

FASD PREVENTION:

An Annotated Bibliography of Articles Published in 2017

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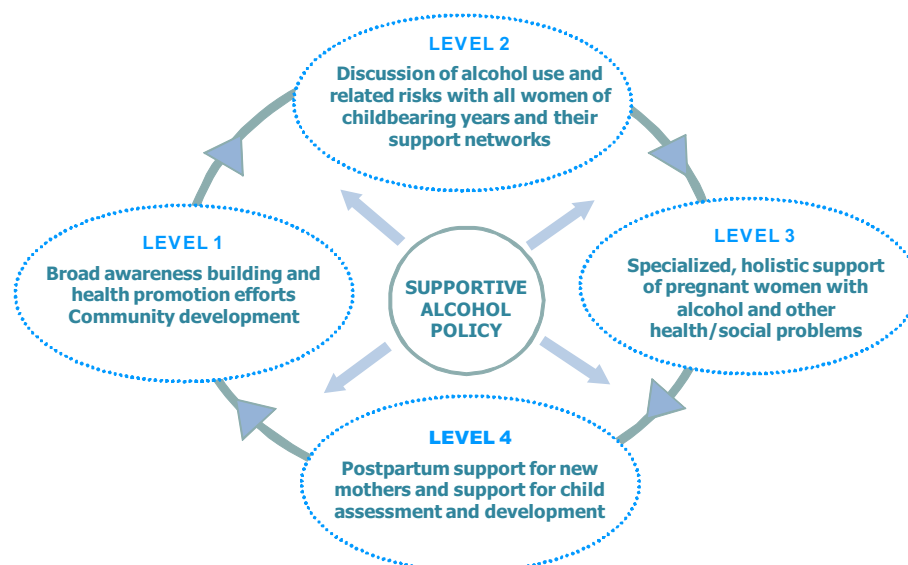
FASD Prevention Literature Search 2017

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Introduction

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 2017:

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 fetal alcohol spectrum disorder OR alcohol related fetal damage] (SU); 2) [FASD OR fetal alcohol OR fetal alcohol OR alcohol exposed pregnancy OR alcohol AND pregnancy] (Any) + [prevention OR preventing OR preventative] (Any); 3) [Fetal OR fetus OR feotus OR foetal] (any) + alcohol (SU); 4) [Alcohol OR drink*] (SU) + [pregnancy OR pregnant] (SU) + prevention (any); 4) [Pregnan* OR conception OR preconception OR post-partum] (SU) + [alcohol OR drink*] (any); 5) Alcohol (SU) + prevention (SU) + [women OR girls OR youth OR teen* OR Aboriginal OR First Nation*] (any); 6) [alcohol OR drink*] (SU) + awareness (any); 7) FASD (SU) + awareness (any); 8) alcohol (SU) + [intervention* (any) + women (SU); 9) [Alcohol OR drink*] (SU) + [motivational interviewing OR Screening OR brief intervention OR SBIR OR SBIRT] (any) + [women OR girls OR gender OR female] (any); 10) [Alcohol OR drink*] (SU) + screening (any) + [women OR girls OR gender OR female] (any); 11) [Alcohol OR drink*] (SU) + brief intervention (any)+ [women OR girls OR gender OR female] (any); 12) [Alcohol or drink*] (SU) + [Home visits OR Home visiting OR NICU OR neonatal intensive care unit OR midwives or midwife or midwifery] (any); 13) [Parent child assistance program OR PCAP] (any); 14) [Pregnan* OR conception OR preconception OR post-partum](any) + [substance use treatment OR 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

One hundred thirteen ($n = 113$) articles were included from our searches. Fourteen ($n = 14$) 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 Kingdom.

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	
Argentina	1	.	.	.	.	.	.		1
Australia	4	2	1	.	1	.	1	1	10
Brazil	1	.	.	.	.	1	.		2
Canada	5	4	2	6	2	2	3	2	26
Denmark	.	.	.	1	.	.	.		1
France	1	.	1	.	.	.	.		2
Ghana	1	1	.	.	.	.	.		2
Italy	.	.	1	1	.	.	.		2
New Zealand	.	.	1	.	.	.	.	1	2
Poland	1	1	.	.	.	.	.		2
Russia	.	1		.	.	.	.		1
South Africa	1	4		.	.	.	.		5
Spain	.	.		1	.	.	.		1
Sweden	2	.		.	1	1	1	1	6
The Netherlands	.	.		.	2	1	.		3
UK (England, Ireland and/or Scotland)	2	2		4	.	1	1		10
USA	4	5	4	19	4	6	2	7	51
	23	20	10	32	10	12	8	12	127

A. Prevalence of drinking in pregnancy

1. Bakhireva, L. N., Sharkis, J., Shrestha, S., Miranda-Sohrabji, T. J., Williams, S., & Miranda, R. C. (2017). Prevalence of Prenatal Alcohol Exposure in the State of Texas as Assessed by Phosphatidylethanol in Newborn Dried Blood Spot Specimens. *Alcoholism: Clinical & Experimental Research*, 41(5), 1004-1011. doi:10.1111/acer.13375

The authors of this study attempted to systematically estimate the prevalence of prenatal alcohol exposure in the state of Texas by measuring ethanol metabolite and phosphatidylethanol (PEth) in a stratified random sample of 1,000 infant residual dried blood spots (irDBSs). The authors estimated the prevalence of prenatal alcohol exposure within 1 month before delivery and compared different geographical regions of the state based on retail liquor licenses, median household income, and prevalence of birth outcomes commonly associated with FASD. In the overall sample, 8.4% of irDBSs were positive for PEth, indicating prenatal alcohol exposure within 1 month before delivery. The findings of this study support recent literature that prenatal alcohol exposure may be more prevalent than previously thought.

2. Da Pilma Leketey, J., Dako-Gyeke, P., Agyemang, S. A., & Aikins, M. (2017). Alcohol consumption among pregnant women in James Town Community, Accra, Ghana. *Reproductive Health*, 14, 1-8. doi:10.1186/s12978-017-0384-4

The authors of this study explored factors that contribute to prenatal alcohol consumption, knowledge of adverse outcomes associated with prenatal alcohol exposure, and alcohol expenditure among pregnant women in Ghana. Pregnant women in the Greater Accra Region of Ghana ($n = 250$) responded to a structured questionnaire covering topics such as: sociodemographic characteristics; alcohol consumption; duration of pregnancy; frequency of alcohol consumption; types of alcohol consumed; facilitators of alcohol consumption; knowledge of adverse effects; and cost of alcoholic beverages. The majority (73%) of participants indicated that they had consumed alcohol prior to pregnancy. Over half of women in the study (53%) who were currently consuming alcohol reported receiving it from friends, as the main reason for their alcohol consumption was socialization. The majority of women who consumed alcohol during pregnancy, as well as those who did not, were aware that alcohol consumption during pregnancy can lead to negative outcomes, such as spontaneous abortion. The results of this study demonstrate that high rates of prenatal alcohol consumption in James Town, Accra, despite women's knowledge about the adverse effects. The authors conclude that these results should be used to inform future health policies regarding prenatal alcohol exposure and maternal and child health interventions.

3. Fortin, M., Muckle, G., Jacobson, S. W., Jacobson, J. L., & Bélanger, R. E. (2017). Alcohol use among Inuit pregnant women: Validity of alcohol ascertainment measures over time. *Neurotoxicology & Teratology*, 64, 73-78. doi:10.1016/j.ntt.2017.10.007

This study sought to address the lack of research that compared the validity of maternal alcohol reports acquired during and after pregnancy among Native Canadian populations, particularly Inuit women. There is a pressing need to develop effective measurement methods to understand why children from certain communities are at an increased risk of alcohol-related neurodevelopmental disorders. Interviews on alcohol consumption were conducted with a sample of 67 women included in the Nunavik Child Development Study (NCDS), both during their pregnancies and again 11 years after delivery. Along with sociodemographic characteristics, the consistency of reported alcohol consumption over time and significant differences in reported quantities were analysed. Results indicated that reports of alcohol consumption and binge exposures were higher when participants

were interviewed during their pregnancies. The findings revealed that interviews conducted at the time of pregnancy carried a higher degree of reliability and offered a more valid information about the number children prenatally exposed to alcohol among Inuit communities.

4. Górniaczyk, A., Czech-Szczapa, B., Sobkowski, M., & Chmaj-Wierzchowska, K. (2017). Maternal health-related behaviours during pregnancy: a critical public health issue. *The European Journal of Contraception & Reproductive Health Care*, 22(4), 321-325. doi:10.1080/13625187.2017.1332304

The authors of this study investigated the health-related behaviours of pregnant women attending antenatal classes, including the use of psychoactive medicines, diet, prevention of neural tube defects, oral cavity hygiene, chronic diseases, and physical activity. One hundred pregnant women in Poland completed a questionnaire on these behaviours, based on the Pregnancy Risk Assessment Monitoring System. Over a quarter (29%) of pregnancies in this study were unplanned. Additionally, 24% of women reported being exposed to second-hand smoke during pregnancy and 9% of women reported drinking alcohol during pregnancy. Alcohol use prior to pregnancy was significantly higher, with 78% of women reporting pre-pregnancy alcohol consumption. The results of this study demonstrate low maternal awareness regarding a variety of health-related behaviours among pregnant women in Poland and speak to the need to effectively educate pregnant women about the importance of maternal and reproductive health.

5. Hashizume Baptista, F., Bispo Rocha, K. B., Lustosa Martinelli, J., Silva de Avó, L. R., Alves Ferreira, R., Ramos Germano, C. M., & Gusmão Melo, D. (2017). Prevalence and factors associated with alcohol consumption during pregnancy. *Revista Brasileira de Saude Materno Infantil*, 17(2), 271-279. doi:10.1590/1806-93042017000200004

The purpose of this study was to investigate the prevalence of alcohol consumption during pregnancy in Brazil based on sociodemographic, reproductive, and newborn-related factors. A cross-sectional, exploratory study was conducted using a sample of post-partum women ($n = 818$) and participants were divided into two groups: alcohol consumers and non-alcohol consumers. 7.3% of women in this sample screened positive on the T-ACE. Women who identified as alcohol consumers were more likely to not have a steady partner. Identifying and characterizing women who may be at risk for alcohol consumption during pregnancy in Brazil can contribute to effective public health interventions for at-risk women.

6. Karjane, N., Rusteikas, S., Kelpin, S., & Svikis, D. (2017). Screening for At-Risk Alcohol and Drug Use in the Perinatal Period: How Do Adolescents Compare to Adult Women? *Journal of Pediatric & Adolescent Gynecology*, 30(2), 268-268. doi:10.1016/j.jpap.2017.03.005

In this published abstract from a clinical research meeting held in Chicago, the authors report on the results of a cross-sectional study of women ($n = 3,317$) attending an urban obstetrics and gynecology clinic in Virginia. Women completed a brief questionnaire about use of alcohol, cigarettes and other drugs including the TWEAK and CAGE screening tests. Pregnant adolescents were less likely to screen positive for at-risk alcohol use, but as likely to screen positive for at-risk drug use as older pregnant women. Pregnant adolescents were also more than twice as likely to screen positive for at-risk drug use than non-pregnant adolescents.

7. Lamy, S., Hennart, B., Houivet, E., Dulaurent, S., Delavenne, H., Benichou, J., . . . Thibaut, F. (2017). Assessment of tobacco, alcohol and cannabinoid metabolites in 645 meconium samples of newborns compared to maternal self-reports. *Journal of Psychiatric Research*, 90, 86-93. doi:10.1016/j.jpsychires.2017.02.012

Researchers in Normandy, France, compared maternal self-report of tobacco, alcohol, and cannabis use in the last trimester of pregnancy with meconium cotinine, ethyl-glucuronide (EtG), and cannabinoid metabolites in newborns to determine fetal psychoactive substance exposure. The women ($n = 724$) included in the study had a median age of 29.6, 1% lived alone, 87% were Caucasian in origin, 55% had a university degree, and 75% were employed. Women were classified as either users or non-users and in total, 33% reported use of cannabis, alcohol or tobacco during the current pregnancy (reported per trimester). Results comparing meconium measurements for exposure to maternal self-report during the third trimester show a high level of concordance for tobacco ($Kappa = 0.79$), a low level of concordance for cannabis ($Kappa = 0.30$), a very low level of concordance for alcohol ($Kappa = 0.025$). The highest meconium levels for EtG corresponded to lower levels of maternal report, and women were most likely to report alcohol use when no levels of EtG were detected. Self-report of cannabis use was not reflected in meconium levels. Researchers compare their findings to other studies and discuss factors affecting their results. They conclude meconium testing for assessing prenatal exposure appears to be valuable for tobacco exposure, "interesting" if high fetal exposure to alcohol is a risk, but needs improvement for assessing cannabis exposure.

8. Lange, S., Probst, C., Heer, N., Roerecke, M., Rehm, J., Monteiro, M. G., . . . Popova, S. (2017). Actual and predicted prevalence of alcohol consumption during pregnancy in Latin America and the Caribbean: systematic literature review and meta-analysis. *Pan American Journal of Public Health*, 41, e89-e89.

The aim of this study was to estimate the prevalence of alcohol consumption during pregnancy within the general population in Latin America and the Caribbean. The authors note that 78% of the countries in the Latin America and Caribbean region report higher alcohol consumption per capita among women than the global average for women. As well, this region has a high proportion of unintended pregnancies (56%). To estimate the prevalence of alcohol consumption during pregnancy, the authors combined three approaches: 1) a comprehensive, systematic literature review; 2) meta-analyses for countries with published data; and 3) regression modelling for countries with no published or few published studies. A total of 24 studies were included in the analysis. Findings estimated among the general population that the prevalence of alcohol consumption during pregnancy was: Brazil, 15.2% (95% CI 10.4%-20.8%); and Mexico, 1.2% (95% CI 0.0%-2.7%). For the 31 countries analyzed using the regression modelling, there was a prevalence rate ranging from 4.8% (95% CI 4.2%-5.4%) in Cuba to 23% (95% CI 20.1%-26.5%) in Grenada. The authors conclude that there need to be greater prevention efforts in this region as well as higher quality studies to determine prevalence rates.

9. Lange, S., Probst, C., Rehm, J., & Popova, S. (2017). Prevalence of binge drinking during pregnancy by country and World Health Organization region: Systematic review and meta-analysis. *Reproductive Toxicology*, 73, 214-221. doi:10.1016/j.reprotox.2017.08.004

The authors estimated prevalence of binge drinking by pregnant women by country and WHO regions to estimate the proportion of drinking and binge drinking by pregnant women, and to learn if over time these rates increased or decreased. The authors performed a comprehensive systematic review and meta-analysis of peer-review studies from 1984-2014. Articles ($n = 58$) were included if they: contained original quantitative research and were published in a peer-reviewed or scholarly publication; reported the prevalence of binge drinking during pregnancy by the general population; and, met quality appraisal criteria. Results were recorded by WHO region and by country within that region. The review showed that in 40% of the countries, over 25% of women who drank in pregnancy binge drank (e.g., Paraguay 77.7%; Benin 77.2%; Seychelles 77.2%). However, in some countries the rates of binge drinking among pregnant women who consumed alcohol was low (e.g., Italy 2.1%; New Zealand 3.0%; Germany 3.5%). Time-trend analysis showed that the rates of binge drinking over time have slightly decreased ($\beta = -0.4$, $p = 0.026$). The authors contend that, given the relationship between unintended pregnancies and binge drinking, and binge drinking as a direct cause of FASD, these results underscore the need for preconception and prenatal care, substance use treatment and a universal prevention protocol like the 4-part model developed by the Public Health Agency of Canada.

10. Liu, W., & Mumford, E. A. (2017). Concurrent Trajectories of Female Drinking and Smoking Behaviors Throughout Transitions to Pregnancy and Early Parenthood. *Prevention Science*, 18(4), 416-427. doi:10.1007/s11121-017-0780-6

This longitudinal study is the first study to identify patterns of concurrent alcohol and cigarette use by mothers from preconception through five years postpartum. The researchers captured women's ($n = 8,800$) self-reported drinking and smoking behaviors at four intervals beginning at preconception through their children's entry into kindergarten. Using a general growth mixture model, smoking/drinking patterns were categorized into a six-class model characterized by trends over time toward higher probability and quantity of smoking and drinking. Trajectory classification was as follows: 41% non-smoking, low probability of drinking; 26% no smoking, moderate drinking; 8% no smoking, escalating high probability of drinking; 11% temporary smoking reduction in pregnancy with low probability of drinking; 9% persistent heavy smoking with declining probability of drinking; and 6% temporary smoking reduction in pregnancy with high probability of drinking. Results confirm previous studies findings that maternal age and education levels are related to smoking and drinking levels. Mothers under age 25 were more likely to be in the primarily smoking classes and less likely to be in the drinking classes, while mothers over age 35 were more likely in the non-smoking and escalating high probability of drinking class. During pregnancy, abstaining from drinking was more common than abstaining from smoking. Those who planned their pregnancies were less likely to be in the chiefly smoking classes or the concurrent smoking/drinking class. In general marriage/cohabitation and breastfeeding was protective for being in the smoking classes but not for the drinking classes. The authors stress the need to begin education and prevention efforts in the preconception period and to use results to tailor public health and clinical efforts.

11. López, M. B., Conde, K., & Cremonte, M. (2017). Alcohol Use Disorders in Argentinian Girls and Women 12 Months Before Delivery: Comparison of DSM-IV, DSM-5, and ICD-10 Diagnostic Criteria. *Journal of Addiction Medicine, 11*(2), 106-113. doi:10.1097/ADM.0000000000000285

The authors interviewed 641 women from a perinatal clinic in Argentina to evaluate the performance of the ICD-10, the DSM-IV and the DSM V in identifying: 1) the prevalence of an alcohol-drinking problems (ADP) diagnosis and 2) the characteristics of the women who received that diagnosis. Most women (83%) were current drinkers and 75% had at least 1 drink during pregnancy. The median age of women was 25.6, 62% had less than 12 years of education, and most were not employed outside the home (54%). Total ADP prevalence for the DSM-IV was 6%, for DSM-V was 8%, and for the ICD-10 was 14%. Agreement between DSM and ICD was improved with modifications reflected in the DSM-5 and it is, therefore, preferred over the DSM-IV. The best diagnostic criterion for discriminating ability was "health issues" and the worst was "legal problems." Poor diagnostic performance of some of the DSM-V criteria could be attributed to intercultural differences.

12. Mårdby, A.-C., Lupattelli, A., Hensing, G., & Nordeng, H. (2017). Consumption of alcohol during pregnancy-A multinational European study. *Women and Birth, 30*(4), e207-e213. doi:10.1016/j.wombi.2017.01.003

Researchers in Europe have used various methodologies to assess the prevalence of drinking during pregnancy by individual countries. The authors employ a single methodology to ascertain a uniform assessment of the prevalence in Europe and to examine differences between countries. A total of 7905 women were recruited from across Europe to complete an online questionnaire. Women enrolled were either pregnant ($n = 4,194$; 53%) or had a child under one-year of age ($n = 3,711$; 47%). Counties with less than 200 enrolled participants were excluded from the study. The overall prevalence of drinking during pregnancy in Europe was 16%. Countries with the lowest prevalence rates of alcohol consumption during pregnancy were Norway (4%), Sweden (7%) and Poland (10%); those with the highest were UK (29%), Russia (27%) and Switzerland (21%). Women who drank during pregnancy were more likely to be older, employed, more highly educated, and smoking before pregnancy, but these maternal factors could not fully explain cross-country differences. Researchers recommend united European interventions be implemented to increase awareness among health care professionals of maternal factors associated with alcohol consumption during pregnancy, particularly in counties with high prevalence rates.

13. McCormack, C., Hutchinson, D., Burns, L., Wilson, J., Elliott, E., Allsop, S., . . . Mattick, R. (2017). Prenatal Alcohol Consumption Between Conception and Recognition of Pregnancy. *Alcoholism: Clinical and Experimental Research, 41*(2), 369-378. doi:10.1111/acer.13305

The authors hypothesize prevalence rates and predictors of alcohol consumption before pregnancy awareness are different from after pregnancy awareness and could reveal different trajectories of consumption. They interviewed 1,403 pregnant women from 4 public antenatal clinics in Australia and found that 61% of women drank alcohol during the pre-recognition period. Drinking at high-risk levels (binge and heavy drinking) was more prevalent than at low-risk levels. Of those who drank, 71% stopped drinking, 18% reduced consumption, and 11% did not reduce consumption following awareness of pregnancy. Women who reduced consumption were likely to be aged 30-35, in their first pregnancy, and drink at moderate levels relative to women who did not reduce consumption after pregnancy recognition. Researchers separately compared abstainers to those who drank at heavy or binge levels prior to pregnancy recognition. The strongest associations for heavy or binge drinking levels were: higher socio-economic status; more likely to be first pregnancy; more likely to be an unplanned pregnancy; more likely to have a university degree; more likely to be born in an English-speaking country; more likely to be older than 36 and less likely to be under 24; and, more

likely to be smokers. The authors illustrate that rates of alcohol-exposed pregnancies are higher when taking into account the pre-recognition period and contend that public health strategies focussing on alcohol use prior to pregnancy may be more effective in reducing alcohol-exposed pregnancies.

14. Oh, S., Reingle Gonzalez, J. M., Salas-Wright, C. P., Vaughn, M. G., & DiNitto, D. M. (2017). Prevalence and correlates of alcohol and tobacco use among pregnant women in the United States: Evidence from the NSDUH 2005–2014. *Preventive Medicine*, 97, 93-99. doi:10.1016/j.ypmed.2017.01.006

This U.S. cross-sectional study examined alcohol and tobacco use among women aged 12-44 ($n = 229,699$) from data gathered in 2005-2014 National Survey on Drug Use and Health (NSDUH). Pregnant women in the study were divided into two groups: adolescents aged 12-17 ($n = 529$) and adults ($n = 7,711$). Data analysis was conducted in three phases to ascertain: 1) demographic characteristics of pregnant women in the U.S.; 2) alcohol and tobacco use among pregnant women; and, 3) correlates of alcohol and tobacco use among pregnant women. Rates of consuming alcohol within the last 30 days among pregnant women were 9% of adults and 12% of adolescents, with both groups less likely to report use compared to their non-pregnant counterparts. Rates for tobacco use within the last 30 days among pregnant women were 15% for adults and 23% among adolescents, with adolescents reporting higher use than their non-pregnant counterparts ($OR = 2.20$, 95% CI 1.53–3.18). Of significance, pregnant women reporting alcohol or tobacco use were also more likely than pregnant abstainers to report: 1) a major depressive episode within the last 12 months, 2) involvement with the criminal justice system, and 3) both alcohol and tobacco use ($OR = 5.00$, 95% CI 2.42–10.32 for adolescents; $OR = 3.02$, 95% CI 2.21–4.14 for adults). The researchers recommend increasing awareness of the deleterious effects of alcohol/tobacco use during pregnancy, consistent messaging, particularly among health providers, and behavioral counseling with special attention for adults dealing with depression or the criminal justice system.

15. Popova, S., Lange, S., Probst, C., Gmel, G., & Rehm, J. (2017). Estimation of national, regional, and global prevalence of alcohol use during pregnancy and fetal alcohol syndrome: a systematic review and meta-analysis. *The Lancet Global Health*, 5(3), e290-e299. doi:10.1016/S2214-109X(17)30021-9

The authors conducted a systematic review and meta-analysis of peer-reviewed journals and scholarly reports published on alcohol use during pregnancy, or on the prevalence of FAS from Nov. 1, 1973 to June 30, 2015. Over 34,000 articles were reviewed to derive estimates of 50 countries across all six regions of the World Health Organization (WHO). Estimates of global prevalence of alcohol use in pregnancy based on meta-analysis of 328 articles was 9.8% (95% CI 8.9-11.1). WHO European Region (EUR) had the highest rate 25.2 (95% CI 21.6-29.6), while the WHO Eastern Mediterranean Region (EMR) had the lowest at 0.2% (95% CI 0.1-0.9). Based on 62 articles, the prevalence of FAS in the general population was 14.6 per 10,000 (95% CI 9.4-23.3). EUR region had the highest rate at 37.4 per 10,000 (95% CI 24.7-54.2), and EMR had the lowest at 0.2 per 10,000 (95% CI 0.2-0.9). Further estimates predict that one in every 67 women who drink alcohol during pregnancy will deliver a child with FAS (119,000 born with FAS worldwide each year). The authors state that results show an urgent global public health problem and recommend that routine standards of care should include screening for alcohol use in all women of childbearing age, contraceptive counselling, and referral to substance use treatment programs for women who have an alcohol use disorder.

16. Reitan, T. (2017). Patterns of polydrug use among pregnant substance abusers. *Nordic Studies on Alcohol and Drugs*, 34(2), 145-159. doi:10.1177/1455072516687256

The aim of this study was to increase knowledge about polydrug use during pregnancy in Sweden. Using client records and administrative data, with primacy given to self-reported data, they conducted a cross-sectional study of pregnant women admitted to compulsory care for substance use ($n = 119$) in Sweden during 2000-2009. Sociodemographic data showed that 42% of the women and at least one other child under the age of 18. There were high rates of children in care (83%); male partners (85%—two-thirds of whom were also abusing substances); and smoking (59%). Average number of drugs used was 2.65, and of those reporting single drug use ($n = 15$), half of those used alcohol. The most commonly used substances were amphetamines (60%), benzodiazepines (59%), opiates (52%), cannabis (41%) and alcohol (33%). The authors state that policies regarding specific drugs are less relevant in clinical settings dealing with polydrug use. They recommend a broader approach to problematic drug use in Sweden, and, specifically, to understanding of the scope and pattern of polydrug use.

17. Smith, L. (2017). Alcohol consumption during pregnancy and breast feeding in Canada is prevalent and not strongly associated with mental health status. *Evidence-Based Nursing*, 20(2), 44. doi:10.1136/eb-2016-102409

The author reviews the findings of Lang S., Quere M., Shield K., *et al.* (see 2015 Annotated Bibliography) and details its implications for practice and research. Health practitioners need to know that women who stop drinking in pregnancy may begin drinking again while breastfeeding and should be informed about possible effects of alcohol on the baby. Further, longitudinal research studies are needed to understand the patterns and trajectory of women's alcohol use from preconception through pregnancy and beyond in order to target intervention development and delivery and thereby improve maternal-child health.

18. Symon, A. (2017). Evaluation of a retrospective diary for peri-conceptual and mid-pregnancy drinking in Scotland: a cross-sectional study. *Acta obstetrica et gynecologica Scandinavica*, 96(1), 53-60. doi: 10.1111/aogs.13050

Researchers evaluated the agreement between two standard alcohol questionnaires and a 7-day retrospective diary (RD) of peri-conceptual and mid-pregnancy alcohol consumption. In two Scottish Health Board clinics, the RD, AUDIT or AUDIT-C, and the Depression Anxiety Stress Scale (DASS-21) were administered face-to-face to women ($n = 510$) attending their mid-pregnancy ultrasound scan. A sub-sample of 30 women provided a hair sample for alcohol metabolite analysis. The RD showed a moderate-to-strong correlation with the other questionnaires. Higher consumption levels were recorded using RD particularly regarding peri-conceptual binge drinking. The results of the retrospective assessment showed 92% of women drank before their pregnancy (40% weekly), and 6% continued to drink past the recommended two-unit limit during their pregnancy. Women who drank heavily before conception were 3.2 times more likely to continue to drink during pregnancy. Researchers concluded that, considering the links between pre-conceptual drinking and continued drinking in pregnancy, the 7-day RD offers clinicians a way to gather information on drinking patterns and levels and, thereby, identify those needing specific interventions.

19. Symon, A., Rankin, J., Sinclair, H., Butcher, G., Barclay, K., Gordon, R., . . . Smith, L. (2017). Peri-conceptual and mid-pregnancy drinking: a cross-sectional assessment in two Scottish health board areas using a 7-day Retrospective Diary. *Journal of Advanced Nursing*, 73(2), 375-385. doi:10.1111/jan.13112

Women ($n = 510$) attending their mid-pregnancy ultrasound scan in two Scottish clinics were recruited for a study to examine if a 7-day retrospective diary (RD) could more accurately assess alcohol consumption in the peri-conceptual and mid-pregnancy period. In face-to-face context with the researcher, women completed paper-based questionnaires on frequency of drinking, types of drink on a Saturday, and consumption levels. The number of women reporting drinking weekly before pregnancy was 187 (40%) and since pregnancy was 16 (17%). Over half (52%) reported drinking above recommended daily limits before pregnancy, while 6% reported exceeding the recommended two-unit limit during their pregnancy. Women who reported an episode of binge drinking before pregnancy were more likely to continue drinking during pregnancy. Wine and spirits were the most popular forms of alcohol, and most drinking was done on the weekend. Researchers conclude that accurate assessments of alcohol use both pre- and post-conception, like the RD, are critical and that health services must commit to providing the resources to do so.

20. Tearne, E., Cox, K., & Giglia, R. (2017). Patterns of Alcohol Intake of Pregnant and Lactating Women in Rural Western Australia. *Maternal & Child Health Journal*, 21(11), 2068-2077. doi:10.1007/s10995-017-2318-8

Researchers recruited women ($n = 489$) and their infants from rural Western Australia hospitals to determine the prevalence and patterns of alcohol consumption during pregnancy and breastfeeding. Women in the Rural Infant Feeding Study (RIFS) were provided a baseline questionnaire in the hospital post-birth and followed up by either telephone interview or online questionnaire at 4, 10, 16, 26, 32, 40, and 52 weeks postpartum. Data analysis was only conducted for women reporting breastfeeding status together with alcohol consumption. Results show that 20% women consumed alcohol during pregnancy. These women were older than 30 years of age (70%) and those who smoked during pregnancy were more than twice as likely to use alcohol in pregnancy (14%, $p = 0.019$) than non-smokers (6%), and to be classified as obese (20%, $p = 0.054$). Rates of breastfeeding mothers consuming alcohol at any level were 46% at 4 months postpartum, 47% at 6 months postpartum, and 52% at 12 months postpartum, while non-breastfeeding mothers were drinking at higher levels 68%, 74%, and 75%, respectively. Most breastfeeding women reported drinking at the level of two drinks per occasion, and most often reported drinking just after feedings. The authors recommend that further research focus on the relationship between long-term outcomes and volume and timing of alcohol intake when breastfeeding.

21. Watt, M. H., Knettel, B. A., Choi, K. W., Knippler, E. T., May, P. A., & Seedat, S. (2017). Risk for Alcohol-Exposed Pregnancies Among Women at Drinking Venues in Cape Town, South Africa. *Journal Of Studies On Alcohol And Drugs*, 78(5), 795-800.

Researchers in South Africa recruited women ($n = 200$) in eight alcohol-serving venues to participate in a cross-sectional survey in order to better understand their risks of alcohol-exposed pregnancy. Before they began drinking, women of reproductive age (18-45 years) completed a brief, researcher-administered survey and the 3-item AUDIT-C. Most of the women met AUDIT-C criteria for current hazardous drinking (96%). Of sexually active participants, 80% reported consistent use of contraceptives, and 20% were at risk for alcohol-exposed pregnancy. Of 176 participants with a previous pregnancy, 65% reported drinking while pregnant including 51% meeting criteria for hazardous drinking, and 47% reporting binge drinking. Researchers conclude that prevention efforts should focus on both alcohol consumption and contraception, targeting alcohol-serving venues for reaching women at risk for AEP and promoting long-acting contraceptive use.

22. Wilson, J., Tay, R. Y., McCormack, C., Allsop, S., Najman, J., Burns, L., . . . Elliott, E. J. (2017). Alcohol consumption by breastfeeding mothers: Frequency, correlates and infant outcomes. *Drug & Alcohol Review*, 36(5), 667-676. doi:10.1111/dar.12473

The authors aimed to estimate the prevalence of alcohol use during breastfeeding, compare the demographics of those who drink and do not drink during breastfeeding, and examine the effects of alcohol use during breastfeeding on breastfeeding duration and infant outcomes. Using data from the Triple B Pregnancy Cohort Study ($n = 457$), the found that the majority of the women consumed alcohol at 8 weeks (61%) and 12 weeks (70%) postpartum. Most women reported consuming one standard drink per occasion and following feeding the baby. Women who drank during breastfeeding, were older, more educated, born in English-speaking country, and had an income of over \$2,000 per week. No deleterious effects were found in infant outcomes at 12 months postpartum, but researchers highlight the reported low levels of alcohol consumption limiting the study's generalisability and need for further research.

23. Zhao, L., McCauley, K., & Sheeran, L. (2017). The interaction of pregnancy, substance use and mental illness on birthing outcomes in Australia. *Midwifery*, 54, 81-88. doi:10.1016/j.midw.2017.08.007

This study assessed the records of 22,053 women who gave birth between 2009 and 2011 in Australia where recording pregnant women's birth outcomes and general health is a national mandatory reporting requirement. Demographics, birth outcomes, and maternal details including histories of mental illness and reported use of substances at first prenatal visit, are included in the record. Women who reported using at least one substance (including tobacco) during pregnancy were more likely to report mental health issues ($OR = 5.57$, 95% CI, 4.57-6.80). Using substances was the strongest predictor for premature birth ($OR = 1.95$, 95% CI 1.50-2.53) and low birth weight ($OR = 2.73$, 95% CI 2-3.47). Identification and support of women with mental health and substance use is important and cross-referral services should be provided.

B. Influences and factors associated with drinking in pregnancy

1. Bohora, S., Chaffin, M., Shaboltas, A., Bonner, B., Isurina, G., Batluk, J., . . . Balachova, T. (2017). Latent Class Analysis of HIV Risk Behaviors Among Russian Women at Risk for Alcohol-Exposed Pregnancies. *AIDS and Behavior*, 21(2), 243-252. doi:10.1007/s10461-017-1929-9

The spread of Human Immunodeficiency Virus (HIV) remain a major public health concern in Eastern Europe and Central Asia, and rates of newly diagnosed cases of HIV infections remain some of the highest in the world in Russia. The authors of this study were interested in investigating the patterns of behaviour that place women of childbearing age at risk for HIV transmission and to determine if sociodemographic characteristics and alcohol use are predictive of this risk pattern. Latent class analysis revealed three classes of risk: high risk, moderate risk, and lower risk. 35% of participants were at high risk with a combination of risk behaviours (e.g., multiple sexual partners, lack of adequate use of condoms). The odds of being classified in Class I (highest risk) compared to Class III (lowest risk) were 3.3 times higher for women who had higher scores on the AUDIT and 3.9 times higher for women who consumed alcohol prior to sexual intercourse. The authors conclude that alcohol use is a significant predictor and risk factor of HIV risk among women of childbearing age in Russia.

2. Brittain, K., Remien, R. H., Phillips, T., Zerbe, A., Abrams, E. J., Myer, L., & Mellins, C. A. (2017). Factors associated with alcohol use prior to and during pregnancy among HIV-infected pregnant women in Cape Town, South Africa. *Drug and Alcohol Dependence*, 173, 69-77. doi:10.1016/j.drugalcdep.2016.12.017

Alcohol use during pregnancy is common in South Africa, with rates of FASD some of the highest in the world. However, there is limited data exploring patterns of consumption among women with HIV, which is likely a critical factor in improving both maternal and child health outcomes. The authors of this study examined patterns of, and factors associated with, alcohol use prior to and during pregnancy among women with HIV in Cape Town, South Africa. Among the 580 women included in this study, 40% reported drinking alcohol in the year prior to pregnancy. This alcohol use was characterized by binge levels of drinking and was associated with a single relationship status, experience of intimate partner violence, and lower levels of HIV-related stigma. Within this specific group of women, 65% had an AUDIT-C score indicating hazardous alcohol use. Interestingly, among women classified as hazardous alcohol users, 70% reported reduced levels of consumption during pregnancy. Although the majority of women reported reduced consumption during pregnancy, almost 1 in 3 women who were characterized as having a hazardous level of alcohol use prior to pregnancy did not report reducing their consumption to below-threshold levels during pregnancy. Factors associated with reduced consumption included earlier gestation when entering antenatal care and a better patient-healthcare provider relationship. The results of this study provide important insights about the trajectory of alcohol use prior to and during pregnancy among women with HIV in South Africa.

3. Coathup, V., Northstone, K., Gray, R., Wheeler, S., & Smith, L. (2017). Dietary Patterns and Alcohol Consumption During Pregnancy: Secondary Analysis of Avon Longitudinal Study of Parents and Children. *Alcoholism: Clinical & Experimental Research*, 41(6), 1120-1128. doi:10.1111/acer.13379

Previous research has indicated that heavy regular and episodic alcohol consumption is associated with poorer dietary consumption, such as lower intakes of fruits and vegetables and higher intakes of processed foods and fried meat. The authors of this study aimed to determine the association

between maternal dietary patterns and prenatal alcohol consumption. Using UK data from the Avon Longitudinal Study of Parents and Children, 9,839 women provided information about alcohol consumption at 18 weeks' gestation and diet at 32 weeks' gestation. Results indicated that drinking during the first trimester and binge drinking during the first half of pregnancy was related to processed dietary patterns, including high intakes of processed meat and low intakes of fruit/vegetables. Lower levels of alcohol consumption (e.g., light to moderate) during the first trimester was associated with a healthier dietary pattern, including high intakes of fruit/vegetables, whole grains, and fish. The authors conclude that a more holistic approach to addressing health behaviours in women of childbearing age is warranted.

4. Coathup, V., Smith, L., & Boulton, M. (2017). Exploration of dietary patterns and alcohol consumption in pregnant women in the UK: A mixed methods study. *Midwifery*, 51, 24-32. doi:10.1016/j.midw.2017.04.011

There is increased evidence that poor maternal nutrition may increase the risk of harm from prenatal alcohol exposure. The authors of this study explored the relationship between maternal dietary patterns and alcohol consumption to determine which factors influence women's decision making during pregnancy. Women ($n = 350$) from the United Kingdom completed a questionnaire, and six women participated in an interview. Results of this study indicated two dietary patterns: 1) a 'prudent' dietary pattern; and 2) a 'cafeteria' dietary pattern. Women who reported frequent alcohol consumption before and during pregnancy were more likely to stick to the 'prudent' dietary pattern, which included a high intake of fruit, vegetables, fish, salad, and pulses, compared to women who abstained from alcohol. The authors found no relationship between alcohol consumption and holding to the 'cafeteria' dietary pattern, which included high intakes of fried food, chocolate, sweets, pudding, and cakes. The authors also identified six key themes through their qualitative analysis. Overall, findings of this study may indicate that those who drink low levels of alcohol during pregnancy in the United Kingdom may have better quality diets compared to women who report no alcohol consumption. These patterns should be considered by health care providers when counselling pregnant women about their pregnancies.

5. Da Pilma Lekettey, J., Dako-Gyeke, P., Agyemang, S. A., & Aikins, M. (2017). Alcohol consumption among pregnant women in James Town Community, Accra, Ghana. *Reproductive Health*, 14, 1-8. doi:10.1186/s12978-017-0384-4

See abstract above.

6. De Genna, N. M., Goldschmidt, L., Marshal, M., Day, N. L., & Cornelius, M. D. (2017). Maternal Age and Trajectories of Risky Alcohol Use: A Prospective Study. *Alcoholism: Clinical & Experimental Research*, 41(10), 1725-1730. doi:10.1111/acer.13451

Previous research has indicated that the transition to parenthood is a particularly notable time for the reduction of alcohol consumption, particularly for women. While age as a biological variable is critical in understanding patterns of alcohol use, it has also been suggested that the timing of the transition to motherhood specifically is a key factor in alcohol use among women. However, no prospective study of maternal alcohol use has focused on the age at transition to motherhood as a predictor of drinking trajectories. Drawing from the results of three U.S. prenatal cohorts, data from 456 pregnant women were merged for an integrative data analysis. Pregnant women were recruited from an urban prenatal clinic and were interviewed about alcohol use during pregnancy at 6, 10, 14, and 16 years postpartum. Growth mixture modeling revealed three groups of mothers based on alcohol use before, during, and after pregnancy. The majority of mothers were identified as having a low-risk trajectory of alcohol use over the 17-year span. However, two groups were classified as higher-risk, which included 23% identified as being in a long-term, high-risk trajectory, and an

additional 11% being in a short-term, high-risk trajectory. Maternal age (e.g., being younger) at first birth predicted inclusion in a high-risk trajectory group and younger mothers were more likely to be classified in the long-term, high-risk group. The authors conclude that the results of this study can help physicians identify women who are likely to exceed the recommended guidelines in the United States.

7. Dukes, K., Tripp, T., Willinger, M., Odendaal, H., Elliott, A. J., Kinney, H. C., . . . the PASS Network. (2017). Drinking and smoking patterns during pregnancy: Development of group-based trajectories in the Safe Passage Study. *Alcohol*, 62, 49-60. doi:10.1016/j.alcohol.2017.03.001

Given the high prevalence of polysubstance use during pregnancy, it is important to identify and investigate co-morbid patterns of substance use during pregnancy, such as drinking and smoking patterns. This article describes the methodological approach used to describe maternal characteristics associated with different patterns of exposure as part of the Safe Passage Study. Exposure trajectories were developed based on data from 11,692 pregnancies from 9,912 women. Women were from three diverse populations, which included: white and American Indian in the Northern Plains region of the United States, and mixed ancestry in South Africa. Group-based trajectory modeling identified five drinking trajectories and seven smoking trajectories. Women with pregnancies that were assigned to the low- or high- continuous drinking groups were less likely to be educated and were more likely to have been enrolled in the study in the third trimester, be of mixed ancestry, or be experiencing depression compared to those in the none, minimal, or quit-smoking groups. Additionally, women assigned to the high- or low- continuous drinking groups were more likely to smoke. The results of this study provide unique insights into the trajectories of prenatal alcohol and tobacco exposure and can aid in determining which patterns of exposure contribute to poor health outcomes.

8. Górniaczyk, A., Czech-Szczapa, B., Sobkowski, M., & Chmaj-Wierzchowska, K. (2017). Maternal health-related behaviours during pregnancy: a critical public health issue. *The European Journal of Contraception & Reproductive Health Care*, 22(4), 321-325. doi:10.1080/13625187.2017.1

See abstract above

9. Kelly, J. F., & Ward, C. L. (2017). Women who drank while pregnant: The importance of social context in the lives of South African pregnant women. *Drugs: Education, Prevention and Policy*, 1-8. doi:10.1080/09687637.2017.1316703

Researchers from South Africa used social representation theory and Foucauldian discourse analysis to learn how women who drink during pregnancy understand their alcohol use, to explore the world in which their understanding was shaped, and to explore how their findings can improve intervention programs. From a small community with a high rate of FASD, 14 women who drank alcohol during pregnancy and enrolled in the local Healthy Mother Healthy Baby program were interviewed. As well, 13 members of their community were recruited using convenience sampling for two focus groups. Of the women interviewed, all reported unplanned pregnancies but varied alcohol use during pregnancy. Findings revealed that for both women and members of their community alcohol use was 1) characterized as a social activity; 2) constructed as a way to manage stress, emotional pain, and life circumstances; and, 3) affected experiences of and attitudes about motherhood. The authors provide implications from the study and suggestions. They conclude that alcohol consumption during pregnancy is a complex issue that is supported by a number of structural

and social issues. Prevention and intervention efforts should not only target the individual and partners, but also social networks and communities.

10. Liu, W., & Mumford, E. A. (2017). Concurrent Trajectories of Female Drinking and Smoking Behaviors Throughout Transitions to Pregnancy and Early Parenthood. *Prevention Science*, 18(4), 416-427. doi:10.1007/s11121-017-0780-6

See abstract above

11. Mårdby, A.-C., Lupattelli, A., Hensing, G., & Nordeng, H. (2017). Consumption of alcohol during pregnancy-A multinational European study. *Women and Birth*, 30(4), e207-e213. doi:10.1016/j.wombi.2017.01.003

See abstract above

12. Oh, S., Reingle Gonzalez, J. M., Salas-Wright, C. P., Vaughn, M. G., & DiNitto, D. M. (2017). Prevalence and correlates of alcohol and tobacco use among pregnant women in the United States: Evidence from the NSDUH 2005–2014. *Preventive Medicine*, 97, 93-99. doi:10.1016/j.ypmed.2017.01.006

See abstract above

13. Petersen-Williams, P., Mathews, C., Jordaan, E., & Parry, C. D. H. (2017). Predictors of Alcohol Use during Pregnancy among Women Attending Midwife Obstetric Units in the Cape Metropole, South Africa. *Substance Use & Misuse*, 1-11. doi:10.1080/10826084.2017.1408654

The authors aim to describe correlates of alcohol use in pregnancy based on demographic predictors, social predictors, and predictors relating to women's partners substance use. They review previous studies detailing prevalence rates of alcohol use among pregnant women in South Africa as determined by self-report. Data from 5,231 women from 11 Midwife Obstetric Units was screened to assess self-reported prevalence of alcohol use. The final sample of women ($n = 684$) completed a structured questionnaire and urinalysis to test for the presence of alcohol. Reported prevalence of alcohol use was 37% (95% CI 32.7 - 41.0), while biologically verified alcohol use was 20% (95% CI 16.3 - 22.8). Predictors of biologically verified alcohol use are different from predictors of self-reported alcohol use. Only partner tobacco use was associated with biologically verified use. Predictors of risk for self-reported alcohol use were: having a marital status other than being married; being a woman of colour; experiencing violence/aggression in the past 12 months compared to more than 12 months ago; having a partner who drinks; and, partner drug use. The authors recommend understanding the contextual issues that surround alcohol use in pregnancy in order to improve prevention/intervention policy and practice.

14. Schmidt, K. A., Lancia, A. J., Alvi, S., & Aldag, J. C. (2017). Alcohol reduction in the first trimester is unrelated to smoking, patient or pregnancy characteristics. *Addictive Behaviors Reports*, 5, 43-48. doi:10.1016/j.abrep.2017.04.003

Researchers used a cross-sectional comparison of women's pre-pregnancy and first-trimester alcohol consumption to examine whether women who screen positive for problem drinking ($n = 126$) reduce their intake during the first trimester, and to determine if that reduction is associated with the pregnancy, the patient, or smoking status. Women self-selected for enrollment in the study, which included anonymous completion of a survey and two questionnaires measuring AUDIT-C scores regarding alcohol. Most of the women were Caucasian, were in their late twenties, non-smokers, from non-rural communities, and had advanced education. Mean gestational age was 8.28 ($sd = 1.97$) and most reported a previous pregnancy, and nausea and vomiting during current pregnancy. Regarding pre-pregnancy alcohol use, 36 (29%) were non-drinkers, 41 (33%) were mild drinkers, and 49 (39%) were problem drinkers, with those assessed at private obstetrician practices showing significantly higher alcohol use ($p = 0.019$, Fisher's exact). Regarding first-trimester alcohol use, 91% of pre-pregnancy drinkers reduced their use AUDIT-C score to zero. Of those with an AUDIT-C score of three or greater in pre-pregnancy, 2% ($n = 1$) had the same score in the first trimester while 92% reduced consumption to zero. None of the participant or pregnancy correlates, including smoking status, were significantly associated with reduction in alcohol use in the first trimester. While the majority of smokers reduced their alcohol use to zero, only half of pre-pregnancy smokers (55%) quit smoking in the first trimester. The authors recommend further research on the relationship between hormones during pregnancy and neurobiological reward system to help explain their findings.

15. Shahram, S. Z., Bottorff, J. L., Kurtz, D. L. M., Oelke, N. D., Thomas, V., & Spittal, P. M. (2017). Understanding the life histories of pregnant-involved young aboriginal women with substance use experiences in three Canadian cities. *Qualitative Health Research*, 27(2), 249-259. doi:10.1177/1049732316657812

Researchers recruited Aboriginal women aged 15-30 in three Canadian cities who had at least one pregnancy and experiences with alcohol and drug use. They conducted semi-structured, ethnographic interviews to gather women's life histories and related social identity. Data was transcribed, coded, and a multi-level intersectional analysis was conducted. Four overall themes emerged: 1) intersectional identities, 2) life histories of trauma many forms, 3) the ever-presence of alcohol and drugs, and, 4) the highs and lows of pregnancy and mothering. Researchers discuss the women's strengths, strategies, and resilience in dealing with their experiences and, in particular in maintaining a relationship with their child(ren). Findings confirm that substance use among Aboriginal women is a response to historical, political, and social inequities, rather than a cause of social inequity and poor health. The authors state that these findings should inform and guide policy and practice to support Aboriginal women and their families.

16. Shahram, S. Z., Bottorff, J. L., Oelke, N. D., Dahlgren, L., Thomas, V., Spittal, P. M., & For the Cedar Project Partnership (2017). The cedar project: using indigenous-specific determinants of health to predict substance use among young pregnant-involved aboriginal women. *BMC Women's Health*, 17, 1-13. doi:10.1186/s12905-017-0437-4

This secondary analysis of data collected from a larger Canadian longitudinal study describes the social context of young Aboriginal women ($n = 291$), and to investigate if the Integrated Life Course and Social Determinants of Model of Aboriginal Health (ILCSD) could be used to predict substance use. Participants were eligible if they used substances and were "pregnant-involved", meaning they had experienced a pregnancy regardless of outcome or subsequent mothering role. ILCSD

determinants were: colonialism, cultural continuity, service use, service barriers, service needs, socio-economic status, physical environments, health behaviours, and trauma. The model's ability to predict heavy versus light use of illicit drugs was assessed for three dependent variables: 1) alcohol use, 2) drug use (smoked), and, 3) drug use (injected). Residential school histories and partner substance use were identified as determinants of substance use, while sex abuse reporting was protective of substance use. The authors state that using "Aboriginal Status" as its own determinant of health promotes a pathological narrative for being Aboriginal in Canada. Results from this study highlight the need to integrate socio-historical contexts into models of health so as to understand what uniquely impacts Aboriginal health.

17. Singal, D., Brownell, M., Chateau, D., Hanlon-Dearman, A., Longstaffe, S., & Roos, L. L. (2017). The Psychiatric Morbidity of Women Who Give Birth to Children with Fetal Alcohol Spectrum Disorder (FASD): Results of the Manitoba Mothers and FASD Study. *The Canadian Journal of Psychiatry*, 62(8), 531-542. doi:10.1177/0706743717703646

Researchers compared differences in psychiatric disorders and antidepressant prescriptions among Canadian women who had given birth to a child with FASD relative to women who had given birth to a child without FASD. Data from a population data repository was linked with data from a FASD diagnostic centre in the province of Manitoba to create a study group ($n = 702$) of mothers whose child received FASD diagnosis and a comparison group ($n = 2,097$). Women in the study group were more likely to be a single parent, to have lower SES, to be younger at first birth, and have a higher number of pregnancies and births. Women in the study group had higher adjusted rates in all data measures: substance use disorder ($RR = 12.65$, 95% CI 8.99-17.80); personality disorder ($RR = 12.93$, 95% CI 4.88-34.22); mood/anxiety disorders ($RR = 1.75$, 95% CI 1.49-2.07) before the pregnancy; maternal psychological distress during pregnancy ($RR = 5.35$, 95% CI 4.58-6.35), and postpartum psychological distress ($RR = 1.71$, 95% CI 1.53-1.90). Findings show that women who give birth to children with FASD face significant mental health burdens. FASD prevention efforts should include improving the mental health of women through increased health provider awareness, support programs, interventions and treatment programs.

18. Smith, L. (2017). Alcohol consumption during pregnancy and breast feeding in Canada is prevalent and not strongly associated with mental health status. *Evidence-Based Nursing*, 20(2), 44. doi:10.1136/eb-2016-102409

See abstract above

19. Watt, M. H., Knettel, B. A., Choi, K. W., Knippler, E. T., May, P. A., & Seedat, S. (2017). Risk for Alcohol-Exposed Pregnancies Among Women at Drinking Venues in Cape Town, South Africa. *Journal Of Studies On Alcohol And Drugs*, 78(5), 795-800.

See abstract above

20. Wilson, J., Tay, R. Y., McCormack, C., Allsop, S., Najman, J., Burns, L., . . . Elliott, E. J. (2017). Alcohol consumption by breastfeeding mothers: Frequency, correlates and infant outcomes. *Drug & Alcohol Review*, 36(5), 667-676. doi:10.1111/dar.12473

See abstract above

21. Zhao, L., McCauley, K., & Sheeran, L. (2017). The interaction of pregnancy, substance use and mental illness on birthing outcomes in Australia. *Midwifery*, 54, 81-88. doi:10.1016/j.midw.2017.08.007

See abstract above

C. Level 1 Prevention

1. Bazzo, S., Black, D., Mitchell, K., Marini, F., Moino, G., Riscica, P., & Fattori, G. (2017). 'Too Young To Drink'. An international communication campaign to raise public awareness of fetal alcohol spectrum disorders. *Public Health*, 142, 111-115. doi:10.1016/j.puhe.2016.08.001

This 'short communication' style article describes the "Too Young to Drink" campaign, which is an international FASD prevention campaign coordinated by the European FASD Alliance, in collaboration with the National Organization on Fetal Alcohol Syndrome (NOFAS) and the European Alcohol Policy Alliance (EUROCARE). This article specifically highlights how social media brought together small groups, tracked how the campaign messages spread, and helped evaluate the dissemination and effectiveness of the campaign. Findings indicate that it is possible to develop and carry out an international campaign to raise public awareness of FASD using social marketing and social media strategies. The findings further support the need for evaluations on the effectiveness of public communication efforts to educate the public about the risks of prenatal alcohol exposure.

2. Cil, G. (2017). Effects of posted point-of-sale warnings on alcohol consumption during pregnancy and on birth outcomes. *Journal of Health Economics*, 53, 131. doi:10.1016/j.jhealeco.2017.03.004

Point-of-sale warning signs have been implemented as a policy in the U.S. to reduce alcohol consumption during pregnancy. From the mid-1980s through to the 2010s, 23 states and the District of Columbia implemented laws that require all alcohol retailers to display signs that warn against the risks of prenatal alcohol consumption. The author of this research uses the variation in the adoption of these laws across the states, and within each state over time, to demonstrate a statistically significant reduction in prenatal alcohol use associated with point-of-sale warning signs.

3. Dossou, G., Gallopel-Morvan, K., & Diouf, J.-F. (2017). The effectiveness of current French health warnings displayed on alcohol advertisements and alcoholic beverages. *European Journal of Public Health*, 27(4), 699-704. doi:10.1093/eurpub/ckw263

In an effort to better understanding the use of alcohol consumption health warnings, the authors of this study explored the effectiveness of two mandatory warnings introduced in France in 1991 and 2007. Using recommendations from Martin-Moreno et al. regarding the interpretation of alcohol labels, the authors conducted in-depth interviews with 26 individuals, aged 15-29. Effectiveness of the health warnings was determined by six factors which included: recall, noticeability, credibility, comprehension, responsiveness, and the ability to encourage moderate drinking or abstinence during pregnancy. Both health warnings were perceived to lack visibility and noticeability because of their size, location, and outdatedness. Additionally, participants perceived the warnings to lack important information (e.g., were vague) and credibility, and to be ineffective in making participants feel concerned about the outcomes associated with prenatal alcohol exposure. The authors conclude that current French health warnings about alcohol consumption are ineffective and require updating.

4. Dunstone, K., Brennan, E., Slater, M. D., Dixon, H. G., Durkin, S. J., Pettigrew, S., & Wakefield, M. A. (2017). Alcohol harm reduction advertisements: a content analysis of topic, objective, emotional tone, execution and target audience. *BMC Public Health*, 17(1), 312-312. doi:10.1186/s12889-017-4218-7

This study examined alcohol harm reduction advertisements and their potential impact on reducing the health and social burden of alcohol consumption. There is a lack of research that identifies advertisement characteristics and efficacy of alcohol harm reduction. The ads were collected by an internet search of Google, YouTube, Vimeo, and other relevant government and health websites. The selection criteria included: English language ads from 2006 to 2014; not having a primary focus on impaired driving or pregnancy; and not funded by the alcohol industry. A systematic content analysis of the ads was performed and 110 individual ads were identified from 72 distinct alcohol harm reduction campaigns. The primary countries of origin included: Australia (40%) and the United Kingdom (26%). The ads focused on the topics of short-term harms, motivation to reduce alcohol consumption, and to drink responsibly. The majority of the ads used a dramatized execution style and portrayed a negative tone. The findings indicated the need to focus on long-term harm, and to better communicate the low-risk drinking guidelines.

5. Godderis, R., & Stephenson, Z. (2017). Preventing Tragedy in Canada? Risk and Responsibility in Government Discourses about Alcohol Consumption and Pregnancy. *Journal of Women, Politics & Policy*, 38(3), 276-297. doi:10.1080/1554477X.2016.1219588

The authors present a feminist and Foucauldian discourse analysis of the fundamental assumptions that informed the first document produced by the Government of Canada regarding alcohol use during pregnancy, *Preventable Tragedy*. Constructions of risk and responsibility are rooted in neoliberal principles and the specific social constructions identified by the authors were constructed in a context of non-evidence based policy making. The authors identified key themes, which included: 1) A preventable tragedy; 2) The science of preventing fetal alcohol syndrome; and 3) Fetal alcohol syndrome as tragedy. The authors contend that these ideas can reinforce problematic notions of individualization that devalue a sense of social responsibility and contribute to a highly moralized discourse regarding pregnancy that encourages the surveillance of women's reproductive bodies and behaviours.

6. Hui, K., Angelotta, C., & Fisher, C. E. (2017). Criminalizing substance use in pregnancy: Misplaced priorities. *Addiction*, 112(7), 1123-1125. doi:10.1111/add.13776

The authors of this editorial comment on the growing trend in the United States to punish women with substance use disorders through laws criminalizing substance use, particularly alcohol use during pregnancy. There is no evidence that punitive measures improve maternal or fetal outcomes and, consequently, these measures are counterproductive and create additional barriers for women with substance use issues (e.g., access to treatment and prenatal care). The authors suggest that work should be toward more comprehensive treatment of women with substance use disorders in order to protect children and support women.

7. Parackal, M., Parackal, S., Eusebius, S., & Mather, D. (2017). The Use of Facebook Advertising for Communicating Public Health Messages: A Campaign Against Drinking During Pregnancy in New Zealand. *JMIR Public Health and Surveillance*, 3(3), e49. doi:10.2196/publichealth.7032

Researchers analyzed the communication process of a Facebook advertising campaign against drinking during pregnancy in New Zealand. The “Don’t Know? Don’t Drink” campaign consisted of a video and three banner advertisements and targeted women aged 18-30. They used Facebook tools to look at user engagement, and text mining to analyze comments ($n = 819$) from which they identified four themes. Logistic regression analysis showed that two “meaning-making” themes exhibited association with the message: risk of pregnancy ($p = 0.003$) and alcohol and culture ($p < 0.001$). Sentiment analysis of these two themes showed more negative than positive comments (47% vs. 28%). User engagement metadata (likes, shares, and views) is consistent with previous research, but further research is needed to understand its evaluative worth. Authors caution against using a one-way communication format for delivering public health warnings via social media, and call for further investigation of two-way communication formats as a way to engage back and possibly improve the acceptability of public health message.

8. Ray, R. (2017). Evaluation of an FASD Prevention Campaign Using Pregnancy Test Dispensers in Alaska and the Yukon. *European Journal of Public Health*, 27(Suppl 3). doi:ckx189.094-ckx189.094. doi:10.1093/eurpub/ckx189.094

Researchers tested the effectiveness of health messages promoting awareness of the risks associated with alcohol-exposed pregnancy. Messages about FASD prevention were placed in women’s restrooms of bars serving alcohol in the Yukon and Alaska. Two sets of matched-population communities had prevention messages either affixed to pregnancy test dispensers or framed as posters. Participants ($n = 2,069$) accessed an electronic survey using a weblink or a QR code with follow-up response at 61%. Using baseline and six-month follow-up data on FASD attitudes, knowledge and risk factors, the dispenser group scored higher than did the poster-only group. This suggests that combining FASD education messaging with a pregnancy test dispenser in bars is a more effective strategy for reaching women with FASD prevention messages.

9. Roberts, S. C. M., Thomas, S., Treffers, R., & Drabble, L. (2017). Forty Years of State Alcohol and Pregnancy Policies in the USA: Best Practices for Public Health or Efforts to Restrict Women's Reproductive Rights? *Alcohol & Alcoholism*, 52(6), 715-721. doi:10.1093/alcalc/agx047

Researchers gathered data about state-level alcohol and pregnancy policies (APP) in the U.S. made between 1970 through 2013 to understand how policies have evolved and whether they reflect public health goals or efforts to restrict the reproductive rights of women. Policies were coded as either supportive of women or punitive to them, and associations with a measure of reproductive rights restrictions and Alcohol Policy Effectiveness Scores were correlated. Researchers made three key findings: 1) They found that the number of alcohol and pregnancy policies have increased over time and across states (No states had APP in 1970, one state in 1980, 20 states in 1990, 38 states in 2000, and 43 states in 2010); 2) The policy environment is becoming increasingly punitive, often with states mixing supportive policies with punitive ones, and; 3) Compared to general alcohol policies that aim to reduce alcohol harms for all, punitive policies are associated with policies that restrict women’s reproductive autonomy. The authors state that punitive policies have been shown to cause women to delay or avoid prenatal care and/or substance use treatment. They call for further research to understand the effects of these policies on alcohol use during pregnancy and birth outcomes. They emphasize that advocates and journalists should focus attention on state activities rather than on updates of CDC communications.

D. Level 2 Prevention

24. Aldridge, A. (2017). The relative impact of brief treatment versus brief intervention in primary health-care screening programs for substance use disorders. *Addiction*, 112, 54-64.

The authors assessed the relative impact of brief treatment compared to brief interventions (BI) in primary care screening programs for changing substance use behaviour. Brief treatment is more intensive compared to BI in both quantity and length of therapy sessions. Patients from the BI group who resembled patients in the brief treatment group were used to determine the relative effect of brief treatment in the United States. The relative treatment impact was not significant for alcohol, illicit drugs, cannabis, or alcohol to intoxication. However, brief treatment compared to BI was found to reduce the frequency of illicit drug use at follow up. Brief treatment appears to have a stronger influence on reducing illicit drug use compared to BI, but is similar in regard to alcohol use, alcohol use to intoxication, and cannabis.

25. Angus, C., Thomas, C., Anderson, P., Meier, P. S., & Brennan, A. (2017). Estimating the cost-effectiveness of brief interventions for heavy drinking in primary health care across Europe. *European Journal of Public Health*, 27(2), 345-351. doi:10.1093/eurpub/ckw122

A 'meta-modelling' approach, informed by previous screening and brief intervention (SBI) cost-effectiveness models, was used to identify the critical factors that drive cost-effectiveness for all 28 European countries. Meta-modelling refers to a simplified version of a complex model which can be used to generate extrapolations about the outputs of that model. The authors collected data on a number of important factors that drive cost-effectiveness for SBI which included: mean per capita alcohol consumption; proportion of the population to be screened over a 10-year SBI program; per capita alcohol-attributable mortality; per capita alcohol-attributable morbidity; mean cost of an alcohol-related hospitalization; and mean SBI-delivery staff cost. Findings revealed that costs are reliant upon the proportion of the population covered by the screening program, the country-specific per capita mortality and morbidity rate, and the country specific costs of general practitioner care and hospitalization. The authors concluded that SBI programs are likely to be cost-effective in 24 of the 28 European countries, with a cost-saving in 50% of countries.

26. Babor, T. F., Del Boca, F., & Bray, J. W. (2017). Screening, Brief Intervention and Referral to Treatment: implications of SAMHSA's SBIRT initiative for substance abuse policy and practice. *Addiction*, 112, 110-117. doi:10.1111/add.13675

The authors describe the major findings and public health implications of a multi-site evaluation of screening, brief intervention, and referral to treatment (SBIRT) in the United States, funded by the US Substance Abuse and Mental Health Services Administration (SAMHSA). SBIRT programs in the two cohorts screened more than 1 million patients regarding substance use, with approximately 1 in 5 patients screening positive in both cohorts. The authors indicate that the SAMHSA programs were implemented with sufficient adherence to evidence-based practice to serve as a reasonable indicator of SBIRT effectiveness. Results revealed that greater intervention intensity was associated with larger decreases in substance use. Both BI and brief treatment were associated with positive outcomes, but BI was more cost-effective in this study for most substances. The implementation and sustainability of SBIRT was facilitated by leadership and the use of substance use specialists, as opposed to general practitioners, to deliver services. Pre-post differences were clinically meaningful and significant for almost every measure of substance use. SBIRT sustainability was influenced by four primary factors: presence of program champions; availability of funding; systematic change; and

effective management of provider challenges. The results of this study provide further evidence for SBIRT in primary care and general medicine.

27. Bager, H., Christensen, L. P., Husby, S., & Bjerregaard, L. (2017). Biomarkers for the Detection of Prenatal Alcohol Exposure: A Review. *Alcoholism: Clinical & Experimental Research*, 41(2), 251-261. doi:10.1111/acer.13309

The most common clinical tool used to assess fetal alcohol exposure is maternal self-disclosure. However, the authors suggest a more 'objective' method is based on the use of biomarkers, either alone or in conjunction with maternal self-report, to determine the presence of prenatal alcohol exposure. The authors conducted a systematic search of the literature to report the clinically relevant biomarkers for the detection of prenatal alcohol exposure. Direct biomarkers fatty acid ethyl esters (FAEEs), ethyl glucuronide (EtG), ethyl sulfate, and phosphatidylethanol (PEth) were found to be the most relevant biomarkers when it came to the detection of prenatal alcohol exposure, including at low amounts. The authors conclude that biomarkers can be an alternative way to assist in the diagnosis of children prenatally exposed to alcohol, and can be useful for research and clinical practice.

28. Bountress, K. E., Metzger, I. W., Maples-Keller, J. L., & Gilmore, A. K. (2017). Reducing sexual risk behaviors: secondary analyses from a randomized controlled trial of a brief web-based alcohol intervention for underage, heavy episodic drinking college women. *Addiction Research & Theory*, 25(4), 302-309. doi:10.1080/16066359.2016.1271416

Heavy episodic drinking and related consequences (e.g., sexual risk behaviours) remain a significant challenge on college campuses in the United States, and college women are at a particularly high risk for negative consequences associated with sexual risk behaviours, such as sexually transmitted infections and unplanned pregnancies. The authors of this study examined the effect of a brief online alcohol intervention for college women aimed at reducing sexual risk behaviours. Using a randomized controlled trial study design, the authors compared women in the intervention group ($n = 53$) to women in the control group ($n = 107$). Outcome measures included condom use assertiveness and number of vaginal sexual partners, collected at baseline and at a three-month follow up. Findings revealed that the BI was associated with higher levels of condom use assertiveness at time of follow-up, and that higher levels of alcohol use were associated with less condom use assertiveness. However, the alcohol intervention was not associated with a reduction in the number of sexual partners. The results of this study suggest that alcohol interventions can impact college women's beliefs, but not necessarily their behaviours, and further interventions are needed that more specifically target both alcohol and sexual risk to reduce sexually risky behaviours.

29. Bracero, L. A., Maxwell, S., Nyanin, A., Seybold, D. J., White, A., & Broce, M. (2017). Improving screening for alcohol consumption during pregnancy with phosphatidylethanol. *Reproductive Toxicology*, 74, 104-107. doi:https://doi.org/10.1016/j.reprotox.2017.09.007

The authors of this study compared the rates of alcohol use among pregnancy women ($n = 423$) using two methods: 1) between urine ethanol testing and self-report (method 1); and 2) between phosphatidylethanol (PEth) dried blood spot testing and self-report (method 2). Using a prospective, cross-sectional observation study design, the authors recruited participants from a group of women seeking prenatal care at a tertiary care medical centre. All study participants were screened at their first prenatal visit by an obstetrical provider who completed SBIRT training. Method 1 identified 11 patients with alcohol use, including five identified by urine and six identified by self-report. Method 2 identified 28 patients, including 22 identified by PEth and six identified by self-report. The six

women with self-reported alcohol use all had negative urine and PEth testing. Overall results of this study indicate that Method 2 had an increase rate of 5.4% for identifying women who had used alcohol in pregnancy compared to Method 1, indicating that PEth testing may be better at detecting alcohol consumption during pregnancy compared to other methods (e.g., urine testing). Furthermore, the authors suggest that the results of this study provide evidence for the strength of combining screening methods to identify the prevalence of prenatal alcohol consumption.

30. Chiandetti, A., Hernandez, G., Mercadal-Hally, M., Alvarez, A., Andreu-Fernandez, V., Navarro-Tapia, E., . . . Garcia-Algar, O. (2017). Prevalence of prenatal exposure to substances of abuse: questionnaire versus biomarkers. *Reproductive Health*, 14, 1-12. doi:10.1186/s12978-017-0385-3

Alcohol and drug consumption has increased among young adults, including women of childbearing age. The authors contend that the use of questionnaires as a measure of prenatal alcohol and drug use underestimates the real prevalence of exposure. Informed by a comprehensive review of the literature from 1992 to 2015, the authors aimed to compare reported rates of prenatal alcohol and drug exposure with biomarkers of exposure. Their review includes 13 published studies that compare prenatal alcohol and drug exposure based on self-report and biomarkers. Results revealed that women who self-reported consumption of alcohol and/or drugs during pregnancy varied (e.g., 0 to 37% for alcohol; 0 to 4% for cocaine; and 3% for THC). However, positive biomarker results demonstrated a higher range of prenatal exposure (e.g., 16 to 44% for alcohol; 15% for cocaine; and 4 to 12% for THC). The authors suggest that the findings of this study provide further support for the recommendation to include biomarkers, in complement to self-report questionnaires, as an indicator of prenatal alcohol or drug exposure.

31. Chow, P. I., Lord, H. R., MacDonnell, K., Ritterband, L. M., & Ingersoll, K. S. (2017). Convergence of online daily diaries and timeline followback among women at risk for alcohol exposed pregnancy. *Journal of Substance Abuse Treatment*, 82, 7-11. doi:10.1016/j.jsat.2017.08.004

There is a need to identify alternative methods that can capture the frequency of drinking and unprotected sex, beyond retrospective self-report measures. The authors of this study examined the degree to which data collected from an online, prospective daily diary merged with data from interview-administered retrospective follow back, which is the current standard among alcohol-exposed pregnancy intervention studies. Participants in this study were randomly assigned to one of two conditions: an online patient education condition or a tailored, online intervention designed to reduce alcohol-exposed pregnancy risk. Results indicated that the intervention condition did not have a significant impact on the degree of convergence between the diaries and the retrospective follow back. However, descriptive analyses revealed that 63% of participants reported problematic alcohol use and unprotected sex in both the diaries and the retrospective follow back, with 70% agreement at follow up. Overall, these study findings indicate that both the retrospective follow back and the diaries together are effective in detecting alcohol use and unprotected sex in women who are at risk for an alcohol-exposed pregnancy.

32. Coons, K.D., Clement, A.L. and Watson, S.L. (2017). Are rural and urban Ontario health care professionals aware of fetal alcohol spectrum disorder? A secondary data analysis of the Fetal Alcohol Syndrome Survey for Health Professionals. *Journal on Developmental Disabilities*, 23(1), 76-91.

While healthcare professionals play a critical role in the prevention of FASD, particularly by providing counselling around alcohol use and consumption during pregnancy, this study demonstrates how many professionals in rural and urban Ontario remain under-educated on FASD. Using 2001-2002 Ontario-specific data from Fetal Alcohol Syndrome Survey for Health Professionals, a secondary data analysis was conducted on 834 participants to examine the awareness of FASD held by rural and urban healthcare professionals. It was observed that while almost all (99.5%) of the surveyed professionals had heard of FASD, only 73% had discussed the risks of alcohol use during pregnancy, 62% advised parents to drink in moderation, and 88% of professionals recommended completely abstaining from alcohol during pregnancy. Chi-squared analyses also showed that rural professionals are more likely than urban professionals to ask pregnant women if they are currently using alcohol ($p = 0.007$). Based on the surveyed data, this study further discusses counselling, recommendations, and FASD prevention.

33. Coons, K.D., Watson, S.L., Yantzi, N.M., Lightfoot, N.E. and Larocque, S. (2017). Health Care Students' Attitudes About Alcohol Consumption During Pregnancy: Responses to Narrative Vignettes. *Global Qualitative Nursing Research*, 4. doi: 10.1177/2333393617740463

This study evaluates medical, midwifery, and nurse practitioner students' attitudes about women who consume alcohol throughout their pregnancies. Twenty-one health care students responded to a scenario-based vignette discussing alcohol consumption during pregnancy, and also participated in a semi structured interview, analyzed by Braun and Clarke's thematic analysis approach. From this methodology, two general results were identified regarding the students' attitudes towards drinking during pregnancy: divergent recommendations for different women, based on perceptions of their level of education, culture/ethnicity, and ability to stop drinking; and understanding the social determinants of health, including the normalization of women's alcohol consumption and potential partner violence. Concluding remarks of this study discuss how health care students need further education about the risks of alcohol consumption during pregnancy and FASD, how to engage in reflective practice to identify their own stereotypical beliefs and attitudes, and how these attitudes may affect their practice.

34. Coons, K. D., Watson, S. L., Yantzi, N. M., Lightfoot, N. E., & Larocque, S. (2017). "No Alcohol Is Recommended, But . . .": Health Care Students' Attitudes About Alcohol Consumption During Pregnancy. *Global Qualitative Nursing Research*, 3, doi:10.1177/2333393617707663

Previous Canadian literature suggests that health care providers require further training and education to support FASD prevention strategies; however, there is still a large gap in literature regarding the knowledge and training of health care students in relation to FASD. This gap in information was at the forefront this study, aiming to understand the attitudes and beliefs of health care students regarding alcohol use during pregnancy. Twenty-one health care students participated in a scenario-based vignette about alcohol consumption during pregnancy. Results of this study indicated that most students recognized that no alcohol consumption during pregnancy is the safest recommendation, but many reported that this advice is not always conveyed during encounters with their pregnant patients. Additionally, three major themes emerged regarding the students' attitudes concerning alcohol use during pregnancy. Concluding remarks discuss the need for health care

professionals to have additional training and education about the risks of alcohol consumption during pregnancy, and the potential health outcomes associated with prenatal alcohol exposure.

35. Ferraguti, G., Ciolli, P., Carito, V., Battagliese, G., Mancinelli, R., Ciafrè, S., . . . Ceccanti, M. (2017). Ethylglucuronide in the urine as a marker of alcohol consumption during pregnancy: Comparison with four alcohol screening questionnaires. *Toxicology Letters*, 275, 49-56. doi:<https://doi.org/10.1016/j.toxlet.2017.04.016>

Ethyl glucuronide (EtG) is an ethanol metabolite used as a biomarker of alcohol consumption. It can be detected in the blood, urine, hair, and nails of the individual, and is a tool that can identify alcohol consumption in pregnant women. This study aimed to explore the predictive value of alcohol screening questionnaires, including the AUDIT-C, T-ACE, and TWEAK, along with a food diary, when compared to urine EtG results. The sample included 70 pregnant women, where urine samples were provided immediately post-interview. Interviews with pregnant women suggested a lower level of alcohol intake. Results indicated that 34% of pregnant women had an at-risk EtG value. These findings reveal that the ascertainment of alcohol consumption during pregnancy using only indirect methods (e.g. self report) may be significantly lower than using biomarkers.

36. Griffith, G., Kumaraswami, T., Chrysanthopoulou, S. A., Mattocks, K. M., & Clark, R. E. (2017). Prescription contraception use and adherence by women with substance use disorders. *Addiction*, 112(9), 1638-1646. doi:10.1111/add.13840

To decrease the incidence of high-risk pregnancies, some recommendations encourage contraceptive counselling for women with substance use disorders, with an emphasis on respecting women's autonomy. Because unintended pregnancy rates are high among women with substance use disorders, the authors sought to investigate three key areas: 1) the association of substance use disorders with prescription contraceptive use, contraceptive method selection, and adherence; 2) whether health care practices participating in the Patient-Centered Medical Home Initiative had better contraceptive use and adherence; and 3) differences in the association of substance use disorder with adherence to oral contraceptives specifically. Participants ($n = 47,902$) in this study were drawn from a retrospective cohort analysis of health care claims and encounter data from women aged 16-45 living in Massachusetts, USA. Substance use disorders were associated with lower rates of prescription contraceptive use and with decreased selection of long-acting reversible contraception (e.g., IUDs or implants). The authors found no significant association between substance use disorders and adherence. In conclusion, women with substance use disorders were less likely to use prescription contraceptives, which may place them at an increased risk for alcohol-exposed pregnancies. However, women with substance use disorders are not significantly less likely to adhere to prescription contraceptives once they are prescribed to them, compared to women without substance use disorders, which illuminates critical implications for sexual and reproductive health counselling.

37. Hanson, J. D., Nelson, M. E., Jensen, J. L., Willman, A., Jacobs-Knight, J., & Ingersoll, K. (2017). Impact of the CHOICES Intervention in Preventing Alcohol-Exposed Pregnancies in American Indian Women. *Alcoholism: Clinical And Experimental Research*, 41(4), 828-835. doi:10.1111/acer.13348

FASD is of particular concern for some American Indian communities. This article presents the findings of one tribally run prevention program, the Oglala Sioux Tribe (OST) CHOICES Program. The OST CHOICES Program was made culturally appropriate and was implemented with 3 different communities (two on reservation and one off). Data on alcohol consumption, sexual activity, and contraception use was collected and analyzed from 193 nonpregnant American Indian women

enrolled in the OST CHOICES Program. All 193 women were at risk for an alcohol exposed pregnancy because of binge drinking and their risk for an unintended pregnancy. Results showed that 51% of women completed both follow-ups post intervention and that there was a significant decrease in alcohol exposed pregnancy risk from baseline at both follow-ups (3 months and 6 months). Women in the OST CHOICES Program were more likely to reduce their risk for an alcohol exposed pregnancy, highlighting the capacity for the CHOICES intervention in a variety of settings and populations.

38. Howlett, H., Abernethy, S., Brown, N. W., Rankin, J., & Gray, W. K. (2017). How strong is the evidence for using blood biomarkers alone to screen for alcohol consumption during pregnancy? A systematic review. *European Journal Of Obstetrics, Gynecology, And Reproductive Biology*, 213, 45-52. doi:10.1016/j.ejogrb.2017.04.005

The purpose of this study was to conduct a systematic review in order to compare the efficacy of blood analysis and maternal self-report among at risk women during pregnancy. A search was conducted of four databases, along with a manual search of relevant key issues. Studies were included on the basis of originality, and whether they compared blood biomarker analysis with self-reported alcohol use for the detection of alcohol consumption among pregnant women. Eight studies met the inclusion criteria and were of sound methodological quality. None of the biomarkers offered both specificity and high sensitivity when compared to self-report. However, some evidence suggested that a combination of biomarkers and self-report offered increased accuracy. The analysis indicated that blood biomarkers were limited in their efficacy, but could complement self-report.

39. Howlett, H., Gray, W. K., Dismore, L., Mackenzie, S., Langley, K., Davidson, C., & Rankin, J. (2017). A survey of attitudes, beliefs and practice regarding alcohol use and screening in pregnancy: an opportunity for support and education? *Journal of Research in Nursing*, 22(8), 618-633. doi:10.1177/1744987117745579

Women ($n = 171$) and their partners ($n = 41$) attending antenatal clinics in England were surveyed about their use and beliefs about alcohol use during pregnancy and their perception of blood and meconium screening for alcohol use. The majority of women (90%) thought women should abstain from alcohol during pregnancy; however, only 41% reported they did not drink alcohol during pregnancy. Of the women who reported drinking during pregnancy, the vast majority (94%) quit drinking when they found out they were pregnant. Most women and their partners (87%) said they would consent to a biomarker screen, and saw it as a way to ensure the health of their baby. The authors did not find a relationship between declining testing and drinking behaviour during pregnancy ($\chi^2(1) = 0.039, p = .844$). An analysis of the free text portion of the survey found key themes including confusion over the safe level of alcohol to consume. Women also identified screening as an opportunity for service providers to educate and provide support to pregnant women about alcohol use.

40. Inoue, M., Entwistle, J., Wolf-Branigin, M., & Wolf-Branigin, K. (2017). Fetal alcohol spectrum disorder information dissemination by health care professions. *Journal of Social Work Practice in the Addictions*, 17(3), 275-290. doi:10.1080/1533256X.2016.1243124

Previous studies have identified that there is no known safe level of alcohol consumption at any point during pregnancy, and FASD is the leading preventable developmental disability. This study sheds light on the fact that the information spread by health care professionals is not always in keeping with this understanding. Researchers identified that physicians and midwives appeared to be the least consistent when it came to recommendations that women abstain from alcohol consumption while pregnant. Concluding remarks explore ways that social workers can help provide more

consistent messaging of alcohol abstinence during pregnancy within the medical field, aiming to lower the incidence of FASD.

41. Jarlenski, M., Hogan, C., Bogen, D. L., Chang, J. C., Bodnar, L. M., & Van Nostrand, E. (2017). Characterization of U.S. State Laws Requiring Health Care Provider Reporting of Perinatal Substance Use. *Women's Health Issues, 27*(3), 264-270. doi:10.1016/j.whi.2016.12.008

Perinatal substance use poses significant challenges for health care professionals. Current patterns of substance use among pregnant women lend credence to the need to investigate how governmental action can be protective from adverse outcomes associated with substance exposure during the perinatal period. Using a systematic content analysis of statutes in the United States, this study aimed to characterize specific provisions enacted in state statutes regarding mandates that health care professionals report perinatal substance use, as well as to determine the proportion of births occurring in states with these statutes. Twenty states had laws requiring health care professionals to report perinatal substance use to child protection services, and four states had laws requiring reporting only when a health care professional perceived the substance use to be associated with child maltreatment. Approximately half of states with any reporting law had a provision encouraging substance use treatment during the perinatal period. The findings of this study add to the body of literature negotiating how state or federal policies in the United States may be used and implemented to support reduction of substance use in the perinatal period.

42. Johnson, S. K., von Sternberg, K., & Velasquez, M. M. (2017). A Comparison of Profiles of Transtheoretical Model Constructs of Change among Depressed and Nondepressed Women at Risk for an Alcohol-Exposed Pregnancy. *Women's Health Issues, 27*(1), 100-107. doi:10.1016/j.whi.2016.09.013

This study aimed to further understand women who remain at risk for an alcohol exposed pregnancy, despite well-established interventions. Using secondary data from the CHOICES intervention, the authors investigated differences between non-depressed and depressed women in the process of changing alcohol use behaviour. A profile analysis was conducted to compare the current status on transtheoretical model constructs of change between depressed ($n = 41$) and non-depressed ($n = 171$) women in CHOICES at baseline and at a 9 month follow up. Differences were observed between groups at baseline and at the 9 month follow up. Women with depression had a profile that has traditionally predicted failure to change drinking behaviour. Profiles of depressed women were identified by high scores on cons for changing alcohol use and desire to drink. Interventions targeted at reducing alcohol exposed pregnancies require more specific tailoring for women with depression.

43. Letourneau, B., Sobell, L. C., Sobell, M. B., Johnson, K., Heinecke, N., & Robinson, S. M. (2017). Preventing alcohol-exposed pregnancies among Hispanic women. *Journal of Ethnicity in Substance Abuse, 16*(1), 109-121. doi:10.1080/15332640.2015.1093991

Researchers enrolled 89 Hispanic women living in south Florida, U.S. deemed at risk for an alcohol-exposed pregnancy (AEP) in the Project Healthy CHOICES prevention intervention. Participants spoke English and Spanish, with 92% stating they could read and write Spanish "well to very well." The objective of the study was to evaluate outcomes as they related to: 1) the language in which the questionnaire was requested; and, 2) the participants' level of acculturation. Response rate was 98%. Researchers found that 66% of participants were no longer at risk for AEP at follow-up, with more women in both language groups reporting a change in contraceptive use than reporting a reduction in drinking. Those requesting the questionnaires in English had greater reduced risk (75%) than

those requesting them in Spanish (41%). As well, women with high English acculturation were significantly less at risk for AEP. Limitations of the study include a small sample size for the Spanish language group. Many from that group who were interested in participating were not eligible to enroll because they did not drink at risky levels. The authors note that Project Healthy CHOICES prevention intervention is self-administered and mail-based and thus requires few resources and no scheduled health service visits.

44. Montag, A. C., Dusek, M. L., Ortega, M. L., Camp-Mazzetti, A., Calac, D. J., & Chambers, C. D. (2017). Tailoring an Alcohol Intervention for American Indian Alaska Native Women of Childbearing Age: Listening to the Community. *Alcoholism: Clinical And Experimental Research*, 41(11), 1938-1945. doi:10.1111/acer.13485

Researchers recruited community participation in order to modify an existing web-based brief SBIRT intervention so that it was culturally congruent for American Indian (AI) Alaskan Native women. Study participants included AI women aged 18-45, Tribal Elders, community leaders, relevant AIs, and non-AI staff from 3 clinic locations in Southern California, U.S. Culturally sensitive recruitment methods, ethics considerations and respectful study procedures are described. In focus groups, participants offered suggestions and insights at each iteration of the process. The authors conclude that their experience may help others tailor interventions in the future.

45. Munro, S., Hui, A., Salmons, V., Solomon, C., Gemmell, E., Torabi, N., & Janssen, P. A. (2017). SmartMom Text Messaging for Prenatal Education: A Qualitative Focus Group Study to Explore Canadian Women's Perceptions. *JMIR Public Health And Surveillance*, 3(1), e7-e7. doi:10.2196/publichealth.6949

Researchers engaged Canadian women in the development of SmartMom, a prenatal education program delivered via one-way text messaging. Forty women in three northern BC rural communities participated in seven focus groups to discuss their perceptions of SmartMom content, quality, usability, and their possible behaviours following messages. A questionnaire captured demographics and mobile phone usage. Of those participating the majority reported using a mobile phone (98%), using text messages "all the time" (70%), and using their phone to surf the Internet (93%). Participants valued the local knowledge and resources and said SmartMom reflected the way they access information. Modifications made following focus groups included adding message streams for subgroups of women on such topics as smoking, and pregnancy after a previous Cesarean birth. As well, links to local programs were added to meet need for social and peer support. Participants found SmartMom to be both relevant and highly acceptable. Results from this study support the initiation of a larger pilot program for further study of usability and of impact on maternal-child health behaviours and outcomes.

46. Nikoo, N., Nikoo, M., Song, M., Wesnel, A., Pervaiz, A., Vogel, M., & Krausz, M. (2017). Effectiveness of prenatal screening for substance use: Critical consciousness, a promising curriculum for compassionate screening. *Mental Health in Family Medicine*, 13, 401-406.

Despite high rates of prenatal screening for substance use (PSSU) implemented in health care settings, it is still ineffective in identifying substance use during pregnancy. Lack of consistent health care, unrecognized social determinants of health, and physicians lack of education and training in and attitudes towards substance use are reasons for PSSU ineffectiveness. The authors conducted an analytic review of the literature to determine an achievable medical school curriculum for developing the necessary skills and compassion to improve PSSU. They determined that along with education

and training in substance use, the development of “critical consciousness” for medical students is required. Critical consciousness entails understanding issues of social justice, reflecting on professional unbiased responsibilities to patients, acknowledging the dignity and autonomy of all patients, and pregnant women who use substances in particular. They conclude that including critical consciousness training can overcome the limitations of current curricula, and recommend further research on availability and efficacy of trainings.

47. Price, S. K., Coles, D. C., & Wingold, T. (2017). Integrating Behavioral Health Risk Assessment into Centralized Intake for Maternal and Child Health Services. *Health & Social Work, 42*(4), 231-238. doi:10.1093/hsw/hlx037

A common practice assumption among health and service providers is that behavioral and health screenings are best delayed until a trusting relationship is developed between provider and client even though it may delay onset of needed services. Researchers of a multi-community home visitation program for pregnant women, designed, implemented and evaluated centralized systems of care that included a broad behavioral health risk assessment at the point of first entry. They hypothesized that screenings could be integrated into initial intake of maternal-child health services if the approach is destigmatizing and the assessment is strengths-based. An 11-question behavioral risk assessment was developed and data from the first full year of the project was examined ($n = 1,515$). The majority of the women (68%) were referred to home visitation. As well, 330 women (22%) screened positive for emotional health risk; 153 (10%) reported current or past experience of interpersonal violence; 176 (12%) met the risk trigger for substance use including alcohol; 272 (18%) reported smoking; 120 (8%) screened positive for both mental health and substance use risk. Referrals were not mutually exclusive. One identified barrier was that women were more accepting of a referral to home visitation than to specialized services, which created capacity issues. The authors conclude that their study reinforces the need for screening at point of entry to community health services in order to improve connection to support services and reduce stigma connected to service utilization and support.

48. Putney, J. M., O'Brien, K. H. M., Collin, C.-R., & Levine, A. (2017). Evaluation of Alcohol Screening, Brief Intervention, and Referral to Treatment (SBIRT) Training for Social Workers. *Journal of Social Work Practice in the Addictions, 17*(1-2), 169-187. doi:10.1080/1533256X.2017.1302884

One of the 12 priorities of the Grand Challenges for Social Work initiative is to reduce the harms caused by alcohol misuse. The authors contend that social workers are uniquely situated to identify and intervene with individuals who are at risk. With funding from Substance Abuse and Mental Health Services Administration (SAMHSA), the authors developed a model of SBIRT for social workers. They trained both social worker students ($n = 134$) and social work field instructors ($n = 37$) and evaluated their training satisfaction level and post-training attitudes, knowledge and skills. Evaluation from the first year of this 3-year project showed that both students (90%) and instructors (100%) were either satisfied or very satisfied with the training, and that there were significant changes in knowledge, attitudes and self-perceived skills in SBIRT. Because self-perceived skills are not the same as competency, the researchers recommend that further evaluation of the model include observational assessment and clients' outcomes.

49. Schuchat, A. (2017). The CDC's Recommendations to Help Prevent Fetal Alcohol Spectrum Disorders. *American Family Physician, 95*(1), 6-7.

The author of this editorial refers to the controversial recommendations by the U.S. Center for Disease Control (CDC) that women of child-bearing age should either a) not drink alcohol or b) use effective contraception as a way to prevent potential negative birth outcomes. The reasons behind the CDC's recommendation are discussed including that 50% of non-pregnant women consume

alcohol, nearly one-half of pregnancies are unplanned, and, women often don't know they are pregnant during the first 6 weeks when fetal development is particularly vulnerable. Recommendations include universal alcohol screening for all adults and that preconception counseling be incorporated into every primary care visit. An overview of SBIR and links to resources is provided. The author concludes that SBIR, regular discussion of reproduction life plans, and ready access to effective contraception can both ensure next-generation health and respect the autonomy of women.

50. Symon, A. (2017). Evaluation of a retrospective diary for peri-conceptual and mid-pregnancy drinking in Scotland: a cross-sectional study. *Acta obstetricia et gynecologica Scandinavica*, 96(1), 53-60. doi: 10.1111/aogs.13050

See abstract above.

51. Velasquez, M. M., von Sternberg, K. L., Floyd, R. L., Parrish, D., Kowalchuk, A., Stephens, N. S., . . . Mullen, P. D. (2017). Preventing Alcohol and Tobacco Exposed Pregnancies: CHOICES Plus in Primary Care. *American Journal Of Preventive Medicine*, 53(1), 85-95. doi:10.1016/j.amepre.2017.02.012

This study compared giving Brief Advice and informational/referral brochures (control group) in a safety net healthcare system to the CHOICES Plus intervention (targeting reduced tobacco and alcohol use and increased effective contraceptive use). Of 11,470 women screened from 12 primary care clinics, 5% were eligible and 261 were randomized into the control or intervention group. Women were assessed at baseline and at 3, 6 and 9 months post-enrollment. Participants had a mean age of 31 years, largely Hispanic (47%) or non-Hispanic black (42%), and 45% were current smokers at risk of both tobacco-exposed and alcohol-exposed pregnancies (TEP and AEP). Compared to the control group, the CHOICES Plus group significantly reduced risk of TEP (incidence rate ratio (*IRR*) = 0.597, 95% CI 0.424 - 0.840 and absolute risk reduction (*ARR*) = 0.233, 95% CI -0.019 - -0.521); reduced risk of AEP (*IRR* = 0.620, 95% CI 0.511 - 0.757 and *ARR* = -0.233, 95% CI -0.239 - -0.226). As well, ineffective use of contraception was reduced (*IRR* = 0.717, 95% CI 0.620-0.830). Addressing this commonly co-occurring risk factor in one preconception program underscores effectiveness of prevention in mitigating need for AEP and TEP interventions.

52. Won, T., Blumenthal-Barby, J., & Chacko, M. (2017). Paid protection? Ethics of incentivised long-acting reversible contraception in adolescents with alcohol and other drug use. *Journal of Medical Ethics*, 43(3), 182-187. doi:10.1136/medethics-2015-103176

Alcohol and other drug use (AOD) is not rare among pregnant adolescents with estimates that 15% of pregnant adolescents aged 15-17 use illicit drugs. Teen pregnancies also carry higher maternal and fetal risks than adult pregnancies. Researchers wanted to explore whether a trial using financial incentives to promote use of long-acting reversible contraception (LARC) is ethical in an adolescent population. The authors developed an ethical framework to evaluate the ethics based on five overarching concepts and conclude that ethical issues are distinct in adolescents and adults. They conclude that there are conditions where it would be ethical to use financial incentives with adolescents including: ruling out coercion, small incentives tied to an educational activity, and follow-up care in case of contraceptive problems or desire for removal. Further, qualitative research to inform the program's structure should be conducted with input from providers, potential patients and their parents.

53. Wright, T. E. (2017). Screening, brief intervention, and referral to treatment for opioid and other substance use during infertility treatment. *Fertility & Sterility*, 108(2), 214-221. doi:10.1016/j.fertnstert.2017.06.012

In this article, the author states risk factors for substance use – depression, anxiety, older age and higher education – are more common in women seeking infertility treatment. Research also shows that they are at higher risk of developing alcohol use disorders. Consequently, providers of infertility treatments have an ethical obligation to provide preconception counseling including screening for substance. An overview of SBIRT is provided and assessment tools, such as the AUDIT-C, and intervention approaches are discussed.

54. Xu, X., Yonkers, K. A., & Ruger, J. P. (2017). Economic evaluation of a behavioral intervention versus brief advice for substance use treatment in pregnant women: results from a randomized controlled trial. *BMC Pregnancy and Childbirth*, 17(1). doi:10.1186/s12884-017-1260-5

An economic evaluation was conducted alongside a randomized controlled trial comparing an intervention integrating motivational enhancement therapy with cognitive behavioural therapy (MET-CBT), with brief advice for reducing substance use and HIV-risk behaviours in pregnant women. Researchers analyzed data from one site using a health care systems perspective and included hospital, medication and intervention costs and physician fees from intake to 3 months postpartum. Clinical outcomes between the interventions were similar and no significant differences were found in the overall cost of care (median total cost = \$26,993/participant for MET-CBT vs. \$27,831/participant for brief advice, $p = 0.90$). MET-CBT has a higher intervention cost than brief intervention (median = \$1,297/participant versus \$303/participant, $p < 0.01$) but costs of care were comparable. Researchers suggest further studies compare MET-CBT in patients with more severe substance use disorders, in different program formats, and quality of life outcomes measures. Further, the potential benefits of brief advice in promoting abstinence in substance users should be assessed.

55. Zizzo, N., & Racine, E. (2017). Ethical challenges in FASD prevention: Scientific uncertainty, stigma, and respect for women's autonomy. *Canadian Journal of Public Health*, 108(4), e414. doi:10.17269/CJPH.108.6048

The authors review scientific knowledge of FASD and the significant ethical challenges inherent in FASD prevention. Challenges include: communicating the risks of drinking during pregnancy given the scientific uncertainty of prenatal alcohol exposure; and, communicating those risks given the potential for stigma and the right to autonomy. The consequences, however, make giving accurate and current information a public health priority. The clinical realm offers a unique position for appropriate messaging as reflected in recommendations from the Canadian Society of Obstetrics and Gynaecology. Primary care physicians can tailor messages to individuals in a way that communicates risks and potential outcomes of alcohol use in pregnancy while acknowledge the limits of knowledge. Patient-centered, compassionate discussions of alcohol use with men and non-pregnant women of all backgrounds promotes a universal approach that is supportive and non-stigmatizing and family physicians are uniquely positioned to best balance these challenges.

E. Preconception interventions

1. Bodin, M., Käll, L., Tydén, T., Stern, J., Drevin, J., & Larsson, M. (2017). Exploring men's pregnancy-planning behaviour and fertility knowledge: a survey among fathers in Sweden. *Upsala Journal of Medical Sciences*, 122(2), 127-135. doi:10.1080/03009734.2017.1316531

Significant attention is now being paid to the pre-pregnancy planning behaviours of both men and women. While research has focused primarily on these behaviours in women, it is also important to understand how men plan for a family and to investigate their fertility knowledge prior to becoming fathers. Using cross-sectional data from a longitudinal pregnancy planning study in Sweden, 796 men between the ages of 15 and 57 were recruited and were asked to fill out a questionnaire about pregnancy planning, lifestyle, and fertility. Eighty-one percent (81%) of men stated that the pregnancy had been very or fairly planned and 17% reported making a lifestyle adjustment prior to pregnancy to improve their health and fertility (e.g., reducing/quitting smoking; reducing/quitting alcohol consumption; increasing amount of exercise). Men who were first-time fathers and men who had used assisted reproductive technology to conceive were more likely to make adjustments. The results of this study suggest that both pregnancy-planning behaviours and fertility knowledge are related to level of education and method of conception, and further research is warranted to further explore these behaviours and underlying factors.

2. Hemsing, N., Greaves, L., & Poole, N. (2017). Preconception health care interventions: A scoping review. *Sexual & Reproductive Healthcare*, 14, 24-32. doi:10.1016/j.srhc.2017.08.004

This scoping review identified 29 intervention evaluations related to knowledge and information for current preconception and interconception health care. These studies are summarized narratively within seven areas: interventions addressing multiple risk factors; dual risk factor interventions; technology assisted interventions; counselling for women/couples with pre-existing health conditions; group health education; community-based social marketing interventions; and interconception interventions. Narrative findings indicate that there has been some development in intervening on preconception health, with many interventions offering assessment or screening followed by brief intervention or counselling. However, despite progress in the field, further research and intervention design is needed, particularly when it comes to including gender transformative principles of preconception care.

3. Lan, L., Harrison, C. L., Misso, M., Hill, B., Teede, H. J., Mol, B. W., & Moran, L. J. (2017). Systematic review and meta-analysis of the impact of preconception lifestyle interventions on fertility, obstetric, fetal, anthropometric and metabolic outcomes in men and women. *Human Reproduction*, 32(9), 1925-1940. doi:10.1093/humrep/dex241

This study utilized a systematic review and meta-analysis approach to address the impact of preconception lifestyle interventions on live birth, birth weight, and pregnancy rate. Participants in this study included non-pregnant women of childbearing age who were intent on conceiving with their male partners. Eight studies were included for analysis. Overall, the results of this review and analysis demonstrated that lifestyle interventions showed benefits for weight loss and increased natural pregnancy rate, but not for live birth or birth weight. While the authors excluded trials solely focused on alcohol or smoking cessation or reduction, they acknowledge that interventions combining both diet and exercise components may be better positioned to improve fertility outcomes by considering broad, multifaceted lifestyle interventions that link diet and exercise components with other factors (e.g., alcohol/smoking cessation). The results of this study emphasize

the need for further research exploring the ideal components of preconception lifestyle interventions within a broader population and on the optimal nature, intensity, and timing of these interventions.

4. Poels, M., van Stel, H. F., Franx, A., & Koster, M. P. H. (2017). Actively preparing for pregnancy is associated with healthier lifestyle of women during the preconception period. *Midwifery*, 50, 228-234. doi:10.1016/j.midw.2017.04.015

Researchers wanted to know if actively preparing for pregnancy through information seeking or preconception care consultation was associated with lifestyle changes during pregnancy. Questionnaires were completed by women who had participated in a community midwifery practice in The Netherlands and had recently given birth ($n = 283$). Researchers performed regression analysis on four parameters that were amenable to change: smoking cessation, drinking cessation, folate intake, and healthier diet. Most of the women were of Dutch ethnicity (80%), high-education level (61%), and high-income level (60%). Of the total, 35% did not seek any information themselves or from a provider and were compared with the remainder who either sought information themselves, consulted a provider, or both. Results show an association between seeking information and three preconception lifestyle changes. Women who sought information for themselves were more likely: to improve their diet ($OR = 7.84$, 95% CI 3.03 - 20.3); to quit drinking ($OR = 5.46$, 95% CI 1.76 - 16.96); and, to start taking folic acid ($OR = 3.90$, 95% CI 1.00-7.62) prior to pregnancy. Smoking cessation was not associated with information seeking, although women who sought information and also consulted with a healthcare provider were significantly more likely to stop smoking ($OR = 26.34$, 95% CI 2.30 - 301.35). Older age, time it takes to conceive, and not having previous children were predictors for preconception care consultation. The authors recommend improving the reach of good preconception health information so that women can access it themselves, as well as focusing on interventions that increase preconception care consultation.

5. Pryor, J., Patrick, S. W., Sundermann, A. C., Pingsheng, W., Hartmann, K. E., & Wu, P. (2017). Pregnancy Intention and Maternal Alcohol Consumption. *Obstetrics & Gynecology*, 129(4), 727-733. doi:10.1097/AOG.0000000000001933

Through the Right from the Start program involving women from three U.S states, the researchers examined the association of pregnancy intention with alcohol consumption of 5,036 women from periconception period through the first trimester of pregnancy and described maternal characteristics of continued drinking during pregnancy. The majority (70%) reported their pregnancy was intended; 55% of those with intended pregnancies and 56% of unintended pregnancies reported alcohol use in the 12 weeks before the first trimester interview; 6% reported current use of alcohol at first trimester interview regardless of intention. Within the youngest group (18-20) who are not old enough to drink legally, 35% consumed alcohol at some point in the pregnancy and this was more likely with unintended pregnancies – 39% vs. 27%). The authors state that their data shows that alcohol use is still prevalent among women intending to conceive, and most women stop or decrease drinking when they find out they are pregnant regardless of pregnancy intention. They conclude that promoting earlier pregnancy awareness (testing near time of anticipated menstrual cycle) as a public health strategy may be more useful than suggesting abstinence from alcohol by all women who could conceive.

6. Ricks, N., Comer, L., Liu, F. Q., DeGrande, H., & Adeniran, O. (2017). Substance Use and Preconception Care: A Review of the Literature. *International Journal of Womens Health and Reproduction Sciences*, 5(1), 3-10.
doi:10.15296/ijwhr.2017.021

The authors reviewed the literature from 2006-2016 pertaining to substance use (SU) among both men and women during the preconception period. They describe findings for women and men in 5 areas: 1) prevalence of substance use; 2) effects of SU on reproductive health; 3) preconception care and SU screening; 4) SU screening tools; 5) brief interventions; and, 6) referrals for treatment. The literature confirms high rates of alcohol use by both men and women including binge drinking rates at 25% for women and 58% for men. There is gender disparity regarding evidence on SU and preconception care with more research needed to understand and intervene with men. When planning pregnancy, women tended to be aware of the risks of SU during pregnancy, but changes in use of alcohol and tobacco did not necessarily occur in the preconception period. Men were aware of SU consequences in general, but not as it related to fertility. Regarding preconception planning, providers are advised to be culturally sensitive and informed on the role of culture on patient's beliefs about family planning, contraception, and childbearing. Authors recommend two interviewing tools for reproductive health providers – the PEARL (Partnership, Empathy, Apology, Respect, and Legitimization) and the GATHER (Greet, Ask patients about themselves, Tell patients about their options, Help patients choose, Explain what to do, and Return for follow-up).

7. Sobell, L. C., Sobell, M. B., Johnson, K., Heinecke, N., Agrawal, S., & Bolton, B. (2017). Preventing Alcohol-Exposed Pregnancies: A Randomized Controlled Trial of a Self-Administered Version of Project CHOICES With College Students and Nonstudents. *Alcoholism: Clinical and Experimental Research*, 41(6), 1182-1190. doi:10.1111/acer.13385

Researchers conducted a randomized control trial with college and nonstudent women ($n = 354$) at-risk for alcohol-exposed pregnancy (AEP) using two Project CHOICES interventions: information-only (IO; $n = 174$) and motivational feedback (MF; $n = 180$). Materials for both groups were available in English and Spanish, and 44% of those enrolled were minorities with 25% identifying as Hispanic. Both groups completed an initial assessment and a 6-month follow-up of socio-demographics, birth control practices, and intentions regarding drinking and pregnancy. The IO group received CDC brochures on risks of drinking while pregnant and information on treatment services, but nothing about contraception. The MF group received non-stigmatizing messages about drinking and contraception. Results showed no significant difference between the two interventions, but did show that, at 6-month follow-up, college students were significantly more likely to not be at risk for AEP and to be using effective contraception. The authors contend that this study shows the most effective prevention strategy for reducing AEP is to communicate to women at-risk that they could become pregnant.

8. Thompson, E. L., Vázquez-Otero, C., Vamos, C. A., Marhefka, S. L., Kline, N. S., & Daley, E. M. (2017). Rethinking Preconception Care: A Critical, Women's Health Perspective. *Maternal and Child Health Journal*, 21(5), 1147-1155.
doi:10.1007/s10995-016-2213-8

The authors state that preconception care aims to focus on all reproductive age persons, and, consequently, evidence-informed health messages are communicated using multiple modalities. In this study, researchers used a women's health perspective to analyze preconception health content available online. Researchers aggregated websites from Google, Yahoo, and Bing to create a final sample of 52 websites coming from a broad array of web domains (.org, .com., .gov). The majority of the sites focused on care for women only (67%), gender, heteronormative and biomedical biases

were present in the health recommendations. Messages assumed women wanted and were capable of pregnancy and medicalized the preconception period, rarely including topics such as violence and social support.

9. Toivonen, K. I., Oinonen, K. A., & Duchene, K. M. (2017). Preconception health behaviours: A scoping review. *Preventive Medicine*, 96, 1-15.
doi:10.1016/j.ypmed.2016.11.022

The authors conducted a scoping review of journal articles published in the last seven years on the importance of specific preconception health behaviours and the extent to which they have been covered in the literature. In total 94 articles met inclusion criteria and were classified as preconception health knowledge ($n = 15$), behaviour ($n = 68$), and intervention ($n = 18$). The largest focus in all categories was folic acid, with alcohol and smoking also often addressed. Despite research showing that a father's health is most influential to his fertility and genetic contribution, only 11% of the studies included men as participants. Studies focusing on environmental risks, stress, or sleep were also existing gaps. Recommendations are to include men in future research, to assess a wider variety of behaviours, to consider intentions, and to explore the intersections of preconception health knowledge, intentions and behaviours in the general public as a means to more effective practice.

10. van Dijk, M. R., Oostingh, E. C., Koster, M. P. H., Willemsen, S. P., Laven, J. S. E., & Steegers-Theunissen, R. P. M. (2017). The use of the mHealth program Smarter Pregnancy in preconception care: rationale, study design and data collection of a randomized controlled trial. *BMC Pregnancy and Childbirth*, 17(1), 46.
doi:10.1186/s12884-017-1228-5

This paper described a study design for an RCT to examine if a developed smartphone coaching program can improve preconception health and lifestyle among couples. The personalized mHealth program called "Smarter Pregnancy" provides information and tips to improve reproductive health for both women and men. Eligible women between the ages of 18 and 45 and their partners of any age are placed into either a general population cohort or a cohort of those receiving fertility treatment (IVF/ICSI). Each cohort has a control and intervention group. Participants complete questionnaires at 6, 9, 12, 18 and 24 weeks into the program and receive individual coaching feedback, text and email messages based on their answers. Researchers expect to show that Smarter Pregnancy improves nutrition and lifestyle in couples contemplating pregnancy, which thereby improves pregnancy outcomes.

F. Level 3 Prevention

1. Abdullah, P., Gallant, S., Saghi, N., Macpherson, A., & Tamim, H. (2017). Characteristics of patients receiving midwife-led prenatal care in Canada: results from the Maternity Experiences Survey (MES). *BMC Pregnancy & Childbirth*, 17, 1-7. doi:10.1186/s12884-017-1350-4

Using data from the Maternity Experiences Survey (MES), the authors aimed to determine the characteristics of women in Canada who received care from a midwife during the prenatal period. Results indicated that across Canada, midwife-led prenatal care was 6.1%. Midwife-led prenatal care was highest in British Columbia (9.8%) and lowest in Nova Scotia, Prince Edward Island, Newfoundland and Labrador, New Brunswick, Saskatchewan, and Yukon collectively (0.3%). Aboriginal status, higher education (i.e., bachelor's degree and graduate degree attainment), and alcohol use were significant factors for receiving midwife-led prenatal care.

2. Avilla, R. M., Surjan, J., de Fátima Ratto Padin, M., Canfield, M., Laranjeira, R. R., & Mitsuhiro, S. (2017). Factors associated with attrition rate in a supportive care service for substance using pregnant women in Brazil. *American Journal on Addictions*, 26(7), 676-679. doi:10.1111/ajad.12579

The authors of this study explored factors associated with attrition rate among women with substance use challenges in Brazil who were attending a supportive care service during pregnancy or soon after the birth of their infant. The attrition rate was high (45%) among the 166 records of women's antenatal consultations reviewed. The high attrition rate was associated with a number of factors including: women with no or limited education (e.g., primary school), no family contact, having children, crack/cocaine use, polydrug use, and substance use problems by the infant's father. The authors conclude that the attrition rate may be because of a number of psychosocial factors including demographic, individual, family, and substance use influences.

3. Baron, R., Heesterbeek, Q., Manniën, J., Hutton, E. K., Brug, J., & Westerman, M. J. (2017). Exploring health education with midwives, as perceived by pregnant women in primary care: A qualitative study in the Netherlands. *Midwifery*, 46, 37-44. doi:10.1016/j.midw.2017.01.012

Using a qualitative, semi-structured interview approach, the authors of this study explored the experiences, wishes, and needs of 22 pregnant women in regards to their health education in primary care with midwives in the Netherlands. Participants in this study considered midwives to be the selected health care provider for prenatal health information and generally appreciated the information given to them by their midwives. However, some participants felt the amount of verbal health information given to them by their midwives was insufficient and that the amount of written information was too much. Additionally, pregnant women indicated that they had a number of questions and uncertainties on a variety of health issues, including alcohol use during pregnancy. The authors suggest that pregnant women may benefit more from health education from their midwives if midwives take an active role in finding out what their individual health care needs are.

4. Lewis, M. W., Wu, L., Prasad, M. R., & Locke, C. (2017). Women attending high-risk substance abuse clinics versus general obstetrics clinics. *Journal of Social Work Practice in the Addictions*, 17(3), 237-257.
doi:10.1080/1533256X.2016.1243122

In this cross-sectional study, researchers compared 141 pregnant women at a high-risk prenatal clinic who were using substances with pregnant women at a general obstetric clinic who were non-drug users. Using data collected in a 12-month period, they matched the women based on parity of reproductive history. Further, in the high-risk clinic, multi-variate analysis of HIV status and STDs was done because 19% had an HIV diagnosis and 20% had another STD. Based on results from previous studies, they hypothesized that the women from the two clinics would differ significantly across a number of variables, and that women in the high-risk clinic who had a mental illness would come to the clinic earlier than those without a mental illness. The results of the study confirmed their hypotheses. Discussion includes overall demographic differences between women in the two clinics and support for establishing specialty clinics to serve high-risk mothers. Barriers that may result in later entry into high-risk prenatal care by substance-using pregnant women without mental illness are detailed and implications for social workers are discussed.

5. McLeish, J., & Redshaw, M. (2017). "I didn't think we'd be dealing with stuff like this": A qualitative study of volunteer support for very disadvantaged pregnant women and new mothers. *Midwifery*, 45, 36-43.
doi:10.1016/j.midw.2016.12.003

The researchers sought to understand the issues experienced by unpaid volunteers working with disadvantaged women during pregnancy and in the postnatal period. They conducted semi-structured interviews with 38 volunteers from 9 different support projects within UK. Each project defined their service users in a variety of ways and provided a range of 0-75 hours of training to their volunteers. Using inductive thematic analysis, researchers identified three themes that best described the experiences of the project volunteers: 1) meeting challenges – including building a trusting relationship, remaining non-judgemental, setting boundaries, and dealing with child protection; 2) needing support – including getting support, being prepared, and staying safe; and, 3) identifying successes – including highlighting small wins, validating their motherhood, and supporting women's access to services. The authors found that the relationship felt different than professional support to the volunteer and the mothers. Volunteers can build empowering and supportive relationships with disadvantaged women, but need to be carefully selected and given realistic training, support, and supervision, especially when volunteering with women with complex needs.

6. Milligan, K., Usher, A. M., & Urbanoski, K. A. (2017). Supporting pregnant and parenting women with substance-related problems by addressing emotion regulation and executive function needs. *Addiction Research & Theory*, 25(3), 251-261. doi:10.1080/16066359.2016.1259617

Given the absence of a consistent theoretical framework for evaluating integrated treatment programs for pregnant and parenting women with problematic substance use, the authors created a preliminary model based on analyses of client perceptions of counselors' behaviours rather than the number and types of services offered. This study conducted six focus groups ($n = 50$) with successfully engaged clients to evaluate a representative sample of integrated treatment programs in Ontario. Thematic analyses were conducted focusing on counselor behaviors and approaches that promote and develop a client's emotional regulation (ER) and executive functioning (EF). Thematic analyses of participant responses suggest that a therapeutic relationship that supports ER and EF were foundational to positive outcomes for clients in these programs. The authors describe the skills

and approaches inherent in ER and EF model and suggest it can bridge the gap between affective and cognitive sciences and implementation of integrated treatment programs.

7. Nordenfors, M., & Höjer, I. (2017). Mothers with substance and alcohol abuse—support through pregnancy and early infancy. *Social Work in Health Care, 56*(5), 381-399. doi:10.1080/00981389.2017.1299072

Researchers gathered experiences of support and its perceived impact from women ($n = 17$) receiving antenatal and child welfare services from a specialized maternal-child clinic (MBHV) in Sweden. Women are referred to MBHV because of substance use during pregnancy and followed by a multidisciplinary team up to six months postpartum. Researchers used a semi-structured questionnaire to interview the women and analyzed using content analysis categorization. Positive supports described by the women included: 1) the way substance-use control mechanisms were handled (i.e., urine samples, meetings with psychologists); 2) timely availability to supports during crisis (same day); 3) holistic approach to services (housing, mental health); 4) informal and trusting relationships with non-judgemental providers; and, 5) shift from an identity as an addict to one of a mother. The authors describe the challenge providers can face in building supportive relationships with mothers and minimizing the risks to children. For future research, they recommend increased efforts to reach women from the clinic with more problematic life situations.

8. Osterman, R., Lewis, D., & Winhusen, T. (2017). Efficacy of motivational enhancement therapy to decrease alcohol and illicit-drug use in pregnant substance users reporting baseline alcohol use. *Journal of Substance Abuse Treatment, 77*, 150-155. doi:10.1016/j.jsat.2017.02.003

Study researchers conducted a secondary analysis of a randomized control clinical trial with pregnant women using substances ($n = 200$) in order to determine the efficacy of using a modified application of Motivational Enhancement Therapy (MET-PS). The first study was conducted by the National Drug Abuse Treatment Clinical and included all types of substance use. Alcohol and illicit drug use was assessed over the 4-week treatment period by self-report and urine drug screens with follow-up at 12-weeks. This secondary analysis included a subgroup of women reporting any alcohol use in the 28 days prior to randomization into the study and compared MET-PS ($n = 27$) with treatment as usual (TAU) ($n = 14$). Researchers found decreased substance use over time for both MET-PS and TAU groups. However, at 12-week follow-up MET-PS participants reported significantly decreased alcohol use days while the TAU group rebounded back toward pre-randomization levels. Preliminary findings suggest that MET-PS may mitigate the risk of FASD by reducing alcohol use by pregnant women who use substances. Additional longitudinal studies are recommended to understand sustainability of treatment effects.

9. Price, S. K., Coles, D. C., & Wingold, T. (2017). Integrating Behavioral Health Risk Assessment into Centralized Intake for Maternal and Child Health Services. *Health & Social Work, 42*(4), 231-238. doi:10.1093/hsw/hlx037

See abstract above

10. Shepherd-Banigan, M., Domino, M. E., Wells, R., Rutledge, R., Hillemeier, M. M., & Van Houtven, C. H. (2017). Do Maternity Care Coordination Services Encourage Use of Behavioral Health Treatment among Pregnant Women on Medicaid? *Women's Health Issues*, 27(4), 449-495. doi:10.1016/j.whi.2017.02.006

In this study, researchers used a random sample of North Carolina Medicaid health records to determine if receiving maternity care coordination (MCC) is related to use of mental health and substance use treatment services during pregnancy and at 3-months post-partum. MCC services are focused on low-income women. Data from pregnant women receiving MCC ($n = 12,235$) was compared to pregnant women not receiving MCC ($n = 57,031$) during a specific period of time. Results showed that receiving MCC in the current month is associated with a relative increase of 20% of any mental health treatment. MCC in the prior month is associated with a relative increase of 34% in the number of mental health visits. However, no association was observed between MCC use and substance-use treatment, which the authors call a lost opportunity. They recommend identifying why pregnant women are not being effectively connected to substance-use treatment as they are to mental health services, and what services are needed to meet their needs.

11. Van Scoyoc, A., Harrison, J., & Fisher, P. (2017). Beliefs and Behaviors of Pregnant Women with Addictions Awaiting Treatment Initiation. *Child & Adolescent Social Work Journal*, 34(1), 65-79. doi:10.1007/s10560-016-0474-0

In this study, researchers interviewed pregnant or postpartum women who used substances and were waiting for treatment regarding their knowledge of the effects of substance use in pregnancy and their efforts to reduce harm. All of the 15 women in the study completed a questionnaire and participated in semi-structured interviews and were eventually accepted into an inpatient substance use treatment program. Data analysis using constructivist grounded theory revealed 10 themes related to substance use in pregnancy within four categories: 1) beliefs about the negative impact on the baby; 2) seeking information about the impact; 3) reducing substance use prior to accessing treatment services; and, 4) engaging in health promoting behaviours. This study shows that women believe that there can be negative effects of substance use on their developing child. Though there was some variation in concern, there was motivation to seek information anonymously and to use that information to try to make positive changes including decreasing substance use. The authors conclude that providing accessible and high-quality information may help women make positive choices on their own and to see out systems of support.

12. Washio, Y., E. Martin, C., Goldstein, N. D., & Terplan, M. (2017). Characteristics of pregnant women who reported alcohol use at admission to substance use treatment. *Journal of Substance Abuse Treatment*, 82, 82-86. doi:10.1016/j.jsat.2017.09.010

In an effort to better understand the substance use and demographic profile of U.S. pregnant women reporting alcohol use, researchers used the Treatment Episode Data Set (TEDS-A) to compare women entering substance use treatment for the first time ($n = 166,863$). Of those reporting alcohol use (43%), half reported it was their primary drug of choice (50%). Those using alcohol only were more likely to be non-Hispanic White, employed, highly educated, married and older. Researchers report a declining trend of alcohol use reported among pregnant women in substance use treatment for the first time. Marijuana was the most common co-used substance with alcohol; tobacco was not included as one of the TEDS-A substances. Understanding the differences in substance use characteristics can inform health interventions and mitigate the effects of prenatal substance use on women and their children.

G. Level 4 Prevention

1. Hafekost, K., Lawrence, D., O'Leary, C., Bower, C., O'Donnell, M., Semmens, J., & Zubrick, S. R. (2017). Maternal alcohol use disorder and subsequent child protection contact: A record-linkage population cohort study. *Child Abuse & Neglect*, 72, 206-214. doi:10.1016/j.chiabu.2017.08.010

Using a population cohort, comprised of administrative linked data, the authors of this study examined the relationship between a maternal alcohol use diagnosis (ICD 9/10) and the timing of diagnosis, and child protection outcomes in Western Australia. This study quantified the relationship between a maternal alcohol use diagnosis (i.e., as a proxy for heavy drinking) and child protection outcomes using generalized linear mixed models and a proportional hazards model. Children of women with an alcohol-use diagnosis were at a significantly higher risk of a substantiated child protection allegation or entry into out-of-home care. The highest risk of contact with the child protection system was associated with a diagnosis of an alcohol use disorder during pregnancy and in the immediate years pre or post pregnancy. The authors conclude that further work is needed to identify effective strategies to help reduce the high rates of alcohol use in this population, and that further support is warranted for women who have been identified as having an alcohol use issue to help reduce the potential negative impacts on their child and involvement with child protection.

2. Hanlon-Dearman, A., Malik, S., Wellwood, J., Johnston, K., Gammon, H., N Andrew, K., . . . Longstaffe, S. (2017). A descriptive Study of a Community-Based Home-Visiting Program with Preschool Children Prenatally Exposed to Alcohol. *Journal Of Population Therapeutics And Clinical Pharmacology*, 24(2), e61-e71. doi:10.22374/1710-6222.24.2.3

Secure attachments are critical to healthy child development. However, previous research suggests that individuals with FASD or prenatal alcohol exposure have an increased risk of insecure caregiver-child attachments and related negative emotional-behavioural outcomes. Attachment-focused interventions can promote positive effects and promote secure caregiver-child relationships, but these interventions have not been investigated or adapted for children with FASD. Twelve caregiver-child dyads in Manitoba, Canada completed an FASD-adapted version of the Circle of Security intervention. The results of this study supported a positive influence of this intervention on child behaviour and parent efficacy for children with FASD and the findings support the use of a community-home attachment intervention for caregivers of children with FASD or prenatal alcohol exposure.

3. Marcellus, L. (2017). A Grounded Theory of Mothering in the Early Years for Women Recovering From Substance Use. *Journal of Family Nursing*, 23(3), 341-365. doi:10.1177/1074840717709366

Researchers followed 18 women from an integrated community-based maternity program during their children's early years in order to provide information about recovery and transition processes. The women completed semi-structured interviews during a 2-year period about their pathways to recovery and parenthood. Their experiences were analyzed using grounded theory methods. The women's transition process is described as "holding it together," and consisted of three components: 1) restoring their sense of self, 2) creating a strong sense of home amid challenging circumstances, and 3) being a strong center for their family. Components that most supported them during transition were longer-term services, supports that addressed social determinants of health, and recognition of women's specific strengths and needs. The author recommends expanding integrated maternity programs and their services, and housing in particular, and extending the time period

women can access them. As well, policy development should incorporate on sex- and gender-based analysis.

4. McLeish, J., & Redshaw, M. (2017). "I didn't think we'd be dealing with stuff like this": A qualitative study of volunteer support for very disadvantaged pregnant women and new mothers. *Midwifery*, 45, 36-43. doi:10.1016/j.midw.2016.12.003

See abstract above

5. Milligan, K., Usher, A. M., & Urbanoski, K. A. (2017). Supporting pregnant and parenting women with substance-related problems by addressing emotion regulation and executive function needs. *Addiction Research & Theory*, 25(3), 251-261. doi:10.1080/16066359.2016.1259617

See abstract above

6. Nordenfors, M., & Höjer, I. (2017). Mothers with substance and alcohol abuse—support through pregnancy and early infancy. *Social Work in Health Care*, 56(5), 381-399. doi:10.1080/00981389.2017.1299072

See abstract above

7. Short, V., Gannon, M., Weingarten, W., Kaltenbach, K., LaNoue, M., & Abatemarco, D. (2017). Reducing Stress Among Mothers in Drug Treatment: A Description of a Mindfulness Based Parenting Intervention. *Maternal & Child Health Journal*, 21(6), 1377-1386. doi:10.1007/s10995-016-2244-1

Researchers assessed the efficacy of a mindfulness-based parenting intervention (MBP) for decreasing stress in a population of pregnant or parenting women in substance use treatment ($n = 59$). Ten cohorts of participants were recruited from a long-term, residential, substance-use treatment program. Participants were all receiving medication-assisted opioid treatment. They attended 12 weekly two-hour sessions that included meditation practice, mindfulness and parenting skills, and group discussions. Participants completed the Adverse Childhood Experiences (ACE) questionnaire at study enrollment and assessments of general stress and parental distress were administered pre- and post-MBP. The mean number of sessions attended was 10; mean age of participants was 30 years. The majority were white, not employed, unmarried, on public assistance, and had high school or less education. The average general adverse childhood exposures experienced was 3.9 ($sd = 2.3$). Both general and parental stress were significantly reduced from baseline but change in general stress was not associated with change in parental stress. Researchers plan to assess and evaluate the efficacy of specific components of MBP on targeted outcomes.

8. Zabotka, J., Bradley, C., & Escueta, M. (2017). 'How could I have done this?' Thoughts of mothers of children with fetal alcohol syndrome. *Journal of Social Work Practice in the Addictions*, 17(3), 258-274.
doi:10.1080/1533256X.2016.1243123

Researchers interviewed 11 birth mothers of children with FASD in order to describe their thoughts, feelings, and coping strategies with regard to the etiology of their children's diagnosis and their role in it. The open-ended questionnaires were coded using "transcendental phenomenological reduction" methods and themes were identified. All the women reported persistent feelings of guilt no matter the circumstances. Four themes were identified that help them frame and understand their drinking during pregnancy: 1) the disease model of addiction; 2) incomplete or inaccurate knowledge of the consequences; 3) taking the advice of others, which included assuming permission when physicians did not address drinking or minimized its effects of during pregnancy; and, 4) not knowing they were pregnant. The authors conclude understanding the feelings of biological mothers who have children with FAS will help in screening, identifying and providing prevention services.

H. Other – stigma, ethical issues, systemic approaches

1. Corrigan, P. W., Lara, J. L., Shah, B. B., Mitchell, K. T., Simmes, D., & Jones, K. L. (2017). The Public Stigma of Birth Mothers of Children with Fetal Alcohol Spectrum Disorders. *Alcoholism: Clinical & Experimental Research*, 41(6), 1166-1173. doi:10.1111/acer.13381

The authors investigated the public stigma towards biological mothers of children with FASD. Stigma impacts not only the person with the disability, such as FASD, but also others in their life, including family members. Participants ($n = 389$) rated four different conditions on levels of difference, disdain, and responsibility which included: serious mental illness, substance use disorder, jail experience, and FASD. Participants were also asked to complete a budget allocation task as an indicator of discrimination. Respondents viewed mothers of children with FASD as more different, disdained, and responsible compared to women with the other three conditions. Budget allocation toward service provision for FASD programs was significantly lower than toward all other human service programs. The findings of this study support the conviction that biological mothers of children with FASD are highly stigmatized in society and that public discrimination may occur against this population.

2. DiNitto, D. M. (2017). Fetal alcohol spectrum disorders: An interview with Dr. Shauna Acquavita, Assistant Professor, University of Cincinnati. *Journal of Social Work Practice in the Addictions*, 17(1-2), 224-235. doi:10.1080/1533256X.2017.1301735

This interview with Dr. Shauna Acquavita regarding FASD in the United States was part of a special issue on reducing and preventing alcohol misuse and its consequences. The interview focuses on how FASD prevention pertains to the field of social work. The interview discusses a number of topics including: a broad overview of FASD; prevalence rates; FASD prevention in a social work context; secondary adverse outcomes; policies and practices regarding FASD prevention; the role of women's partners in FASD prevention; and the role social workers play in preventing FASD and engaging with other disciplines to reduce the challenges associated with alcohol misuse and its consequences.

3. Dukes, K., Tripp, T., Petersen, J., Robinson, F., Odendaal, H., Elliott, A., . . . Burd, L. (2017). A modified Timeline Followback assessment to capture alcohol exposure in pregnant women: Application in the Safe Passage Study. *Alcohol*, 62, 17-27. doi:10.1016/j.alcohol.2017.02.174

Currently, there is no recognized standard for assessing prenatal alcohol exposure regarding the specific effects including quantity, frequency, and timing. The Safe Passage Study was designed to investigate the role of prenatal alcohol exposure in regards to poor perinatal and postnatal outcomes. In the Safe Passage Study, interview-based timeline followback was used to capture information regarding the specific effects of prenatal alcohol exposure around the time of conception through to 1 month post-birth. This study included participants from two regions: the Northern Plains region of the United States, and Cape Town, South Africa. The sample consisted of 11,892 pregnancies from 10,088 women in three diverse populations who were followed using a modified 30-day Timeline Followback calendar for collecting information about prenatal alcohol exposure. The authors collected information regarding sharing, type/brand, container size, and duration, in order to determine the amount of alcohol consumed. A total of 53,823 drinks were reported. Sharing was reported for 74% of drinks in South Africa and 10% in the United States. This study is the first study of this size to wholly encompass multiple factors into a single measure to more accurately investigate daily alcohol consumption and to assess patterns of consumption over time. The multiple methods

used to assess prenatal alcohol exposure can increase the accuracy of measuring alcohol consumption during pregnancy.

4. Fitzpatrick, J. P., Oscar, J., Carter, M., Elliott, E. J., Latimer, J., Wright, E., & Boulton, J. (2017). The Marulu Strategy 2008-2012: overcoming Fetal Alcohol Spectrum Disorder (FASD) in the Fitzroy Valley. *Australian And New Zealand Journal Of Public Health*, 41(5), 467-473. doi:10.1111/1753-6405.12689

In 2008, Aboriginal leaders concerned about the high rates of FASD in Fitzroy Valley, Australia, began to introduce restrictions on access to take away full strength alcohol, and engaged with strategic partners to more broadly address FASD in the region. This study reviewed previous literature on community-led FASD strategies to help develop and implement their own community-led, researcher-supported, FASD strategy. Key components of earlier literature included strategy ownership, leadership, governance by participating communities, and a research framework, which was all combined to inform the Marulu FASD strategy. Researchers held community meetings and workshops to help develop the Marulu FASD strategy, and when feasibility and community consent allowed researchers to conduct a FASD prevalence study, implementation of this strategy was furthered. In 2012, all previous efforts led to the establishment of the Marulu FASD Unit within a local Aboriginal organization, to help sustain and organize ongoing strategies. This study concludes by discussing the effectiveness of community control with public health initiatives when Aboriginal communities prioritize these concerns and participate with strategic partners to overcome them. Furthermore, the authors discuss how the Marulu FASD strategy can be used a template for action for not only FASD, but other public health issues internationally.

5. Gibbs, A., & Sherwood, K. (2017). Putting Fetal Alcohol Spectrum Disorder (FASD) on the Map in New Zealand: A Review of Health, Social, Political, Justice and Cultural Developments. *Psychiatry, Psychology & Law*, 24(6), 825-842. doi:10.1080/13218719.2017.1315784

By the mid-1990s, New Zealand began to recognize the distinct impairments that result from prenatal alcohol exposure. The national system that offers support for individuals with FASD and their families in New Zealand utilizes a multidisciplinary and multiagency approach in order to provide a high standard of assistance and care. This paper traces the developments within New Zealand's health, justice, social, and cultural sectors, as well as the work of individual trailblazers, that put FASD on the map. New Zealand's story of recognizing FASD displays determination, hope, and opportunity, while still acknowledging there is still room for improvement.

6. Kameg, B., Knapp, E., Pierce-Bulger, M., & Mitchell, A. M. (2017). Educational Opportunities for Fetal Alcohol Spectrum Disorder Prevention. *Journal of Addictions Nursing*, 28(2), 53-54. doi:10.1097/JAN.000000000000170

Many individuals, including nurses, are unaware of the risks of moderate and high-risk alcohol use in the United States. There is a need for nurses, and other health care providers, who encounter pregnant women and women of childbearing age to routinely screen and discuss the risks of alcohol consumption. Prevention techniques, including screening and brief intervention, need to be routine practice for nurses and other health care providers. Because nurses are one of the most trusted professionals in a health care setting, they are ideally positioned to ensure that all women in their care are making evidence-based decisions regarding alcohol use before, during, and after the prenatal period.

7. Landgren, M. (2017). How much is too much? The implications of recognising alcohol as a teratogen. *Acta Paediatrica*, 106(3), 353-355.
doi:10.1111/apa.13696

In this editorial, the author, who is a pediatrician, reviews the scientific evidence confirming that alcohol is a teratogen during pregnancy, which has biological effects on a foetus that can be linked to a number physical and behavioral issues later in life. Based on current research, the author highlights three key issues that impact effective FASD prevention efforts: 1) an essential component of FASD is preconception drinking habits; 2) self-report of drinking habits and children's behaviour is unreliable; and, 3) abnormal behaviour caused by alcohol-exposure is often not evident in children until they are school-aged, 7-10 years old. The author states there is an urgent need for more research and action and recommends that prevention begin during preconception and that children showing symptoms of alcohol-exposures be assessed in a team setting in a variety of settings.

8. Lewis, M. S. (2017). Criminalizing Substance Abuse and Undermining Roe v. Wade: The Tension between Abortion Doctrine and the Criminalization of Prenatal Substance Abuse. *William & Mary Journal of Women and the Law*, 23, 185-218.

This article focuses on intersections of legal, scientific and medical issues affecting abortion laws and the criminalization of women who use substances in pregnancy in 3 U.S. states – Alabama, Tennessee and South Carolina. The article is divided into 3 parts: 1) approaches to prosecuting women for prenatal substance use; 2) US Supreme Court precedent on abortion and issues of viability and access to abortion; and, 3) review of the most recent scientific information on fetal harm and development, addiction, pregnancy and viability. The author details statistics regarding prenatal substance use prosecution illustrating that prosecutions may interfere with abortion rights and are based on use of illicit substances not on the possible harm to the fetus. The constitutionality of prosecuting women for prenatal substance use and of a woman's right to an abortion are both determined by the point of viability of the fetus. Based on the scientific information detailed in the article, the author seeks to inform legal approaches to prenatal substance use by concluding: substance use is separate from addiction; not all fetuses are harmed by substance use; alcohol and tobacco can cause more harm to fetal health than illegal drugs; possibility of harm to the fetus is greatest during the first trimester, which is when the legal right to abortion is most unfettered.

9. Lollar, C. E. (2017). Criminalizing pregnancy. *Indiana Law Journal*, 92(3), 947.

The author questions the motivation behind laws set up to prosecute women for prenatal illicit substance use and contends that they are causing greater harms to women and children than are the potential harms from drug use. In discussing the latest medical research, the negative effects of illicit drugs are shown to be less harmful on the health of the fetus in scope, scale and degree than those of legal drugs such as alcohol, tobacco and prescription drugs. Likewise, other factors that can harm a developing fetus – paternal behaviours, poverty, violence, and lack of prenatal care – are not subject to prosecution. As well, the author details the long-term harms of criminalization on children and women as illustrated by lack of access to prenatal care and removal of children. The author concludes that current laws are built on moral constructions of motherhood based on race-, gender- and class-bias and that a more empirically based, holistic, health and welfare approach is needed.

10. Morton Ninomiya, M. E. (2017). More than words: Using visual graphics for community-based health research. *Canadian Journal of Public Health, 108*(1), e91-e94. doi:10.17269/cjph.108.5660

The author argues that using visual graphics can improve accessibility, transparency and engagement in research processes, data and analysis particularly when there are diverse stakeholders. The researchers used institutional ethnography and interviews with community members to construct a map of FASD support and services in an eastern Indigenous community in Canada. They created specific visual graphics using an idea-mapping software for each phase of the study: development, data collection, analysis, and dissemination. The author details some of the challenges and requirements inherent in visual graphics and underscores the need to include culturally meaningful knowledge and imagery. She concludes that visual graphics “levelled the playing field” by making study processes accessible and by facilitating dialogue between academic and non-academic stakeholders.

11. Onoye, J. M., & Thompson, M. D. (2017). Challenges and Progress in Building a Comprehensive Statewide System for Fetal Alcohol Spectrum Disorders Prevention in Hawai'i. *Maternal and Child Health Journal, 21*(5), 1002-1009. doi:10.1007/s10995-017-2270-7

Researchers wanted to understand the challenges and successes of a statewide FASD prevention and intervention activities in Hawai'i. They gathered qualitative and quantitative information on the activities of the FASD Task Force in Hawai'i over a decade and categorized into six thematic areas: 1) policy; 2) public awareness/education; 3) professional education/training; 4) screening and identification; 5) treatment and services; and 6) data and surveillance. Results showed that there was incremental progress particularly in the areas of education and training where external resources from SAMHSA and the CDC were leveraged. The hiring of a state-wide FASD coordinator was instrumental in increasing support for FASD initiatives, building a collaborative network, and coordinating activities at a system level, but the position was eventually eliminated. Beyond the remoteness of the Hawai'i, the overall lack of funding and resources limited capacity for creating a sustainable system of screening, education, and treatment. Recommendations include creating a state comprehensive strategic plan and building upon reforms to integrate universal screening and brief intervention of pregnant women into standard primary care practice.

12. Ordean, A., Graves, L., Chisamore, B., Greaves, L., & Dunlop, A. (2017). Prevalence and Consequences of Perinatal Substance Use—Growing Worldwide Concerns. *Substance Abuse: Research and Treatment, 11*. doi:10.1177/1178221817704692

Despite the well-established knowledge of the harms caused by alcohol, tobacco and opioid use during pregnancy, and numerous interventions to reduce them, there remains a significant proportion of substance-exposed pregnancies in the world. Unintended pregnancies are high among all women, but higher among those with substance use disorders. The authors present current advances, knowledge and challenges in preventing substance-exposed pregnancies. They note that integrated service delivery from preconception to postpartum is the most effective model for meeting the needs of childbearing women in substance use treatment. This includes family planning services, multi-level FASD initiatives that employ FASD-informed approaches and innovative and gendered approaches to smoking cessation and opioid use, particularly in rural areas. Future research efforts should focus on preconception care, and improvements in both system design and prevention and management of substance-using women and their infants.

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
Prevalence of Drinking During Pregnancy					
n = 23	Bakhireva	Prevalence of Prenatal Alcohol Exposure in the State of Texas as Assessed by Phosphatidylethanol in Newborn Dried Blood Spot Specimens	Cross-sectional	U.S.	4
	Da Pilma et al.	Alcohol consumption among pregnant women in James Town Community, Accra, Ghana	Cross-sectional	Ghana	4
	Fortin et al.	Alcohol use among Inuit pregnant women: Validity of alcohol ascertainment measures over time	Cohort	Canada	4
	Górniaczyk et al.	Maternal health-related behaviours during pregnancy: a critical public health issue	Questionnaire	Poland	5
	Hashizume Baptista et al.	Prevalence and factors associated with alcohol consumption during pregnancy	Cross-sectional	Brazil	5
	Karjane	Screening for At-Risk Alcohol and Drug Use in the Perinatal Period: How Do Adolescents Compare to Adult Women?	Cross-sectional	U.S.	5
	Lamy et al.	Assessment of tobacco, alcohol and cannabinoid metabolites in 645 meconium samples of newborns compared to maternal self-reports	Cross-sectional	France	6
	Lange et al. (2017a)	Actual and predicted prevalence of alcohol consumption during pregnancy in Latin America and the Caribbean: systematic literature review and meta-analysis	Systematic review and meta-analysis	Canada (review of Latin American and Caribbean)	6
	Lange et al. (2017b)	Prevalence of binge drinking during pregnancy by country and World Health Organization region: Systematic review and meta-analysis	Systematic review & meta-analysis	Canada	7
	Liu & Mumford	Concurrent Trajectories of Female Drinking and Smoking Behaviors Throughout Transitions to Pregnancy and Early Parenthood	Cohort	U.S.	7

#	Author	Title	Method	Country	Page
	López, Conde & Cremonte	Alcohol Use Disorders in Argentinian Girls and Women 12 Months Before Delivery: Comparison of DSM-IV, DSM-5, and ICD-10 Diagnostic Criteria	Cross-sectional	Argentina	8
	Mårdby et al.	Consumption of alcohol during pregnancy-A multinational European study	Cross-sectional	Sweden and Norway	8
	Mccormack et al.	Prenatal Alcohol Consumption Between Conception and Recognition of Pregnancy	Cross-sectional	Australia	8
	Oh et al.	Prevalence and correlates of alcohol and tobacco use among pregnant women in the United States: Evidence from the NSDUH 2005–2014	Cross-sectional	U.S.	9
	Popova et al.	Estimation of national, regional, and global prevalence of alcohol use during pregnancy and fetal alcohol syndrome: a systematic review and meta-analysis	Systematic review & meta-analysis	Canada	9
	Reitan	Patterns of polydrug use among pregnant substance abusers	Cross-sectional	Sweden	10
	Smith	Alcohol consumption during pregnancy and breast feeding in Canada is prevalent and not strongly associated with mental health status	Commentary	Canada	10
	Symon	Evaluation of a retrospective diary for peri-conceptual and mid-pregnancy drinking in Scotland: a cross-sectional study	Cross-sectional	UK - Scotland	10
	Symon et al.	Peri-conceptual and mid-pregnancy drinking: a cross-sectional assessment in two Scottish health board areas using a 7-day Retrospective Diary	Cross-sectional	UK - Scotland	11
	Tearne, Cox & Giglia	Patterns of Alcohol Intake of Pregnant and Lactating Women in Rural Western Australia	Prospective cohort	Australia	11
	Watt et al.	Risk for Alcohol-Exposed Pregnancies Among Women at Drinking Venues in Cape Town, South Africa	Cross-sectional	South Africa	11
	Wilson et al.	Alcohol consumption by breastfeeding mothers: Frequency, correlates and infant outcomes	Prospective cohort	Australia	12
	Zhao, Mccauley & Sheeran	The interaction of pregnancy, substance use and mental	Cross-sectional	Australia	12

#	Author	Title	Method	Country	Page
		illness on birthing outcomes in Australia			
Influences and factors associated with drinking in pregnancy					
n = 20	Bohora et al.	Latent Class Analysis of HIV Risk Behaviors Among Russian Women at Risk for Alcohol-Exposed Pregnancies	Cross-sectional	Russia	13
	Brittain et al.	Factors associated with alcohol use prior to and during pregnancy among HIV-infected pregnant women in Cape Town, South Africa	Longitudinal	South Africa	13
	Coathup et al.	Dietary Patterns and Alcohol Consumption During Pregnancy: Secondary Analysis of Avon Longitudinal Study of Parents and Children	Longitudinal (secondary data analysis)	UK	13
	Coathup, Smith & Boulton	Exploration of dietary patterns and alcohol consumption in pregnant women in the UK: A mixed methods study	Mixed methods	UK	14
	Da Pilma Lekettey et al.	Alcohol consumption among pregnant women in James Town Community, Accra, Ghana	Cross-sectional	Ghana	4
	De Genna et al.	Maternal Age and Trajectories of Risky Alcohol Use: A Prospective Study	Cohort	U.S.	14
	Dukes et al.	Drinking and smoking patterns during pregnancy: Development of group-based trajectories in the Safe Passage Study	Cohort, secondary data analysis	U.S.	15
	Górnaczyk et al.	Maternal health-related behaviours during pregnancy: a critical public health issue	Questionnaire	Poland	5
	Kelly et al.	Women who drank while pregnant: The importance of social context in the lives of South African pregnant women	Qualitative	South Africa	15
	Liu & Mumford	Concurrent Trajectories of Female Drinking and Smoking Behaviors Throughout Transitions to Pregnancy and Early Parenthood	Cohort	U.S.	7
	Oh et al.	Prevalence and correlates of alcohol and tobacco use among pregnant women in the United States: Evidence from the NSDUH 2005–2014	Cross-sectional	U.S.	9
	Petersen-Williams et al.	Predictors of Alcohol Use during Pregnancy among Women Attending Midwife Obstetric	Cross-sectional	South Africa	16

#	Author	Title	Method	Country	Page
		Units in the Cape Metropole, South Africa			
	Schmidt et al.	Alcohol reduction in the first trimester is unrelated to smoking, patient or pregnancy characteristics	Cross-sectional	U.S.	17
	Shahram et al. (2017a)	Understanding the life histories of pregnant-involved young aboriginal women with substance use experiences in three Canadian cities	Qualitative	Canada	17
	Shahram et al. (2017b)	The cedar project: using indigenous-specific determinants of health to predict substance use among young pregnant-involved aboriginal women	Qualitative	Canada	17
	Singal	The Psychiatric Morbidity of Women Who Give Birth to Children with Fetal Alcohol Spectrum Disorder (FASD): Results of the Manitoba Mothers and FASD Study	Case control	Canada	18
	Smith	Alcohol consumption during pregnancy and breast feeding in Canada is prevalent and not strongly associated with mental health status	Commentary	Canada	10
	Watt et al.	Risk for Alcohol-Exposed Pregnancies Among Women at Drinking Venues in Cape Town, South Africa	Cross-sectional	South Africa	11
	Wilson et al.	Alcohol consumption by breastfeeding mothers: Frequency, correlates and infant outcomes	Prospective cohort	Australia	12
	Zhao, Mccauley & Sheeran	The interaction of pregnancy, substance use and mental illness on birthing outcomes in Australia	Cross-sectional	Australia	12
Level 1 Prevention					
n = 10	Bazzo et al.	'Too Young To Drink'. An international communication campaign to raise public awareness of fetal alcohol spectrum disorders	Cross-sectional	Italy	20
	Cil	Effects of posted point-of-sale warnings on alcohol consumption during pregnancy and on birth outcomes	Systematic content analysis (media ads)	Australia	20

#	Author	Title	Method	Country	Page
	Dossou, Gallopel-Morvan & Diouf	The effectiveness of current French health warnings displayed on alcohol advertisements and alcoholic beverages	Feminist discourse analysis	Canada	20
	Dunstone et al.	Alcohol harm reduction advertisements: a content analysis of topic, objective, emotional tone, execution and target audience	Qualitative	France	21
	Godderis & Stephenson	Preventing Tragedy in Canada? Risk and Responsibility in Government Discourses about Alcohol Consumption and Pregnancy	Thematic analysis of social media	New Zealand	21
	Hui, Angelotta & Fisher	Criminalizing substance use in pregnancy: Misplaced priorities	Case control (ecological)	U.S.	21
	Parackal et al.	The Use of Facebook Advertising for Communicating Public Health Messages: A Campaign Against Drinking During Pregnancy in New Zealand	Editorial/ Commentary	U.S.	22
	Ray	Evaluation of an FASD Prevention Campaign Using Pregnancy Test Dispensers in Alaska and the Yukon	Quasi experimental (time series)	U.S. and Canada	22
	Roberts et al.	Forty Years of State Alcohol and Pregnancy Policies in the USA: Best Practices for Public Health or Efforts to Restrict Women's Reproductive Rights?	Policy analysis	U.S.	22
Level 2 Prevention					
<i>n</i> = 32	Aldridge	The relative impact of brief treatment versus brief intervention in primary health-care screening programs for substance use disorders	Before and after	U.S.	23
	Angus et al.	Estimating the cost-effectiveness of brief interventions for heavy drinking in primary health care across Europe	Meta modelling (cost effectiveness)	UK	23
	Babor, Del Boca & Bray	Screening, Brief Intervention and Referral to Treatment: implications of SAMHSA's SBIRT initiative for substance abuse policy and practice	Multisite program evaluation	U.S.	23

#	Author	Title	Method	Country	Page
	Bager et al.	Biomarkers for the Detection of Prenatal Alcohol Exposure: A Review	Narrative review	Denmark	24
	Bountress et al.	Reducing sexual risk behaviors: secondary analyses from a randomized controlled trial of a brief web-based alcohol intervention for underage, heavy episodic drinking college women	RCT	U.S.	24
	Bracero et al.	Improving screening for alcohol consumption during pregnancy with phosphatidylethanol	Cross-sectional	U.S.	24
	Chiandetti et al.	Prevalence of prenatal exposure to substances of abuse: questionnaire versus biomarkers	Literature review	Spain	25
	Chow et al.	Convergence of online daily diaries and timeline followback among women at risk for alcohol exposed pregnancy	RCT	U.S.	25
	Coons, Clement & Watson	Are rural and urban Ontario health care professionals aware of fetal alcohol spectrum disorder? A secondary data analysis of the Fetal Alcohol Syndrome Survey for Health Professionals	Secondary data analysis	Canada	26
	Coons et al. (2017a)	Health Care Students' Attitudes About Alcohol Consumption During Pregnancy: Responses to Narrative Vignettes	Qualitative	Canada	26
	Coons et al. (2017b)	No Alcohol Is Recommended, But . . . : Health Care Students' Attitudes About Alcohol Consumption During Pregnancy	Qualitative	Canada	26
	Ferraguti et al.	Ethylglucuronide in the urine as a marker of alcohol consumption during pregnancy: Comparison with four alcohol screening questionnaires	Cross-sectional	Italy	27
	Griffith et al.	Prescription contraception use and adherence by women with substance use disorders	Retrospective cohort	U.S.	27
	Hanson et al.	Impact of the CHOICES Intervention in Preventing Alcohol-Exposed Pregnancies in American Indian Women	Quasi-experimental (time series)	U.S.	27
	Howlett et al. (2017a)	How strong is the evidence for using blood biomarkers alone to screen for alcohol consumption	Systematic review	UK	28

#	Author	Title	Method	Country	Page
		during pregnancy? A systematic review			
	Howlett et al. (2017b)	A survey of attitudes, beliefs and practice regarding alcohol use and screening in pregnancy: an opportunity for support and education?	Cohort	UK	28
	Inoue, M et al.	Fetal alcohol spectrum disorder information dissemination by health care professions	Cross sectional	U.S.	28
	Jarlenski et al.	Characterization of U.S. State Laws Requiring Health Care Provider Reporting of Perinatal Substance Use	Systematic content analysis (statutes)	U.S.	29
	Johnson, Von Sternberg & Velasquez	A Comparison of Profiles of Transtheoretical Model Constructs of Change among Depressed and Nondepressed Women at Risk for an Alcohol-Exposed Pregnancy	Secondary data analysis	U.S.	29
	Letourneau et al.	Preventing alcohol-exposed pregnancies among Hispanic women	Quasi experimental (time series)	U.S.	29
	Montag et al.	Tailoring an Alcohol Intervention for American Indian Alaska Native Women of Childbearing Age: Listening to the Community	Qualitative	U.S.	30
	Munro et al.	SmartMom Text Messaging for Prenatal Education: A Qualitative Focus Group Study to Explore Canadian Women's Perceptions	Qualitative	Canada	30
	Nikoo et al.	Effectiveness of prenatal screening for substance use: Critical consciousness, a promising curriculum for compassionate screening	Non-systematic literature review	Canada	30
	Price, Coles & Wingold	Integrating Behavioral Health Risk Assessment into Centralized Intake for Maternal and Child Health Services	Evaluation	U.S.	31
	Putney et al.	Evaluation of Alcohol Screening, Brief Intervention, and Referral to Treatment (SBIRT) Training for Social Workers	Before and after	U.S.	31
	Schuchat	The CDC's Recommendations to Help Prevent Fetal Alcohol Spectrum Disorders	Editorial/ Commentary	U.S.	31
	Symon	Evaluation of a retrospective diary for peri-conceptual and	Cross-sectional	UK	10

#	Author	Title	Method	Country	Page
		mid-pregnancy drinking in Scotland: a cross-sectional study			
	Velasquez et al.	Preventing Alcohol and Tobacco Exposed Pregnancies: CHOICES Plus in Primary Care	RCT	U.S.	32
	Won, Blumenthal-Barby & Chacko	Paid protection? Ethics of incentivised long-acting reversible contraception in adolescents with alcohol and other drug use	Ethical Evaluation	U.S.	32
	Wright	Screening, brief intervention, and referral to treatment for opioid and other substance use during infertility treatment	Narrative review	U.S.	33
	Xiao et al.	Economic evaluation of a behavioral intervention versus brief advice for substance use treatment in pregnant women: results from a randomized controlled trial	Economic evaluation (RCT)	U.S.	33
	Zizzo & Racine	Ethical challenges in FASD prevention: Scientific uncertainty, stigma, and respect for women's autonomy	Commentary	Canada	33
Preconception interventions					
n = 10	Bodin et al.	Exploring men's pregnancy-planning behaviour and fertility knowledge: a survey among fathers in Sweden	Scoping review	Canada	34
	Hemsing, Greaves & Poole	Preconception health care interventions: A scoping review	Scoping review	Canada	34
	Lan et al.	Systematic review and meta-analysis of the impact of preconception lifestyle interventions on fertility, obstetric, fetal, anthropometric and metabolic outcomes in men and women	Systematic review and meta-analysis	Australia	34
	Poels et al.	Actively preparing for pregnancy is associated with healthier lifestyle of women during the preconception period	Cross-sectional	Sweden	35
	Pryor et al.	Pregnancy Intention and Maternal Alcohol Consumption	Cross-sectional	The Netherlands	35
	Ricks et al.	Substance Use and Preconception Care: A Review of the Literature	RCT	The Netherlands	36
	Sobell et al.	Preventing Alcohol-Exposed Pregnancies: A Randomized Controlled Trial of a Self-	Content analysis	U.S.	36

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		Administered Version of Project CHOICES With College Students and Nonstudents			
	Thompson et al.	Rethinking Preconception Care: A Critical, Women's Health Perspective	Literature review	U.S.	36
	Toivonen, Oinonen & Duchene	Preconception health behaviours: A scoping review	Prospective cohort	U.S.	37
	Van Dijk et al.	The use of the mHealth program Smarter Pregnancy in preconception care: rationale, study design and data collection of a randomized controlled trial	RCT	U.S.	37
Level 3 Prevention					
n = 12	Abdullah et al.	Characteristics of patients receiving midwife-led prenatal care in Canada: results from the Maternity Experiences Survey (MES)	Cross-sectional	Canada	38
	Avilla et al.	Factors associated with attrition rate in a supportive care service for substance using pregnant women in Brazil	Retrospective case control	Brazil	38
	Baron et al.	Exploring health education with midwives, as perceived by pregnant women in primary care: A qualitative study in the Netherlands	Qualitative	The Netherlands	38
	Lewis et al.	Women attending high-risk substance abuse clinics versus general obstetrics clinics	Cross sectional	U.S.	39
	Mcleish & Redshaw	I didn't think we'd be dealing with stuff like this: A qualitative study of volunteer support for very disadvantaged pregnant women and new mothers	Qualitative	UK	39
	Milligan, Usher & Urbanoski	Supporting pregnant and parenting women with substance-related problems by addressing emotion regulation and executive function needs	Qualitative	Canada	39
	Nordenfors & Höjer	Mothers with substance and alcohol abuse—support through pregnancy and early infancy	Qualitative	Sweden	40
	Osterman, Lewis & Winhusen	Efficacy of motivational enhancement therapy to decrease alcohol and illicit-drug use in pregnant substance users reporting baseline alcohol use	RCT, secondary data analysis	U.S.	40

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	Price & Wingold	Integrating Behavioral Health Risk Assessment into Centralized Intake for Maternal and Child Health Services	Evaluation	U.S.	31
	Shepherd-Banigan et al.	Do Maternity Care Coordination Services Encourage Use of Behavioral Health Treatment among Pregnant Women on Medicaid?	Cross-sectional	U.S.	41
	Van Scoyoc, Harrison & Fisher	Beliefs and behaviors of pregnant women with addictions awaiting treatment initiation	Qualitative	U.S.	41
	Washio et al.	Characteristics of pregnant women who reported alcohol use at admission to substance use treatment	Cross-sectional	U.S.	41
Level 4 Prevention					
n = 8	Hafekost et al.	Maternal alcohol use disorder and subsequent child protection contact: A record-linkage population cohort study	Cohort	Australia	42
	Hanlon-Dearman et al.	A descriptive Study of a Community-Based Home-Visiting Program with Preschool Children Prenatally Exposed to Alcohol	Before and after (pilot)	Canada	42
	Marcellus	A Grounded Theory of Mothering in the Early Years for Women Recovering From Substance Use	Qualitative	Canada	42
	Mcleish & Redshaw	I didn't think we'd be dealing with stuff like this: A qualitative study of volunteer support for very disadvantaged pregnant women and new mothers	Qualitative	UK	39
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	Nordenfors & Höjer	Mothers with substance and alcohol abuse—support through pregnancy and early infancy	Qualitative	Sweden	40
	Short et al.	Reducing Stress Among Mothers in Drug Treatment: A Description of a Mindfulness Based Parenting Intervention	Before and after	U.S.	43
	Zabotka, Bradley & Escueta	'How could I have done this?' Thoughts of mothers of children with fetal alcohol syndrome	Qualitative	U.S.	44

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Other					
n = 12	Corriganes et al.	The Public Stigma of Birth Mothers of Children with Fetal Alcohol Spectrum Disorders	Cross-sectional	U.S.	45
	Dinitto	Fetal alcohol spectrum disorders: An interview with Dr. Shauna Acquavita, Assistant Professor, University of Cincinnati	Narrative review	Australia	45
	Dukes et al.	A modified Timeline Followback assessment to capture alcohol exposure in pregnant women: Application in the Safe Passage Study	Commentary	Canada	45
	Fitzpatrick et al.	The Marulu Strategy 2008-2012: overcoming Fetal Alcohol Spectrum Disorder (FASD) in the Fitzroy Valley	Narrative review	Canada	46
	Gibbs & Sherwood	Putting Fetal Alcohol Spectrum Disorder (FASD) on the Map in New Zealand: A Review of Health, Social, Political, Justice and Cultural Developments	Narrative review	New Zealand	46
	Kameg et al.	Educational Opportunities for Fetal Alcohol Spectrum Disorder Prevention	Editorial/Commentary	Sweden	46
	Landgren	How much is too much? The implications of recognising alcohol as a teratogen	Interview	U.S.	47
	Lewis	Criminalizing Substance Abuse and Undermining Roe v. Wade: The Tension between Abortion Doctrine and the Criminalization of Prenatal Substance Abuse	Cross-sectional	U.S.	47
	Lollar	Criminalizing pregnancy	Editorial/Commentary	U.S.	47
	Morton Ninomiya	More than words: Using visual graphics for community-based health research	Document review	U.S.	48
	Onoye & Thompson	Challenges and Progress in Building a Comprehensive Statewide System for Fetal Alcohol Spectrum Disorders Prevention in Hawai'i	Legal analysis	U.S.	48
	Ordean et al.	Prevalence and Consequences of Perinatal Substance Use—Growing Worldwide Concerns	Legal analysis	U.S.	48