

**FASD PREVENTION: AN ANNOTATED  
BIBLIOGRAPHY OF ARTICLES PUBLISHED IN  
2016**

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# FASD Prevention Literature Search 2016

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## Introduction

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Annually, researchers associated with the Prevention Network Action Team (pNAT) of the CanFASD Research Network search the academic literature for articles related to fetal alcohol spectrum disorder (FASD) prevention. The findings are organized using a four-level prevention framework used by the pNAT to describe the wide range of work that comprises FASD prevention. The annual literature search is intended to update those involved in FASD prevention in Canada, so they can inform their practice and policy work with current evidence. The members of the pNAT also have the opportunity in monthly webmeetings to discuss the implications of the findings for their work.

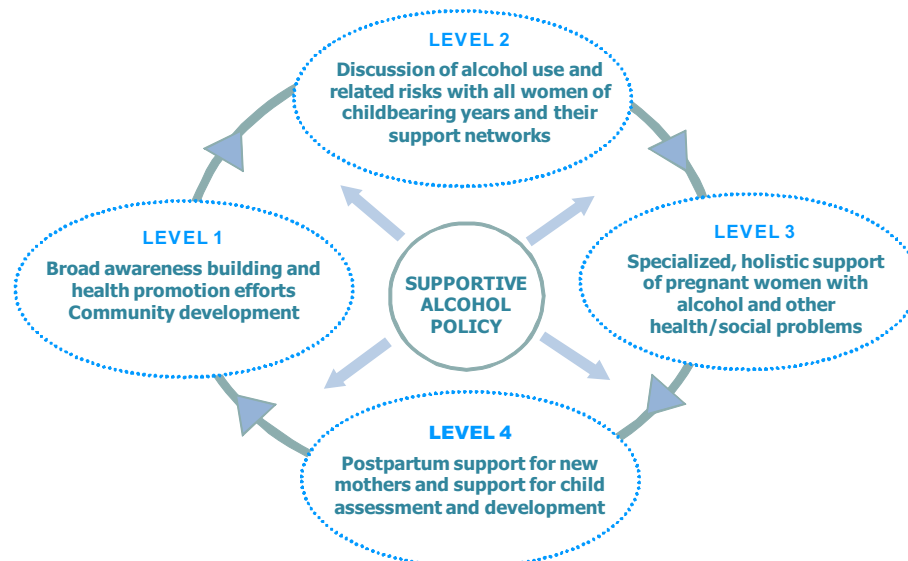
## Search Methods

The following databases were searched using Ebsco Host for articles published between January and December 2016:

1. Academic Search Complete
2. Bibliography of Native North Americans
3. CINAHL Complete (Cumulative Index of Nursing and Allied Health Literature)
4. MEDLINE with Full Text
5. PsycINFO
6. Social Work Abstracts
7. Urban Studies Abstracts
8. Women's Studies International

Searches of each database were conducted using the following search terms: 1) [fetal alcohol syndrome OR fetal alcohol spectrum disorder OR FASD OR foetal alcohol spectrum disorder OR alcohol related fetal damage] (SU); 2) [FASD OR fetal alcohol OR foetal alcohol OR alcohol exposed pregnancy OR alcohol AND pregnancy] (Any) + [prevention OR preventing OR preventative] (Any); 3) [Fetal OR fetus OR foetus OR foetal] (any) + alcohol (SU); 4) [Alcohol OR drink\*] (SU) + [pregnancy OR pregnant] (SU) + prevention (any); 5) [Pregnan\* OR conception OR preconception OR post-partum] (SU) + [alcohol OR drink\*] (any); 6) Alcohol (SU) + prevention (SU) + [women OR girls OR youth OR teen\* OR Aboriginal OR First Nation\*] (any); 7) [alcohol OR drink\*] (SU) + awareness (any); 8) FASD (SU) + awareness (any); 9) alcohol (SU) + intervention\* (any) + women (SU); 10) [Alcohol OR drink\*] (SU) + motivational interviewing (any) + [women OR girls OR gender OR female] (any); 11) [Alcohol OR drink\*] (SU) + screening (any) + [women OR girls OR gender OR female] (any); 12) [Alcohol OR drink\*] (SU) + brief intervention (any) + [women OR girls OR gender OR female] (any); 13) [Alcohol OR drink\*] (SU) + [home visits OR home visiting] (any); 14) [Alcohol OR drink\*] (SU) + community based; 15) [Alcohol OR drink\*] (SU) + [NICU OR neonatal intensive care unit]; 16) [Pregnan\* OR conception OR preconception OR post-partum] (any) + substance use treatment (any); 17) [Pregnan\* OR conception OR preconception OR post-partum] (any) + harm reduction (any).

All searches were limited to articles published in the English language. Articles were further screened for relevance to the FASD NAT, and non-relevant articles (e.g. diagnosis of FASD) were removed from the list. Articles were then categorized into one or more theme, as presented below.



## Search Results

Seventy-two (n=72) articles were included from our searches. Twenty-three (n=23) articles were assigned to more than one category. Table 1 provides an overview of the number of articles found in each topic area by country. It can be seen that research on FASD prevention, published in English is most often being generated in the United States and Canada followed by Australia and the United Kingdoms.

**Table 1: Studies identified by topic and country**

Country	Number of Studies								Total
	Prevalence	Influences	Level 1	Level 2	Preconception	Level 3	Level 4	Other	
Australia	2	5	3	.	1	.	.	1	12
Canada	3	1	2	1	1	2	1	5	16
Denmark	1	.	1	.	.	.	.	.	2
EU (Generally)	.	.	.	.	.	.	.	1	1
Finland	1	.	.	.	.	.	.	.	1
Germany	.	.	.	1	.	.	.	.	1
Lithuania	.	.	.	1	.	.	.	.	1
Nepal	1	1	.	.	.	.	.	.	2
Nigeria	1	1	.	.	.	.	.	.	2
Norway	.	.	.	.	.	1	.	.	1
Russia	1	1	.	.	1	.	.	.	3
South Africa	4	4	.	1	.	.	.	.	9
Spain	.	.	.	1	.	.	.	.	1
Sweden	.	1	.	1	.	.	.	.	2
The Netherlands	.	1	1	1	.	.	.	.	3
UK (England, Ireland and/or Scotland)	3	1	3	3	1	.	.	1	12
USA	7	5	3	8	.	4	3	2	32
	24	21	13	18	4	7	4	10	101

## Prevalence of drinking in pregnancy

1. Alshaarawy, O., Breslau, N., & Anthony, J. C. (2016). Monthly Estimates of Alcohol Drinking During Pregnancy: United States, 2002-2011. *Journal of Studies on Alcohol & Drugs*, 77(2), 272-276.

The authors hypothesized that a month-by-month view of pregnancy and drinking, instead of the traditional trimester view, might better reveal that: 1) women reduce their drinking when they find out they are pregnant, and; 2) persistent drinking levels in pregnant women may reflect alcohol dependency. Using the existing National Survey on Drug Use and Health, investigators gathered cross-sectional snapshots of current pregnancy status and drinking levels from US women aged 12-44 years from 2002-2011. Drinking levels were assessed for heavy episodic drinking and alcohol dependence. Results confirmed that drinking levels of pregnant women dropped in Month 2, and that higher drinking levels in Month 4 remained consistent and may indicate alcohol dependency. Investigators contend that more studies that use the monthly estimates should be conducted because they offer information on the timing of alcohol use and cessation during pregnancy that will assist with research and prevention efforts.

2. Balachova, T., Bard, D., Bonner, B., Chaffin, M., Isurina, G., Tsvetkova, L., & Volkova, E. (2016). Do attitudes and knowledge predict at-risk drinking among Russian women? *The American Journal of Drug and Alcohol Abuse*, 42(3), 306-315. doi:10.3109/00952990.2016.1141914

The authors used a cross sectional survey to identify the beliefs and knowledge of FASD held by urban and rural Russian women aged 18-44 (n = 648), and determine if FASD knowledge and attitudes towards drinking during pregnancy correlated with risky drinking. Women were screened for risky alcohol consumption using T-ACE and TWEAK. Only 34% of all women had heard of FAS. Of that number 46% reported that FAS was a birth defect; 42% reported that it was a lifetime condition; and, 75% reported that the cause of FAS was maternal drinking. Of the overall sample, 40% of women thought either alcohol consumption during pregnancy was not harmful, or did not know if it was harmful; and 8% had accurate knowledge of FAS. Pregnant women, and drinking pregnant women in particular, had lower knowledge scores than non-pregnant women. Knowledge score ( $F(1,7)= 7.21, p<0.04$ ) and attitude score ( $F(1,7)= 11.07, p< 0.02$ ) were significant for predicting alcohol use during pregnancy. Unexpectedly, knowledge was not associated with decreased alcohol use during the preconception period even if women were trying to conceive. These findings strongly support education and public health campaigns about alcohol and FASD. The authors stress the need to target the preconception period in order to reduce at-risk drinking and alcohol-exposed pregnancies.

3. Brown, Q. L., Hasin, D. S., Keyes, K. M., Fink, D. S., Ravenell, O., & Martins, S. S. (2016). Health insurance, alcohol and tobacco use among pregnant and non-pregnant women of reproductive age. *Drug and Alcohol Dependence, 166*, 116-124. doi:10.1016/j.drugalcdep.2016.07.001

The authors performed a cross sectional analysis to understand the relationship between health insurance coverage and prevention of tobacco and alcohol use among women aged 12-44 participating in the National Survey of Drug Use and Health during 2010-2013 (n= 97,788). Results from logistic regression models showed that among pregnant women, having health insurance was associated with lower odds of using alcohol in the past month (AOR= 0.47; 95% CI= 0.27-0.82), but not for using tobacco (AOR= 1.14; 95% CI= 0.73-1.76). Among non-pregnant women with health insurance, the odds were opposite: higher odds of alcohol use in the past month (AOR 1.23; 95% CI= 1.15-1.32) and lower odds of tobacco (AOR = 0.67; 95% CI= 0.63, 0.72). The authors conclude that health insurance during pregnancy is promising for reducing alcohol use during pregnancy, but suggests more needs to be done to reduce tobacco use during pregnancy.

4. Cohen, K., Capponi, S., Nyamukapa, M., Baxter, J., Crawford, A., & Worly, B. (2016). Partner involvement during pregnancy and maternal health behaviors. *Maternal and Child Health Journal, 20(11)*, 2291-2298. doi:10.1007/s10995-016-2048-3

Using a convenience sample from a prenatal clinic in the US, pregnant women were surveyed about “support” and its effect on alcohol and tobacco consumption. Women surveyed (n= 198) identified a support person (partner, family, other), completed the Norbeck Social Support Questionnaire (NSSQ), and sociodemographic information. Of the 60 partners present at prenatal visit, 26 participated in the survey. Results show that partnered versus non-partnered women had lower rates of alcohol (26% versus 42%), and tobacco consumption (3% versus 12%). Women’s perceived partner support was not associated with lower levels of alcohol consumption, but it was associated with lower levels of tobacco consumption. Both increased income, being married and higher education were associated with positively influencing NSSQ scores.

5. English, L. L., Mugenyi, G., Nightingale, I., Kiwanuka, G., Ngonzi, J., Grunau, B. E., MacLeod, S., Koren, G., Delano, K., Kabakyenga, J., Wiens, M. O. (2016). Prevalence of ethanol use among pregnant women in Southwestern Uganda. *Maternal and Child Health Journal, 20(10)*, 2209-2215. doi:10.1007/s10995-016-2025-x

To determine the prevalence and predictors of alcohol consumption during pregnancy in Southwestern Uganda, women and children enrolled as a dyad (n = 505), completed an questionnaire on alcohol and tobacco use before and during pregnancy, demographic information, education levels, and attitudes and beliefs about alcohol use during pregnancy. Those reporting drinking alcohol at any time also completed the TWEAK. Meconium samples were collected from all children. Eighty-one women (16%) reported using alcohol; 53% scored two or more points on the TWEAK, indicating possible problem drinking. Few meconium samples were ethanol (EtG) positive, and biological outcomes did not align with reported use. Self-reports were higher than EtG positive meconium, however, the TWEAK questionnaires were associated with EtG positive meconium. Based on this study, the authors found: 1) high prevalence of alcohol-exposed pregnancies in SW Uganda; 2) pre-conception alcohol use is the strongest predictor of use throughout pregnancy; 3) alcohol use by a partner is associated with maternal drinking throughout pregnancy; 4) maternal education is a protective factor; 5) secondary education predicted lower odds of drinking in pregnancy; and, 6) “low-risk perceptions” of alcohol use in pregnancy were significantly associated with consumption. Recommendations include improving educational programs on alcohol exposed pregnancy (AEP) and FASD, and screening for alcohol use in pregnancy to intervene earlier.

6. Green, P. P., McKnight-Eily, L. R., Tan, C. H., Mejia, R., & Denny, C. H. (2016). Vital Signs: Alcohol-Exposed Pregnancies-United States, 2011-2013. *MMWR: Morbidity & Mortality Weekly Report*, 65(4), 91-97. doi:10.15585/mmwr.mm6504a6

The Center for Disease Control analyzed responses from female participants on the National Survey on Family Growth 2011-2013 to determine: 1) prevalence of alcohol-exposed pregnancy (AEP) risk, and 2) characteristics of women at risk for an AEP. Women who met four criteria (n = 4,303) were considered to be at risk for AEP if: 1) they had sexual intercourse with a male in the last 4 weeks; 2) drank any amount of alcohol in the last 30 days; 3) neither partner used any form of contraception in the month before the interview; and, 4) neither partner was sterile. Additionally, women were grouped according to whether or not they wanted to become pregnant. The calculated prevalence estimate for AEP risk was 7% for women aged 15-44 years of age. Risk for AEP was higher among women who were: 1) married (12%) or cohabitating (14%); 2) who had one live birth (14% compared with 6% with none or 6% with 2 or more); 3) current smokers (11% compared with 6% non-smokers). By age, the risk was highest among women 25-29 years (10%) and lowest among women 15-20 years (2%). There was a positive association between education and AEP risk, but not for race/ethnicity and AEP risk. Alcohol use did not differ based on whether or not a woman desired to become pregnant. Based on this study the CDC recommends a wide-ranged approach to include both primary care (screening and brief intervention, contraception) and population-based strategies (electronic screening/brief intervention, enforcement of alcohol age restrictions).

7. Kesmodel, U. S., Petersen, G. L., Henriksen, T. B., & Strandberg-Larsen, K. (2016). Time trends in alcohol intake in early pregnancy and official recommendations in Denmark, 1998-2013. *Acta Obstetrica et Gynecologica Scandinavica*, 95(7), 803-810. doi:10.1111/aogs.12890

Following a change in Danish government recommendations regarding alcohol consumption during pregnancy (in 2007) from condoning some consumption to total abstinence, the authors investigated if the change impacted average alcohol intake and binge drinking in early pregnancy. Over n=68,000 pregnant women receiving hospital prenatal care between 1998 and 2013 completed a self-report questionnaire assessing binge drinking, average number of drinks consumed per week, and timing of consumption. Findings suggest that the number of women reporting abstinence significantly increased from 1998 (31%) to 2013 (83%), and there was a decline in both the number of women who reported binge drinking and the average number of drinks consumed per week. Interestingly, the greatest decline in drinking occurred between 1998 and 2007, which is prior to when the government modified their recommendations. The authors conclude that greater awareness around the dangers of alcohol consumption during pregnancy may better explain drinking trends than official recommendations from the government.

8. Kreshak, A., Villano, J., Clark, A., Deak, P., Clark, R., & Miller, C. (2016). A descriptive regional study of drug and alcohol use in pregnant women using results from urine drug testing by liquid chromatography-tandem mass spectrometry. *The American Journal of Drug and Alcohol Abuse*, 42(2), 178-186. doi:10.3109/00952990.2015.1116540

The authors investigated the prevalence of drug and alcohol use among pregnant women in Southern California. Liquid chromatography-tandem mass spectrometry was conducted on urine samples from 295 women at all stages of pregnancy who were attending urban and suburban obstetric clinics to examine the presence of drugs and alcohol. Overall, 14% of urine samples tested positive for a substance, and only one sample was positive for more than one. The most common substance detected was alcohol (6%), followed by marijuana (4%) and opioids (4%). Compared with previous research, the authors note that these findings suggest increased rates of opioid use, stable rates of alcohol use, and decreased rates of marijuana use among pregnant women. They suggest that urine analysis may be useful for the accurate identification of women at-risk for adverse outcomes.

9. Matusiewicz, A. K., Ilgen, M. A., & Bohnert, K. M. (2016). Changes in alcohol use following the transition to motherhood: Findings from the National Epidemiologic Survey on Alcohol and Related Conditions. *Drug and Alcohol Dependence*, 168, 204-210. doi:10.1016/j.drugalcdep.2016.08.635

Despite a substantial body of literature examining acute reductions of alcohol consumption during pregnancy, little research has been conducted to examine drinking trends following the transition to motherhood. The authors compared drinking patterns of women who became mothers and women who did not, over a three-year period. Data was collected from the US National Epidemiological Survey on Alcohol and Related Conditions (NESARC) from 2,118 women aged 18 years and older who reported at least one drink in the previous year. Fifteen percent (15%) of these women became first-time mothers (including those with adopted, foster, or step-children) between the study baseline and three-year follow-up. Alcohol use was measured using frequency of consumption, heavy drinking (4+ in one occasion), and typical number of drinks consumed in one sitting over the last year. At baseline, women in both groups reported similar levels of drinking across all indicators. At follow up, women who became mothers showed significantly lower levels of drinking across indicators, even after adjusting for demographic factors and baseline alcohol use. The authors concluded by noting that further research is needed to explore: the association between motherhood and alcohol consumption, interventions to reduce heavy drinking among women, and the impact of drinking on long-term well-being of both mothers and their children.

10. May, P. A., Hasken, J. M., Blankenship, J., Marais, A.-S., Joubert, B., Cloete, M., . . . Seedat, S. (2016). Breastfeeding and maternal alcohol use: Prevalence and effects on child outcomes and fetal alcohol spectrum disorders. *Reproductive Toxicology*, 63, 13-21. doi:10.1016/j.reprotox.2016.05.002

This study examined the prevalence of maternal alcohol consumption during the breastfeeding period, and its impact on child outcomes at 7 years old. Data was collected from 1,047 mothers in several communities in South Africa. Almost all (90%) mothers breastfed their children (for an average of 20 months), and 70% of all mothers consumed alcohol while breastfeeding. Significantly more women who drank prenatally also drank during the breastfeeding period, and 42% of women who reported abstinence during pregnancy drank while breastfeeding. Exposure to alcohol through breast milk was also associated with a 6.4 times greater likelihood of later being diagnosed with FASD. These group differences remained even after controlling for prenatal drinking and other maternal risk factors. In conclusion, the authors note that maternal alcohol consumption during the breastfeeding period has detrimental effects on child growth and developmental outcomes.



11. Muggli, E., O'Leary, C., Donath, S., Orsini, F., Forster, D., Anderson, P. J., . . . Halliday, J. (2016). "Did you ever drink more?" A detailed description of pregnant women's drinking patterns. *BMC Public Health, 16*, 1-13. doi:10.1186/s12889-016-3354-9

Researchers in Australia gathered data on drinking patterns from women early in their pregnancies (n=1,500), retrospectively during their first trimester, and then during the second and third trimesters. The questionnaire focused on 1) dose, including a pictorial drink guide across nine types of alcoholic drinks; and, 2) timing, including special-occasion and difficult-times drinking. Forty percent (41%) of women did not drink during pregnancy; 27% drank in the first trimester only (87% stopped when they found out they were pregnant); and, 27% drank at some level throughout pregnancy. Pregnant women who drank were more likely to have an unplanned pregnancy, and to have had their first intoxication before age 18. Special-occasion question revealed important data about binge drinking that would not have been captured otherwise, which suggests that using this type of question would improve the accuracy of self-reporting assessments. The authors underscore that as in other studies, they found that pre-pregnancy drinking predicts drinking in pregnancy. They discuss implications for targeting health promotion and interventions and for improving research methods.

12. Niemelä, S., Niemelä, O., Ritvanen, A., Gissler, M., Bloigu, A., Werler, M., & Surcel, H.-M. (2016). Fetal Alcohol Syndrome and Maternal Alcohol Biomarkers in Sera: A Register-Based Case-Control Study. *Alcoholism: Clinical & Experimental Research, 40*(7), 1507-1514. doi:10.1111/acer.13101

Using three separate nationwide registers in Finland from 1987 to 2005, researchers were able to compare information and biomarkers of women who gave birth to a child with Foetal Alcohol Syndrome (FAS) (n= 565) with a control group women. Data on background characteristics of the women was compared to biomarkers of alcohol consumption available from prenatal serum screenings used to identify infectious disease. Each case identified that had an available prenatal serum screening (n= 385) was matched by age and year of blood sampling with two cases from the control group (n= 745). Mothers of children with FAS were more likely to smoke (85% versus 3%) and to have lower socio-economic status. Biomarkers of alcohol consumption were significantly higher among mothers of children with FAS and were able to predict 46% of these mothers. Moreover, the combination gamma-glutamyltransferase (GGT) and carbohydrate-deficient transferrin (%CDT) was the best predictor. Although the authors describe the limitations of using biomarkers to identify alcohol exposed pregnancies, they contend that systematically using biomarkers during the first trimester of pregnancy can help with identification and intervention.

13. Onah, M. N., Field, S., van Heyningen, T., & Honikman, S. (2016). Predictors of alcohol and other drug use among pregnant women in a peri-urban South African setting. *International Journal of Mental Health Systems, 10*(38). doi: 10.1186/s13033-016-0070-x

Researchers conducted a cross sectional study to learn the association between alcohol and other drug (AOD) use and the life events of pregnant women in low-income areas. They enrolled 376 pregnant women from a midwifery primary obstetric care clinic in a high-density, rural-urban transition area in Cape Town, South Africa. Using a diagnostic interview with The Expanded Mini-International Neuropsychiatric Interview (MINI Plus) Version 5.0.0, they assessed the participants for depression, anxiety, suicidal ideation, and AOD use. Several other measures were included to assess socioeconomic status, food insecurity, perceived social support, conflict, and risk for psychological distress. Of the women sampled, 18% reported current AOD use. Within that group 22% reported suicidal ideations, 19% had an anxiety diagnosis, and 18% were experiencing a major depressive episode. Women aged 24-29 reported higher levels of AOD use than any other group. Food insufficiency was a strong predictor of AOD use, and women deemed “very poor” and the “poorest” were twice as likely to use AOD than the “least poor” (OR 2.33, 95% CI 1.74–2.71; OR 1.75, 95% CI 1.53–2.78). Women with a planned pregnancy were less likely to use than those with an unplanned pregnancy (OR 0.30, 95% CI 0.11–0.80). Women who experienced mental health issues in the past were twice as likely to use AOD than women who did not (OR 12.13, 95% CI 1.81–2.61). Researchers conclude that the association of AOD and mental health issues likely reflects how adverse living conditions support multiple mental health problems, and they make suggestions for prevention and intervention efforts.

14. Onwuka, C. I., Ugwu, E. O., Dim, C. C., Menuba, I. E., Iloghalu, E. I., & Onwuka, C. I. (2016). Prevalence and Predictors of Alcohol Consumption during Pregnancy in South-Eastern Nigeria. *Journal of Clinical & Diagnostic Research, 10*(9), 10-13. doi:10.7860/JCDR/2016/21036.8449

To examine the prevalence of, and factors associated with, alcohol use during pregnancy, the authors conducted a cross sectional study of 380 women using antenatal care services at a hospital in Enugu, South-Eastern Nigeria. The questionnaires collected data on: socio-demographics, knowledge of the negative effects of alcohol use during pregnancy on the fetus, knowledge of FASD and the source/s of their knowledge, use of alcohol during their pregnancy, amount and type of alcohol consumed, their reason for consuming alcohol, and interest in stopping alcohol use. The rate of alcohol consumption during pregnancy was 23%, and the most common beverage was stout beer (63%). Just over one-third (36%) of participants were knowledgeable of the negative effects of alcohol for the fetus. The factors associated with alcohol use during pregnancy in this sample were: age <30 years, being nulliparous, not having a post-secondary education, consuming alcohol prior to pregnancy, and a lack of knowledge regarding the negative effects of alcohol on the fetus ( $p < 0.05$ ). The authors conclude that alcohol use during pregnancy among women in this region of Nigeria is high, and given the association with a lack of knowledge regarding the harmful effects on the fetus, public health campaigns to increase awareness are warranted.

15. Pettigrew, S., Jongenelis, M., Chikritzhs, T., Pratt, I. S., Slevin, T., & Glance, D. (2016). A Comparison of Alcohol Consumption Intentions Among Pregnant Drinkers and Their Nonpregnant Peers of Child-Bearing Age. *Substance Use & Misuse, 51*(11), 1421-1427. doi:10.3109/10826084.2016.1172641

To investigate alcohol consumption among women in Australia, the authors conducted three national online surveys. Data from women of childbearing age was categorized by pregnancy status: pregnant (n=101), possibly pregnant, (n=178), and not pregnant (n=1,957). Women who were currently pregnant were most likely to report that they should (47%) and will (53%) reduce their alcohol use. The proportion of women reporting they intended to consume five or more drinks during one occasion in the next two weeks did not differ significantly by pregnancy status (33% pregnant, 32% non-pregnant, and 39% possibly pregnant). Older pregnant women reported higher rates of heavy drinking intentions, and fewer intentions to reduce their drinking. The authors conclude that the similar rates of heavy drinking intentions between pregnant and non-pregnant women indicate that current public health guidance to abstain from alcohol use during pregnancy has not yet had an impact at a population level.

16. Popova, S., Lange, S., Probst, C., Parunashvili, N., & Rehm, J. (2017a). Prevalence of alcohol consumption during pregnancy and Fetal Alcohol Spectrum Disorders among the general and Aboriginal populations in Canada and the United States. *European Journal of Medical Genetics, 60*(1), 32-48.

Two independent systematic reviews and meta-analyses were conducted to examine the pooled prevalence of: 1) alcohol use and binge drinking during pregnancy; and 2) FAS and FASD among Aboriginal people and the general population in Canada and the USA. The pooled estimate revealed that 10% of women in Canada and 15% of women in the USA consume alcohol during pregnancy, and in both countries 3% of women binge drink during pregnancy. The prevalence rate of alcohol use among Aboriginal women was three times higher in the USA and four times higher in Canada than among the general population. Further, approximately 20% of Aboriginal women in the USA and Canada binge drink during pregnancy. In Canada, the rate of FAS was approximately 1 per 1000, and the rate of FASD was 5 per 1000. Among Aboriginal people in Canada, the rate of FAS was 38 times higher, and rate of FASD was 16 times higher than the general population. In the USA, the rate of FAS was approximately 2 per 1000, and the rate of FASD was 15 per 1000. Among Aboriginal people in the USA, the rate of FAS was 4 per 1000, and rate of FASD was 10 per 1000. The authors note that the prevalence estimates of FAS and FASD should be interpreted with caution, due to the low number of available studies and the presence of methodological weaknesses. However, the authors conclude that there was a clear need for prevention and surveillance approaches to measure and reduce the use of alcohol during pregnancy and rates of FASD.

17. Popova, S., Lange, S., Probst, C., Shield, K., Kraicer-Melamed, H., Ferreira-Borges, C., Rehm, J. (2016b). Actual and predicted prevalence of alcohol consumption during pregnancy in the WHO African Region. *Tropical Medicine & International Health*, 21(10), 1209-1239. doi:10.1111/tmi.12755

A systematic review and multiple meta-analyses were conducted to assess the prevalence of alcohol use and binge drinking during pregnancy in the World Health Organization African Region, by country. For countries with fewer than two prevalence studies, or no available data, predictions were based on regression modelling. The pooled prevalence rates of alcohol use in pregnancy in Central Africa ranged from 2.2% in Equatorial Guinea (95% CI 1.6–2.8%) to 12.6% in Cameroon (95% CI 9.9–15.4%). In Eastern Africa, rates ranged from 3.4% in Seychelles (95% CI 2.6–4.3%) to 20.5% in Uganda (95% CI 16.4–24.7%). In South Africa, rates ranged from 5.7% in Botswana (95% CI 4.4–7.1%) to 14.2% in Namibia (95% CI 11.1–17.3%). In Western Africa, rates ranged from 6.6% in Mauritania (95% CI 5.0–8.3%) to 14.8% in Sierra Leone (95% CI 11.6–17.9%). In Algeria in North Africa the rate was 4.3% (95% CI 3.2–5.3%; Algeria). The only country with two studies on the prevalence of binge drinking during pregnancy was South Africa (4.6%) (95% CI 3.1–6.4%; I<sup>2</sup> = 74.1%). The authors conclude that education, surveillance and interventions are needed in some African countries where rates of alcohol use or binge drinking during pregnancy are high.

18. Singal, D., Brownell, M., Hanlon-Dearman, A., Chateau, D., Longstaffe, S., & Roos, L. L. (2016). Manitoba mothers and fetal alcohol spectrum disorders study (MBMomsFASD): protocol for a population-based cohort study using linked administrative data. *BMJ Open*, 6(9), e013330-e013330. doi:10.1136/bmjopen-2016-013330

This article describes the research plan for the study of a large retrospective cohort of mothers whose children were diagnosed with FASD, designed to investigate risk factors associated with giving birth to children with FASD; and maternal physical and health outcomes, and use of health and social services in Manitoba. The researchers will be linking children diagnosed with FASD from a provincially centralised FASD assessment clinic (from March 1999 to March 2012) to their birth mothers using de-identified administrative health data housed at the Manitoba Centre for Health Policy, and are generating a comparison cohort of women with children who did not have an FASD diagnosis. The longitudinal data on use of services, as well as the data on risks associated with having a child affected, will provide important information for FASD prevention design.

19. Symon, A., Rankin, J., Butcher, G., Smith, L., & Cochrane, L. (2016a). Evaluation of a retrospective diary for peri-conceptual and mid-pregnancy drinking in Scotland: a cross-sectional study. *Acta Obstetrica et Gynecologica Scandinavica*. doi:10.1111/aogs.13050

The authors assessed peri-conceptual and mid-pregnancy alcohol consumption using a week-long retrospective diary and standard alcohol questionnaires, the agreement between these instruments. This cross sectional study was undertaken in two Scottish health board areas involving 510 women attending mid-pregnancy ultrasound scan clinics. Face-to-face administration of an alcohol retrospective diary, AUDIT or AUDIT-C, and the Depression-Anxiety-Stress Scale (DASS-21) was conducted. A sub-sample (n=30) provided hair for alcohol metabolite analysis. The retrospective diary correlated moderately with the AUDIT tools, and found significantly higher peri-conceptual consumption, (median unit consumption on “drinking days” 6.8; range 0.4-63.8); and additional “special occasions” consumption ranged from 1 to 125 units per week. Biomarker analysis identified three instances of hazardous peri-conceptual drinking. The authors conclude that women report higher consumption levels when completing the retrospective diary, especially “binge” drinking, and note the benefits of it to capture pre-pregnancy and antenatal drinking.

20. Symon, A., Rankin, J., Sinclair, H., Butcher, G., Smith, L., Gordon, R., & Cochrane, L. (2016b). Peri-Conceptual and Mid-Pregnancy Alcohol Consumption: A Comparison between Areas of High and Low Deprivation in Scotland. *Birth: Issues in Perinatal Care*, *43*(4), 320-327. doi:10.1111/birt.12252

This study assessed if general population alcohol consumption patterns were reflected among pregnant women in two Scottish areas with different deprivation levels. Women in two health boards (HB1, lower deprivation levels, n = 274; HB2, higher deprivation levels, n = 236) were administered (face-to-face) a 7-day Retrospective Diary tool to capture peri-conceptual and mid-pregnancy alcohol consumption. A greater proportion of women in the higher deprivation area (HB2) sometimes drank peri-conceptually, but women in the lower deprivation area (HB1) were more likely to drink every week (50% compared with 30%;  $p < 0.001$ ) and to exceed daily limits (6 units) at least once each week (32% compared with 15%;  $p < 0.001$ ). After pregnancy recognition, consumption levels fell sharply, but women in HB2 were more likely to drink above recommended daily limits (2 units) each week (3% compared with 0%;  $p < 0.05$ ). However, women in HB1 were more likely to drink frequently. Women with the highest deprivation scores in each area drank on average less than women with the lowest deprivation scores. The authors conclude that heavy episodic and frequent consumption was more common in the lower deprivation area, in contrast with general population data. The authors note the importance of eliciting a detailed alcohol history at the antenatal booking visit, and of giving clear messaging about the risks of drinking when pregnant.

21. Thapa, N., Aryal, K. K., Puri, R., Shrestha, S., Shrestha, S., Thapa, P., . . . Stray-Pedersen, B. (2016). Alcohol consumption practices among married women of reproductive age in Nepal: A population based household survey. *PLoS ONE*, *11*(4).

This study assessed the prevalence of alcohol consumption among married women of reproductive age in Nepal using a household survey administered over a 5-month period in 2013. A total of 9000 married women of reproductive age were interviewed using a semi-structured questionnaire. The results showed a national prevalence of ever having consumed alcohol among married women of reproductive age of 25% (95% CI 21.7-28.0), last 12 months 18% (95% CI 15.3-20.7) and last 30 days (current drinking) 12% (95% CI 9.8-14.1). There was substantial variation among the districts ranging from 2% to 60%. Analysis found that women with no education or with formal education, dalit and janajatis ethnicity, whose husbands drink alcohol, who brew alcohol at home and women from mountains were significantly at higher risk of consuming alcohol. Among the women who drank alcohol in last 12 months, a substantial proportion of them drank home brewed alcoholic beverages (96%, 95% CI 94.3-97.4).

22. Urban, M. F., Olivier, L., Louw, J. G., Lombard, C., Viljoen, D. L., Scorgie, F., & Chersich, M. F. (2016). Changes in drinking patterns during and after pregnancy among mothers of children with fetal alcohol syndrome: A study in three districts of South Africa. *Drug and Alcohol Dependence, 168*, 13-21. doi:10.1016/j.drugalcdep.2016.08.629

This article describes alcohol use patterns by pregnant women in three districts of South Africa (Cape Winelands, an inland mining town and coastal towns). Mothers (n=156) and proxy informants (n=50) of school-entry children diagnosed with FAS and partial-FAS were interviewed, and compared with 55 controls. Study participants were of low socio-economic status (SES), and a majority of children were either in foster care (12%) or had been cared for by relatives for long periods (44%). Seventy-seven percent (77%) of cases reported current drinking, 35% had stopped drinking during pregnancy, and 6% increased drinking. Many women who stopped in pregnancy resumed postpartum, however cessation in pregnancy was strongly associated with discontinuation in the long run (OR= 3.3; 95% CI 1.2-8.9; p= 0.005). At interview, 36% of cases and 18% of controls were at risk of an alcohol-exposed pregnancy (p= 0.02). A key co-existing risk was a median maternal mass 22kg lower than controls, with 20% being underweight and 14% microcephalic. The authors conclude that the rise in cessation of drinking during pregnancy over time suggests rising awareness of FAS. Because cessation is associated with recidivism after pregnancy, but also with reduced long-term drinking, interventions need to reach pregnant women and extend into the postpartum period.

23. Washio, Y., Mericle, A. A., Cassey, H., Daubert, A. M., & Kirby, K. C. (2016). Characteristics of low-income racial/ethnic minority pregnant women screening positive for alcohol risk. *Journal of Immigrant and Minority Health, 18*(4), 850-855. doi:10.1007/s10903-015-0238-5

This study examined the prevalence and characteristics associated with alcohol risk among low-income, predominantly racial/ethnic minority pregnant women in an urban area in the USA. Pregnant women receiving nutritional care (n=225) were recruited to complete a five-minute survey in the waiting room of a nutritional support service they were accessing. The survey questions covered demographic information, homelessness status, alcohol, cigarette and other drug use, and whether they were living with a person who used substances. The questions about alcohol use were those included in the TWEAK screening tool. Twenty-six percent (26%) screened positive for alcohol risk. Current smoking status (AOR 2.9, 95% CI 1.2-7.0; p=0.018) and a history of marijuana use (AOR 3.1, 95% CI 1.6-6.2; p=0.001) were the strongest predictors of alcohol risk status. The authors note the importance of screening for alcohol risk, smoking, and illicit drug use among pregnant women and note the usefulness of the TWEAK in identifying alcohol risk in settings serving women who are of low income and are racially and culturally diverse.

24. Winter, G. F. (2016). Alcohol, pregnancy and the precautionary principle. *British Journal of Midwifery, 24* (10), 684-684. doi: 10.12968/bjom.2016.24.10.684

In this commentary, the author discusses the "precautionary principle", the approach to FASD prevention taken by Finland, Norway, Sweden, and Denmark. The principle purports that given the absence of clear scientific data on safe levels of alcohol consumption during pregnancy, there is "certain uncertainty," regarding safe levels and, therefore, the message to women is "why take chances." The author describes how this principle has gained endorsement even though it does not follow a logical progression of the facts (or lack of them), which is the scientific approach to medical recommendations. Instead, the precautionary principle reflects the influence of socio-cultural interpretations of the facts. Moreover, for these reasons, more facts may not solve the issue of certainty.

## Influences and factors associated with drinking in pregnancy

1. Balachova, T., Bard, D., Bonner, B., Chaffin, M., Isurina, G., Tsvetkova, L., & Volkova, E. (2016). Do attitudes and knowledge predict at-risk drinking among Russian women? *The American Journal of Drug and Alcohol Abuse*, 42(3), 306-315. doi:10.3109/00952990.2016.1141914

(See abstract above)

2. Brown, Q. L., Hasin, D. S., Keyes, K. M., Fink, D. S., Ravenell, O., & Martins, S. S. (2016). Health insurance, alcohol and tobacco use among pregnant and non-pregnant women of reproductive age. *Drug and Alcohol Dependence*, 166, 116-124. doi:10.1016/j.drugalcdep.2016.07.001

(See abstract above)

3. Cohen, K., Capponi, S., Nyamukapa, M., Baxter, J., Crawford, A., & Worly, B. (2016). Partner involvement during pregnancy and maternal health behaviors. *Maternal and Child Health Journal*, 20(11), 2291-2298. doi:10.1007/s10995-016-2048-3

(See abstract above)

4. English, L. L., Mugenyi, G., Nightingale, I., Kiwanuka, G., Ngonzi, J., Grunau, B. E., . . . Wiens, M. O. (2016). Prevalence of ethanol use among pregnant women in Southwestern Uganda. *Maternal and Child Health Journal*, 20(10), 2209-2215. doi:10.1007/s10995-016-2025-x

(See abstract above)

5. Green, P. P., McKnight-Eily, L. R., Tan, C. H., Mejia, R., & Denny, C. H. (2016). Vital Signs: Alcohol-Exposed Pregnancies--United States, 2011-2013. *MMWR: Morbidity & Mortality Weekly Report*, 65(4), 91-97. doi:10.15585/mmwr.mm6504a6

(See abstract above)

6. Haydon, H. M., Obst, P. L., & Lewis, I. (2016). Beliefs underlying Women's intentions to consume alcohol. *BMC Women's Health*, 16, 1-12. doi:10.1186/s12905-016-0317-3

The authors investigated women's underlying intentions for making drinking choices and their actual behaviors based on age and levels of drinking. Two questionnaires were created based on the Theory of Planned Behaviour-- a theory used to predict health and social behaviours. Women aged 18-37 (mean = 35) were asked to complete two online questionnaires: Questionnaire 1 (n= 1039) about their intentions to drink alcohol (low-risk, frequency, high-risk/binge), and two weeks later; and Questionnaire 2 (n= 845) about their alcohol consumption. Except for intention to drink at low risk levels, women's intentions to drink and their underlying choices were related to age. For instance, older women (aged 45+) were more likely to intend to drink frequently and related beliefs were relaxation and stress relief. Women aged 18-24 were more likely to intend to binge drink and related beliefs were birthday celebrations, higher tolerance, access to wineries and wine clubs, and not having children. The authors contend that the study results underscore the importance of targeting interventions and messaging to specific ages and drinking behaviors, as women's intentions and choices may change over the lifespan.

7. Högberg, H., Skagerström, J., Spak, F., Nilsen, P., & Larsson, M. (2016). Alcohol consumption among partners of pregnant women in Sweden: a cross sectional study. *BMC Public Health*, 16, 1-10. doi:10.1186/s12889-016-3338-9

In this study the authors examined: patterns of alcohol consumption among partners of pregnant women (using the AUDIT-C), motivations for partners to modify their drinking behaviours pre- and postnatally, and perceptions of the advice they received from midwives about alcohol consumption. A questionnaire was administered through 30 antenatal clinics in Sweden between 2009 and 2010. Responses were received from n=444 partners of women who were >17 weeks pregnant. Almost all (95%) of the respondents reported some level of drinking before pregnancy, with 18% reporting binge drinking (6+ standard drinks per occasion) at least once per month in the last year. Over half (58%) reported reduced consumption after pregnancy recognition, with a higher proportion of binge drinkers reducing their alcohol use compared with not-frequent binge drinkers (p= 0.025). Men most commonly reported their reason for reducing alcohol use was support for and solidarity with their partner (49%), not wanting to drink alone (34%), and an increased sense of responsibility (34%). Thirty-seven percent (37%) of partners reported receiving social support for their reduced alcohol consumption, and partners generally appreciated counselling provided by midwives about drinking and pregnancy. The authors conclude that pregnancy is a crucial time to promote interventions to decrease drinking during pregnancy for both mothers and their partners.

8. Holland, K., McCallum, K., & Walton, A. (2016). 'I'm not clear on what the risk is': women's reflexive negotiations of uncertainty about alcohol during pregnancy. *Health, Risk & Society*, 18(1/2), 38-58. doi:10.1080/13698575.2016.116618

This study was undertaken in Australia to explore the perspectives of women (n=20) regarding factors influencing their knowledge and behaviours about alcohol consumption during pregnancy. Emphasis was placed on health advice and media reporting. Data was collected through semi-structured qualitative interviews or focus groups with women who were either pregnant, planning to become pregnant, or had recently had a child. All women reported stopping or reducing their alcohol use upon pregnancy recognition. Several themes emerged: guilt and reassurance about drinking before realizing they were pregnant, choosing abstinence as the safest option despite uncertainty around level of risk, and not denying themselves of an occasional drink if it "felt right" for them. Women also called for a clear and responsible public message about prenatal alcohol consumption, and caution around "policing" pregnant women through guilt about their decision to drink.



9. McBride, N., & Johnson, S. (2016). Fathers' Role in Alcohol-Exposed Pregnancies: Systematic Review of Human Studies. *American Journal of Preventive Medicine*, 51(2), 240-248. doi:10.1016/j.amepre.2016.02.009

This systematic literature review included studies on the impact of paternal alcohol consumption on maternal drinking patterns and child health outcomes. Eleven medium- or large-scale studies were identified between 1990 and 2014, most of which were conducted in the US. The majority (7) of studies investigated the impact of paternal preconception drinking on fetal and infant health; four of these studies also focused on paternal consumption during pregnancy, and one included information on paternal drinking post-pregnancy. Paternal preconception consumption was found to be associated with lower rates of live birth and higher rates of miscarriage and spontaneous abortion among couples undergoing in fertility treatments. In two studies examining paternal preconception drinking and birth weight, one reported no significant findings, and another reported higher risk for low birth weight and gestational age. One additional study examined the effects of alcohol consumption on sperm health and found some indication of lower count and underdevelopment. Among studies examining infant health, one study found no significant effect of paternal consumption (pre-, during-, or 6 months post-pregnancy) on offspring intellectual disability, and two studies found significantly greater risk for leukemia, ventricle malformation, and abnormal situs. Three studies examined the relationship between paternal and maternal drinking during pregnancy, and all found that paternal consumption to be associated with higher rates of consumption among pregnant partners. The authors concluded that paternal alcohol consumption is an important factor related to maternal prenatal drinking, sperm health, and infant and child development, highlighting that healthy pregnancies and outcomes are not only the responsibility of mothers, but also their partners.

10. Muggli, E., O'Leary, C., Donath, S., Orsini, F., Forster, D., Anderson, P. J., . . . Halliday, J. (2016). "Did you ever drink more?" A detailed description of pregnant women's drinking patterns. *BMC Public Health*, 16, 1-13. doi:10.1186/s12889-016-3354-9

(See abstract above)

11. Onah, M. N., Field, S., van Heyningen, T., & Honikman, S. (2016). Predictors of alcohol and other drug use among pregnant women in a peri-urban South African setting. *International Journal of Mental Health Systems*, 10.

(See abstract above)

12. Onwuka, C. I., Ugwu, E. O., Dim, C. C., Menuba, I. E., Iloghalu, E. I., & Onwuka, C. I. (2016). Prevalence and Predictors of Alcohol Consumption during Pregnancy in South-Eastern Nigeria. *Journal of Clinical & Diagnostic Research*, 10(9), 10-13. doi:10.7860/JCDR/2016/21036.8449

(See abstract above)

13. Pettigrew, S., Jongenelis, M., Chikritzhs, T., Pratt, I. S., Slevin, T., & Glance, D. (2016). A Comparison of Alcohol Consumption Intentions Among Pregnant Drinkers and Their Nonpregnant Peers of Child-Bearing Age. *Substance Use & Misuse*, 51(11), 1421-1427. doi:10.3109/10826084.2016.1172641

(See abstract above)

14. Roberts, S. C. M., Subbaraman, M. S., Delucchi, K. L., Wilsnack, S. C., & Foster, D. G. (2016). Moderators and mediators of the relationship between receiving versus being denied a pregnancy termination and subsequent binge drinking. *Drug and Alcohol Dependence*, *159*, 117-124. doi:10.1016/j.drugalcdep.2015.11.033

This study used data from the Turnaway Study, a prospective cohort study which involved 956 women seeking termination of their pregnancy at 30 facilities in the US; some of these women received terminations and some were refused terminations due to late gestation. This study analyzes data from the 452 women who received terminations and 231 women who were refused terminations, to investigate if baseline characteristics (including stress, number of social roles, and emotions regarding the pregnancy) mediate the association between termination and binge drinking. Data collected at baseline, 6-month, 12-month, 18-month, 24-month, and 30-month interviews was analyzed. The authors found that having a previous live birth mediated the association between termination and binge drinking; binge drinking was lower among women with previous live births who carried to term compared to women who terminated the pregnancy. For nulliparous women who were denied a termination, the reduction in binge drinking was not maintained, and by 2.5 years follow up binge drinking among nulliparous women who terminated and those who were denied termination were similar. Stress, negative emotions about the pregnancy and social roles were not found to mediate the association with binge drinking. While positive emotions regarding the pregnancy reported at one week mediated binge drinking at 6-month follow up, this was not sustained at 2.5 year follow-up.

15. Singal, D., Brownell, M., Hanlon-Dearman, A., Chateau, D., Longstaffe, S., & Roos, L. L. (2016). Manitoba mothers and fetal alcohol spectrum disorders study (MBMomsFASD): protocol for a population-based cohort study using linked administrative data. *BMJ Open*, *6*(9), e013330-e013330. doi:10.1136/bmjopen-2016-013330

(See abstract above)

16. Thapa, N., Aryal, K. K., Puri, R., Shrestha, S., Shrestha, S., Thapa, P., . . . Stray-Pedersen, B. (2016). Alcohol consumption practices among married women of reproductive age in Nepal: A population based household survey. *PLoS ONE*, *11*(4).

(See abstract above)

17. Urban, M. F., Olivier, L., Louw, J. G., Lombard, C., Viljoen, D. L., Scorgie, F., & Chersich, M. F. (2016). Changes in drinking patterns during and after pregnancy among mothers of children with fetal alcohol syndrome: A study in three districts of South Africa. *Drug and Alcohol Dependence*, *168*, 13-21. doi:10.1016/j.drugalcdep.2016.08.629

(See abstract above)

18. Washio, Y., Mericle, A. A., Cassey, H., Daubert, A. M., & Kirby, K. C. (2016). Characteristics of low-income racial/ethnic minority pregnant women screening positive for alcohol risk. *Journal of Immigrant and Minority Health, 18*(4), 850-855. doi:10.1007/s10903-015-0238-5

(See abstract above)

19. Watt, M. H., Eaton, L. A., Dennis, A. C., Choi, K. W., Kalichman, S. C., Skinner, D., & Sikkema, K. J. (2016). Alcohol use during pregnancy in a South African community: Reconciling knowledge, norms, and personal experience. *Maternal and Child Health Journal, 20*(1), 48-55. doi:10.1007/s10995-015-1800-4

The aim of this study was to qualitatively explore knowledge and attitudes about maternal alcohol consumption among South African women who reported alcohol use during pregnancy. In-depth interviews with women in Cape Town who were pregnant or within one year postpartum and self-reported alcohol use during pregnancy were used to explore personal experiences with drinking during pregnancy, community norms and attitudes towards maternal drinking, and knowledge about FASD. Women's knowledge of the impacts of fetal alcohol exposure was often inaccurate, based on receiving information from competing sources, and the internalizing of misinformation. Women expressed feeling judged, ambivalent, or defensive about their behaviors, and ultimately uncertain about their alcohol use. The authors see the need to deliver accurate information about the harms of fetal alcohol exposure through sources perceived as trusted and reliable. In addition, at the Individual intervention level women would benefit from assistance with reconciling competing attitudes and identifying motivations for reducing alcohol use during pregnancy.

20. Winter, G. F. (2016). Alcohol, pregnancy and the precautionary principle. *British Journal of Midwifery, 24*(10), 684-684. doi:10.12968/bjom.2016.24.10.684

(See abstract above)

21. Wulp, N. Y., Hoving, C., & Vries, H. (2016). Correlates of partner support to abstain from prenatal alcohol use: a cross-sectional survey among Dutch partners of pregnant women. *Health & Social Care in the Community, 24*(5), 614-622. doi:10.1111/hsc.12235

This study identified correlates of partner support, through an online cross-sectional study of Dutch partners of pregnant women (n=237). Respondents were recruited through Dutch midwifery practices in September-October 2009. Questionnaires were based on the I-Change Model. Partners reporting high support, compared with those reporting low support, were more likely to: desire their partner to abstain from alcohol use; have received advice from their pregnant spouse or midwife that abstinence was desirable; see more advantages to providing support; have stronger perceptions that the baby would experience harm from prenatal alcohol use; have more influences from their social environment encouraging their support, have greater self-efficacy; and a stronger intention to support their partner during the remainder of the pregnancy. The authors conclude that health professionals may improve their alcohol advice by discussing the advantages and disadvantages of support with the partner and by encouraging couples to discuss and propose solutions for the situations in which partners find it difficult not to support alcohol abstinence.

## Level 1 Prevention

1. Avery, M. R., Droste, N., Giorgi, C., Ferguson, A., Martino, F., Coomber, K., & Miller, P. (2016). Mechanisms of influence: Alcohol industry submissions to the inquiry into fetal alcohol spectrum disorders. *Drug & Alcohol Review, 35*(6), 665-672. doi:10.1111/dar.12399

Industry groups seek to influence government policies to protect their vested interest in a number of ways including lobbying, industry-funded research, and targeted media. As part of its 'Inquiry into FASD' the Australian House committee received 92 submissions from health, academic, government groups and individuals from around the country. In 2012, the committee tabled its final report entitled *FASD: The Hidden Harm*. The investigators examined industry submissions to the Inquiry and determined that four strategies were used to minimize or refute concerns related to alcohol and FASD. Strategic aims included undermining community concern, disputing the evidence, campaigning for ineffective industry measures, and attacking researchers and health professionals. The authors conclude that the alcohol industry uses the same strategies as did the tobacco industry to promote their financial interests above public health, and that the government is more bound to the interests of the alcohol industry than to the interests of the public.

2. Bell, E., Andrew, G., Di Pietro, N., Chudley, A. E., Reynolds, J. N., & Racine, E. (2016). It's a Shame! Stigma Against Fetal Alcohol Spectrum Disorder: Examining the Ethical Implications for Public Health Practices and Policies. *Public Health Ethics, 9*(1), 65-77. doi:10.1093/phe/phv012

The authors reviewed social and biomedical literature as well as qualitative research on experiences of those with FASD and put forward a model for understanding stigma based on: 1) attitudes toward women who drink during pregnancy; 2) beliefs about those who have FASD and their families; and, 3) the experiences of those affected by FASD as compared to those of others who have other neurodevelopmental or mental health conditions. Results show that stigma may direct research efforts and promote knowledge gaps; and dignity and consequences are impacted by stigma and thereby raise ethical issues. Consequences of inadvertent and deliberate use of stigma in public health FASD efforts are described. Authors call for the development of an ethical framework for systematically analysing stigma in public health FASD efforts, so that positive outcomes are viewed alongside possible harms related to stigma.

3. Charness, M. E., Riley, E. P., & Sowell, E. R. (2016). Drinking during pregnancy and the developing brain: Is any amount safe? *Trends in Cognitive Sciences, 20*(2), 80-82. doi:10.1016/j.tics.2015.09.011

The authors review the evidence and explain why it may not be possible to prove whether or not low to moderate drinking during pregnancy causes no fetal harm. The resulting ambiguity has played out in popular media and caused confusion for women. Consequently, we have to consider what can be proved-- that there is no known safe amount of alcohol during pregnancy. The authors suggest that current uncertainty can serve both to reassure women who may have consumed alcohol before knowing they were pregnant, and to encourage women to not drink during pregnancy. They recommend that pregnant women be encouraged in their efforts to reduce harms rather than be stigmatized for drinking.

4. Eguiagaray, I., Scholz, B., & Giorgi, C. (2016). Sympathy, shame, and few solutions: News media portrayals of fetal alcohol spectrum disorders. *Midwifery, 40*, 49-54. doi:10.1016/j.midw.2016.06.002

There exists a general lack of understanding of FASD among the public, and many countries have no policies to address it. Because a wide range of health information is now disseminated through the media, the authors look at the way the Australian media frames the issue and how their messages affect their audience. They identify 1) sympathy and 2) shame as the two dominant, but often contradictory, frames used in discussing FASD. Groups described as deserving of sympathy were children and adults with FASD, and in some cases mothers who consumed alcohol in pregnancy. Groups described as deserving of blame included biological mothers (1/5 of articles reviewed), health care providers, and government. Notably, two groups were not included in calls to account for their role in ameliorating FASD: partners of pregnant women, and the alcohol industry and advertising. The authors make recommendations for all groups and suggest further research of other forms of media, and social media, in particular.

5. Fitzgerald, N., Angus, K., Emslie, C., Shipton, D., & Bauld, L. (2016). Gender differences in the impact of population-level alcohol policy interventions: evidence synthesis of systematic reviews. *Addiction, 111*(10), 1735-1747. doi:10.1111/add.13452

In this review of systematic reviews of alcohol policy interventions at the population level, the authors examined gender-specific data and analyses considered in population level alcohol policy interventions. They then conducted narrative syntheses of the relevant data as to “whom the evidence does and does not apply.” Inclusion criteria followed a prescribed framework with 63 reviews being included and then categorized into 10 broad alcohol policy areas. Findings showed that few systematic reviews reported results by gender and many stated that gender-specific information was unavailable in the primary study. The authors discuss the 10 policy areas and describe how the lack of gender-specific data significantly impacts alcohol policy. They conclude that data on gender differences should be included in research in order to increase effectiveness of alcohol policy, particularly regarding mass media and advertising.

6. Haydon, H. M., Obst, P. L., & Lewis, I. (2016). Beliefs underlying Women's intentions to consume alcohol. *BMC Women's Health, 16*, 1-12. doi:10.1186/s12905-016-0317-3

(See abstract above)

7. Kalinowski, A., & Humphreys, K. (2016). Governmental standard drink definitions and low-risk alcohol consumption guidelines in 37 countries. *Addiction, 111*(7), 1293-1298. doi:10.1111/add.13341

The authors explored variability in the definition of a standard drink size, and guidelines about low-risk drinking. Information was gathered through structured Internet searches, direct contact with government agencies, and/or consultation with experts in 37 countries. Of the 75 countries included in the study, the majority of governments had not adopted a standard drink definition; information was included from 37 countries. The modal standard drink was reported to be 10g of pure ethanol (range 8g to 20g). Substantial variability in the recommendations for low-risk drinking were also noted, with daily limits ranging from 10g-42g for women and 10g-56g for men, and weekly limits ranging from 98g-140g for women and 150g-280g for men. In addition to national differences, there were inconsistencies and discrepancies in the information presented by several countries. To

conclude, the authors note that many countries do not define standard drink sizes or low-risk drinking, and that caution should be taken when comparing drinking guidelines across the globe.

8. Kesmodel, U. S., Petersen, G. L., Henriksen, T. B., & Strandberg-Larsen, K. (2016). Time trends in alcohol intake in early pregnancy and official recommendations in Denmark, 1998-2013. *Acta Obstetrica et Gynecologica Scandinavica*, *95*(7), 803-810. doi:10.1111/aogs.12890

(See abstract above)

9. Lee, E., Sutton, R. M., & Hartley, B. L. (2016). From scientific article to press release to media coverage: advocating alcohol abstinence and democratising risk in a story about alcohol and pregnancy. *Health, Risk & Society*, *18*(5/6), 247-269. doi:10.1080/13698575.2016.1229758

The authors use content and thematic analysis to describe the “risk story” that was associated with the 2012 article “Fetal Alcohol Exposure and IQ at Age 8: Evidence from a Population-Based Birth-Cohort Study” (which examined the role of genes, prenatal alcohol metabolism, and child outcomes in which the authors concluded there was no safe amount of alcohol to consume during pregnancy), as well as the press communications and media coverage that followed. The authors provide an overview of the debate around the risk of alcohol consumption during pregnancy, and describe “democratization” as referring to the message that risk applies to any drinking and every woman equally. The authors note that the reporting of the key findings from the 2012 study was not completely in line with the article’s findings, due to the way the media release framed the findings, as well as the selective reporting of data and factual inaccuracies introduced by journalists (particularly in how they reported the link between drinking and child IQ) in the subsequent public communications. The authors note how the media tends to sensationalize individual risk, over the influence of broader determinants of health – and that researchers have an important responsibility to influence how the stories of their findings are told.

1. O'Connor, M. J., Quattlebaum, J., Castañeda, M., & Dipple, K. M. (2016). Alcohol Intervention for Adolescents with Fetal Alcohol Spectrum Disorders: Project Step Up, a Treatment Development Study. *Alcoholism: Clinical & Experimental Research*, *40*(8), 1744-1751. doi:10.1111/acer.13111

Adolescents with neurocognitive effects of prenatal alcohol exposure (PAE) have increased vulnerability for alcohol misuse and for related alcohol use disorders in adulthood. The authors describe results from the Project Step-Up, a developmentally sensitive, harm-reduction group intervention designed for adolescent participants with FASD and their caregivers. Adolescent participants (n=54; 30 females; 24 males) attended weekly, 60-minute intervention sessions over a 6-week period. Their caregivers concurrently, but separately, attended sessions on PAE effects on the brain, adolescent alcohol use, and the related parenting challenges. When teens were classified based on life-time drinking histories researchers found that 33% were light/moderate drinkers (n = 18), and 67% were abstinent/infrequent drinkers (n= 36), consequently these groups were evaluated separately. Assessments pre-intervention, during, and 3-months post intervention showed: 1) no difference pre- and post- intervention for abstinent/infrequent drinkers; and, 2) significant decrease in alcohol risk and negative behaviours related to alcohol use for the Project Step-up group post-intervention when compared to Control group (Cohen’s  $d = 1.08$  and  $0.99$ ). This study suggests that a manualized intervention delivered by trained therapists did not foster drinking in teens, showed positive results in risk and behaviours, and should be considered within the context of the intervention limitations described.

10. Petticrew, M., Douglas, N., Knai, C., Durand, M. A., Eastmure, E., & Mays, N. (2016). Health information on alcoholic beverage containers: has the alcohol industry's pledge in England to improve labelling been met? *Addiction*, *111*(1), 51-55. doi:10.1111/add.13094

In the United Kingdom, warning labels on alcohol products are based on a voluntary agreement between the government and alcohol industry, and in 2011, the industry committed to label 80% of products. The authors assessed the 100 best-selling alcohol brands (n=156 total alcohol products) in the UK for: presence of health warning labelling, and the clarity of the message and placement of the label. Specifically, the messages were assessed for information on: 1) the number of alcohol units, 2) government guidelines on alcohol consumption, 3) warnings regarding alcohol use during pregnancy, 4) mention of the Drinkaware website, 5) and a statement regarding responsible use. The size and colour of text and warning information was also assessed. They found that guidelines on alcohol consumption, information on alcohol units and pregnancy warnings were included on 78% of the products analyzed. While the mean font size of the unit guidelines was 8.17-point, pregnancy warnings were 5.95 mm and was often smaller on wine bottles. In conclusion, the authors note that more consistent labelling, with larger font and logos are required.

11. Poole, N., Schmidt, R. A., Green, C., & Hemsing, N. (2016). Prevention of Fetal Alcohol Spectrum Disorder: Current Canadian Efforts and Analysis of Gaps. *Substance Abuse: Research and Treatment*, *2016*(Suppl. 1), 1-11. doi:10.4137/SART.S34545

Canadian FASD experts have classified the prevention of fetal alcohol spectrum disorder (FASD) in four levels: Level 1) public awareness and health promotion; Level 2) conversations with women of reproductive age and their partners regarding alcohol use; Level 3) specialized support for women who are pregnant; and Level 4) support for new mothers in the postpartum period. To identify and describe the current levels of services in Canada, an online Delphi survey was completed by a sample of 50 service providers, civil servants and researchers involved in FASD prevention. The authors found that Canadian practices reflected the four levels of prevention, although these were not evenly distributed across the country. They note the need to: improve the availability, scope, and integration of services, education and support, and to link FASD prevention efforts with the wider health promotion and substance use prevention fields.

12. Roozen, S., Black, D., Peters, G. J. Y., Kok, G., Townend, D., Nijhuis, J. G., . . . Curfs, L. M. G. (2016). Fetal Alcohol Spectrum Disorders (FASD): an Approach to Effective Prevention. *Current Developmental Disorders Reports*, *3*(4), 229-234.

Despite widespread campaigns to prevent AEP, current strategies may be ineffective or counterproductive. Prevention campaigns are often based on the belief that increased awareness will lead to a change in behavior. However, the authors argue that prevention campaigns should be based on evidence based health promotion principles to increase their effectiveness, and describe Intervention Mapping (IM). IM offers a process to develop, implement and evaluate health promotion activities. Each of the six steps of IM inform the next step, although the steps are iterative, not linear. The steps are as follows: 1. Create a logic model of the problem based on a needs assessment; 2. State the outcomes and objectives; 3. Develop the program plan, including scope, sequence, change methods, and practical applications; 4. Produce the intervention, including program materials and messages; 5. Plan program use, including adoption, implementation, and maintenance; 6. Develop an evaluation plan. The author describes each of the six steps using FASD prevention as an example.

## Level 2 Prevention

1. Charness, M. E., Riley, E. P., & Sowell, E. R. (2016). Drinking during pregnancy and the developing brain: Is any amount safe? *Trends in Cognitive Sciences, 20*(2), 80-82. doi:10.1016/j.tics.2015.09.011

(See abstract above)

2. Eichler, A., Grunitz, J., Grimm, J., Walz, L., Raabe, E., Goecke, T. W., . . . Kornhuber, J. (2016). Did you drink alcohol during pregnancy? Inaccuracy and discontinuity of women's self-reports: On the way to establish meconium ethyl glucuronide (EtG) as a biomarker for alcohol consumption during pregnancy. *Alcohol, 54*, 39-44. doi:10.1016/j.alcohol.2016.07.002

The authors support determining low to moderate levels of alcohol consumption during pregnancy in order to implement early interventions for children before developmental consequences can be observed. They followed 180 women comparing EtG results at birth with self-reports of alcohol use during the third trimester (gestational) and when their children were 6-8 years (retrospective). Using two thresholds for positive EtG compared for significance ( $\geq 10$  ng/g (n= 42) and  $\geq 120$  ng/g (n= 26)) they looked at variables of 1) Inaccuracy of self-report and, 2) Inconsistency of self-report gestationally and retrospectively. Regarding inaccuracy: women did not differ significantly in their self-reports whether their children were EtG-positive or EtG-negative. Both groups of women deny alcohol consumption. Of those women reporting alcohol consumption during pregnancy, there is a significant difference between EtG-positive and EtG-negative groups in the reported amount of alcohol consumed. Specifically, for women retrospectively reporting 5 or more drinks per month, an EtG over the threshold is more probable. Regarding inconsistency: Women who denied alcohol consumption in the gestational report, also denied it in the retrospective report (95%) showing consistency between the 2 reporting periods. However, of women who reported alcohol consumption in gestational report, only 28% reported it in retrospective report, showing that self-report may be more biased retrospectively. The authors support using EtG markers as a way to identify children needing early development interventions. They conclude that although self-reports are not reliable, neither gestational nor retrospective measures correspond to EtG markers, and that further research should focus on correlating EtG values with child development instead of women's self-reports.

3. Jensen, J., Kenyon, D. B., & Hanson, J. D. (2016). Preventing alcohol-exposed pregnancy among American-Indian youth. *Sex Education, 16*(4), 368-378. doi:10.1080/14681811.2015.108207

This article presents the findings of a community needs assessment of the CHOICES Programme in the Oglala Sioux Tribe (OST) in South Dakota, USA. The programme is designed to reduce alcohol-exposed pregnancies (AEP), and has shown some promise in American Indian (AI) adult women at risk for having an AEP. The goal of the study was to explore the possibility of expanding the CHOICES programme in the OST community. Key informant interviews were conducted with n=25 service providers, and 8 focus groups were facilitated with n=58 adult AI women (aged 18-44) and men (aged 18+), as well as elder women (aged 45+). Several themes emerged, including the importance of involving youth in the programme, emphasis on education in the prevention of AEPs (especially through school-based programming), consideration of family as integral to the prevention of AEPs, and inclusion of a strong cultural component in prevention efforts. The authors conclude that these findings provide evidence for the expansion of AEP prevention initiatives in the OST community and identified several key elements to support such expansion.



4. Joya, X., Mazarico, E., Ramis, J., Pacifici, R., Salat-Batlle, J., Mortali, C., García-Algar, O., & Pichini, S. (2016). Segmental hair analysis to assess effectiveness of single-session motivational intervention to stop ethanol use during pregnancy. *Drug & Alcohol Dependence, 158*, 45-51. doi:10.1016/j.drugalcdep.2015.10.028

The authors investigated the effectiveness of a single-session motivational interview (MI) for reducing alcohol consumption during pregnancy, using segmental hair analysis as an indicator of drinking. Pregnant women of low socio-economic status and high rate of immigration who were attending a prenatal clinic in Barcelona, Spain (n=168) were randomly assigned to either the MI group or educational control condition (ECC). Women answered the AUDIT, and provided hair samples for analysis after the birth of their child. Analysis of hair samples revealed that 41% of participants abstained from alcohol entirely throughout pregnancy, while 59% showed some evidence of alcohol consumption, 24% of whom exceeded the cut-off for chronic ethanol consumption. The results of the hair analysis showed low correspondence with self-reports of drinking, which the authors attribute to women's misreporting or under-reporting of alcohol use. There were not statistical differences between the intervention and control, although the intervention group had a trend toward maintained abstinence. The intervention did not effectively support reduced drinking among women who moderately or excessively consumed alcohol before the intervention. The authors conclude that single-session MI is not an effective intervention for reducing alcohol consumption during pregnancy in this population; however multi-session MI may be more promising. Furthermore, the authors note that segmental hair analysis may be used to improve the accuracy of detecting and monitoring alcohol use during pregnancy.

5. Lacey, J. O. (2016). Reducing alcohol harm: early intervention and prevention. *Community Practitioner, 89*(2), 26-29.

In this narrative review, the authors highlight the importance of brief supportive interventions by community practitioners in reducing alcohol consumption. The author reviewed recent changes to the UK alcohol consumption guidelines, including low-risk guidelines and definitions of standard drink size, as well as binge, harmful, and dependent drinking; and a recommendation of abstinence for pregnant women. Brief alcohol interventions were then discussed, including their essential components and a review of the evidence of support for such interventions. The article concluded with a brief overview of FAS and FASD, and provided suggestions for how community health practitioners may help in preventing new cases.

6. McQuire, C., et al. (2016). "Objective Measures of Prenatal Alcohol Exposure: A Systematic Review." *Pediatrics 138*(3): 1-17.

This systematic review examined the validity of objective measurements of prenatal alcohol exposure. Literature published between 1990 and 2015 was searched in thirteen academic databases. A total of 12 studies were identified that met inclusion criteria. The authors report variations in test performances across these studies: maternal blood (sensitivity 0%-100%, specificity 79%-100%, based on 4 studies), maternal hair (sensitivity 19%-87%, specificity 56%-86%, based on 2 studies) maternal urine (sensitivity 5%-15%, specificity 97%-100%, based on 2 studies), and combinations of biomarkers (sensitivity 22%-50%, specificity 56%-97%, based on 3 studies). High sensitivity (82% to 100%) was demonstrated for tests of the concentration of fatty acid ethyl esters (in meconium and placental tissues), although specificity varied (13% to 98%). The authors note a high risk of bias due to the selective reporting of outcomes and the use of self-report for reference standards. The authors conclude that evidence is insufficient to support the uptake in practice of objective measures of prenatal alcohol exposure, and that further large-scale studies are required to examine the potential application of biomarkers in meconium and placental tissues.

7. Montag, A. C. (2016). Fetal alcohol-spectrum disorders: identifying at-risk mothers. *International Journal of Women's Health*, 8, 311-323.  
doi:10.2147/IJWH.S85403

In this narrative review, the authors overview screening tools and biomarkers. They make a case for incorporating screening and regular use of biomarkers into routine obstetric and gynecologic care. The authors discuss the reasons early identification is beneficial to both women and their children and justify the methods used to identify them along with associated bioethical implications. Currently, women are identified based on maternal characteristics, self-report assessments, and biomarker tests of alcohol-exposed pregnancies, but none of these methods are sufficient by themselves. The authors support including preconception drinking in self-reports and furthering biomarker technology research. They recommend implementation of universal and routine screening for alcohol consumption to include: 1) self-report; 2) biomarker technologies where necessary; 3) brief interventions; and, 4) referral and treatment.

8. Palm, A., Olofsson, N., Danielsson, I., Skalkidou, A., Wennberg, P., & Högberg, U. (2016). Motivational interviewing does not affect risk drinking among young women: A randomised, controlled intervention study in Swedish youth health centres. *Scandinavian Journal of Public Health*, 44(6), 611-618.  
doi:10.1177/1403494816654047

To test the effects of a motivational interviewing intervention, the authors randomized young Swedish women (n=1051, age 15-22) with risky drinking, defined as an AUDIT-C score of 5 or greater to either receive a motivational interviewing intervention as part of their health care visit at a youth health centre, or to receive regular care. A questionnaire was administered to all the women after their visit, and again at 12 months follow-up. Significant decreases in risky and binge drinking were identified in both groups, with 30% of the women who reported high risk drinking at baseline no longer being high risk at 12 month follow up. Generalised estimating equation analyses did not find any significant differences in effect between the groups, which did not change when adjusting for educational level, foreign background, violence victimisation or sexual identity. Of the women who did not report risky drinking at baseline, 20% reported new risky drinking patterns at follow up. The author concludes the paper by discussing the issues with using screening instruments in youth population to “capture the large mobility in drinking behaviour in young people.”

9. Parrish, D. E., von Sternberg, K., Castro, Y., & Velasquez, M. M. (2016). Processes of change in preventing alcohol exposed pregnancy: A mediation analysis. *Journal of Consulting and Clinical Psychology, 84*(9), 803-812.  
doi:10.1037/ccp0000111

A randomized control trial (RCT) was conducted to examine the mechanisms of change of project CHOICES, an intervention based on motivational interviewing and the trans-theoretical model, aimed at decreasing the risk of AEP. The intervention addresses risky drinking (4 drinks or more per day, or 7 or more drinks per week) and contraception use. Both behavioural and experiential processes of change (POC), as identified in the trans-theoretical model of change, were studied. The authors hypothesized that the CHOICES treatment would increase the experiential POC, which would then increase the behavioural POC which would impact the treatment outcomes (risky drinking, contraception use) and risk of AEP. A total of 830 women identified as at-risk for AEP were randomized to: CHOICES information plus counselling (IPC) (n=416) or information only (IO) conditions (n=414). A path analyses was used, with the treatment outcomes and POC mediator variables measured at 3-months and 9-months for each behavior (risky drinking and contraception use). The overall models demonstrated good fit, and the indirect effect of the treatment group on outcome via POC variables was significant for those models predicting risky alcohol use (standardized estimate 0.02, 95% CI 0.034-0.002) and inadequate contraception (standardized estimate 0.05, 95% CI 0.08-0.02). While the indirect effect of treatment group on AEP risk via POC for inadequate contraception was significant (standardized estimate 0.03, 95% CI 0.05-0.01), the indirect effect of POC variables for risky alcohol use was not significant (standardized estimate 0.01, 95% CI 0.017-0.002). The authors conclude that addressing experiential POC variables early in treatment and behavioural POC later in treatment may improve the effectiveness of motivation based interventions.

10. Poole, N., Schmidt, R. A., Green, C., & Hemsing, N. (2016). Prevention of Fetal Alcohol Spectrum Disorder: Current Canadian Efforts and Analysis of Gaps. *Substance Abuse: Research and Treatment, 2016*(Suppl. 1), 1-11.  
doi:10.4137/SART.S34545

(See abstract above)

11. Roberts, S. (2016a). Conclusion overreach in alcohol and pregnancy article. *Journal of Studies on Alcohol and Drugs, 77*(4), 667-668.  
doi:10.15288/jsad.2016.77.667

In this letter to the editor, Roberts responds to the article: Alshaarawy, O., Breslau, N., & Anthony, J. C. (2016). Monthly estimates of alcohol drinking during pregnancy: United States, 2002–2011. *Journal of Studies on Alcohol and Drugs, 77*, 272–276. She critiques their conclusion that women who drink be advised to use pregnancy test kits after every sexual encounter that might give rise to a conception. She notes that they make “broad—and worrisome—recommendation about how sexually active women of reproductive age should behave.” This conclusion is viewed as problematic by Roberts because: it does not account for chance of becoming pregnant in any month, does not account for the time lag between fertilization and implantation, and is based on a misunderstanding of the ability of pregnancy tests to confirm pregnancy (the earliest detection in home pregnancy tests being 5 days before a missed period). Roberts argues that conclusions should be based on the evidence, rather than using public health as a means to assert control over women’s sexual behavior.

12. Roberts, S. C. M., Ralph, L. J., Wilsnack, S. C., Foster, D. G., & Roberts, S. C. M. (2016b). Which women are missed by primary health-care based interventions for alcohol and drug use? *Addictive Behaviors*, *55*, 32-37. doi:10.1016/j.addbeh.2015.12.015

The authors assessed the associations between binge drinking, alcohol related problem symptoms (APS), substance use before pregnancy confirmation, and having a usual source of health care (USOC) (e.g. a doctor's office, clinic, health department clinic, or Planned Parenthood clinic). Baseline interview data from the Turnaway Study was analyzed, a prospective cohort study which involved 956 women seeking termination of their pregnancy at 30 facilities in the US; some of whom received terminations and some refused terminations due to late gestation. Over half of the women reported having a USOC; women with an APS were less likely to have an USOC (44% vs 60%;  $p < 0.05$ ), and women reporting substance use were also less likely to have an USOC (51% vs. 61%;  $p < 0.05$ ). This association was not found for binge drinking. In multivariate analyses, having APS were, but substance use was not, associated with a lack of USOC. The authors conclude that primary health care prevention approaches may not reach the majority of women who are at risk of having an alcohol exposed pregnancy.

13. Symon, A., Rankin, J., Butcher, G., Smith, L., & Cochrane, L. (2016a). Evaluation of a retrospective diary for peri-conceptual and mid-pregnancy drinking in Scotland: a cross-sectional study. *Acta Obstetrica et Gynecologica Scandinavica*. doi:10.1111/aogs.13050

(See abstract above)

14. Symon, A., Rankin, J., Sinclair, H., Butcher, G., Smith, L., Gordon, R., & Cochrane, L. (2016b). Peri-Conceptual and Mid-Pregnancy Alcohol Consumption: A Comparison between Areas of High and Low Deprivation in Scotland. *Birth: Issues in Perinatal Care*, *43*(4), 320-327. doi:10.1111/birt.12252

(See abstract above)

15. Veryga, A., & Tubelyte, E. (2016). P.7.a.002 - Cultural and other aspects of fetal alcohol spectrum disorder prevention and identification in Lithuania. *European Neuropsychopharmacology*, *26*, S710-S711. doi:10.1016/S0924-977X(16)31850-8

This brief report records the findings of two questionnaires administered to a) general practitioners and obstetricians-gynecologists on attitudes on alcohol use in pregnancy ( $n=74$ ), and b) neonatologists ( $n=27$ ) to determine the prevalence of FASD symptoms among newborns in their practice in Lithuania. The authors found that despite strong scientific recommendations to abstain from alcohol during pregnancy, 12% of physicians recommend alcohol as a remedy for pregnant patients; and 43% of participants claimed that their pregnant patients use alcohol following recommendations of another doctor. During the period of 2007–2011 10 cases of FAS were officially diagnosed in Lithuania, while in only one Lithuanian hospital neonatologists treat more than 100 newborns with typical FAS symptoms per year. Given the much higher FAS morbidity rate worldwide, it appears the syndrome is underdiagnosed in Lithuania and needs more attention from health care system.

16. Watt, M. H., Eaton, L. A., Dennis, A. C., Choi, K. W., Kalichman, S. C., Skinner, D., & Sikkema, K. J. (2016). Alcohol use during pregnancy in a South African community: Reconciling knowledge, norms, and personal experience. *Maternal and Child Health Journal, 20(1)*, 48-55. doi:10.1007/s10995-015-1800-4

(See abstract above)

17. Wright, T. E., Terplan, M., Ondersma, S. J., Boyce, C., Yonkers, K., Chang, G., & Creanga, A. A. (2016). The role of screening, brief intervention, and referral to treatment in the perinatal period. *American Journal of Obstetrics & Gynecology, 215(5)*, 539-547. doi:10.1016/j.ajog.2016.06.038

This article discusses the conclusions of an expert panel convened in 2012 by the US Centres for Disease Control on the need for, and benefits of, screening, brief intervention, and referral to treatment by prenatal care providers to reduce the burden of substance use in pregnancy. They concluded that screening for substance use during pregnancy, and responding based on level of risk should be universal. Women at low risk should receive brief advice, those classified as moderate risk should receive a brief intervention using the principles of motivational interviewing, whereas those who are high risk need referral to specialty care. Given that screening, brief intervention, and referral to treatment has the potential to reduce the burden of substance use in pregnancy it should be integrated into prenatal care.

18. Wulp, N. Y., Hoving, C., & Vries, H. (2016). Correlates of partner support to abstain from prenatal alcohol use: a cross-sectional survey among Dutch partners of pregnant women. *Health & Social Care in the Community, 24(5)*, 614-622. doi:10.1111/hsc.12235

(See abstract above)

### Preconception interventions

1. Balachova, T., Bard, D., Bonner, B., Chaffin, M., Isurina, G., Tsvetkova, L., & Volkova, E. (2016). Do attitudes and knowledge predict at-risk drinking among Russian women? *The American Journal of Drug and Alcohol Abuse, 42(3)*, 306-315. doi:10.3109/00952990.2016.1141914

(See abstract above)

2. Bye, A., Shawe, J., Stephenson, J., Bick, D., Brima, N., & Micali, N. (2016). Differences in pre-conception and pregnancy healthy lifestyle advice by maternal BMI: Findings from a cross sectional survey. *Midwifery, 42*, 38-45. doi:10.1016/j.midw.2016.09.013

The authors used a survey with pregnant women (n= 1,173) attending antenatal care in the UK to determine differences in pre-pregnancy and pregnancy healthy lifestyle advice they received from health care practitioners. Researchers examined routine advice provided on weight management based on BMI, tobacco cessation, and alcohol intake, as well as tobacco and alcohol use before and during pregnancy. Available data on pre-pregnancy BMI showed that 69% of women were of normal weight, 25% were obese or overweight, and 6% were underweight. Advice offered to women of normal BMI or low BMI was similar (OR 2.55, 95% CI 1.64-3.96), while women of high BMI were offered specific pre-conception advice on healthy weight (OR 1.79, 95% CI 1.26-2.54), preconception diet (OR 1.58, 95% CI 1.06-2.37), reducing alcohol use (OR 1.63, 95% CI 1.06-2.51) and smoking cessation (OR 1.62, 95% CI 1.05-2.50). During pregnancy, alcohol use for all women was lower than pre-conception; around half of all women reported alcohol consumption at some point during their pregnancy. For best pregnancy outcomes, preconception care should advise all women of the importance of a healthy lifestyle for best pregnancy outcomes as well as manage any pre-existing health conditions.

3. McBride, N., & Johnson, S. (2016). Fathers' Role in Alcohol-Exposed Pregnancies: Systematic Review of Human Studies. *American Journal of Preventive Medicine, 51(2)*, 240-248. doi:10.1016/j.amepre.2016.02.009

(See abstract above)

4. Poole, N., Schmidt, R. A., Green, C., & Hemsing, N. (2016). Prevention of Fetal Alcohol Spectrum Disorder: Current Canadian Efforts and Analysis of Gaps. *Substance Abuse: Research and Treatment, 2016(Suppl. 1)*, 1-11. doi:10.4137/SART.S34545

(See abstract above)

## Level 3 Prevention

1. Acquavita, S. P., Kauffman, S. S., Talks, A., & Sherman, K. (2016). Pregnant women with substance use disorders: The intersection of history, ethics, and advocacy. *Social Work in Health Care, 55*(10), 843-860.  
doi:10.1080/00981389.2016.1232670

Efforts to develop effective interventions to mitigate harms from substance use disorders (SUD) among pregnant women are hampered because pregnant women are largely excluded from clinical trials. The authors examine the history and consequences of excluding and including women of childbearing potential from clinical trials over the last 60 years. In a discussion of the ethical issues, they argue that excluding pregnant women with SUD from clinical studies while many are subjected to drug testing and punitive practices for using them is contrary to the ethical principles of “autonomy, beneficence and justice.” Further, exclusion practices impede the discovery of and improvements in care outcomes for the vulnerable population they purport to protect. A model for including pregnant women in SUD clinical trials using an “empowered decision-making ethical framework” that prioritizes prenatal care, prevention and education, and access to voluntary treatment services is presented and discussed. Future steps to improving research and outcomes for women with SUD are suggested.

2. Knopf, A. (2016). Pregnant and postpartum women with SUDs need full continuum of care. *Alcoholism & Drug Abuse Weekly, 28*(8), 1-4.  
doi:10.1002/adaw.30479

This issue of Alcohol & Drug Abuse Weekly includes news on the US federally funded system that gives pregnant and postpartum women priority treatment for substance use disorders. The news brief discusses: a residential grant program for pregnant and postpartum women, and Substance Abuse Prevention and Treatment (SAPT) block grants given to states; medication for pregnant women addicted to opioids; and challenges that substance use treatment providers encounter when working with pregnant women with substance use disorders, including the involvement of the criminal justice system and child protection services.

3. Meixner, T., Milligan, K., Urbanoski, K., & McShane, K. (2016). Conceptualizing integrated service delivery for pregnant and parenting women with addictions: Defining key factors and processes. *Canadian Journal of Addiction, 7*(3), 49-57.

The authors used concept mapping to explore the issue of integrated service delivery for women who are pregnant/parenting and living with addictions. The project was conducted in Ontario, Canada, and 30 stakeholders with expertise in research, service delivery, integrated service management, and policy were included in the study. Concept mapping occurred in several phases, and clusters were identified in the following areas (in order of perceived importance): holistic care for mother, baby, and dyad with a focus on empowerment; enhanced access to and coordination of care for clients; engagement of multiple ministries; individually tailored and continuous service delivery throughout life stages; partnerships characterized by innovation and coordination; and sustainability, leadership, and investment in program staff. The authors assert that this study identified key factors and complex process related to effective service delivery for pregnant or parenting women with addictions, and highlighted the necessity of integration and coordination across programming, administration, and policy.

4. Myra, S. M., Ravndal, E., Torsteinsson, V. W., & Wiig, E. M. (2016). Pregnant substance-abusing women in involuntary treatment: Attachment experiences with the unborn child. *Nordic Studies on Alcohol and Drugs*, 33(3), 299-313. doi:10.1515/nsad-2016-0023

Since 1996, the use of involuntary treatment for women who use substances during pregnancy has been legal in Norway. In this study, qualitative interviews were conducted with eight women in to examine how women perceive attachment with their unborn baby in the context of mandatory treatment. The women had experienced low levels of social support, economic disadvantage, and many had experienced abuse and/or lived with parents who substance use issues. The analysis of the qualitative data revealed three main themes: 1) the involuntary treatment was perceived as promoting safety and connection to their unborn baby; 2) women reported experiencing reflexive attachment to their unborn baby upon confirmation of pregnancy/ at the first ultrasounds; and 3) women spoke about their experiences of trauma, abuse, neglect and substance abuse in their families. The authors conclude that women's adverse childhood experiences are the main barrier to attachment with their baby, and that mandatory treatment may provide a context in which to begin to facilitate positive attachment, and break the transmission of risk to the next generation.

5. Poole, N., Schmidt, R. A., Green, C., & Hemsing, N. (2016). Prevention of Fetal Alcohol Spectrum Disorder: Current Canadian Efforts and Analysis of Gaps. *Substance Abuse: Research and Treatment*, 2016(Suppl. 1), 1-11. doi:10.4137/SART.S34545

(See abstract above)

6. Robinowitz, N., Muqueeth, S., Scheibler, J., Salisbury-Afshar, E., & Terplan, M. (2016). Family planning in substance use disorder treatment centers: Opportunities and challenges. *Substance Use & Misuse*, 51(11), 1477-1483. doi:10.1080/10826084.2016.1188944

The authors conducted focus groups and in depth interviews with clients (n=41), staff (n=23) and medical providers (n=9) to determine the feasibility and acceptability of offering family planning services at three substance use treatment centres in Baltimore. Clients reported that they were interested in receiving family planning services, as they often encounter barriers accessing these services while in treatment, and preferred to access family planning on site at the treatment centre. Although treatment providers identified barriers to implementation including time constraints, they also agreed that it would be best to provide these services on site. The authors conclude that treatment centres can play a role in offering preventative and health services including family planning services, which may reduce future substance exposed pregnancies and improve the reproductive health of substance using women.



7. Van Scoyoc, A., Harrison, J. A., & Fisher, P. A. (2016). Beliefs and behaviors of pregnant women with addictions awaiting treatment initiation. *Child & Adolescent Social Work Journal*. doi:10.1007/s10560-016-0474-0

This study examined the protective behaviors that women with addictions engage in during the period of time between when they first find out they are pregnant and when they begin treatment for substance use problems. Semi-structured interviews were conducted with 15 women who were pregnant or postpartum, who had used illicit substances during pregnancy, and were currently receiving inpatient treatment services. Participants retrospectively reported on their experiences. Women reported being concerned about the consequences of prenatal exposure and making efforts to protect the baby from harm. On their own, they sought information anonymously, increased their engagement in health-promoting behaviors, and decreased their use of alcohol and other drugs. The authors conclude that substance-using women are often motivated to protect their baby from harm and actively engage in harm reduction efforts prior to accessing treatment services.

#### Level 4 Prevention

1. Knopf, A. (2016). Pregnant and postpartum women with SUDs need full continuum of care. *Alcoholism & Drug Abuse Weekly*, 28(8), 1-4. doi:10.1002/adaw.30479

(See abstract above)

2. Ondersma, S. J., Svikis, D. S., Thacker, L. R., Beatty, J. R., & Lockhart, N. (2016). A randomised trial of a computer - delivered screening and brief intervention for postpartum alcohol use. *Drug and Alcohol Review*, 5(6), 710-718. doi:10.1111/dar.12389

Universal screening and brief intervention (SBIR) is a promising practice for reducing alcohol use during pregnancy. Research shows that most women cut down or abstain from alcohol while they are pregnant, but most return to previous drinking patterns post-partum. Maintaining reduced alcohol use in the post-partum period could positively affect outcomes for children and families. Using a randomised control group of women (n= 123), the authors compared results of those completing a 20-minute electronic-based brief intervention (n= 63) and those not receiving the intervention (n= 62). Unlike a parallel study around drug use, they found no evidence that this particular e-SBIR was effective in reducing alcohol use among postpartum women. In discussing their findings, they make suggestions for improving the content, delivery and methods of the intervention. Because of the significant advantages inherent in technology-based approaches, such as cost-effectiveness, intervention reach, and ease of implementation, they support further research of e-SBIR in order to identify the key components for success.

3. Poole, N., Schmidt, R. A., Green, C., & Hemsing, N. (2016). Prevention of Fetal Alcohol Spectrum Disorder: Current Canadian Efforts and Analysis of Gaps. *Substance Abuse: Research and Treatment*, 2016(Suppl. 1), 1-11. doi:10.4137/SART.S34545

(See abstract above)

4. Walker, L. O., Murphey, C. L., & Xie, B. (2016). Missed Opportunities for Postpartum Behavioral and Psychosocial Health Care and Acceptability of Screening Options. *Journal of Obstetric, Gynecologic, And Neonatal Nursing: JOGNN / NAACOG*, 45(5), 614-624. doi:10.1016/j.jogn.2016.05.004

This study surveyed women in the postpartum period about discussions with health care providers on a range of health issues, the acceptability of screening, and access to a provider with whom to comfortably discuss sensitive topics. A random sample of women stratified on race/ethnicity and income, drawn from vital records, in a southwestern US community (n=168) who were in their first postpartum year were mailed a questionnaire about health care and screening for depression, diet, physical activity, smoking, and alcohol use during the postpartum period. Women reported that discussion of depression most often occurred (51%) during health care encounters, and discussion of weight were often occurred (14%). More than 94% of women indicated they would "welcome" or "not mind" screenings for depression, diet, physical activity, alcohol use, or smoking at health care visits. Methods and contexts for screening seen as acceptable were: screening during their infants' pediatric health care visits (>90%), screening on an electronic device at their health care visits (86%), screening at home on a web site (84%). More women without health insurance (58%) compared with those with insurance (24%) indicated that they lacked a health professional with whom they could comfortably discuss sensitive topics such as depression. Considerable gaps exist in postpartum health screening and discussions, yet most women find a variety of screening settings and methods acceptable.

## Other

1. Abadir, A. M., & Ickowicz, A. (2016). Fetal alcohol spectrum disorder: reconsidering blame. *CMAJ: Canadian Medical Association Journal*, 188(3), 171-172. doi:10.1503/cmaj.151425

Women who have children with FASD are often blamed for either drinking during pregnancy, or for having untreated addiction issues. The assumption is that mothers choose to drink while pregnant despite knowing the teratogenic effects of alcohol on their unborn children and are, therefore, unfit. Research on the social determinants of health reveals these assumptions as incorrect, and identifies the larger role played by lack of information and support, and for having untreated addiction issues. The authors challenge the assumption is that mothers choose to drink while pregnant despite knowing the teratogenic effects of alcohol on their unborn children and are, therefore, unfit. Further, recent epigenetic research links both paternal and maternal alcohol consumption during the preconception period to FASD in children. Consequently, the authors recommend that interventions target both men and women and promote abstaining from alcohol before and during pregnancy.

2. EBCOG. (2016). EBCOG Position Paper on Alcohol and pregnancy. *European Journal of Obstetrics & Gynecology & Reproductive Biology*, 202, 99-100. doi:10.1016/j.ejogrb.2016.04.020

Many women in Europe continue to drink during pregnancy and unplanned pregnancies can be particularly impacted by alcohol exposure. The European Board and College of Obstetrics and Gynaecology (EBCOG) reviews the known negative effects related to stage of pregnancy, amounts of alcohol, and the negative effects upon IQ of even low levels of alcohol exposure. They recommend that providers and health educators: 1) educate the public on the risks of unprotected sex and alcohol use, and the effects on the fetus of alcohol consumption during pregnancy; and, 2) resolve to identify women with alcohol disorders in the earliest stages of pregnancy and, preferably, pre-conception, and to refer them to appropriate support and treatment.

3. Hotham, E. D., Ali, R. L., White, J. M., & Robinson, J. S. (2016). Ethical considerations when researching with pregnant substance users and implications for practice. *Addictive Behaviors, 60*, 242-243. doi:10.1016/j.addbeh.2016.03.007

In this brief commentary, the authors discuss the ethical issues related to researching pregnant substance users and the implications of these issues on the outcomes of research related to practice. The author posits that there is a commonly held belief among much of society that substance use during pregnancy is harmful to the fetus, a belief that may not be shared with substance users. The disapproval of substance users, as well as the importance placed foetal health over women's health may lead to a delay or avoidance of antenatal care. "Engaging substance users in research in antenatal settings, whether or not a treatment intervention is involved, takes place against this background of disapproval coupled with a general reluctance to involve any pregnant women in research." The authors conclude that research with substance using pregnant women depends on a context of trust and the absence of judgment and that valid research findings will only be identified if confidentiality is adequately addressed.

4. Pei, J., Tremblay, M., McNeil, A., Poole, N., & McFarlane, A. (2016). Neuropsychological Aspects of Prevention and Intervention for FASD in Canada. *Journal of Pediatric Neuropsychology*. doi:10.1007/s40817-016-0020-1

In this review and call to action, the authors detail efforts, successes, and recommendations for five major areas of FASD: epidemiology, conceptualization, research, prevention, and intervention. In the section FASD Prevention in Canada, they overview the national FASD prevention framework which lays out four areas for involvement: a) raising awareness, b) brief counselling, c) prenatal support, and, d) post-partum support. Provincial and strategic plans and multi-sectoral approaches call for universal FASD prevention efforts as well as selective efforts to reach specific subgroups of women and to reduce stigma. Universal prenatal screenings are in place in some provinces and recommended for all of Canada. Programs such as P-CAP in Alberta support women at the highest-risk with wrap-around services and support to them and their children. More evaluation is needed to support a systematic FASD prevention approach that links levels and sectors, and increases inter-agency collaboration and cooperation. Overall, it will be crucial to continue cross-sectoral, high-quality research and evaluation to improve effective FASD prevention and intervention efforts.

5. Popova, S., Lange, S., Burd, L., & Rehm, J. (2016c). The Economic Burden of Fetal Alcohol Spectrum Disorder in Canada in 2013. *Alcohol and Alcoholism (Oxford, Oxfordshire), 51(3)*, 367-375. doi:10.1093/alcalc/agv117

This study assessed the cost-of-illness attributed to FASD in Canada, by examining direct costs for: health care resources, law enforcement, children/ youth in care, housing, special education, long term care services, and research and prevention. The authors also analyzed the indirect costs, including: loss of productivity for those affected by FASD, increased morbidity and early mortality. The total estimated cost was \$1.8 billion (ranging from a lower estimate of \$1.3 billion to a higher estimate of \$2.3 billion). The greatest FASD related cost was the loss of productivity due to morbidity and mortality which made up 41% of the total cost (\$532 million to \$1.2 billion). The second greatest cost were those incurred by the Canadian correctional system, estimated at 29% of the total cost (or \$378.3 million). The third greatest cost were health care costs, which comprised 10% of the total costs (or \$128.5-\$226.3 million). The authors conclude that the economic costs of FASD in Canada are significant, and policies and interventions that prevent FASD could reduce many of these costs.

6. Rutman, D. (2016). Becoming FASD Informed: Strengthening Practice and Programs Working with Women with FASD. *Substance Abuse: Research and Treatment, 10(Suppl 1)*, 13-20. doi:10.4137/SART.S34543

This article identifies key components of an FASD informed approach to service provision, to support the work of health and social care providers, working with women, adults, and young people who may have FASD. The Canadian author draws on the emerging literature, research on support needs, and evaluations of FASD-related programs. The article discusses what an FASD-informed approach is, and provides examples of FASD-informed adaptations to practice, programming, and the physical environment useful to those working in community-based programs with women or young people with substance use problems and/or who have experienced violence, maltreatment, or trauma, who may also have FASD.

7. Seiler, N. K. (2016). Alcohol and Pregnancy: CDC's Health Advice and The Legal Rights of Pregnant Women. *Public Health Reports, 131(4)*, 623-627.

This article discusses the unintended harms associated with laws requiring mandatory reporting of alcohol use not in alignment with the US Centres for Disease Control's recommendation that women of reproductive age avoid alcohol when they are pregnant, are attempting to become pregnant, or could become pregnant. The author overview current laws related to alcohol use during pregnancy including identifying the number of US states where laws are punitive. They then estimate number of cases where women have faced civil or criminal sanctions, such as civil commitment (i.e., involuntary treatment or protective custody) during pregnancy, or with the temporary or permanent removal of children by child protective services agencies after birth. The importance of the public health community's awareness of how information designed to promote positive health behaviors can have serious legal consequences is noted, depending on how law enforcement authorities use such information to shape their own practices.

8. Stewart, M. (2016). Fictions of Prevention: Fetal Alcohol Spectrum Disorder and Narratives of Responsibility. *North American Dialogue, 19(1)*, 55-66. doi:10.1111/nad.12040

This commentary examines the narratives, policies and discourse surrounding FASD as a disability, substance use risk, and FASD prevention; and the resultant implications of these narratives for legal, health and social service interventions. The commentary takes the controversial 2016 advice issued by the US Centres for Disease Control about drinking and contraception use by women of childbearing years as its starting point, and the author argues for a more nuanced and contextualized understanding of the context in which FASD may arise, that will result in improved women's health, legal and child welfare policy and practice.

9. Walker, D. S., Edwards, W. E. R., & Herrington, C. (2016). Fetal alcohol spectrum disorders: Prevention, identification, and intervention. *Nurse Practitioner, 41(8)*, 28-35. doi:10.1097/01.NPR.0000488709.67444.92

This narrative review provides a selective review of evidence aimed at nurses to provide an overview of FASD and current recommendations supporting abstinence from alcohol during pregnancy. As well, clinical methods related to screening, intervention, treatment and management of both pregnant women and their children are detailed, including a chart comparing alcohol screening questionnaires. Underscoring the importance of treatment for women, they conclude that APRNs (nurses) are uniquely positioned to lead prevention efforts around screening, intervention, and referral.

10. Wilkinson, D., Skene, L., De crespigny, L., & Savulescu, J. (2016). Protecting Future Children from In-Utero Harm. *Bioethics*, 30(6), 425-432. doi:10.1111/bioe.12238

This article considers ethical issues related to heavy alcohol use in pregnancy, women’s autonomy, fetal harm, and the possible legal case for intervention to prevent fetal harm. The authors list a range of interventions to prevent harm to ‘future children’, and note that not all legal protective measures that might be possible are justifiable or practicable. Among other avenues for possible action, the authors note that measures that are most likely to be successful and widely supported are education, support and counselling, and suggest that systemic responsibility for providing these could be expanded.

## Summary of included studies by method and country of study

Table 2: Included studies by method, country and page number

	Author	Title	Method	Country	Page
<b>Prevalence of Drinking During Pregnancy</b>					
n=24	Alshaarawy, Breslau, & Anthony (2016)	Monthly Estimates of Alcohol Drinking During Pregnancy: United States, 2002-2011	Cross sectional	USA	4
	Balachova et al. (2016)	Do Attitudes and Knowledge Predict at-Risk Drinking among Russian Women?	Cross sectional	Russia	4
	Brown et al. (2016)	Health Insurance, Alcohol and Tobacco Use among Pregnant and Non-Pregnant Women of Reproductive Age	Cross sectional	USA	5
	Cohen et al. (2016)	Partner Involvement During Pregnancy and Maternal Health Behaviors	Cross sectional	USA	5
	English et al. (2016)	Prevalence of Ethanol Use among Pregnant Women in Southwestern Uganda	Cross sectional	South Africa	5
	Green et al. (2016)	Vital Signs: Alcohol-Exposed Pregnancies--United States, 2011-2013	Cross sectional	USA	6
	Kesmodel et al. (2016)	Time Trends in Alcohol Intake in Early Pregnancy and Official Recommendations in Denmark, 1998-2013	Cross sectional	Denmark	6
	Kreshak et al. (2016)	A Descriptive Regional Study of Drug and Alcohol Use in Pregnant Women Using Results from Urine Drug Testing by Liquid Chromatography-Tandem Mass Spectrometry	Cross sectional	USA	7

	<b>Author</b>	<b>Title</b>	<b>Method</b>	<b>Country</b>	<b>Page</b>
	Matusiewicz, Ilgen, & Bohnert (2016)	Changes in Alcohol Use Following the Transition to Motherhood: Findings from the National Epidemiologic Survey on Alcohol and Related Conditions	Longitudinal	USA	7
	May et al. (2016)	Breastfeeding and Maternal Alcohol Use: Prevalence and Effects on Child Outcomes and Fetal Alcohol Spectrum Disorders	Cross sectional	South Africa	7
	Muggli et al. (2016)	Did You Ever Drink More? A Detailed Description of Pregnant Women's Drinking Patterns	Prospective Cohort	Australia	8
	Niemela et al. (2016)	Fetal Alcohol Syndrome and Maternal Alcohol Biomarkers in Sera: A Register-Based Case-Control Study	Case-control	Finland	8
	Onah et al. (2016)	Predictors of Alcohol and Other Drug Use among Pregnant Women in a Peri-Urban South African Setting	Cross sectional	South Africa	9
	Onwuka et al. (2016)	Prevalence and Predictors of Alcohol Consumption During Pregnancy in South-Eastern Nigeria	Cross sectional	Nigeria	9
	Pettigrew et al. (2016)	A Comparison of Alcohol Consumption Intentions among Pregnant Drinkers and Their Nonpregnant Peers of Child-Bearing Age	Cross sectional	Australia	10
	Popova et al. (2016a)	Prevalence of alcohol consumption during pregnancy and Fetal Alcohol Spectrum Disorders among the general and aboriginal populations in Canada and the United States	Systematic reviews and meta-analysis	Canada	10
	Popova et al. (2016b)	Actual and Predicted Prevalence of Alcohol Consumption During Pregnancy in the Who African Region	Systematic reviews and meta-analysis	Canada	11
	Singal et al. (2016)	Manitoba Mothers and Fetal Alcohol Spectrum Disorders Study (Mbmomsfasd): Protocol for a Population-Based Cohort Study Using Linked Administrative Data	Study protocol	Canada	11

	<b>Author</b>	<b>Title</b>	<b>Method</b>	<b>Country</b>	<b>Page</b>
	Symon et al. (2016a)	Evaluation of a Retrospective Diary for Peri-Conceptual and Mid-Pregnancy Drinking in Scotland: A Cross-Sectional Study	Cross sectional	Scotland	12
	Symon et al. (2016b)	Peri-Conceptual and Mid-Pregnancy Alcohol Consumption: A Comparison between Areas of High and Low Deprivation in Scotland	Cross sectional	Scotland	12
	Thapa et al. (2016)	Alcohol Consumption Practices among Married Women of Reproductive Age in Nepal: A Population Based Household Survey	Cross sectional	Nepal	12
	Urban et al. (2016)	Changes in Drinking Patterns During and after Pregnancy among Mothers of Children with Fetal Alcohol Syndrome: A Study in Three Districts of South Africa	Cross sectional	South Africa	13
	Washio et al. (2016)	Characteristics of Low-Income Racial/Ethnic Minority Pregnant Women Screening Positive for Alcohol Risk	Cross sectional	USA	13
	Winter (2016)	Alcohol, Pregnancy and the Precautionary Principle	Commentary	UK	13
<b>Influences and factors associated with drinking in pregnancy</b>					
n=21	Balachova et al. (2016)	Do Attitudes and Knowledge Predict at-Risk Drinking among Russian Women?	Cross sectional	Russia	4
	Brown et al. (2016)	Health Insurance, Alcohol and Tobacco Use among Pregnant and Non-Pregnant Women of Reproductive Age	Cross sectional	USA	5
	Cohen et al. (2016)	Partner Involvement During Pregnancy and Maternal Health Behaviors	Cross sectional	USA	5
	English et al. (2016)	Prevalence of Ethanol Use among Pregnant Women in Southwestern Uganda	Cross sectional	South Africa	5
	Green et al. (2016)	Vital Signs: Alcohol-Exposed Pregnancies--United States, 2011-2013	Cross sectional	USA	6
	Haydon, Obst, & Lewis (2016)	Beliefs Underlying Women's Intentions to Consume Alcohol	Cross sectional	Australia	15
	Hogberg et al. (2016)	Alcohol Consumption among Partners of Pregnant Women in Sweden: A Cross Sectional Study	Cross sectional	Sweden	15

	<b>Author</b>	<b>Title</b>	<b>Method</b>	<b>Country</b>	<b>Page</b>
	Holland, McCallum, & Walton (2016)	'I'm Not Clear on What the Risk Is': Women's Reflexive Negotiations of Uncertainty About Alcohol During Pregnancy	Qualitative	Australia	15
	McBride, & Johnson (2016)	Fathers' Role in Alcohol-Exposed Pregnancies: Systematic Review of Human Studies	Systematic review	Australia	16
	Muggli et al. (2016)	Did You Ever Drink More? A Detailed Description of Pregnant Women's Drinking Patterns	Prospective cohort	Australia	8
	Onah et al. (2016)	Predictors of Alcohol and Other Drug Use among Pregnant Women in a Peri-Urban South African Setting	Cross sectional	South Africa	9
	Onwuka et al. (2016)	Prevalence and Predictors of Alcohol Consumption During Pregnancy in South-Eastern Nigeria	Cross sectional	Nigeria	9
	Pettigrew et al. (2016)	A Comparison of Alcohol Consumption Intentions among Pregnant Drinkers and Their Nonpregnant Peers of Child-Bearing Age	Cross sectional	Australia	10
	Roberts et al. (2016)	Moderators and Mediators of the Relationship between Receiving Versus Being Denied a Pregnancy Termination and Subsequent Binge Drinking	Longitudinal	USA	17
	Singal et al. (2016)	Manitoba Mothers and Fetal Alcohol Spectrum Disorders Study (Mbmomsfasd): Protocol for a Population-Based Cohort Study Using Linked Administrative Data	Study protocol	Canada	11
	Thapa et al. (2016)	Alcohol Consumption Practices among Married Women of Reproductive Age in Nepal: A Population Based Household Survey	Cross sectional	Nepal	12
	Urban et al. (2016)	Changes in Drinking Patterns During and after Pregnancy among Mothers of Children with Fetal Alcohol Syndrome: A Study in Three Districts of South Africa	Cross sectional	South Africa	13
	Washio et al. (2016)	Characteristics of Low-Income Racial/Ethnic Minority Pregnant Women Screening Positive for Alcohol Risk	Cross sectional	USA	13



	Author	Title	Method	Country	Page
	Watt et al. (2016)	Alcohol Use During Pregnancy in a South African Community: Reconciling Knowledge, Norms, and Personal Experience	Qualitative (Interviews)	South Africa	18
	Winter (2016)	Alcohol, Pregnancy and the Precautionary Principle	Commentary	UK	13
	Wulp, Hoving, & Vries (2016)	Correlates of Partner Support to Abstain from Prenatal Alcohol Use: A Cross-Sectional Survey among Dutch Partners of Pregnant Women	Cross sectional	Netherlands	18
<b>Level 1 Prevention</b>					
n=13	Avery et al. (2016)	Mechanisms of Influence: Alcohol Industry Submissions to the Inquiry into Fetal Alcohol Spectrum Disorders	Content analysis	Australia	19
	Bell et al. (2016)	It's a Shame! Stigma against Fetal Alcohol Spectrum Disorder: Examining the Ethical Implications for Public Health Practices and Policies	Systematic review	Canada	19
	Charness et al. (2016)	Drinking During Pregnancy and the Developing Brain: Is Any Amount Safe?	Commentary	USA	19
	Eguiagaray et al. (2016)	Sympathy, Shame, and Few Solutions: News Media Portrayals of Fetal Alcohol Spectrum Disorders	Content analysis (Framing analysis)	Australia	20
	Fitzgerald et al. (2016)	Gender Differences in the Impact of Population-Level Alcohol Policy Interventions: Evidence Synthesis of Systematic Reviews	Narrative synthesis of systematic reviews	UK	20
	Haydon et al. (2016)	Beliefs Underlying Women's Intentions to Consume Alcohol	Prospective design survey	Australia	15
	Kalinowski & Humphreys (2016)	Governmental Standard Drink Definitions and Low-Risk Alcohol Consumption Guidelines in 37 Countries	Cross sectional	USA	20
	Kesmodel et al. (2016)	Time Trends in Alcohol Intake in Early Pregnancy and Official Recommendations in Denmark, 1998-2013	Cross sectional	Denmark	6
	Lee et al. (2016)	From Scientific Article to Press Release to Media Coverage: Advocating Alcohol Abstinence and Democratising Risk in a Story About Alcohol and Pregnancy	Qualitative (Content and thematic analysis)	UK	21

	<b>Author</b>	<b>Title</b>	<b>Method</b>	<b>Country</b>	<b>Page</b>
	O'Connor et al. (2016)	Alcohol Intervention for Adolescents with Fetal Alcohol Spectrum Disorders: Project Step up, a Treatment Development Study	Before and after (pilot)	USA	21
	Petticrew et al. (2016)	Health Information on Alcoholic Beverage Containers: Has the Alcohol Industry's Pledge in England to Improve Labelling Been Met?	Cross sectional	UK	22
	Poole et al. (2016)	Prevention of Fetal Alcohol Spectrum Disorder: Current Canadian Efforts and Analysis of Gaps	Cross sectional	Canada	22
	Roozen et al. (2016)	Fetal Alcohol Spectrum Disorders (FASD): An Approach to Effective Prevention	Narrative Review	Netherlands	22
<b>Level 2 Prevention</b>					
n=18	Charness, Riley, & Sowell (2016)	Drinking During Pregnancy and the Developing Brain: Is Any Amount Safe?	Commentary	USA	19
	Eichler et al. (2016)	Did You Drink Alcohol During Pregnancy? Inaccuracy and Discontinuity of Women's Self-Reports: On the Way to Establish Meconium Ethyl Glucuronide (Etg) as a Biomarker for Alcohol Consumption During Pregnancy	Cross sectional	Germany	23
	Jensen, Kenyon, & Hanson (2016)	Preventing Alcohol-Exposed Pregnancy among American-Indian Youth	Qualitative	USA	23
	Joya et al. (2016)	Segmental Hair Analysis to Assess Effectiveness of Single-Session Motivational Intervention to Stop Ethanol Use During Pregnancy	Randomized control trial (RCT)	Spain	24
	Lacey (2016)	Reducing Alcohol Harm: Early Intervention and Prevention	Narrative review	USA	24
	McQuire et al. (2016)	Objective Measures of Prenatal Alcohol Exposure: A Systematic Review	Systematic review	UK	24
	Montag (2016)	Fetal Alcohol-Spectrum Disorders: Identifying at-Risk Mothers	Narrative Review	USA	25
	Palm et al. (2016)	Motivational Interviewing Does Not Affect Risk Drinking among Young Women: A Randomised, Controlled	RCT	Sweden	25

	<b>Author</b>	<b>Title</b>	<b>Method</b>	<b>Country</b>	<b>Page</b>
		Intervention Study in Swedish Youth Health Centres			
	Parrish et al. (2016)	Processes of Change in Preventing Alcohol Exposed Pregnancy: A Mediation Analysis	RCT	USA	26
	Poole et al. (2016)	Prevention of Fetal Alcohol Spectrum Disorder: Current Canadian Efforts and Analysis of Gaps	Cross sectional	Canada	22
	Roberts (2016a)	Conclusion Overreach in Alcohol and Pregnancy Article	Letter to the editor	USA	26
	Roberts (2016b)	Which Women Are Missed by Primary Health-Care Based Interventions for Alcohol and Drug Use?	Longitudinal	USA	27
	Symon et a. (2016a)	Evaluation of a Retrospective Diary for Peri-Conceptual and Mid-Pregnancy Drinking in Scotland: A Cross-Sectional Study	Cross sectional	Scotland	12
	Symon et a. (2016b)	Peri-Conceptual and Mid-Pregnancy Alcohol Consumption: A Comparison between Areas of High and Low Deprivation in Scotland	Cross sectional	Scotland	12
	Veryga & Tubelyte (2016)	Cultural and Other Aspects of Fetal Alcohol Spectrum Disorder Prevention and Identification in Lithuania	Cross sectional	Lithuania	27
	Watt et al. (2016)	Alcohol Use During Pregnancy in a South African Community: Reconciling Knowledge, Norms, and Personal Experience	Qualitative (Interviews)	South Africa	18
	Wright et al. (2016)	The Role of Screening, Brief Intervention, and Referral to Treatment in the Perinatal Period	Expert meeting findings	USA	28
	Wulp, Hoving, & Vries (2016)	Correlates of Partner Support to Abstain from Prenatal Alcohol Use: A Cross-Sectional Survey among Dutch Partners of Pregnant Women	Cross sectional	Netherlands	18
<b>Preconception interventions</b>					
n=4	Balachova et al. (2016)	Do Attitudes and Knowledge Predict at-Risk Drinking among Russian Women?	Cross sectional	Russia	4

	Author	Title	Method	Country	Page
	Bye et al. (2016)	Differences in Pre-Conception and Pregnancy Healthy Lifestyle Advice by Maternal Bmi: Findings from a Cross Sectional Survey	Cross sectional	UK	29
	McBride & Johnson (2016)	Fathers' Role in Alcohol-Exposed Pregnancies: Systematic Review of Human Studies	Systematic review	Australia	16
	Poole et al. (2016)	Prevention of Fetal Alcohol Spectrum Disorder: Current Canadian Efforts and Analysis of Gaps	Cross sectional	Canada	22
<b>Level 3 Prevention</b>					
n=7	Acquavita et al. (2016)	Pregnant Women with Substance Use Disorders: The Intersection of History, Ethics, and Advocacy	Narrative Review	USA	30
	Knopf (2016)	Pregnant and Postpartum Women with Suda Need Full Continuum of Care	News for policy makers	USA	30
	Meixner et al. (2016)	Conceptualizing Integrated Service Delivery for Pregnant and Parenting Women with Addictions: Defining Key Factors and Processes	Qualitative (Concept mapping)	Canada	31
	Myra et al. (2016)	Pregnant Substance-Abusing Women in Involuntary Treatment: Attachment Experiences with the Unborn Child	Qualitative	Norway	31
	Poole et al. (2016)	Prevention of Fetal Alcohol Spectrum Disorder: Current Canadian Efforts and Analysis of Gaps	Cross sectional	Canada	22
	Robinowitz et al. (2016)	Family Planning in Substance Use Disorder Treatment Centers: Opportunities and Challenges	Qualitative	USA	31
	Van Scoyoc, Harrison & Fisher (2016)	Beliefs and Behaviors of Pregnant Women with Addictions Awaiting Treatment Initiation	Qualitative	USA	32
<b>Level 4 Prevention</b>					
n=4	Knopf (2016)	Pregnant and Postpartum Women with Suda Need Full Continuum of Care	News for policy makers	USA	30
	Ondersma et al. (2016)	A Randomised Trial of a Computer, Delivered Screening and Brief Intervention for Postpartum Alcohol Use	RCT	USA	32

	<b>Author</b>	<b>Title</b>	<b>Method</b>	<b>Country</b>	<b>Page</b>
	Poole et al. (2016)	Prevention of Fetal Alcohol Spectrum Disorder: Current Canadian Efforts and Analysis of Gaps	Cross sectional	Canada	22
	Walker, Murphey, & Xie (2016)	Missed Opportunities for Postpartum Behavioral and Psychosocial Health Care and Acceptability of Screening Options	Cross sectional	USA	33
<b>Other</b>					
n=10	Abadir & Ickowicz (2016)	Fetal Alcohol Spectrum Disorder: Reconsidering Blame	Commentary	Canada	33
	EBCOG (2016)	EBCOG Position Paper on Alcohol and Pregnancy	Position paper	Europe	33
	Hotham et al. (2016)	Ethical Considerations When Researching with Pregnant Substance Users and Implications for Practice	Commentary	Australia	34
	Pei et al. (2016)	Neuropsychological Aspects of Prevention and Intervention for FASD in Canada. Journal of Pediatric Neuropsychology	Narrative Review	Canada	34
	Popova et al. (2016c)	The Economic Burden of Fetal Alcohol Spectrum Disorder in Canada in 2013	Cost of illness	Canada	34
	Rutman (2016)	Becoming FASD Informed: Strengthening Practice and Programs Working with Women with FASD	Commentary	Canada	35
	Seiler (2016)	Alcohol and Pregnancy: CDC's Health Advice and the Legal Rights of Pregnant Women	Commentary	USA	35
	Stewart (2016)	Fictions of Prevention: Fetal Alcohol Spectrum Disorder and Narratives of Responsibility	Commentary	Canada	35
	Walker, Edwards, & Herrington (2016)	Fetal Alcohol Spectrum Disorders: Prevention, Identification, and Intervention	Selective literature summary	USA	35
	Wilkinson et al. (2016)	Protecting Future Children from in-Utero Harm	Commentary	UK	36