, J. P., Kalberg, W. O., Robinson, L. K., Buckley, D., Manning, M., & Hoyme, H. E. (2009). Prevalence and epidemiologic characteristics of FASD from various research methods with an emphasis on recent in-school studies. *Developmental Disabilities Research Reviews*, 15(3), 176–192. <https://doi.org/10.1002/ddr.68>.
- McLachlan, K., Roesch, R., Viljoen, J. L., & Douglas, K. S. (2014). Evaluating the psycholegal abilities of young offenders with Fetal Alcohol Spectrum Disorder. *Law and Human Behavior*, 38(1), 10–22.
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & The PRISMA Group (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA Statement. *PLoS Medicine*, 6(7), e1000097. <https://doi.org/10.1371/journal.pmed.1000097>.
- Momino, W., Félix, T. M., Abeche, A. M., Zandoná, D. L., Scheibler, G. G., Chambers, C., ... Schüler-Faccini, L. (2012). Maternal drinking behavior and Fetal Alcohol Spectrum Disorders in adolescents with criminal behavior in southern Brazil. *Genetics and Molecular Biology*, 35(4), 960–965.
- Mutch, R. C., Jones, H. M., Bower, C., & Watkins, R. E. (2016). Fetal Alcohol Spectrum Disorders: Using knowledge, attitudes and practice of justice professionals to support their educational needs. *Journal of Population Therapeutics and Clinical Pharmacology*, 23(1), e77–e89.
- Olson, H. C., Feldman, J. J., Streissguth, A. P., Sampson, P. D., & Bookstein, F. L. (1998). Neuropsychological deficits in adolescents with Fetal Alcohol Syndrome: Clinical findings. *Alcoholism: Clinical and Experimental Research*, 22(9), 1998–2012.
- Pei, J., Denys, K., Hughes, J., & Rasmussen, C. (2011). Mental health issues in Fetal Alcohol Spectrum Disorder. *Journal of Mental Health*, 20(5), 473–483.
- Pei, J., Leung, W. S. W., Jampolsky, F., & Alsbury, B. (2016). Experiences in the Canadian criminal justice system for individuals with Fetal Alcohol Spectrum Disorders: Double jeopardy? *Canadian Journal of Criminology and Criminal Justice*, 58(1), 56–86.
- Popova, S., Bekmuradov, D., Mihic, A., & Rehm, J. (2011). Fetal Alcohol Spectrum Disorder prevalence estimates in correctional systems: A systematic literature review. *Canadian Journal of Public Health*, 102(5), 336–340.
- Popova, S., Lange, S., Burd, L., & Rehm, J. (2015). Cost attributable to Fetal Alcohol Spectrum Disorder in the Canadian correctional system. *International Journal of Law and Psychiatry*, 41, 76–81.
- Popova, S., Lange, S., Burd, L., & Rehm, J. (2016). The economic burden of Fetal Alcohol Spectrum Disorder in Canada in 2013. *Alcohol and Alcoholism*, 51(3), 367–375. <https://doi.org/10.1093/alcalc/agg117>.

- Premji, S., Benzie, K., Serrett, K., & Hayden, K. A. (2007). Research-based interventions for children and youth with a Fetal Alcohol Spectrum Disorder: Revealing the gap. *Child: Care, Health and Development*, 33(4), 389–397.
- Rangmar, J., Hjern, A., Vinnerljung, B., Strömmland, K., Aronson, M., & Fahlke, C. (2015). Psychosocial outcomes of Fetal Alcohol Syndrome in adulthood. *Pediatrics*, 135(1), e52–e58.
- Roebuck, T. M., Mattson, S. N., & Riley, E. P. (1999). Behavioral and psychosocial profiles of alcohol-exposed children. *Alcoholism: Clinical and Experimental Research*, 23(6), 1070–1076.
- Rogers, B. J., McLachlan, K., & Roesch, R. (2013). Resilience and enculturation: Strengths among young offenders with Fetal Alcohol Spectrum Disorder. *First Peoples Child & Family Review*, 8(1), 62–80.
- Rojas, E. Y., & Gretton, H. M. (2007). Background, offence characteristics, and criminal outcomes of Aboriginal youth who sexually offend: A closer look at Aboriginal youth intervention needs. *Sexual Abuse: A Journal of Research and Treatment*, 19(3), 257–283.
- Smith, D. K., Johnson, A. B., Pears, K. C., Fisher, P. A., & DeGarmo, D. S. (2007). Child maltreatment and foster care: Unpacking the effects of prenatal and postnatal parental substance use. *Child Maltreatment*, 12(2), 150–160.
- Stade, B., Ali, A., Bennett, D., Campbell, D., Johnston, M., Lens, C., ... Koren, G. (2009). The burden of prenatal exposure to alcohol: Revised measurement of cost. *The Canadian Journal of Clinical Pharmacology*, 16(1), e91–e102.
- Stewart, M., & Glowatski, K. (2014). Front-line police perceptions of Fetal Alcohol Spectrum Disorder in a Canadian province. *The Police Journal*, 87(1), 17–27.
- Stinson, J. D., & Robbins, S. B. (2014). Characteristics of people with intellectual disabilities in a secure US forensic hospital. *Journal of Mental Health Research in Intellectual Disabilities*, 7(4), 337–358.
- Streissguth, A. P., Barr, H. M., Kogan, J., & Bookstein, F. L. (1996). *Understanding the occurrence of secondary disabilities in clients with Fetal Alcohol Syndrome (FAS) and Fetal Alcohol Effects (FAE). Final report to the Centers for Disease Control and Prevention (CDC)*, 96-06.
- Streissguth, A. P., Bookstein, F. L., Barr, H. M., Press, S., & Sampson, P. D. (1998). A fetal alcohol behavior scale. *Alcoholism, Clinical and Experimental Research*, 22(2), 325–333. <https://doi.org/10.1111/j.1530-0277.1998.tb03656.x>.
- Streissguth, A. P., Bookstein, F. L., Barr, H. M., Sampson, P. D., O'Malley, K., & Young, J. K. (2004). Risk factors for adverse life outcomes in Fetal Alcohol Syndrome and fetal alcohol effects. *Journal of Developmental & Behavioral Pediatrics*, 25(4), 228–238.
- Tait, C. L., Mela, M., Boothman, G., & Stoops, M. A. (2017). The lived experience of paroled offenders with Fetal Alcohol Spectrum Disorder and comorbid psychiatric disorder. *Transcultural Psychiatry*, 54(1), 107–124.
- Thanh, N. X., & Jonsson, E. (2009). Costs of Fetal Alcohol Spectrum Disorder in Alberta, Canada. *The Canadian Journal of Clinical Pharmacology*, 16(1), 80–90.
- Thanh, N. X., & Jonsson, E. (2015). Costs of Fetal Alcohol Spectrum Disorder in the Canadian criminal justice system. *Journal of Population Therapeutics and Clinical Pharmacology*, 22(1), e125–31.
- Truth and Reconciliation Commission of Canada (2015). Honouring the truth, reconciling for the future: Summary of the final report of the Truth and Reconciliation Commission of Canada. Retrieved from [http://www.trc.ca/websites/trcinstitution/File/2015/Findings/Exec\\_Summary\\_2015\\_05\\_31\\_web\\_o.pdf](http://www.trc.ca/websites/trcinstitution/File/2015/Findings/Exec_Summary_2015_05_31_web_o.pdf).