FATHER INVOLVEMENT AND FETAL ALCOHOL SPECTRUM DISORDER: DEVELOPING BEST PRACTICES

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ABSTRACT

Background
In the three decades since it was first identified, Fetal Alcohol Spectrum Disorder (FASD) has become recognized as the leading cause of cognitive disability in the U.S. and Canada, resulting in profound social and economic costs. While the occurrence of FASD requires maternal alcohol consumption during pregnancy, the factors associated with maternal drinking are often not identified, and difficult to address because they require intervention at level of social and health policy levels.

Objective
This article reviews the fundamentally important, but frequently minimized, and ignored role of fathers and their role in either contributing to or protecting against maternal alcohol consumption.

Methods
This article reviews the current literature on fathers and FASD. A specific focus on four distinct spheres in which fathers influence this condition emerge from the literature: genetics, being in couple relationship, part of a family, and in the larger environment.

Results
Informed by the literature, a series of best practice guidelines for men across these four domains is outlined. Finally, future directions are explored in which fathers are encouraged to participate with mothers and the larger community to preventing FASD.

Discussion
More active father involvement will not end FASD, but in stepping forward, and adding their voices, fathers can contribute to prevention and assist those with this condition.

The impact of prenatal consumption of alcohol on children has been recognized across cultures and through history. In 1968, Lemoine and colleagues scientifically investigated and described the developmental abnormalities of children born from heavy drinking alcoholic mothers.[1] However, it was not until Jones, Smith, Ulleland, and Striessguth published a series of three articles in 1973 and 1974, in which the diagnosis of Fetal Alcohol Syndrome (FAS) was named, that the phenomenon received international scientific and public attention.[2,3,4]

Fetal Alcohol Spectrum Disorder (FASD) is "a birth defect that has its primary effect on the brain."[5] FASD is caused by maternal drinking during pregnancy. This syndrome, which has its primary impact on the brain, can also affect physical growth, development, temperament, learning, intelligence, cognitive ability, behaviour, memory, hyperactivity, and stress tolerance.[2,4,5,7]

This condition is considered across a spectrum comprising a number of diagnoses describing the range of effects of prenatal alcohol exposure, including Fetal Alcohol Syndrome (FAS), Partial Fetal Alcohol Syndrome (pFAS), Alcohol Related Neurodevelopmental Disability (ARND) and Alcohol Related Birth Defects (ARBD). In 2005, the Canadian Medical Association published national guidelines for diagnosis of FAS, pFAS and ARND developed by Health Canada.[5] The term FASD will be used to

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signify this condition as it captures diagnoses across the spectrum.

FASD is the most common known cause of cognitive disability.[6] It has been reported around the world,[7] and children with this syndrome have been identified across all socioeconomic groups. Estimated prevalence rates of the incidence of FAS range from 0.5 to 3 per 1000 births.[6,7,9-14] The estimated cost of raising a child with FAS is reported between $1 to $2 million US,[5,8,15-17] with annual costs in the US projected at some $10 billion US.[15] Canadian figures report the costs associated with FASD, of those between the ages of 1 to 21 years alone to exceed $344 million CDN annually.[18]

For over three decades, researchers have sought to better understand the nature of the condition, while informing the public, health care professions, educators, and governmental policies. While significant advances in a number of areas have been made in knowledge acquisition, education, and prevention, the prevalence rates of FASD are little changed. According to Devries and Waller, "in the 30 years since this disability was identified, we have made too little progress in preventing it and in knowing how to help those who are affected."[10] The long held belief that research will produce the knowledge that informs and educates individuals into changing their behaviour appears fallible. Williams and Gloster found a weak relationship between knowledge of FASD and the behaviour of maternal alcohol consumption. They reported that "results suggest that education by itself may not be sufficient to make dramatic changes in behaviour." Consequently, it is increasingly recognized that "science and education alone are not enough to solve this tragic problem."[5] We need to look beyond a narrowed focus on mothers who consume alcohol during pregnancies to include the complex familial, social, biological, and psychological factors that influence maternal drinking.

One fundamentally important, but frequently minimized and ignored factor is the role of fathers in FASD. From a population health perspective fathers are associated with a number of determinants of health including a number of genetic, relational, familial, and environmental factors that either contribute to or protect against maternal alcohol consumption. This article reviews the current literature on FASD with specific focus on the four distinct spheres in which fathers influence this condition, namely genetics, being in couple relationship, part of a family, and in the larger environment. After reviewing the contribution of fathers and father involvement, a series of best practice guidelines for men across these four domains will be outlined. Finally, future directions that are informed by research will be explored in which fathers are encouraged to participate with mothers and the larger community in preventing FASD. Similarly, researchers, service providers, and policy makers are equally encouraged to involve men in the treatment, education, and prevention of this global health care issue.

The Self: Genetic Impacts of Paternal Alcohol Use

According to Friedler, "Focus on the singular role of the pregnant female in the health of the fetus and neonate has tended to minimize concern for possible male-mediated effects."[20] In reviewing the existing literature on paternal drinking and alcohol related birth defects, some genetic findings emerge. However, this issue has unfortunately received little scientific attention[21] and lacks a framework of investigation. In the studies that seek to investigate the genetic influence of male alcohol consumption, researchers routinely recommend the importance of further research in this area,[17,21-26] yet father involved research in FASD is scarce.

In animal studies the issue of paternal alcohol exposure has received more interest, although it is consistently described as needing greater and more extensive evaluation.[27] Animal investigations reveal that paternal use of alcohol is associated with a number of genetic conditions, birth defects, malformations, and problems. Conception and neonatal impacts of paternal use include reduced fertility;[28] reduced fecundity (the percentage of pregnancies carried to term);[28] impact on fetal development;[29]and higher fetal mortality.[29]

Progeny in paternal exposed studies have also been associated with physical malformations;[23,30,31] increased adrenal weights at birth, decreased spleen weights at weaning, and decreased testosterone levels at maturity;[23,32] increased susceptibility of the immune system;[23,33]

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and mixed results on the impact on birth weights.[23,26,31,33-35] Behaviorally a number of concerns have been associated with paternal exposure to alcohol,[35]including hyperactivity;[31,36]changes in adult locomotor activity;[36]decreased ability to cope with stress;[23,36] and a variety of learning and memory deficits.[23] While it is impossible to extrapolate these findings to humans, it is important to consider the genetic implications of alcohol exposure derived from the field of animal studies.

Males who drink alcohol are exposed to toxins which directly impact and affect their biological health. Alcohol is a recognized teratogenic drug[5,18]and as such causes human malformations. The scientific community understands that "there is no teratogenic agent yet studied in humans which has shown a clear threshold effect" where the substance is considered safe at a particular level.[37] Males who use alcohol and biologically contribute to a pregnancy have done so with semen that may possess toxins which can damage genetic material of the children.[11] This is not an unknown phenomenon, as genetically alcoholism has been found to run in families[23,38]and a paternal consumption of alcohol has been associated with an increased risk in a number of birth malfunctions and abnormalities.[21] Furthermore, twin and adoptive studies "consistently implicate the importance of genetic influences."[39]

The male relationship of alcoholism to the reproductive process and biological mechanisms has received some focus over the years. Alcoholism has been reported to have adverse effects on testicular function and spermatogenesis.[39] Specifically, alcohol is found to be a direct testicular toxin, which can cause atrophy of the seminiferous tubules, loss of sperm cells, and an increase in abnormal sperm.[38] Furthermore, alcohol can cause a significant deterioration in sperm concentration, sperm output, and motility. While scientific investigations are beginning to reveal clear genetic associations, these studies are too few to draw definitive conclusions.

According to Passaro and associates "very little is known about the effect of paternal drinking before conception on pregnancy and outcomes."[26] Nonetheless, a number of investigations are yielding important findings. Specifically, paternal alcohol use has been associated with developmental, cognitive and behavioural effects on children.[40] Developmentally, fathers' drinking is associated with increases in ventricular sepal deficits in children; hormonal and nervous system abnormalities;[29] and slight association with an increased risk of spontaneous abortions.[21,40] Birth weights have been the focus of three investigations that yielded mixed results, with one study citing low birth weights mildly associated with paternal alcohol consumption, but two others finding no association.[26,41]

A consistent and dominant finding is that paternal alcohol use negatively impacts intelligence and cognitive ability. This finding has been described in the literature for several decades. Nylander (1960) found that children of alcoholic fathers have often demonstrated cognitive impairments. More recently, Weinberg (1997) reported "children of alcoholic fathers also can present with difficulties in learning, language, and temperament."[43] A number of studies have concluded that children of paternal alcoholics have decreased cognitive ability, learning difficulties, and academic performance.[23,44-46]

In studies where environmental factors have generally been controlled, hyperactivity and oppositional behavioural problems have been frequently associated in children of fathers using alcohol.[23,29,47,48] To date, no FASD cases have been documented without maternal drinking or resulting from paternal drinking alone.[49] However, Duckworth and Norton postulate that "fathers who drink may contribute to these conditions [FASD/FAE] as well."[11] A review of the growing body of research in this area suggests that paternal alcohol consumption carries a number of genetic risks for children. Men's drinking matters.

The Couple: Fathers and Relationships

Fathering, like mothering, is not simply a biological and genetic act. Men become fathers in relationships with their children and their partners. Forming, maintaining, and contributing to relationships with their partners, shapes their emerging fathering perspective. How both partners interact and co-create this relationship assists in the development of their respective parental roles.

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Male involvement in a relationship with women of childbearing years can therefore have serious influence on the relational and social factors connected with maternal drinking and FASD. A number of social risk factors associated with maternal alcohol use in pregnancy are attributed to their male partners.[12,13,23-25]

First, the role of male partners in the negotiation of adequate family planning may play a critical role in the prevention of FASD. A large percentage of women and men drink alcohol in their adult lives. General U.S. prevalence rates describe that about 14% of men and 3-4% of women consume two or more drinks a day.[50] According to one preconception study, 45% of women surveyed reported consuming alcohol 3 months prior to finding out they were pregnant.[51] In another study, approximately 25% of American women studied reported that they used alcohol during their first months of pregnancy.[11] In a 1992 national U.S. study, 60% of women drank occasionally and 44% were considered 'light drinkers.[52] Alcohol rates for childbearing women in the U.S. hover around 50%.[52] Most women limit or stop alcohol consumption when they learn they are pregnant. However, according to Jacqueline Forrest's epidemiological study, 56% of pregnancies in the U.S. are unintended.[53] Consequently, it is not surprising that drinking during the first trimester, when many women are not aware of their pregnancies is not uncommon. Mutually supportive family planning involving male partners mitigates the risk of conceiving an unplanned pregnancy and the possible use of alcohol use before the pregnancy is known.

Another social risk factor consistently associated in a couple relationship centers on the relationship's environment; specifically, the degree to which drinking is tolerated and encouraged or not. According to Ernest Abel,[23,54] about 75% of children born with FASD have biological fathers who are heavy drinkers and alcoholics. In other studies, mothers with an FASD child describe somewhat lower rates (22%) of alcohol abuse by their partners.[25] While some researchers have hypothesized a type of 'assortive mating' in which individuals who drink seek out partners who also drink,[55]an underlying finding is that paternal drinking is a risk factor for maternal drinking.[13,53,56] Also, it has been shown that male partners who are opposed to the mother's intention to stop drinking influence her inability to reduce alcohol consumption.[57] A further social risk factor is the supportive or stressful nature of the couple relationship. Frank and colleagues reported that "paternal substance abuse may heighten the social stressors impinging on both mother and child."[24] This factor is particularly salient when the use of alcohol and other drugs has become a way for women to deal with emotional pain.[57,58] In contrast, living in a stable and nurturant home is a protective factor against maternal drinking.[7]

The level of stability of commitment in a couple/marital relationship is another factor associated with maternal drinking. Marital status is a significant predictor of drinking during pregnancy. Specifically, single women have a greater likelihood of drinking than do married women.[12,51,52] However, the stability of the couple relationship is further associated with a decreasing risk factor in women who consume alcohol.[59] Further, physical and sexual abuses in a relationship are risk factors for women drinking during pregnancies.[52] This long association between partner or spousal abuse and violence and women consuming alcohol.[52] Covington and Surry reported that the use of alcohol by women as a means to cope with violence and abuse is common.[58] According to Astley and colleagues, their study results that revealed almost all of the birth mothers of children with FAS investigated had been physically or sexually abused reflected a established association in the literature.[57] Consequently, men have a number of social and relational influences with their partners that can decrease or increase the risk of maternal alcohol consumption, which impacts FASD in their children.

The Family: Paternal Influences in Extended Families

Children observe and learn from the behaviours of their parents. Men and women are the role models for the next generation. Consequently, the male's influence in FASD extends to the larger family environment. Parents need to educate both their daughters and sons in the responsible consumption of alcohol and FASD throughout their childhood, adolescence and adulthood. It is estimated that a family history of alcohol abuse increases the likelihood from 3 to 5 times that

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biological offspring will develop alcoholism over their lifetimes.[38] Similarly, other researchers have reported that extended family with heavy alcohol consumption is a risk factor for maternal drinking.[12,60]

Another risk factor is childhood physical and sexual abuse. In one FASD study, 95% of mothers of FASD children had been physically or sexually abused in their lifetime with 12-53% of alcoholic women reporting incest or other childhood sexual abuse.[9,57] Clearly, it is essential for fathers to directly and indirectly exert their influence to oppose any form or tolerance of abuse to their children. While it is imperative for communities, organizations, and governments to oppose any abuse against women and children at the familial level, it is essential that fathers work toward eliminating this familial risk factor.

Another vital factor for fathers and mothers is to capitalize on their role to encourage alcohol-free pregnancies in their daughter. According to Rhodes and colleagues, most young women who quit or reduce their drinking during pregnancy were encouraged by others, specifically parents or mentors, to avoid alcohol use during their pregnancies.[61] Similarly, Astley and associates reported that women who had a significantly larger and more satisfactory support network, including their families, were more likely to abstain from alcohol consumption during pregnancy.[57]

The Environment: Structural and Societal Factors

In each expanding circle, beginning with the individual and moving to the couple and onto the family, the impact of males on FASD is evident. While males have less direct impact within the larger sphere of environmental influence, their potential to exert influence on this level warrants examination. Detailing the myriad of environmental, societal, structural, economic, social, religious, and cultural influences on FASD is beyond the scope of this article. Notwithstanding, it is important to highlight key areas in this larger context where men may directly or indirectly exercise influence. In focusing on this larger domain it is important to recognize that "FASD is not caused by the environment in which a child is raised after birth, but by the toxic effects of alcohol prior to birth."[62] Thus, while larger factors may perpetuate, impact, or affect maternal drinking, they are not the cause of FASD; however, they are contributing factors to women's use of alcohol in pregnancy, which is indeed the cause of FASD. It is critical, therefore, to acknowledge and address the underlying factors which contribute to women's use of alcohol in pregnancy.

This article will explicate two larger dynamics associated with FASD in the research that reflect a population health perspective which incorporates social determinants of health, specifically socioeconomic status (SES) and ethnicity. It is evident in the growing body of FASD literature that "those who are most disadvantaged by poverty, bear the greatest burden of risk for FASD."[63] Studies frequently note that FASD is more common among children of low-income families (71%) compared with women of higher SES status,[64] and that low SES is an increased risk factor for women drinking during pregnancy.[7,12,52,65,66] A number of reasons have emerged to explain this phenomenon, including differing nutritional status during pregnancy between SES groups.[67] Others have proposed that the complex underlying factors contributing to women's use of alcohol in pregnancy (e.g., concurrent drug use, elevated rates of physical and sexual abuse, fewer resources and opportunities to access assistance) requires complex social, economic and political commitment in order to support women to break the cycle of alcohol use.[7,12,52,64,66] It may therefore be unrealistic to expect or assume women in lower socioeconomic environments can change their patterns of substance abuse without specialized assistance and support, and socio-economic policy responses.

Like women, men are similarly subject to the larger structural and societal influences which impact individuals in low SES environments and cannot merely 'pull themselves up by their boot straps' to readily change this reality. However, men and fathers do have some impact, whether positive or negative, in the SES environment of their child or their child's mother.

A second factor centers on ethnicity or ethnic groups. It is problematic at best to extrapolate the impact on disadvantaged ethnic groups from their histories and experiences; however, it is clearly recognizable that FASD disproportionately

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impacts certain populations.[63,68] Furthermore, these minority populations have long been recognized as oppressed economically, socially, and culturally by the dominant majorities. This factor is perhaps most strikingly evident in the prevalence rates of FASD among different ethnic groups in North America per 10, 000 births: Whites, 0.9; Blacks, 6.0; and Native Americans 29.0.[69] Studies have also found the higher rate of FASD among aboriginal populations in Canada, United States, and in Australia.[8,66,70] According to Rhodes and colleagues, "these findings underscore the importance of considering racial and contextual variables surrounding" adolescent pregnancy, maternal drinking and substance use.[61] However, it is important to recognize that these findings are subject to a research bias in the field of FAS. Specifically, the populations that have been found to have the highest rates of FASD have been studied the most. For example, research that focuses on FASD and the middle or higher SES white populations, have received noticeably less attention.

FASD "has been called 'an equal opportunity affliction.' Children with this syndrome have been identified among all socioeconomic groups and all nationalities."[8] While it is important to recognize the research bias in over investigated populations, this condition is evident in disadvantaged ethnic groups. Also, "FASD is a major health problem in cultures that have problems with alcohol."[62] While maternal drinking is necessary for a child to have FASD, it may be important to look beyond the individual circumstances which bring women and men to alcohol use, but to also address the role of larger societal contributing influences.

This review confirms that men contribute to, and exert a variety of influences on women's alcohol use in pregnancy at the individual, couple, family, and environmental levels. In analyzing the current state of knowledge in this field a number of best practice guidelines for fathers emerge. Informed by research, these best practice guidelines are designed to inform men and fathers how they may positively impact on FASD in their own behaviours, within their relationships, with significant others, in family contexts, and in the larger environment.

Father Involvement and Best Practice Guidelines

In general, men and fathers have been excused from actively addressing their influences on FASD. "In the case of FASD, the single-minded focus on alcohol as the sole cause of the observed outcome blinded doctors to the social context in which prenatal exposure to alcohol occurred and to any potential ameliorating or exacerbating factors."[64] Consequently it is hardly unexpected that, in a study conducted by Williams and Gloster, men were likely "to correctly indicate that the father's alcohol intake does not directly affect the unborn baby, biologically."[19]

Fathers influence has been ignored or minimized with men's involvement somewhat limited. According to the social constructional approach, men, like women, are active agents in the co-construction of their identity and roles. Within this perspective, broader social and structural forces are also recognized as shaping behaviour. Consequently, blaming fathers or mothers is an inaccurate, incomplete, and unproductive approach that reduces responsibility to the individual level and ignores the larger social determinants of health, such as poverty or disadvantaged minority status.

According to Devries and Waller, "in the 30 years since this disability was identified, we have made too little progress in preventing it and in knowing how to help those who are affected."[10] Clearly, the factors associated with maternal alcohol use during pregnancy are complex and resistant to change.[9,71] The following sections offer best practice guidelines to support professionals, educators, and clinicians in opening up opportunities for and to promote father increased involvement within FASD.

The Self: Individual Involvement and FASD Best Practices Guidelines

Males can be supported to become aware of their individual and genetic influences on alcohol use and, such knowledge can promote the opportunity of increased responsible involvement at an individual level. Specifically, professionals can inform and encourage men to be aware of the following:

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1. Alcohol is a toxin that impacts their health.
2. Alcohol is a recognized teratogenic drug that potentially affects their semen.
3. Alcohol is associated with adverse effects on testicular function, spermatogenesis, and can cause a significant deterioration in sperm concentration and output.
4. When men drink alcohol and contribute to a pregnancy, animal models suggest that they have done so with semen that may possess toxins, which can damage genetic material of the children.
5. Alcohol consumption in males is an associated risk to a number of birth malfunctions and abnormalities.
6. Alcohol consumption in fathers has been associated with a number of health problems in their children (e.g., increases in ventricular sepal deficits, hormonal and nervous system abnormalities, and some association with an increased risk of spontaneous abortions).
7. Paternal alcohol use in the preconception period can negatively impact intelligence and cognitive ability in their children.
8. Paternal alcohol use in preconception, during pregnancy, and after birth has been associated in hyperactivity and oppositional behavioural problems in their children.
9. Paternal drinking without maternal alcohol consumption can not cause Fetal Alcohol Spectrum Disorder; however, fathers who drink may contribute to this condition through their influence on women's alcohol use in pregnancy.

The Couple: Fathers in Relationships and FASD Best Practices Guidelines

Service providers can also promote best practices by supporting men to recognize their opportunities for positive involvement in their social relationships with women. Specifically, professionals can educate and support males to become more aware of their ability to encourage positive change and limit negative influence in their relationships in the following ways:

1. Men and women in a relationship affect each others' behaviours.
2. Male partners who drink foster an environment where alcohol use is tolerated and encouraged.
3. Male partners who are opposed to the mother's intention to stop drinking may influence her inability to reduce alcohol consumption.
4. Males are responsible for their own drinking behaviour and its potential impact on others.
5. Males can directly and indirectly oppose abuse of females in any form (e.g., perpetrate, engage, condone, minimize, justify, association, passive observer).
6. Professional support may help to end abuse in relationships.
7. Males and females are responsible for the promotion of a stable and committed relationship.
8. Males and females in relationships considering children may want to plan together their use of alcohol.
9. Males and females can positively encourage and support each other in reducing and/or eliminating their drinking before conception.
10. Males and females can actively support and assist each other in family planning (e.g., birth control, time, finances, relationships stability, extended family influence).
11. Males and females can actively participate in the preparations for the new child (e.g., attending medical appointments, planning).
12. Males and females can promote, support, and advocate for a nurturing home environment.

The Family: Paternal Influences in Extended Families and FASD Best Practices Guidelines

In promoting best practices, professionals can support and encourage father informed involvement in the family system in the following ways:

1. Fathers have the opportunity to set a positive role model for their children by not abusing substances.
2. Children are more likely to become alcoholics as adults if their fathers are alcoholics.
3. Physical or sexual abuse of children by father is associated with children abusing alcohol as adults.
4. Fathers and mothers can support both yearly education in K-12 programs at school and discussions at home on FASD with their sons and daughters.

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5. Fathers can capitalize on their role to encourage alcohol free pregnancies in their daughters.
6. Fathers' support is associated with increased success rates of adult daughters who are trying to reduce or eliminate alcohol consumption during their pregnancies.
7. Fathers' promotion of their adult daughters' support network is associated with women who achieve absenteeism in alcohol consumption during their pregnancies.
8. Fathers and mothers can promote, support, and advocate a nurturing home environment.

The Environment: Structural and Societal Factors and FASD Best Practices Guidelines

Finally, it is important for professionals to recognize, support, and promote men's involvement in larger societal factors. This can be achieved by professionals supporting and informing men in the following ways:

1. Men can positively influence and become involved in larger societal factors that impact FASD.
2. Males and females can choose to no longer accept the incorrect assumption that FASD is an individual issue.
3. Victim blaming does not help in reducing FASD.
4. Males along with females can promote FASD as a national social and health issue.
5. Males can lend their voices as fathers to the advocating, promotion, creation, development, implementing, and monitoring of FASD programs and policies.
6. Males and females can be involved with FASD policy planning, delivery, and implementation around the needs of families.
7. Males and females can encourage greater collaboration between those providing health services and education with individuals impacted by FASD.
8. Males and females can encourage increased professional training (medicine, healthcare, legal system) on FASD.
9. FASD strategies (prevention & education) need to include the community.
10. FASD strategies need to reach out to diverse, ethnic, economically disadvantaged, and underserved populations.
11. Greater linkages between service providers and educators with governments.
12. Males and females can advocate for education that targets both knowledge transmission and behavioural changes.
13. Men can effectively add their voice to the promotion of a National Strategy (education, research, service delivery, programs, etc.) for FASD.

CONCLUSION

Over the past three decades, significant progress has been made in understanding, diagnosing, treating, and preventing FASD. Unfortunately, prevalence rates have changed little. The complex factors that contribute to and support maternal drinking need to be addressed in confronting this national health issue. FASD is not an individual issue; rather, FASD is a population health issue that requires prevention and treatment to consider related social determinants of health. Fathers and their involvement is a distinct and significant factor that unmistakably exerts positive and/or negative influence on FASD across a number of domains, specifically genetics, partnering relationships, family life, and larger environmental and structural conditions.

Clearly, mothers will remain central in the education, treatment, and prevention of FASD. However, the exclusion of fathers appears to be detrimental to mothers' efforts to reduce their alcohol use, to the parenting of children with FASD, to the support of families, and to participating in larger systemic and environmental changes required to address this national health care problem.

The inclusion of fathers in the education, treatment, and prevention of this burdensome illness requires a number of changes. There is evidence in the FASD literature that victim blaming, morality and judgment against mothers are at best counterproductive, and may contribute to the continuation of maternal drinking. According to Armstrong, writers on this field often focus on the "harsh intrauterine environment" created by women who drink during pregnancy, frequently referred to as a harsh alcoholic environment, fetal hazard, acute fetal poisoning, embryotoxin, recidivist maternal

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alcoholics, where "women have clearly failed to isolates women seeking help, ignores the complicated factors that propagate alcohol use, and allows for others, including fathers, to abdicate responsibility to their contribution to problem or in seeking solutions. Another change needs to be the commitment of health care professionals, service providers, and policy initiatives to support the inclusion and active participation of fathers in the education, treatment, and prevention of this condition. This support of fathers is often neglected; for example, the National Task Force in the United States that was chartered to investigate FASD failed to include any reference to fathers in its recommendations.[72] If fathers are to join, room must be made for their participation.

Finally, the complexity of this growing health care issue requires not only greater research support and activities, but more concerted approaches that incorporate educators, service providers, families, health care professionals, and the various levels of government. According to Devries and Waller, "Pitifully, little research has occurred at the place where the behavioral rubber meets the road—at the level of the family and the community."[10] Furthermore, it is now essential to both investigate and include fathers in FASD research.

More active father involvement will not end FASD, but in stepping forward, exerting their influence, and adding their voices, fathers can contribute to prevention and assist those with this condition.

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