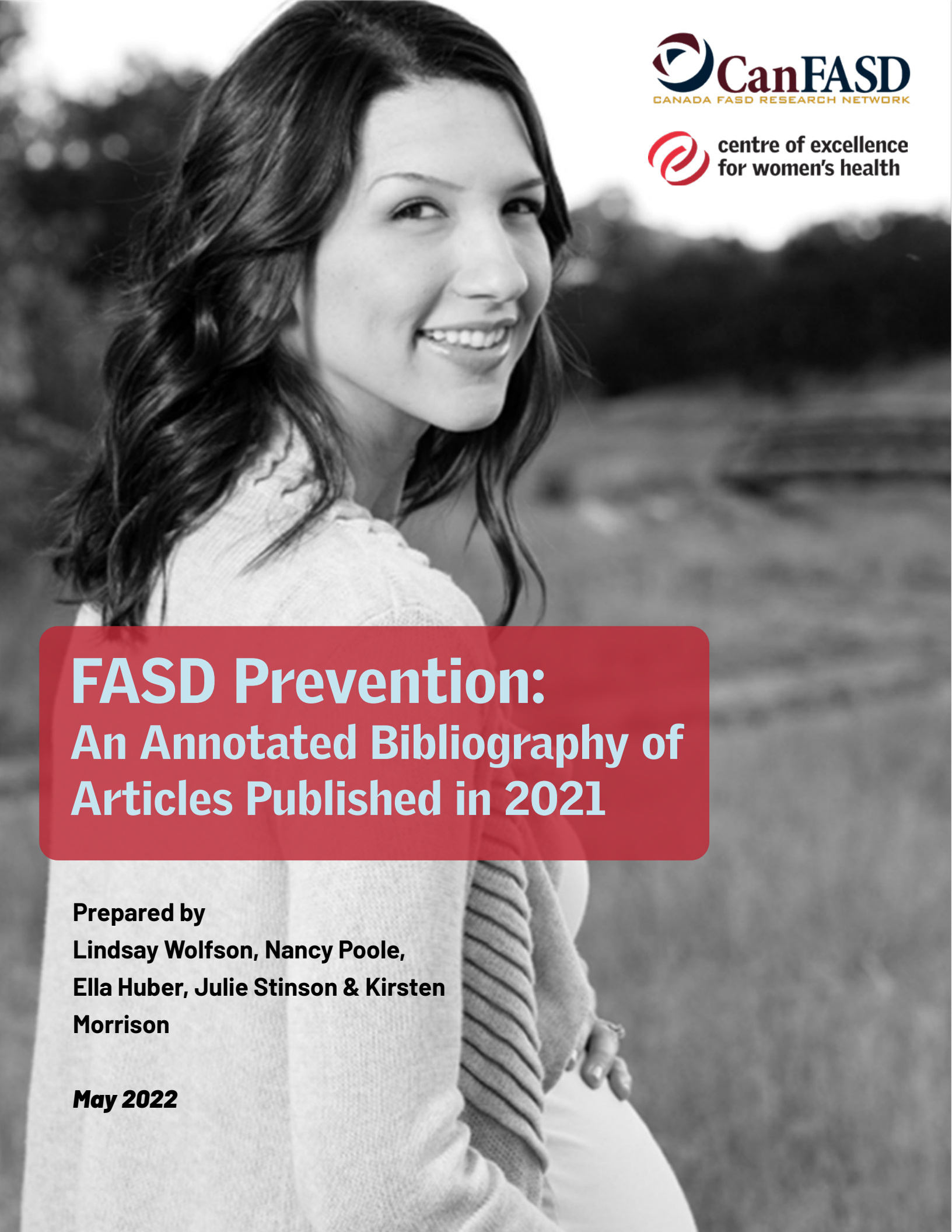

CanFASD
CANADA FASD RESEARCH NETWORK

centre of excellence for women's health

FASD Prevention:
An Annotated Bibliography of Articles Published in 2021

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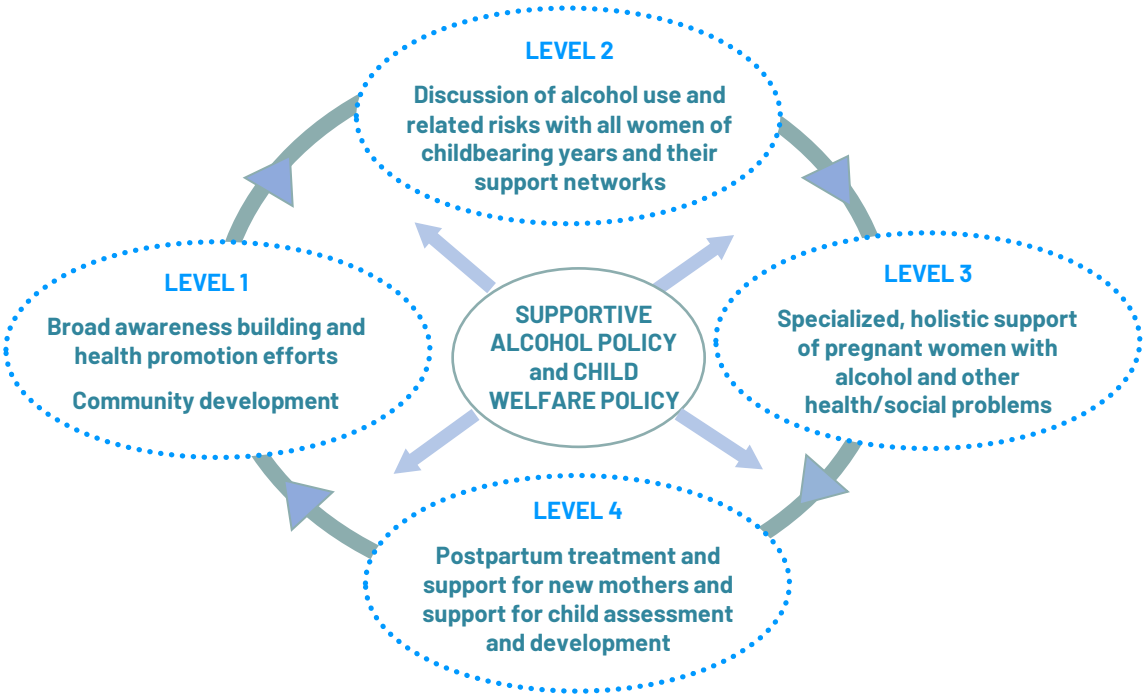
FASD Prevention Literature Search 2021

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 web meetings 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 2021:

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

Searches of each database were conducted using the following search terms: 1)[Fetal Alcohol Spectrum Disorder OR FASD OR fetal alcohol OR feotal alcohol OR alcohol exposed pregnancy OR alcohol] + [pregnancy] + [prevention OR preventing OR preventative]; 2)[Alcohol OR drink*] + [pregnan* OR conception OR preconception OR postpartum OR prenatal OR antenatal OR perinatal or maternal] + prevention; 3) [Alcohol OR drink*] + prevention + [women OR girls OR youth OR teen* OR mother OR Aboriginal OR Indigenous OR First Nation* OR Inuit OR Métis]; 4)[Alcohol OR drink* OR FASD] + [awareness OR education OR policy] + [women OR girls OR female OR mother]; 5)[Alcohol OR drink*] + intervention*+ [women OR girls OR female OR mother]; 6)[Alcohol OR drink*] + stigma + [women OR girls OR female OR mother]; 7)[Alcohol OR drink*] + [motivational interviewing OR Screening OR brief intervention OR SBIR OR SBIRT] + [women OR girls OR gender OR female OR mother OR pregnan*]; 8)[Alcohol or drink*] + [home visit* OR NICU OR neonatal intensive care unit OR midwives or midwife or midwifery]; 9)[Pregnan* OR conception OR preconception OR post-partum OR mother] + [substance use treatment OR harm reduction]; 10)[Pregnan* OR conception OR preconception OR post-partum OR mother] + [wraparound OR parent child assistant program OR PCAP OR community OR holistic OR integrated OR multidisciplinary]; 11)[Alcohol OR drink*] + [land-based OR cultur*] + [women OR girls OR youth OR teen* OR mother OR Aboriginal OR Indigenous OR First Nation* OR Inuit OR Métis];

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

Ninety nine (n = 98) articles were included from our searches. Four (n = 4) articles were assigned to more than one category and four (n = 4) were attributed to more than one country. Table 1 provides an overview of the number of articles found in each topic area by country and demonstrates that in the past year, research on FASD prevention published in English was most often being generated in the United States of America (US), Canada, the United Kingdom (UK), and Australia.

Table 1: Studies identified by topic and country

	Number of Studies						
Country	**Prevalence and Influences**	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Other**	**Total**
Australia	2	1	3	0	1	2	**9**
Brazil	2	0	0	0	0	0	**2**
Canada	4	1	1	3	2	6	**17**
Ethiopia	4	0	0	0	0	0	**4**
Germany	0	0	1	0	0	0	**1**
Greece	0	1	0	0	0	0	**1**
Israel	1	0	0	0	0	0	**1**
Italy	0	0	1	0	0	0	**1**
Japan	2	0	0	0	1	0	**3**
Lebanon	0	1	0	0	0	0	**1**
Lesotho	1	0	0	0	0	0	**1**
Malaysia	0	1	0	0	0	0	**1**
New Zealand	0	1	0	1	0	0	**2**
South Africa	5	0	1	0	0	1	**7**
South Korea	1	0	0	0	0	0	**1**
Sweden	1	0	1	0	0	0	**2**
Switzerland	0	1	0	0	0	0	**1**
The Netherlands	2	0	1	0	0	0	**3**
Uganda	2	0	0	0	0	0	**2**
UK	1	3	7	1	0	1	**13**
US	9	1	13	2	4	7	**36**
	37	**11**	**29**	**7**	**8**	**17**	**109**

A. Prevalence of, and influences and factors associated with, drinking in pregnancy

1. **Addila, A. E., Azale, T., Gete, Y. K., & Yitayal, M. (2021). Determinants of hazardous alcohol use among pregnant women attending antenatal care at public health facilities in Gondar town, Northwest Ethiopia: A nested case-control study. *PloS ONE*, *16*(7), e0253162. https://doi.org/10.1371/journal.pone.0253162**

This Ethiopian study identified determinants of hazardous alcohol use among pregnant women attending antenatal care. The authors found that husband's lack of formal education, being a housewife, having a poor household wealth index, having an unplanned pregnancy, having a poor social support system, depression, or not knowing the risks associated with alcohol use in pregnancy were associated with hazardous alcohol use. The use of routine alcohol screening during antenatal care visits can be used to provide information on the risks of associated with alcohol use in pregnancy and prompt a referral system for clinical management. The authors conclude that antenatal care providers play a pivotal role in ensuring that women receive adequate advice on alcohol use and providing awareness on alcohol use during pregnancy.

2. **Addila, A. E., Azale, T., Gete, Y. K., & Yitayal, M. (2021). Individual and community-level predictors of maternal alcohol consumption during pregnancy in Gondar town, Northwest Ethiopia: A multi-level logistic regression. *BMC Pregnancy and Childbirth,* 419.**

This community-based cross-sectional study investigated the individual- and community-level predictors of maternal alcohol consumption among 1,237 pregnant women in Gondar town, Norwest Ethiopia. The prevalence of alcohol consumption during pregnancy in this sample was 30.26%. Individual-level predictors of alcohol consumption during pregnancy were: low level of knowledge on harmful effects, positive attitude towards alcohol, history of alcohol use pre-pregnancy, having a partner that uses alcohol, having a partner that encourages alcohol use, and perceptions of cultural or social acceptability of alcohol consumption. Community-level predictors were: a lack of exposure to media or other messages about the risks of drinking alcohol during pregnancy and low level of educational attainment. The results demonstrate a need for individual- and community-based interventions to increase awareness of the health effects of drinking during pregnancy and support women to make healthy choices during pregnancy.

3. **Addila, A. E., Azale, T., Gete, Y. K., & Yitayal, M. (2021). The effects of maternal alcohol consumption during pregnancy on adverse fetal outcomes among pregnant women attending antenatal care at public health facilities in Gondar town, Northwest Ethiopia: a prospective cohort study. *Substance Abuse Treatment, Prevention, and Policy*, *16*(1), 1-15. https://doi.org/10.1186/s13011-021-00401-x**

This Ethiopian study examined the effects of prenatal alcohol consumption on adverse fetal outcomes. The incidence of low birth weight, preterm birth, and stillbirth were 12.63%, 6.05% and 4.27%, respectively. The authors found that non-hazardous and hazardous alcohol use during pregnancy was associated with low birth weight. Hazardous alcohol consumption during pregnancy was significantly associated with preterm birth. The results indicate an increasing risk of adverse birth outcomes, especially preterm delivery and low birth weight, with increasing levels of prenatal alcohol use. Increased prevention efforts, including screening women for alcohol use during antenatal care visits and providing accurate information to women who use alcohol may prevent potential risks of adverse birth outcomes.

4. **Adebiyi, B. O., Mukumbang, F. C. (2021). Perspectives of policymakers and service providers on why Fetal Alcohol Spectrum Disorders remain unabated in South Africa: A qualitative study. *International Journal of Mental Health and Addiction.* https://doi.org/10.1007/s11469-021-00679-9**

This South African study explored policymaker and service provider perspectives of the influences contributing to the high incidence of FASD. Individual, interpersonal, community, institutional, and policy factors were identified. Relevant individual level factors included late antenatal appointments, alcohol consumption during pregnancy, and socio-economic conditions. At the interpersonal level, participants identified inadequate support groups for women. Community-level influences identified were the widespread availability of illegal liquor stores and a lack of specialized prevention programs. Inadequate training for professionals and a lack of collaboration between government departments were identified as

institutional level influences. Finally, the absence of a specific FASD policy was identified as a barrier to preventing FASD. The authors call for holistic, human rights-based, and cross-department policies and programs to prevent FASD in South Africa.

5. **Agiresaasi, A., Tumwesigye, N. M., Nabiwemba, E., Kiguli, J., Maina, G. W., & Nassanga, G. (2021). Alcohol use during pregnancy in post-conflict northern Uganda: pregnant women's experiences and provider perceptions. *Substance Abuse Treatment, Prevention, and Policy*, *16*(1), 1-13.**

This Northern Ugandan study explored pregnant women's experiences, knowledge, attitudes and provider perceptions regarding prenatal alcohol consumption in hopes of informing interventions to address alcohol-exposed pregnancies in post-conflict settings. The authors found a diverse range of views regarding maternal alcohol use during pregnancy. Women in the study found themselves in alluring situations that pre-disposed them to drinking alcohol such as brewing alcohol as a source of livelihood, pregnancy-induced craving for alcohol, and participation in cultural festivities that are characterised by eating and drinking alcohol. There were some prevention interventions pre-existing in communities to address alcohol use during pregnancy. The findings highlight the importance of having culturally informed prevention strategies and accurate messaging from health care providers to provide a supportive environment for mothers.

6. **Albright, D. L., McDaniel, J., Suntai, Z., Horan, H., & York, M. (2021). Pregnancy and binge drinking: An intersectionality theory perspective using veteran status and racial/ethnic identity. *Maternal and Child Health Journal*, *25*(8), 1345-1351. doi: 10.1007/s10995-021-03171-x**

This US study examined the prevalence of binge drinking among pregnant women using intersectional theory and the intersections of racial/ethnic identity and veteran status. Combined data was used from the 2016, 2017 and 2018 Behavioural Risk Factor Surveillance System (BRFSS), which is a telephone survey that collects health-related risk behaviours, chronic health conditions and the use of preventative services among US residents. Authors found binge drinking was highest among racial/ethnic minority veterans at 17.42%, compared to 5.34% among white veterans, 4.05% among non-veteran racial/ethnic minorities and 3% among non-veteran white people. The results of the study highlight the increased stressors of intersecting identities for those who are veterans and identify as coming from a racial/ethnic minority group. The authors discuss the need to customize prevention messaging, so it is inclusive of intersecting identities.

7. **Boing, A. F., Boing, A. C., Jakovljevic Pudla Wagner, K., dos Santos Saraiva, S., & Tomasi, Y. T. (2021). Individual and contextual variables associated with smoking and alcohol consumption during pregnancy. *Revista Brasileira de Enfermagen,* 74(suppl 4), e20200804. doi: 10.1590/0034-7167-2020-0804.**

Using data from the Unified Health System, this Brazilian study examined the association between individual characteristics and living environment with smoking and drinking during pregnancy among 3,580 pregnant women. The prevalence of smoking and alcohol use during pregnancy was 9.3% and 7.2%, respectively. One in six women reported exposure to secondhand smoke. Individual characteristics that were associated with smoking were older age, lower income and lower education. Housing factors that influenced smoking as well as exposure to secondhand smoke were living in a neighbourhood with higher levels of violence, lower levels of social cohesion, and low levels of infrastructure that encourage physical activity. Alcohol consumption during pregnancy was higher among those who did not live with a partner, were Black, and lived in areas where there is little infrastructure that encourages physical activity. The findings demonstrate the need for policies and programs to focus on individual characteristics, especially socioeconomic markers, as well as living environment and community factors when addressing alcohol and tobacco use during pregnancy. The authors suggest that educational and health promotion interventions be incorporated into nurses' prenatal consultations with women and point to opportunities for action in health councils to improve living conditions and increase health equity.

8. **Breunis, L. J., Wassenaar, S., Sibbles, B. J., Aaldriks, A. A., Bijma, H. H., Steegars, E. A. P., Koch, B. C. P. (2021). Objective assessment of alcohol consumption in early pregnancy using phosphatidylethanol: A cross-sectional study. *BMC Pregnancy and Childbirth,* 21, 342.**

In this Dutch study, the prevalence of alcohol consumption during early pregnancy (gestational age of less than 15 weeks) was biochemically assessed using phosphatidylethanol and compared to self-reported alcohol consumption. Overall, 684 blood samples were analyzed for phosphatidylethanol levels, of which 5.3% indicated prenatal alcohol consumption in the previous two weeks. The majority (89%) of women with a positive phosphatidylethanol test did not report their alcohol use to their obstetric care provider when asked. Routine screening with phosphatidylethanol in maternal blood samples may help identify women who need support to stop or reduce alcohol consumption during pregnancy.

9. **Cook, J. L. (2021). Alcohol use during pregnancy and fetal alcohol spectrum disorder in Canada: who, what, where?.** ***Health Promotion and Chronic Disease Prevention in Canada: Research, Policy and Practice*****, 41(9), 264. https://doi.org/10.24095/hpcdp.41.9.03**

This Canadian editorial gives a brief summary of the ways in which information has been collected regarding alcohol use during pregnancy. The author reports on what has already been done in terms of data collection in Canada and what needs to still be done to accurately report a national prevalence rate.

10. **De Jong, M., George, A., & Jacobs, T. (2021). A scoping review of the determinants of Fetal Alcohol Spectrum Disorder in South Africa: An intersectional perspective.** ***Health Policy and Planning, 36*****(9), 1459 – 1469. doi: 10.1093/heapol/czab101**

This South African study used an intersectional feminist perspective to explore the social determinants influencing FASD in South Africa. A scoping review was conducted, and 21 articles were included for analysis. The authors sought to identify the social and structural determinants related to FASD are interconnected and related to broader inequalities experienced by women and children. The included literature was primarily quantitative, and the findings reflect that social norms, knowledge around alcohol use and alcohol use during pregnancy, alcohol addiction and dependency, gender-based violence, stigma, moralization, and access to contraception – including emergency contraception – and trauma and mental health services are related to alcohol use in pregnancy. There was limited analysis of how the determinants intersect with one another or perspectives from women's voices. Further research is required that explores the power dynamics and other barriers to alcohol cessation during pregnancy.

11. **Fetene, M. T., Teji, K., Assefa, N., Bayih, W. A., Tsehaye, G., Hailemeskel, H. S. (2021). Magnitude and associated factors of substance use among pregnant women attending antenatal care in public hospitals of eastern Ethiopia.** ***BMC Psychiatry*****, 21(96).**

This hospital-based cross-sectional study aimed to assess the prevalence and associated factors of substance use among 510 pregnant women attending antenatal care in Eastern Ethiopia. The overall prevalence of substance use in this sample was 26.5%. Pregnant women reported chewing khat (19.6%), using alcohol (9.4%) and using tobacco (2.4%), and the co-use of substances (20.7%). Factors associated with substance use during pregnancy were pre-pregnancy substance use, partner substance use, family substance use, and household income. The authors recommend providing preconception health education to women, their partners, and their family members to prevent antenatal substance use.

12. **Finanger, T., Spigset, O., Gråwe, R. W., Andreassen, T. N., Løkken, T. N., Aamon, T. O., Bratt, G. E.,... Skråstad, R. B. (2021). Phosphatidylethanol as blood biomarker of alcohol consumption in early pregnancy: An observational study in 4,067 pregnant women.** ***Alcoholism: Clinical & Experimental Research,*** **45(4), 886-892. doi: 10.1111/acer.14577.**

This Norwegian study examined the prevalence of early prenatal alcohol exposure using an alcohol biomarker, phosphatidylethanol 16:0/18:1 (PEth), that can detect alcohol consumption up to several weeks later. A total of 4,533 blood samples from 4,067 women were examined. Positive PEth samples were found in 50 (1.4%) women at gestational week 12, three women (0.4%) tested positive at week 24, and in 5 cases the timing of testing was not known. There were no significant differences by age or rural/urban residence in the proportion of women who tested positive for alcohol consumption during early pregnancy. The authors suggest further investigation of utility of PEth as a diagnostic tool in the antenatal setting.

13. **Hasken, J. M., Marais, A-S., de Vries, M., Joubert, B. Cloete, M., Botha, I., Roux Symington, S.,... May, P. A. (2021). Gestational age and birth growth parameters as early predictors of fetal alcohol**

spectrum disorders. *Alcoholism: Clinical & Experimental Research, 45*(8), 1624 – 1638. doi: 10.1111/acer.14656.

This South African study investigated whether an FASD diagnosis at age 7 is associated with preterm birth and/or small for gestational age (SGA). Children (*n* = 737) aged 7 were randomly selected from five cohort studies, with birth data leveraged from clinic records. There were 255 children diagnosed with FASD at age 7, of which 18.4% were born preterm, 51.4% were SGA, and 5.9% were preterm and SGA compared to 12.0%, 27.7%, and 0.5% respectively among children without an FASD diagnosis. Mothers of children with FASD were significantly more likely to report drinking during all trimesters, multiple pregnancies, lower educational attainment, and older age at pregnancy compared to controls. FASD diagnosis at age 7 was significantly associated with SGA after controlling for drinks per day during first trimester, number of trimesters of drinking, maternal education level, tobacco use, and maternal age. SGA was found to be associated with three common FASD diagnoses: fetal alcohol syndrome, partial FAS, and alcohol-related neurodevelopmental disorder. The authors conclude that there is a robust association between SGA at birth and a diagnosis of FASD at age 7.

14. **Hebert, L. E., & Sarche, M. C. (2021). Pre-pregnancy and prenatal alcohol use among American Indian and Alaska Native and Non-Hispanic White Women: Finding from PRAMS in five states. *Maternal Child Health Journal, 25*(9), 1392 – 1401. doi: 10.1007/s10995-021-03159-7**

This US estimated pre-pregnancy and prenatal alcohol use among American Indian and Alaska Native (AI/AN) women, examined variation in alcohol use by state and rural/urban residence, and investigated potential risk factors for prenatal alcohol use among AI/AN and non-Hispanic white (NHW) women. Data was pooled from five states, Alaska, New Mexico, Oklahoma, South Dakota, and Washington. Overall, AI/AN women were significantly less likely to report pre-pregnancy alcohol use than NHW women (56% vs. 76%). Of the women who reported pre-pregnancy alcohol use, AI/AN women were significantly more likely to report consuming 1 or more drinks during pregnancy than NHW women (4.3% vs. 2.4%). Different risk factors emerged for AI/AN women and NHW women, with older age and homelessness increasing the odds of prenatal alcohol use for AI/AN women and college education and urban residence increasing the odds for NHW women. These findings demonstrate the need for tailored interventions to address the needs of AI/AN women.

15. **Hen-Herbst, L., Tenenbaum, A., Senecky, Y., & Berger, A. (2021). Pregnant women's alcohol consumption and knowledge about its risks: An Israeli survey. *Drug and Alcohol Dependence, 228*, 109023. https://doi.org/10.1016/j.drugalcdep.2021.109023**

This Israeli study evaluated alcohol consumption during the preconception and pregnancy periods and related risk factors including knowledge of risks of prenatal alcohol exposure. Israeli women (*n* = 802) completed an anonymous online survey. The majority (67.2%) of pregnant women reported drinking alcohol in the two months prior to pregnancy recognition and 12% reported drinking during pregnancy. However 28.1% of women reported knowing someone who had consumed alcohol during pregnancy. Women in their first pregnancies, with a higher education, were Jewish, and secular reported the highest preconception rates of alcohol consumption. Approximately 40% of respondents reported receiving no education on the harms of alcohol use during pregnancy. While many participants reported abstaining from alcohol following pregnancy recognition, there was still a percentage of women who continued to consume alcohol without knowing the harms associated with alcohol use in pregnancy. Information about prenatal alcohol exposure needs to be more widely disseminated.

16. **Jorda, M., Conant, B. J., Sandstrom, A., Klug, M. G., Angal, J., & Burd, L. (2021). Protective factors against tobacco and alcohol use among pregnant women from a tribal nation in the Central United States. *PLoS ONE, 16*(2), e0243924. https://doi.org/10.1371/journal.pone.0243924**

This US study examined population-specific factors that are protective against alcohol and smoking during pregnancy. Data from the Safe Passages study of pregnant women (*n* = 421) from a rural Indigenous Nation. Pregnant women reported smoking during pregnancy (*n* = 314), smoking and drinking during pregnancy (*n* = 149), not smoking (*n* = 84), and quitting smoking during pregnancy (*n* = 23), demonstrating higher substance use rates compared to the US national average. Protective factors against substance use during pregnancy included living with someone (92% less likely to smoke and drink), having at least or more than 12 years education (126% and 206% less likely to smoke and drink, respectively), being employed (111% less likely to

smoke and drink), or not being depressed (229% less likely to smoke and drink). These factors should be considered in future interventions to reduce tobacco and alcohol use during pregnancy.

17. **Leggat, G., Livingston, M., Kuntsche, S., & Callinan, S. (2021). Changes in alcohol consumption during pregnancy and over the transition towards parenthood. *Drug and Alcohol Dependence*, *225*, 108745.**

This Australian study examined changes in alcohol use during pregnancy and the years following childbirth among men and women, and how patterns of use vary by education level. Alcohol consumption data was obtained from individuals who were pregnant, or the partner of a pregnant women, for three years prior and following birth. Authors found women's alcohol use significantly decreased during pregnancy but significantly increased post-pregnancy to near pre-pregnancy levels of use, regardless of education. Men's alcohol use increased post-childbirth except for those with a high-school education. Among men with an undergraduate education, there was a significant increase in alcohol use postnatally. The research demonstrates the importance of increasing awareness among partners. Further, interventions and harm reduction strategies are needed for addressing drinking over the pre-postnatal period specifically focused on socioeconomic status and education level.

18. **Lyall, V., Wolfson, L., Reid, N., Poole, N., Moritz, K. M., Egert, S., Browne, A. J., & Askew, D. A. (2021). "The problem is that we hear a bit of everything…": A qualitative systematic review of factors associated with alcohol use, reduction, and abstinence in pregnancy. *International Journal of Environmental Research and Public Health, 18*(7), 2445. doi: 10.3390/ijerph18073445**

This systematic review from Australian and Canadian researchers examined qualitative studies of pregnant and recently postpartum women to understand the barriers and facilitators that influence alcohol use during pregnancy. A search of qualitative, English language articles in five databases identified was conducted. Twenty-seven (n = 27) articles were included and thematically analyzed. Five themes related to women's alcohol use, reduction, and abstention were identified, including social norms and relationships; stigma; trauma and other stressors; alcohol information and messaging; and access to trusted and equitable care and resources. Additional analysis of individual, interpersonal, institutional, and population-level factors identified that structural and systemic factors related to prenatal alcohol use was underexplored in the qualitative research. Rather, the research largely reported on individual level choice and decision-making around alcohol use in pregnancy. More research is needed that considers these factors in order to reduce stigma and address intersecting structural and systemic factors that impact maternal and fetal health.

19. **Lynch, V., Clemans-Cope, L., Howell, E., & Hill, I. (2021). Diagnosis and treatment of substance use disorder among pregnant women in three state Medicaid programs from 2013 to 2016. *Journal of Substance Abuse Treatment*, *124*, 108265. https://doi.org/10.1016/j.jsat.2020.108265**

This US study describes the timing of enrollment and health care utilization among Medicaid-enrolled pregnant women with substance use disorders (SUD). The authors used linked maternal and infant Medicaid claims, enrollment data and infant birth records from three states to estimate the share of sample women diagnosed with a specified SUD before or during the birth month, with a specified SUD after the birth month, and with only an unspecified SUD diagnosed. The authors found in two years surrounding birth, 3.6% of women had a specified SUD diagnosis first observed before or during the birth month and 1.7% had a specified SUD diagnosis first observed after the birth month. Less than two-thirds of women with a specified SUD diagnosis received any SUD treatment during the study period and women with an unspecified SUD were about half as likely to get treatment. Among women with an unspecified SUD, 3.1% of women had conditions related to alcohol use disorder or poisoning from substance use. The findings draw attention to the need for interventions to improve the identification of substance use-related needs and provision of treatment among women, and the role of Medicaid and other public policy approaches in increasing incentivization for health care providers.

20. **Macleod, C. I., Young, C., & Molokoe, K. (2021). Alcohol use during pregnancy: prevalence and patterns in selected Buffalo City areas, South Africa. *African Journal of Reproductive Health*, *25*(1), 114-121.**

This South African study explored the prevalence, patterns, and factors associated with alcohol use among pregnant women attending antenatal clinics in two former township areas of Buffalo City. A survey was conducted and administered by healthcare providers. Authors found two-thirds of respondents did not drink alcohol. However, among those who did consume alcohol during pregnancy, findings pointed towards high levels of risky alcohol use. Variables associated with risky drinking were age, race, report of intimate partner violence (IPV), and other regular drinker in the home. Variables not associated with risky drinking were employment status, education status, relationship status, and parity and gestation. The authors discussed interventions needed for reducing alcohol use during pregnancy which included responding to drinking youth cultures, drinking norms within the home, and IPV.

21. **Marlow, M., Christie, H., Skeen, S., Rabie, S., Louw, J. G., Swartz, L., ... & Tomlinson, M. (2021). Alcohol use during pregnancy in rural Lesotho: "There is nothing else except alcohol".** ***Social Science & Medicine*****,** ***291*****, 114482.**

This qualitative study investigated perceptions of, and motivations for, alcohol consumption during pregnancy among pregnant women and mothers in rural Lesotho. Pregnant women and mothers with young children were interviewed on what they know about the risks of drinking alcohol during pregnancy and their perceptions of women who drink during pregnancy. Sixty-five percent (65%) of respondents reported they consumed alcohol during pregnancy. The authors identified four themes, including: 1) alcohol use in daily and cultural life; 2) alcohol as a coping mechanism; 3) the effects of prenatal alcohol use; and 4) access to information about alcohol consumption. Alcohol was found to be a prominent feature of daily life and a key part of traditional events and ceremonies. Respondents reported being unaware of risks associated with prenatal alcohol use and believed alcohol, especially home-brewed, had cleansing or protective factors for the baby. Alcohol was also viewed as a hunger suppressant, allowing women to save food for their children. The authors discuss the cultural and economic context of respondents use of alcohol during pregnancy and the importance of addressing the conditions that prompt women's alcohol use during pregnancy in order to reduce consumption.

22. **Martinelli, J. L., Germano, C. M. R., de Avó, L. R. D. S., Fontanella, B. J. B., & Melo, D. G. (2021). Alcohol Consumption During Pregnancy in Brazil: Elements of an Interpretive Approach.** ***Qualitative Health Research*****,** ***31*****(11), 2123-2134. doi: 10.1177/10497323211023443**

This Brazilian study sought to increase understanding of alcohol consumption during pregnancy among pregnant women. The authors interviewed fourteen women ($n = 14$) who identified as drinking alcohol during pregnancy. Alcohol consumption during pregnancy was associated with three interconnected issues: subjective and individual issues, sociocultural and environmental issues, and misinformation. Subjective and individual issues included expectations, motivations, and women's difficulty in identifying their own consumption as risky. Sociocultural and environmental issues included alcohol cultural value, ease of access, and influence from relatives, friends, and partners. Misinformation included inconsistent opinions in the media and lack of information or incorrect information during prenatal care. The authors discuss a combination of collective and individual health educative actions are necessary to decrease alcohol consumption during pregnancy. Non-stigmatizing media campaigns that are explicit in their information and more education for health care professionals are needed to reduce adverse outcomes associated with alcohol use during pregnancy.

23. **May, P. A., Hasken, J. M., Hooper, S. R., Hedrick, D. M., Jackson-Newsom, J., Mullis, C. E., ... & Hoyme, H. E. (2021). Estimating the community prevalence, child traits, and maternal risk factors of fetal alcohol spectrum disorders (FASD) from a random sample of school children.** ***Drug and Alcohol Dependence*****,** ***227*****, 108918.**

The US study assessed the prevalence, child traits, and maternal risk for FASD in first grade students. The authors randomly sampled first grade students ($n = 231$) and interviewed mothers ($n = 72$) for maternal risk. The authors reported that FASD prevalence was 7.1% among first grade children. There were significant differences between the physical traits (height, weight, head circumference, body mass index, and dysmorphology scores) of children diagnosed with FASD and compared to the entire sample. Intellectual function and inhibition were not significantly different between those with FASD and those without. Individuals with FASD reported six significantly worse behavioural measures including teacher-rated

aggressive behaviour, opposition defiant problems, conduct problems, parent-rated problems of communication, daily living, and socialization. Significant maternal risk factors included postpartum depression, frequency of drinking, and recovery from problem drinking. The authors found that clinical evaluations can help estimate the prevalence and traits of FASD in a community which can be supportive in developing prevention strategies and early interventions.

24. **Murakami, K., Ishikuro, M., Ueno, F., Noda, A., Onuma, T., Matsuzaki, F., Metoki, H., Obara, T., Kuriyama, S. (2021). Maternal personality and alcohol use during pregnancy in Japan: The Tohoku Medical Megabank Project Birth and Three-Generation Cohort Study. *Addiction Behaviours, 122,* 107020. doi: 10.1016/j.addbeh.2021.107020.**

This Japanese study investigated associations between maternal personality factors and alcohol use in early (<14 weeks of gestation) and middle (14–27 weeks of gestation) pregnancy. Using data from the Tohoku Medical Megabank Project Birth and Three-Generation Cohort Study, it was found that different personality factors were associated with alcohol use at different time points during pregnancy. Women with higher extraversion scores were more likely to use alcohol in early and middle pregnancy. Higher psychoticism was associated with continued alcohol use in middle pregnancy. Lower levels of religiosity or social naivety was associated with alcohol use in early pregnancy, but not middle pregnancy. Finally, neuroticism was not associated with alcohol use at either stage of pregnancy.

25. **Murakami, K., Obara, T., Ishikuro, M., Ueno, F., Noda, A., & Kuriyama, S. (2021). Associations of education and work status with alcohol use and cessation among pregnant women in Japan: the Tohoku Medical Megabank Project Birth and Three-Generation Cohort Study. *BMC Public Health, 21*(1), 1-10.**

This Japanese studied examined the associations of education and work status with alcohol use and alcohol cessation during pregnancy. Data was analyzed from 11,839 pregnant women who participated in the Tohoku Medical Megabank Project Birth and Three-Generation Cohort Study from 2013-2017. The authors found the prevalence of alcohol use in early pregnancy was 20.9% and in middle pregnancy was 6.4%. While higher education was associated with alcohol use in early pregnancy both among working and non-working women, working women with a higher education were more likely to cease alcohol use between early and middle pregnancy. Working women, especially those with lower education, were more likely to consume alcohol throughout pregnancy. The findings highlight the need to target public health interventions to prevent alcohol use among pregnant women.

26. **Oh, S. S, Park, S., You, Y-A., Jee, Y., Ansari, A., Kim, S. M.,... Kim, Y. J. (2021). Prenatal exposure to alcohol, tobacco, and coffee: Associated congenital complications and adverse birth outcomes. *International Journal of Environmental Research and Public Health, 18,* 3140. https://doi.org/10.3390/ijerph18063140**

This South Korean study examined the association between prenatal alcohol, tobacco, and caffeine exposure and adverse birth outcomes and congenital complications. The study analyzed data from 1,675 South Korean women who were less than three years postpartum. More women reported drinking three or more coffees per day (28.18%) and secondhand smoke exposure (25.43%) compared to smoking (1.43%) or drinking (11.58%) during pregnancy. A minority of women reported alcohol use during all three trimesters (1.13%). Prenatal alcohol exposure was associated with an increased risk of birth defects and disabilities (OR: 11.24, 95% CI: 1.08 – 117.86). Prenatal secondhand smoke exposure and coffee consumption was associated with increased risk of low birth weight. The results indicated the impacts of prenatal alcohol, tobacco, and coffee exposure on neonatal and maternal health; and indicated the need for more awareness.

27. **Popova, S. Dozet, D., O'Hanlon, G., Temple, V., Rehm, J. (2021). Maternal alcohol use, adverse neonatal outcomes and pregnancy complications in British Columbia, Canada: A population-based study. *BMC Pregnancy and Childbirth, 21,* 74.**

This Canadian study investigated the prevalence of alcohol being identified as a risk factor by antenatal care providers and further sought to identify the associations between alcohol use, adverse neonatal outcomes, and pregnancy complications. The authors examined 144,779 records from the BC Perinatal Data Registry. Alcohol use during pregnancy was identified as a risk factor among 1.1% records, with yearly prevalence

rates ranging between 0.9% and 1.3% for fiscal years 2014/2015 and 2017/2018. Maternal characteristics associated with alcohol use identified as a risk factor were: younger age, fewer antenatal visits, being primiparous, history of mental illness, substance use, and smoking. Alcohol use during pregnancy was associated with increased odds of low birth weight, respiration distress, difficulty with breastfeeding, and other feeding problems in neonates. The authors call for consistent, thorough screening and prevention efforts in Canada.

28. **Persson, A., Lindmark, S., Petersson, K., Gabriel, E., Thorsell, M., Lindström, K., ... & Magnusson, Å. (2021). Alcohol and illicit and non-medical prescription drug use before and during pregnancy in Stockholm, Sweden: A cross-sectional study. *Sexual & Reproductive Healthcare*, *29*, 100622. https://doi.org/10.1016/j.srhc.2021.100622**

This Swedish study explored estimates of alcohol and drug use among pregnant women attending antenatal care lectures. Authors found that among those who answered all questions about alcohol use during pregnancy, 4.2% reported alcohol use, and those who answered all questions about illicit or non-medical prescription drug use during pregnancy, 0.5% reported illicit or non-medical prescription drug use. The study findings demonstrate decreased prevalence of alcohol and illicit and non-medical prescription drug use compared to previous studies in Sweden, Europe, and globally suggesting that alcohol use during pregnancy may have decreased over the last twenty years.

29. **Racine, N., McDonald, S., Chaput, K., Tough, S., Madigan, S. (2021). Pathways from maternal adverse childhood experiences to substance use in pregnancy: Findings from the All Our Families cohort. *Journal of Women's Health, 30*(12), 1795 – 1803. doi: 10.1089/jwh.2020.8632**

This Canadian study explored the mechanisms by which maternal exposure to adverse childhood experiences (ACEs) may influence substance use during pregnancy. Maternal education, previous substance use, and depressive symptoms were significant mediators of the association between maternal ACEs and substance use during pregnancy. However, the direct association between maternal ACEs and substance use in pregnancy remained significant after accounting for mediating effects. Addressing the mental health and socioeconomic challenges associated with exposure to ACEs prior to pregnancy may reduce the risk of prenatal alcohol exposure.

30. **Rockliffe, L., Peters, S., Heazell, A. E. P., & Smith, D. M. (2021). Factors influencing health behaviour change during pregnancy: a systematic review and meta-synthesis. *Health Psychology Review*, 15:4, 613-632, DOI: 10.1080/17437199.2021.1938632**

This systematic review and meta-analysis by UK researchers aimed to identify influences on four key health behaviours in pregnant women, namely dietary behaviour, physical activity, smoking, and alcohol use. Qualitative data from 92 studies were included and three main themes were found to influence health behaviour change: 1) A time to think about "me," 2) Adopting a "good mother" role, and 3) Beyond mother and baby. Women were concerned for their own health as well as their baby's health, but were also influenced by a desire to maintain ownership over their body, societal roles and expectations, pre-pregnancy behaviours, practical and environmental factors, and their level of knowledge regarding health behaviours during pregnancy. Many women reported that advice on alcohol use during pregnancy was unclear. The authors purport that with both internal and external factors influencing women's decision-making and motivation regarding health behaviours during pregnancy, a holistic approach to maternal behaviour change by clinicians may be most effective.

31. **Stanhope, K. K., Picon, M., Schlusser, C., Haddad, L. B., Jamieson, D. J., Comeau, D. L., ... & Kramer, M. R. (2021). Chronic Stress and Preconception Health Among Latina Women in Metro Atlanta. *Maternal and Child Health Journal*, *25*(7), 1147-1155. https://doi.org/10.1007/s10995-021-03164-w**

This US study described preconception health indicators among pregnant Latina women with and without chronic stress in Atlanta. The authors assessed women's chronic stress, pregnancy intention, previous trauma, and preconception behaviour changes including folic acid and prenatal vitamin use, and reduction in alcohol and tobacco use. Less than a quarter of women reported taking vitamins or improving nutrition. Just less than half of women reported experiencing chronic pain at the time of conception. Chronically stressed

women were more likely to be obese, less likely to plan their pregnancy, and less likely to report preconception health behaviours. The study highlights the importance of supporting women with chronic pain in prompting preconception behaviour change.

32. **Thompson, E. L., Barnett, T. E., Litt, D. M., Spears, E. C., & Lewis, M. A. (2021). Discordance between perinatal alcohol use among women and provider counseling for alcohol use: An assessment of the Pregnancy Risk Assessment Monitoring System. *Public Health Reports, 136*(6), 719-725. doi: 10.1177/0033354920984146**

This US study described the sociodemographic factors associated with receipt of prenatal alcohol counseling and perinatal alcohol use among US women. Data was used from the Pregnancy Risk Assessment Monitoring System (2012 – 2015; *n* = 135,111). Preconception alcohol use, prenatal alcohol use (during last 3 months of pregnancy), and prenatal alcohol counseling was collected. Over half of pregnant women (56%) reported preconception alcohol use, 70.5% received prenatal alcohol counseling, and 7.7% reported prenatal alcohol use during the last 3 months of pregnancy. Black women were significantly less likely than white women to report preconception alcohol use (OR = 0.49; 95% CI, 0.46-0.52). Similarly, Hispanic women were less likely than non-Hispanic women to report preconception alcohol use (OR = 0.62; 95% CI, 0.58-0.66). Black women were significantly more likely than white women to receive prenatal alcohol counseling (OR = 1.66; 95% CI, 1.55-1.77), as were Hispanic women compared to non-Hispanic women (OR = 1.51; 95% CI, 1.40-1.61). The authors found similar patterns across age, education, and health insurance status. Disparities in alcohol counseling occurred despite the national recommendation for universal screening and counseling prenatally, and therefore authors emphasize continued integration of universal screening for alcohol use during pregnancy is needed.

33. **Thompson, E. L., Litt, D. M., Griner, S. B., & Lewis, M. A. (2021). Cognitions and behaviors related to risk for alcohol-exposed pregnancies among young adult women. *Journal of behavioral medicine*, 44(1), 123-130.**

This US study examined alcohol and sex-related cognitions and behaviours associated with women's risk for an alcohol-exposed pregnancy. Sexually active women aged between 18 and 20 were assessed for contraceptive use and heavy episodic drinking to determine the risk of alcohol-exposed pregnancy. Women who reported alcohol-related sexual expectancies related to sexual enhancement were at an increased risk of having an alcohol-exposed pregnancy. However, women were considered less likely to be at risk if they used safer sex protective behavioural strategies. Future interventions should consider safer sex behavioural strategies when reducing the risk of alcohol-exposed pregnancies.

34. **Wynn, A., Nabukalu, D., Lutalo, T., Wawer, M., Chang, L. W., Kiene, S. M., ... & Wagman, J. A. (2021). Alcohol use during pregnancy in Rakai, Uganda. *PloS one*, *16*(8), e0256434. https://doi.org/10.1371/journal.pone.0256434**

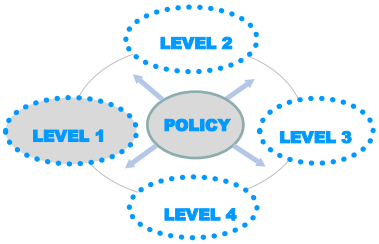
This Ugandan study analyzed the prevalence of antenatal alcohol use in the Rakai region. The authors assessed associations between self-reported antenatal alcohol use, sociodemographic characteristics, IPV, and HIV status. The authors founds alcohol use during pregnancy was common and associated with religion, place of work, more than one past year sex partners, having a partner who drank before sex in the past 12 months, and past year IPV. The authors discussed the need for more research to understand the quantity, frequency, and timing of antenatal alcohol use as well as the need to prioritize intervention strategies for those at higher risk of antenatal alcohol use who live in low resource settings.

35. **Zhang, L., Dailey, R. K., Price, M., Misra, D. P., Giurgescu, C. (2021). Intimate partner violence, prenatal stress, and substance use among pregnant Black women. *Public Health Nursing, 38*, 555-563.**

This US cross-sectional study aimed to investigate whether there is an association between intimate partner violence (IPV) and substance use during pregnancy mediated by prenatal stress among 203 Black women. Women between 8 and 29 weeks of gestation were recruited. Experiences of IPV pre-pregnancy were associated with cigarette smoking and marijuana use, but not with alcohol use during pregnancy. Perceived stress significantly mediated the association between IPV and marijuana use. The authors recommendations include training health care professionals who care for pregnant women on how to

respond to IPV disclosure and screening for IPV prior to pregnancy in addition to substance use and stress. They also suggest collecting information on experiences and perceptions of racial discrimination and stigma.

B. Level 1 Prevention



1. **Adebiyi, B. O., Mukumbang, F. C., & Beytell, A-M. (2021). Policy requirements for the prevention and management of Fetal Alcohol Spectrum Disorder in South Africa: A policy brief. *Frontiers in Public Health.* https://doi.org/10.3389/fpubh.2021.592726**

This South African policy brief intends to guide policymakers in developing comprehensive and multisectoral policies to prevent and manage FASD. The authors adapted the World Health Organization's approach to guideline development and conducted interviews with policymakers, focus groups with service providers, a document review of relevant South African policy documents, and a scoping review of international prevention and management strategies. Given that prevalence of FASD is suggested to be highest in South Africa, and no existing policies exist, multi-sectorial collaboration, mandated training, and family-centered approaches are required to prevent FASD and respond to social determinants of health.

1. **Atkins, D. N., & Durrance, C. P. (2021). The impact of state-level substance use policies on infant foster care entry in the United States. *Children and Youth Services Review, 130,* 106194. https://doi.org/10.1016/j.childyouth.2021.106194**

This US study used data from the Adoption and Foster Care Analysis and Reporting System to investigate the effects of state-level policies that treat prenatal substance use identified at birth as child abuse or neglect on admissions of children younger than one to the foster care system. It was found that the rate of entry of children under the age of one was approximately 9.5% more frequent in states with these policies, although this was not statistically significant. The authors recommend implementing interventions that consider the complexities of prenatal substance use and support women in making behaviour changes during pregnancy, as an alternative to punitive policies.

2. **Bulut, O. & Kennedy, K. (2021). Measuring and understanding public awareness of fetal alcohol spectrum disorders in Alberta, Canada. *Journal of Public Health.***

This Canadian study evaluated the quality of the *2017 What Albertans Know about Fetal Alcohol Spectrum Disorders Survey (FASD Survey),* which aimed to measure FASD awareness in Alberta. 1,205 adults were surveyed, and the average nonresponse rates were less than 1%, except for a few questions that had up to 5% missing data. The participants responded to most questions in the FASD Survey very similarly, regardless of their gender. However, women participants were more likely to endorse the question that people with FASD may experience learning difficulties and men participants were more likely to endorse the question about general knowledge of FASD. The largest gap between men and women participants were for the question of "no alcohol use while trying to get pregnant." The findings indicate that the FASD survey is a promising instrument to evaluate the awareness of FASD, but further improvements are needed to make conclusions about FASD awareness, especially among different gender groups.

3. **Feeny, E., Dain, K., Varghese, C., Atiim, G. A., Rekve, D., & Gouda, H. N. (2021). Protecting women and girls from tobacco and alcohol promotion. *BMJ, 374,* https://doi.org/10.1136/bmj.n1516**

This analysis from UK, Swiss, Malaysian, and Australian researchers described the sex specific impacts of tobacco and alcohol, their interactions with gender, and how women continue to be targeted by the alcohol and tobacco industries through narratives of empowerment while simultaneously hypersexualizing and perpetuating harmful gender norms and roles. The authors highlight the importance of gender transformative approach in low and middle income countries to counter tobacco and alcohol promotion and promote gender equity.

4. **Naja, F., Ayoub, J., Baydoun, S., Nassour, S., Zgheib, P., & Nesreddine, L. (2021). Development of national dietary and lifestyle guidelines for pregnant women in Lebanon. *Maternal & Child Nutrition 17*(4): e13199. doi: 10.1111/mcn.13199.**

This study described the development of the Lebanese diet and lifestyle guidelines during pregnancy (DLGP). Existing international DLGPs were synthesized, and a multidisciplinary group of experts (n = 11) identified the themes of the guidelines. A consensus was defined as an agreement of 80%. Seventeen main themes were identified, and for the Lebanese DLGP, participants reached consensus on 7 themes: gestational weight gain, diet diversity, hydration, food safety, harmful foods, physical activity and breastfeeding. In addition, the group formulated three themes based on merging/modifying existing themes: supplementation, alcohol and smoking and religious fasting. Two context-specific new themes emerged: wellbeing and nutrition resilience. For each of the identified themes, the group agreed upon the wording of its guidelines and description. This study is the first from the Eastern Mediterranean Region to develop through consensus building, context and culture-specific dietary and lifestyle guidelines for pregnant women, which includes guidance on abstaining from alcohol during pregnancy.

5. **Parackal, M., Parackal, S., Mather, S., & Eusebius, S. (2021). Dynamic transactional model: A framework for communicating public health messages via social media. *Perspectives in Public Health, 141*(5), 279 – 286. doi: 10.1177/1757913920935910.**

This New Zealand study investigated the suitability of a dynamic transactional model (DTM), a two-way communication model, on social media. 'Don't know? Don't drink' was a Facebook campaign against drinking alcohol during pregnancy, which targeted women of childbearing age. The authors analyzed comments for the frequency of topics and polarity of sentiments. Results revealed nine independent topics, confirming the plurality of topics. The conversation contained both positive and negative terms, establishing the polarity of sentiment. DTM exhibited the potential to be a theoretical framework for recommending and evaluating social media sites like Facebook for communicating public health messages about drinking alcohol during pregnancy.

6. **Reynolds, R., Cook, P., McCarthy, R. (2021). A digital campaign to increase awareness of alcohol-exposed pregnancy. *Perspectives in Public Health, 141*(3), 124 – 126. https://doi.org/10.1177/1757913920955218**

This UK article described a public marketing campaign, #Drymester, targeting women 18 – 50 and their families that was funded through the Greater Manchester Health and Social Care Partnership. The aims of the campaign included the risks of alcohol use during pregnancy, impacts of FASD, and the chief medical officer's advice about alcohol use in pregnancy. The campaign used the messaging of 'No Safe Time, No Safe Amount'. The evaluation showed strong reach (4.5 million views) of the initial digital campaign. Over half the people who saw the campaign responded positively and more than 1 in 5 thought it was excellent. Prior to the evaluation, 73% of participants felt that it was important message and that increased to 86% among people who were pregnant. The clear messaging and receptivity of #Drymester shows promising impacts on disseminating messaging around the risks of drinking during pregnancy.

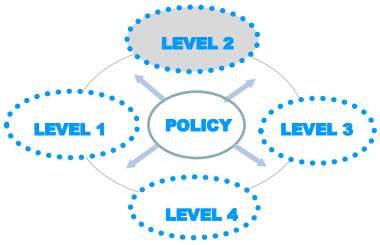
7. **Reynolds, R., McCarthy, R., & Cook, P. A. (2021). We do things differently here: The Greater Manchester approach to preventing alcohol-exposed pregnancy. *Perspectives in Public Health, 141*(5), 252-254. doi:10.1177/1757913920985553**

This article describes the Alcohol-Exposed Pregnancy Programme, an early intervention and awareness program developed in Manchester, UK. The objectives of the program are to raise public and professional awareness of FASD, provide preconception care, screening, and antenatal health advice, develop specialist and peer support groups, and determine the prevalence of FASD in Manchester. The Programme adapted Project CHOICES to support women aged 16 – 44 at risk of having an alcohol exposed pregnancy. #Drymester was a key component of the Programme. Through the Programme, n = 720 professionals received training and n = 756 women were identified as being at risk of having an alcohol-exposed pregnancy (56.7% of whom engaged in subsequent support offered). The Programme has shown impact and demonstrates the value of having multi-initiative FASD prevention efforts.

8. **Tsakiridis, I, Oikonomidou, A. C., Bakaloudi, D. R., Dagklis, T., Papazisis, G., & Chourdakis, M. (2021). Substance Use During Pregnancy: A Comparative Review of Major Guidelines. *Obstetrical & Gynecological Survey, 76*(10), 634-643. doi: 10.1097/OGX.0000000000000943**

The aim of this review by Greek researchers was to summarize and compare recommendations from recently published guidelines on substance use during pregnancy, specifically alcohol and smoking from the Royal Australian and New Zealand College of Obstetricians and Gynaecologists, the World Health Organization (WHO), the Society of Obstetricians and Gynaecologists of Canada (SOGC), and the American College of Obstetricians and Gynecologists (ACOG). All of the reviewed guidelines recommended appropriate counseling and screening women regarding alcohol, smoking, and other substance use during the antenatal period, while the management options varied. For alcohol dependence, all of the guidelines except from the Royal Australian and New Zealand College of Obstetricians and Gynaecologists recommend prompting treatment. All the guidelines, except from the WHO, suggest screening for substance use and coexistent sexually transmitted infections. Brief interventions are considered beneficial, a gradual decrease in benzodiazepines is suggested, as well as the discontinuation of cannabis and methamphetamine use. There is controversy regarding breastfeeding among women who use cannabis and methamphetamine, as the WHO recommendations favour continued breastfeeding, whereas the SOGC and ACOG do not. Finally, all the guidelines state that, following delivery, close monitoring of the neonate is needed. The diversity of guidelines' recommendations concerning substance use reflects the different ways pregnant women experience routine antenatal care in the absence of strong evidence. More research in the areas of dispute may allow for the adoption of an international consensus, in order to identify substance use early, and to appropriately support pregnant women who use substances.

2. Level 2 Prevention



1. **Bakhireva, L. N., Leeman, L., Roberts, M., Rodriguez, D. E., & Jacobson, S. W. (2021). You didn't drink during pregnancy, did you? *Alcoholism: Clinical and Experimental Research, 45*(3), 543-547. doi:10.1111/acer.14545**

The aim of this US study was to identify self-report tools that are efficient in accurately characterizing PAE. Timeline follow-back (TLFB) interviews were administered with 121 pregnant women at baseline to capture alcohol use in the periconceptional period and the past 30 days. The interview also included questions about timing and number of drinks at the most recent drinking episode, maximum number of drinks in a 24-hour period since the last menstrual period, and number of drinks on 'special occasions'. Measures of alcohol use were analyzed to determine the number of binge episodes by participants who consumed 4 drinks/occasion or more and the proportion of women with one or more binge episodes. Average alcohol consumption was found to be 0.6 oz of absolute alcohol per day (approx. 8.4 drinks/week). Only 3.3% of participants reported 1 or more binge episodes on the TLFB, 19.8% had 1 or more binge episode when asked about 'special occasions,' and 52.1% when asked about the number of drinks the last time they drank alcohol. An even higher prevalence (89.3%) of bingeing was obtained based on the maximum number of drinks consumed in a 24-hour period. The authors note how self-reported quantity of alcohol use varies greatly based on type of questions asked. Brief targeted questions about maximum number of drinks in 24 hours and total number of drinks during the most recent drinking episode provide much higher estimates of alcohol use and thus might be less affected by self-reporting bias.

2. **Chambers, R. A., Begay, J., Patel, H., Richards, J., Nelson, D., Rosenstock, S., Huskon, R.,... Tingey, L. (2021). Rigorous evaluation of a substance use and teen pregnancy prevention program for American Indian girls and their female caregivers: A study protocol for a randomized controlled trial. *BMC Public Health, 21*, 1179.**

This US study protocol described the randomized controlled trial of the Asdzáán Be'eená program, a teen pregnancy and substance use prevention program for Navajo girls and their female caregivers. Navajo girls ages 10 – 14 and their female caregivers will be enrolled and randomized to the intervention or control arm. The intervention arm will consist of 11-sessions led by community-based facilitators. The controlled arm will receive non-monetary incentives. This study protocol presents one of the first randomized controlled trials

of a community developed and implemented program to promote protective factors associated with delayed substance use and sexual initiation among Navajo girls.

3. **D'Angelo, A., Ferraguti, G., Petrella, C., Greco, A., Ralli, M., Vitali, M., ... & Messina, M. P. (2021). Challenges for Midwives' Healthcare Practice in the Next Decade: COVID-19–Global Climate Changes–Aging and Pregnancy–Gestational Alcohol Abuse. *La Clinica Terapeutica*, *172*(1), 30-36. doi: 10.7417/CT.2021.2277**

This Italian review described the upcoming challenges facing midwives in the next decade, including COVID-19, climate change, infertility, and alcohol use. The authors discuss the importance of midwives in the education on the risk of drinking alcohol during pregnancy and the importance of sharing accurate information. The authors describe the crucial role of midwives in FASD prevention with professional development and tailored education on the risks of alcohol use in pregnancy.

4. **Deutsch, A. R., Lustfield, R., & Hanson, J. D. (2021). Where there's a will, there's a way? Strategies to reduce or abstain from alcohol use developed by Northern Plains American Indian women participating in a brief, alcohol-exposed pregnancy preconceptual intervention. *Alcoholism: Clinical & Experimental Research*, *45*(11), 2383-2395. doi:10.1111/acer.14721**

This US study qualitatively analyzed strategies chosen to reduce alcohol use by AI/AN women participating in a culturally tailored, brief, preconceptual AEP-reduction intervention. One hundred-sixty Northern Plains AI/AN women who were participating in a brief AEP-reduction program developed a plan to accomplish an alcohol reduction/abstention goal at the first and last program sessions. The plan included choosing one or more strategies to (1) achieve the goal, (2) mitigate barriers, and (3) use cultural strengths. The authors found that most participants reported only one strategy in each area, and that common goal-achieving and barrier-mitigation strategies included positive social supports and avoiding negative or alcohol-involved social environments. Other strategies involved circular logic (e.g., the strategy to reduce drinking was to drink less). Both traditional and western cultural strengths were reported as important resources, although many participants had no cultural resource strategy. The authors conclude that programs aimed at reducing AEPs may need to provide participants more support to develop effective multi-strategies behaviour change plans to reduce alcohol use, when implemented within areas with high levels of trauma and contextual barriers that can impact strategy selection. Such support could include ways to improve health on both interpersonal and community levels.

5. **Hanson, J. D, Oziel, K., Sarche, M., MacLehose, R. F., Rosenman, R., & Buchwald, D. (2021). A culturally tailored intervention to reduce risk of alcohol-exposed pregnancies in American Indian communities: Rationale, design, and methods. *Contemporary Clinical Trials*, *104*, 106351. doi: 10.1016/j.cct.2021.106351**

This American study protocol describes Native CHOICES, a cultural adaptation of CHOICES intervention, in AI/AN communities. CHOICES has been well evidenced and has been shown to reduce the risk of alcohol-exposed pregnancies. AI/AN women will be randomized to the intervention or a services-as-usual, waitlist control condition. The Native CHOICES intervention consists of 2 motivational interviewing (MI) sessions, an elective contraception counseling session, and electronic messaging to boost the effects of MI. Those assigned to the control group are eligible to enroll in Native CHOICES following the completion of the 6 months post-baseline data collection. In addition to testing intervention effectiveness, the study is designed to yield a comprehensive economic evaluation, which will provide important information regarding the financial feasibility and sustainability of Native CHOICES for healthcare systems serving AI/ANs.

6. **Hayes, L., Parlin, C., Azevedo, L. B., Jones, D., Newham, J., Olajide, J., McCleman, L., Heslehurst, N. (2021). The effectiveness of smoking cessation, alcohol reduction, diet and physical activity interventions in improving maternal and infant health outcomes: A systematic review of meta-analyses. *Nutrients*, *13*(3), 1036. doi: 10.3390/nu13031036**

This systematic review of meta-analyses from UK researchers examines the efficacy of prenatal diet, physical activity, smoking, and alcohol interventions. Fourteen databases were searched for systematic reviews published from 2008 and thirty six (n = 36) articles reported on behavioural outcomes, including outcomes on smoking (n = 16), alcohol (n = 4), and diet and physical activity (n = 16). The most consistent

evidence was related to improving dietary, physical activity, and smoking outcomes during pregnancy compared to outcomes related to alcohol behaviour change during pregnancy. Future research is needed that explores alcohol interventions and outcomes – and that evaluates interventions in low and middle income countries.

7. **Hernandez, E. M., McCrory Calarco, J. (2021). Health decisions amidst controversy: Prenatal alcohol consumption and the unequal experience of influence and control in networks. *Social Science & Medicine, 286*, 114319.**

Using data from the Health Information and Behaviors During Pregnancy Study, this US study aimed to understand how women make decisions about drinking during pregnancy given conflicting information, controversy, and stigma regarding light or moderate prenatal alcohol consumption. Through interviews with first-time pregnant women (*n* =40) and their health care providers (*n* =14), it was found that women's decision-making was influenced by: 1) The consistency of the messages they received; 2) Their social position relative to the source of information/enforcer; and 3) The strength of their relationship to the enforcer. Many health care providers reported that their advice would differ based on whether they were in a social or professional setting. The importance of clear communication about health risks is demonstrated by the findings. The authors conclude that medical recommendations and public health interventions ought to consider the inequities among pregnant women's experiences of social influence and control.

8. **Högberg, H., Pålsson, P., Spak, F., Larsson, M., & Wells, M. B. (2021). Two screening instruments for collecting alcohol-related information from expectant mothers and fathers: Testing the reliability of the Parent Alcohol Screening Questionnaire and the Social Support for an Alcohol-Free Pregnancy Questionnaire. *Health & Social Care in the Community, 29*(6), 1896-1914. doi:10.1111/hsc.13303**

This Swedish study aimed to test the reliability of two alcohol screening instruments: (1) The Parent Alcohol Screening Questionnaire (PASQ5), and (2) the Social Support for an Alcohol-free Pregnancy (SSAFP) questionnaire. Repeated surveys were done with expectant mothers and fathers at several points during pregnancy using different data collection methods, (verbally and in writing) within regular antenatal visits, at different time points over the pregnancy. Both the PASQ5 and SSAFP were found to be reliable tools, in both verbal and written contexts, and when retesting their reliability throughout the pregnancy. The authors concluded that both tools may be helpful for clinicians who aim to have a deeper dialogue about alcohol consumption during pregnancy. These tools may also be helpful for researchers aiming to better understand a person's changes in alcohol intake and/or their social support network.

9. **Kennedy, M., Kumar, R., Ryan, N. M., Bennett, J., la Hera Fuentes, G., & Gould, G. S. (2021). Codeveloping a multibehavioural mobile phone app to enhance social and emotional well-being and reduce health risks among Aboriginal and Torres Strait Islander women during preconception and pregnancy: a three-phased mixed-methods study. *BMJ Open*, *11*(11): e052545.**

This Australia study described the development and pretest of a prototype multibehavioural change app, MAMA-EMPOWER, which aims to enhance social and emotional well-being and reduce health risks among Aboriginal and Torres Strait Islander women during preconception and pregnancy. Topics focused on mental health, smoking cessation, nutrition, and alcohol and other substance use. The researchers interviewed Aboriginal and Torres Strait Islander women and conducted workshops with community members and expert to identify values to those who would be using the app. In the interview and workshop phases, users rated information and aesthetics as highest importance while functionality, engagement and subjective quality had lower scores. Interviews revealed the app had acceptability, though there were issues with functionality. Study researchers then co-designed the app with Aboriginal researchers and community members, followed by a pretest of the app with Aboriginal women and communities in urban and regional New South Wales, Australia. Developing a multibehavioural change mobile phone app with and for Aboriginal and Torres Strait Islander communities and women on health-related topics during pregnancy is new in research and requires extensive consultation and strong theoretical foundation of behavioural change techniques. In the next iteration of the app, authors aim to find better ways to personalize the content to women's needs, and ensure full functionality before conducting a larger trial.

10. **Khan, H. & Cescutti-Butler, L. (2021). Enhancing undergraduate midwifery: Using drug and alcohol baby simulators in education. *British Journal of Midwifery*, *29*(11). https://doi.org/10.12968/bjom.2021.29.11.620**

This UK study explored if drug and alcohol neonate simulators could enhance undergraduate midwifery students' knowledge of the impact of teratogens during pregnancy. Two simulators were used. A non-interactive simulator demonstrated the effects of prenatal alcohol exposure on the neonate including sentinel facial features. An interactive drug simulator was small for gestational age and mirrored symptomology of neonates experiencing neonatal abstinence syndrome. Data was qualitatively collected during sessions where students interacted with the drug and alcohol simulators. The findings were thematically analyzed and described three main themes, including the value of interacting with neonatal simulators in enhancing knowledge; understanding the role of supporting parents in the postpartum period; and the role of midwives in educating people about the impacts of substance use in pregnancy. The authors concluded that simulators may be a helpful pedagogic tool in engaging students and enhancing knowledge on prenatal substance use.

11. **Munoz, K., Suchy, C., Rutledge, D. N. (2021). Knowledge and attitudes of maternity nurses and ancillary team members about substance use addiction during pregnancy and postpartum. *MCN: The American Journal of Maternal/Child Nursing*, *46*(2), 82- 87. doi: 10.1097.NMC.0000000000000703**

This US study described the knowledge and attitudes of maternity nurses and other care providers in a community hospital about substance use by pregnant and postpartum women. Nurses, patient care technicians, and ancillary caregivers working permanently in prenatal and postpartum health were invited to complete the survey. The majority of respondents described being knowledgeable about the impacts of prenatal substance use on neonatal health. Many (80%) agreed or strongly agreed that mothers who use substances have challenges and can successfully recovery from addiction. Over half (55%) of respondents agreed or strongly agreed that mothers who use substances can be good parents. However, efforts are still needed to increase empathy and acceptance. Education and skill-building may be worth implementing with further evaluation of the efficacy of similar programs in maternal care settings.

12. **Nawabi, F., Alayli, A., Krebs, F., Lorenz, L., Shukri, A., Bau, A-M., & Stock, S. (2021). Health literacy among pregnant women in a lifestyle intervention trial: Protocol for an explorative study on the role of health literacy in the perinatal service setting. *BMJ Open, 11*, e047377. doi: 10.1136/bmjopen-2020-047377**

This German protocol describes a German lifestyle intervention entitled GeMuKi (an acronym for 'Gemeinsam Gesund: Vorsorge plus für Mutter und Kind' – Strengthening health promotion: Enhanced check-up visits for mother and child). GeMuKi is brief lifestyle intervention implemented to improve health literary during antenatal appointments. Data will be collected from 2017 – 2022 using a hybrid effectiveness-implementation design. Women have been recruited by their gynaecologist before 12th week gestation and will be followed until birth. Throughout the study, gynaecologists and midwives have, and will use, motivational interviewing techniques to improve health literacy and make aware lifestyle-related risk factors. Through this research, the authors hope to explore the associations between health literacy, health outcomes, health service use, and efficacy of the brief lifestyle intervention.

13. **Patel, E., Bandara, S., Saloner, B., Stuart, E. A., Goodman, D., Terplan, M., McCourt, A.,... McGuinty, E. E. (2021). Heterogeneity in prenatal substance use screening despite universal screening recommendations: Findings from the Pregnancy Risk Assessment Monitoring System, 2016 – 2018. *American Journal of Obstetrics & Gynecology MFM*, *3*(5), 100419. doi: 10.1016/j.ajogmf.2021.100419**

This US study described the prevalence of prenatal substance use screening by state, year, substance, and prenatal substance use policies. Further, it explored individual-level factors associated with receipt of screening among women. The authors analyzed data from 103,508 women participating in the Pregnancy Risk Assessment Monitoring System survey. The authors found that approximately 95% of women reported being asked about alcohol or cigarette use, while only 80% reported being asked about drug use during a prenatal appointment. The prevalence of screening increased between 2016 and 2018. In states where there

were laws designating prenatal substance use as child abuse or neglect, rates of screening was lower across all substances. In states with laws mandating providers to test for substance use in pregnancy had a higher prevalence of screening. Individual-level characteristics, including being younger, less educated, unmarried, Black, non-Hispanic, or publicly insured, and having a history of cigarette use pre-pregnancy were associated with increased odds of reporting prenatal substance use screening. The authors discuss how, regardless of recommendations for universal screening, that state-level policies and selective screening approaches impact the prevalence of screening.

14. **Reid, N., Schölin, L., Erng, M. N., Montag, A., Hanson, J., & Smith, L. Preconception interventions to reduce the risk of alcohol-exposed pregnancies: A systematic review. *Alcoholism: Clinical and Experimental Research, 45*(12), 2414 – 2429. doi: 10.1111/acer.14725**

This systematic review from Australian, US, and UK researchers explored preconception interventions to prevent alcohol-exposed pregnancies. Four electronic databases were searched for preconception interventions that enrolled women and/or their support network from 1970 onward. Nineteen studies were included, fourteen of which evaluated Project CHOICES-based interventions. Changes in risk of prenatal alcohol exposures were often guided by changes in contraceptive use; however, some interventions led to changes in both contraceptive and alcohol use. The systematic review demonstrated that preventing unplanned pregnancy can be an effective way of reducing risk for an alcohol-exposed pregnancy.

15. **Reynolds, R., McCarthy, R., & Cook, P. A. (2021). We do things differently here: The Greater Manchester approach to preventing alcohol-exposed pregnancy. *Perspectives in Public Health, 141*(5), 252-254. doi:10.1177/1757913920985553**

See above (Level 1).

16. **Samawi, L., Petersen-Williams, P., Meyers, B., & Fuhr, D. C. (2021). Efficacy of psychological interventions to reduce alcohol consumption among pregnant and postpartum women: A systematic review. *Archives of Women's Mental Health, 24*, 557 – 568.**

This systematic review from the UK and South African researchers synthesized evidence on psychological interventions to reduce alcohol consumption among pregnant and postpartum women at risk of having an alcohol exposed pregnancy. The authors limited the search to English language randomized controlled trials and quasi-experimental studies identified through six electronic databases. In total, 11 articles were included (9 with pregnant women, 2 with postpartum women). Five of the included studies, describing a range of interventions ranging from multi-session brief interventions to self-help manuals, demonstrated a reduction or abstinence from alcohol use. While all studies were reported to have methodological limitations, psychological interventions may be effective in supporting a reduction or abstinence from alcohol during pregnancy and postpartum. Interventions with higher levels of engagement (such as multi-session brief interventions) showed higher efficacy than studies where interventions were delivered in a single session. However, the authors note that more, and higher quality research, is needed to make conclusions about the overall efficacy of psychological interventions on alcohol reduction during pregnancy and postpartum.

17. **Schölin, L., Watson, J., Dyson, J., & Smith, L. A. (2021). Midwives' views on alcohol guidelines: A qualitative study of barriers and facilitators to implementation in UK antenatal care. *Sexual & Reproductive HealthCare, 29*, 100628. doi: 10.1016/j.srhc.2021.100628**

This UK study explored midwives' views on the implementation of the 2016 Chief Medical Officers' alcohol guidelines in antenatal care in the UK. The authors conducted interviews and focus groups with 22 midwives working in maternity and educational settings. While midwives were aware of the recommendations for women to abstain from alcohol during pregnancy, they were unaware that the source of abstinence advise was the 2016 guidelines. Midwives expressed the increased clarity in the 2016 guidelines. Enhancing trust and relationships with women was seen as a facilitator to asking about alcohol, something that not all midwives felt was appropriate at initial appointments with women. This further allowed midwives to tailored responses to women's needs. Further efforts are required to disseminate the guidelines to midwives.

18. **Shah, P. V., Tong, S., Hwang, S. S., Bourque, S. L. (2021). Racial/ethnic differences in prenatal and postnatal counseling about maternal and infant health-promoting practices among teen mothers. *Journal of Pediatric and Adolescent Gynecology, 34*(1), 40 – 46. doi: 10.1016/j.jpag.2020.10.002**

This US study explored racial and ethnic disparities in prenatal and postnatal counselling of teen mothers using data from the Pregnancy Risk Assessment Monitoring System data from 2012 – 2016. Mothers 19 years of age and younger (*n* = 544,930) were included. Non-Hispanic Black teens were more likely to receive counselling on tobacco, alcohol, illicit drugs, or HIV testing compared to non-Hispanic white teens. Hispanic teens were less likely to receive tobacco counselling and more likely to receive influenza counselling compared to non-Hispanic white teens. There were no disparities by ethnicity and race for prenatal counselling. This study demonstrated how racial and ethnic differences in perinatal counselling continue to persist. More research is needed to understand the drivers behind these disparities.

19. **Sijpkens, M. K., van Voorst, S. F., Rosman, A. N., de Jong-Potjer, L. C., Denktaş, S., Koch, B. C., ... & Steegers, E. A. (2021). Change in lifestyle behaviors after preconception care: a prospective cohort study. *American Journal of Health Promotion, 35*(1), 116-120.**

This Dutch study evaluated the effects of preconception care consultations on lifestyle behaviour. Women aged 18 – 41 in deprived neighbourhoods who visited a general practitioner or midwife for a preconception care consultation were assessed for initiation of folic acid supplementation, cessation of smoking, alcohol consumption, and illicit drug use using self-reported and biomarker data. Behavioural changes were measured at baseline and three-month follow up. At follow-up, there were significant changes in prevalence of folic acid use and self-reported binge drinking. The study highlights the importance of preconception health interventions in improving periconception health.

20. **Silang, K., Sanguino, H., Sohal, P. R., Sioux, C., Kim, H. S., & Tomfohr-Madsen, L. M. (2021). eHealth interventions to treat substance use in pregnancy: A systematic review and meta-analysis. *International Journal of Environmental Research and Public Health, 18*(19), 9952. https://doi.org.10.3390/ijerph18199952**

This systematic review and meta-analysis from Canadian researchers evaluated the efficacy of eHealth substance use treatment interventions during pregnancy. The authors searched five databases from May 2020 – April 2021 for relevant randomized controlled trials. Articles were included if they reported on administration of an eHealth intervention and substance use outcomes among pregnant individuals. Six studies were identified that reported on smoking (*n* = 3), alcohol (*n* = 2), and other substance use outcomes (*n* = 1). Interventions used different delivery modalities including computer (*n* = 3), Internet (*n* = 1), telephone (*n* = 1), and text (*n* = 1). The findings suggest that compared to controls eHealth interventions significantly contributed to reduced substance use in pregnant individuals compared to controls. eHealth interventions offer an accessible treatment modality to reduce substance use during pregnancy.

21. **Smith, L. A., Dyson, J., Watson, J., & Schölin, L. (2021). Barriers and enablers of implementation of alcohol guidelines with pregnant women: A cross-sectional survey among UK midwives. *BMC Pregnancy and Childbirth, 21*(1), 134.**

This study investigated midwives' practices following the release of the 2016 UK Chief Medical Officer's Alcohol guidelines for pregnancy, which was updated from previous guidelines to advise women to abstain from alcohol when planning or during a pregnancy. Midwives were recruited through professional networks and social media for an online survey. Of *n* = 842 respondents, 58% were aware of the guidelines of whom 91% (*n* = 438) cited abstinence was recommended, although 19% (93) cited recommendations from previous guidelines. 97% of midwives 'always or usually' advised women to abstain from alcohol during the initial appointment, and 38% at subsequent antenatal appointments. The most common reasons for advising abstinence at subsequent appointments were due to social influences, beliefs about consequences, and beliefs about capabilities (all indicative of barriers). The least common reasons included knowledge and professional role and identity (indicative of facilitators). Beliefs about capabilities, emotion (representing the 'feeling that it is rewarding'), and professional role and identity were strong predictors of midwives advising all women to abstain from alcohol at appointments other than at booking. The authors suggest that skill development and reinforcement of support from colleagues and the wider maternity healthcare system could support midwives' implementation of alcohol advice at each antenatal appointment, not just at

booking, which could lead to improved outcomes for women and infants. Implementation of alcohol care pathways in maternity settings are beneficial from a life course perspective for women, children, families, and the wider community.

22. **Stahl, D. L., & Matthews, L. J. (2021). Caring for parturients with substance use disorders. *Anesthesiology Clinics*, *39*(4), 761-777.**

This US review describes information on substance use in pregnancy for obstetric anesthesiologists. Authors provide a history of current evidence on screening, tobacco use, marijuana, alcohol, stimulants and opioids. The authors describe anesthetic considerations for pain control and care of women in labour (parturients) with SUDs and the importance of screening for SUDs throughout the prenatal period. Further, they provide resources for treatment and support. It is important for obstetric anesthesiologists to be familiar with the effects of substance use in pregnancy and additional pain management strategies.

23. **Thompson, E. L., Barnett, T. E., Litt, D. M., Spears, E. C., & Lewis, M. A. (2021). Discordance between perinatal alcohol use among women and provider counseling for alcohol use: An assessment of the Pregnancy Risk Assessment Monitoring System, *Public Health Reports, 136*(6), 719-725. doi: 10.1177/0033354920984146**

See above (Prevalence of, and influences and factors associated with, drinking in pregnancy).

24. **Townsel, C., Metz, T. D., & Bunik, M. (2021). The Term Newborn: Prenatal Substance Exposure. *Clinics in Perinatology, 48*(3), 631-646. doi:10.1016/j.clp.2021.05.011**

This statement about optimal practice by multidisciplinary health care providers in the US underlined how care for pregnant patients with substance use disorders must be provided in a nonjudgmental manner with recognition of addiction as a chronic medical illness in order to establish a therapeutic relationship and improve outcomes. The authors promote the use of repeated screening of all pregnant patients for substance use during prenatal care using validated screening tools and referral for treatment as appropriate. They further describe specific adverse perinatal outcomes associated with the use of a variety of substances and promotes non-pharmacological family centred care, including collaboration among providers to support safe breastfeeding.

25. **Ulrich, M., Petersen Memmo, E., Cruz, A., Heinz, A., & Iverson, R. E. (2021). Implementation of a universal screening process for substance use in pregnancy. *Obstetrics & Gynecology, 137*(4), 695 – 701. doi: 10.1097/AOG.0000000000004305**

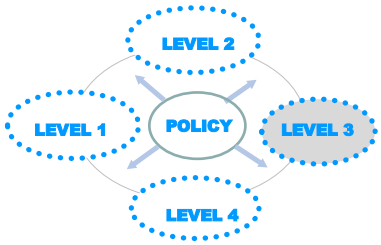
This US study involved the implementation of a standardized universal substance use screening process based on the modified 5Ps screening tool for prenatal patients at an urban tertiary care hospital. Throughout the implementation period, substance use screening was completed 84% of the time. Of those who were screened, 20% of women screened positive for prenatal substance use. Throughout the study period implementation of brief interventions decreased from 80% to 50%, indicating a need for a sustainable process for prenatal substance use screening. Further research is required that evaluates how health care providers respond to positive substance use screens.

26. **Walker, R, Drakeley, S., & Boyle, J. (2021). Preconception women's views of promoting preconception women's health in Australia. *Health Promotion Journal of Australia, 32* (Suppl 2) 22-28. doi: 10.1002/hpja.402**

This Australian study explored how preconception health is prioritized and how to increase women's awareness and uptake of health lifestyle behaviours in the preconception period. Non-pregnant women participated in a focus group. Two themes and five sub-themes were identified. Participants believed preconception health to be important for all women, while admitting that was not a high priority if not planning a pregnancy. Participants suggested a range of interventions that spanned the social-ecological model of health to engage preconception women in preventive actions and promote preconception health. These interventions included having access to reputable and easily accessible online sources of preconception health information, education and at secondary schools and public health campaigns. The authors suggest future initiatives to engage women in the preconception stage should span the social-ecological model of health and consider women's personal preferences for accessible and tailored

preconception health information and support at individual, interpersonal, community and organisational levels, as well as in the broader environment.

3. Level 3 Prevention



1. **Cidro, J., Doenmez, C., Sinclair, S., Nychuk, A., Wodtke, L., & Hayward, A. (2021). Putting them on a strong spiritual path: Indigenous doulas responding to the needs of Indigenous mothers and communities. *International Journal for Equity in Health, 20*(1), 189. doi:10.1186/s12939-021-01521-3**

This Canadian paper analyzed interviews with members of five Indigenous doula collectives to demonstrate their shared challenges, strategies, and missions. Indigenous doulas provide continuous, culturally appropriate support to Indigenous women during pregnancy, birth, and the postpartum period. Qualitative interviews were conducted with members of five Indigenous doula collectives across Canada. Two prominent themes emerged in the interviews. Firstly, participants indicated that responding to community needs involves harm reduction and trauma-informed care, supporting cultural aspects of birthing and family, and helping clients navigate socioeconomic barriers. Secondly, participants' comments on providing care to mothers emphasized the importance of advocacy in healthcare systems, boosting their clients' confidence and skills, and being the "right" doula for their clients. These two interrelated themes stem from Indigenous doulas' efforts to counter dynamics in healthcare and social services that can be harmful to Indigenous families, while also integrating cultural teachings and practices. The authors conclude that through building strong, trusting, and non-judgemental connections with mothers and responding to community needs, Indigenous doulas play a critical role in countering medical racism in hospital settings and advancing the resurgence of Indigenous birthing sovereignty.

2. **Hubberstey, C., Rutman, D., Van Bibber, M., & Poole, N. (2021). Wraparound programmes for pregnant and parenting women with substance use concerns in Canada: Partnerships are essential. *Health & Social Care in the Community*. doi:10.1111/hsc.13664**

This Canadian article examined the partnerships that are fundamental to wraparound service delivery (wherein multiple services are offered at one location in order to engage pregnant or parenting women experiencing substance use problems, and to address the complex social, health and other challenges they face). Sixty service partners and 108 programme staff were interviewed, and qualitative data analysis techniques were applied. Programmes most commonly formed partnerships with child welfare, health services (e.g. primary care, public health and perinatal care) and specialised health services such as mental health services, maternal addictions and Opioid Agonist Therapy. The programmes had fewer partnerships with housing, income assistance, Indigenous cultural programming, infant development and legal services. Key benefits of partnerships included: clients' improved access to health and social care, addressing social determinants of health; partners' increased knowledge about the significance of trauma in relation to women's substance use; improved child welfare outcomes and strengthened cultural safety and (re)connection. Key challenges included: tensions between partners regarding differing perceptions, mandates and responsibilities; personal differences and systemic barriers. By means of steady dialogue and collaboration, partners increased their appreciation and use of the trauma-informed, harm reduction approaches that are central to wraparound programmes.

3. **Kelty, E., Mishka, T., Melanie, G., & Preen, D. (2021). Pharmacotherapies for the Treatment of Alcohol Use Disorders During Pregnancy: Time to Reconsider? *Drugs, 81*(7), 739-748. doi:10.1007/s40265-021-01509-x**

This review from New Zealand researchers New Zealand weighed up the harms associated with alcohol use and Alcohol Use Disorder (AUD) during pregnancy with the potential benefits of medications for AUD in pregnancy, including acamprosate, naltrexone and disulfiram. The authors note there is little published evidence to support the safety of medications for AUD in pregnancy. However, from the research available it is likely that only disulfiram has the potential to cause serious fetal harm whereas acamprosate and naltrexone do not appear to be associated with substantial risks of congenital malformations or other

serious consequences. Given the potential risks associated with alcohol consumption during pregnancy, the use of acamprosate and naltrexone should be considered for the treatment of pregnant women with AUD based on the current evidence base, although more research is warranted.

4. **Nagpal, T. S., Bhattacharjee, J., da Silva, D. F., Souza, S. C. S., Mohammad, S., Puranda, J. L., ... Adamo, K. B. (2021). Physical activity may be an adjuvant treatment option for substance use disorders during pregnancy: A scoping review. *Birth Defects Research, 113*(3), 265-275. doi:10.1002/bdr2.1803**

This scoping review by Canadian researchers summarized the available literature that has assessed the relationship between prenatal exercise and substance use disorders. Eight studies were included in this review (five human studies, three animal model studies). Studies in humans suggested that pregnant women with SUDs are interested in physical activity interventions, but the metabolic and physiological effects of substances may hinder prenatal exercise outcomes. Rodent models show preliminary evidence for improved mental health outcomes following prenatal exercise for substance use disorders. The findings from this review may inform the development of future clinical trials to test the effect of structured exercise programs as an adjunctive treatment option for pregnant women with substance use disorders.

5. **Patton, E. W., Saia, K., & Stein, M. D. (2021). Integrated substance use and prenatal care delivery in the era of COVID-19. *Journal of Substance Abuse Treatment*, 124, 108273. doi:10.1016/j.jsat.2020.108273**

This US article explored the literature on prenatal care models and discusses the experience of New England's largest safety net hospital with integrated substance use and prenatal care delivery during COVID-19 including changes in regulations for take home dosing for methamphetamine treatment for opioid use disorder. Patients' early responses to the hybrid in-person and telemedicine care model offered during COVID-19 restrictions were found to be overwhelmingly positive. The authors note that thoughtful planning and further research will be necessary to ensure equitable access to the benefits of telemedicine and take home dosing for all pregnant and postpartum patients with substance use disorder.

6. **Raffi, E. R., Gray, J., Conteh, N., Kane, M., Cohen, L. S., & Schiff, D. M. (2021). Low barrier perinatal psychiatric care for patients with substance use disorder: Meeting patients across the perinatal continuum where they are. *International Review of Psychiatry, 33*(6), 543-552. doi:10.1080/09540261.2021.1898351**

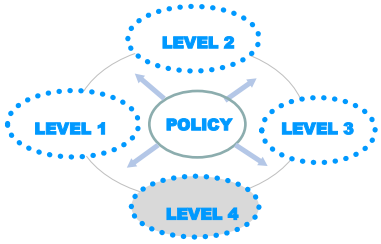
In this US review, the authors discuss approaches to low-barrier perinatal psychiatric care for women with SUDs to promote engagement in care. The authors reviewed (1) appropriate psychiatric assessment and diagnostic work-up; (2) treatment planning incorporating shared-decision making, non-punitive and culturally sensitive patient-centred care, and principles of harm reduction with a focus on psychopharmacology, and (3) the benefits of an integrated and collaborative multidisciplinary care model. The authors see this as important as pregnant and postpartum patients with SUD often have co-occurring mental health disorders; the complications can contribute to maternal morbidity and mortality; and the perinatal period can be both a motivating and a vulnerable period for care.

7. **Rayment-Jones, H., Dalrymple, K., Harris, J., Harden, A., Parslow, E., Georgi, T., & Sandall, J. (2021). Project20: Does continuity of care and community-based antenatal care improve maternal and neonatal birth outcomes for women with social risk factors? A prospective, observational study. *PloS ONE, 16*(5), e0250947. doi:10.1371/journal.pone.025094**

This UK study aimed to compare maternal and neonatal clinical birth outcomes for women with social risk factors accessing different models of maternity care. Quantitative data on pregnancy and birth outcome measures for 1,000 women accessing standard care, group practice and specialist models of care at two large, inner-city maternity services were prospectively collected and analyzed. The level of continuity of care and place of antenatal care were used as independent variables to explore these potentially influential aspects of care. Women who received standard maternity care were significantly less likely to have skin to skin contact with their baby shortly after birth (RR 0.34, CI 0.14-0.80) compared to the specialist model of care. Antenatal care based in the hospital setting was associated with a significant increase in preterm birth (RR 2.38, CI 1.32-4.27) and low birth weight (RR 2.31, CI 1.24-4.32) compared to community-based antenatal

care, despite women's medical risk factors. A subgroup analysis found that preterm birth was increased further for women with the highest level of social risk accessing hospital-based antenatal care (RR 3.11, CI1.49-6.50), demonstrating the protective nature of community-based antenatal care. The authors conclude that community-based antenatal care, with a focus on continuity of carer reduced health inequalities and improved maternal and neonatal clinical outcomes for women with social risk factors. The findings support the current policy drive to increase continuity of midwife-led care, whilst adding that community-based care may further improve outcomes for women at increased risk of health inequalities.

4. Level 4 Prevention



1. **Adams, Z. M., Ginapp, C. M., Price, C. R., Qin, Y., Madden, L. M., Yonkers, K., & Meyer, J. P. (2021). "A good mother": Impact of motherhood identity on women's substance use and engagement in treatment across the lifespan. *Journal of Substance Abuse Treatment*, 130, 108474. doi:10.1016/j.jsat.2021.108474**

The US study evaluated how motherhood is a potential barrier and facilitator to engagement in SUD treatment. Study staff conducted 20 qualitative interviews with women in SUD treatment to assess experiences with SUD treatment, in which motherhood emerged as a key theme. Twelve women then participated in four focus groups centered on motherhood. Analysis revealed that most women identified their children and responsibilities as mothers and caretakers as important motivators to accessing SUD treatment. Motherhood was also a barrier to treatment, in that women feared losing child custody by disclosing substance use and few live-in programs accommodate women with children. Multiple women expressed guilt about their substance use, sensing that it contributed to perceived abandonment or separation from their children. Reunification was important to recovery. The authors conclude that women with SUD who are mothers experience specific barriers to treatment engagement and recovery and need treatment programs that address interpersonal and structural factors across the lifespan as mothers, caretakers, and grandmothers.

2. **Barnett, E. R., Knight, E., Herman, R. J., Amarakaran, K., & Jankowski, M. K. (2021). Difficult binds: A systematic review of facilitators and barriers to treatment among mothers with substance use disorders. *Journal of Substance Abuse Treatment*, 126, 108341. doi:10.1016/j.jsat.2021.108341**

This US study aimed to systematically identify facilitators and barriers to substance use and mental health treatment for mothers with substance use disorder who are pregnant or parenting young children in the United States and Canada. Their search of five online databases as well as gray literature published in the past two decades focused on parent or provider perspectives. The authors qualitatively examined the perspectives of treatment-seeking pregnant women and mothers diverse in race/ethnicity, region, and treatment settings. The authors note the compelling and complex centrality of motherhood, which served as both a facilitator and barrier. Motherhood often interacted with relational (e.g., perceiving stigma vs. support from providers, family, friends, partners) and structural (e.g., time commitments, childcare) factors to both hinder and help engagement in treatment. They conclude that policy-makers and practitioners can make tangible improvements to the financing and delivery of substance use treatment for mothers and future research in specific areas such as an examination of the relationships between various structural factors and treatment outcomes can inform this improvement.

3. **Cidro, J., Doenmez, C., Sinclair, S., Nychuk, A., Wodtke, L., & Hayward, A. (2021). Putting them on a strong spiritual path: Indigenous doulas responding to the needs of Indigenous mothers and communities. *International Journal for Equity in Health, 20*(1), 189. doi:10.1186/s12939-021-01521-3**

See Above (Level 3).

4. **Hubberstey, C., Rutman, D., Van Bibber, M., & Poole, N. (2021). Wraparound programmes for pregnant and parenting women with substance use concerns in Canada: Partnerships are essential. *Health & Social Care in the Community*. doi:10.1111/hsc.13664**

See Above (Level 3).

5. **Massi, L., Hickey, S., Maidment, S.-J., Roe, Y., Kildea, S., Nelson, C., & Kruske, S. (2021). Improving interagency service integration of the Australian Nurse Family Partnership Program for First Nations women and babies: A qualitative study. *International Journal for Equity in Health, 20*(1), 212. doi:10.1186/s12939-021-01519-x**

This Australian study examined how the Australian Nurse Family Partnership Program (ANFPP), an evidence-based home visiting program that offers health education, guidance, social and emotional support to first-time Aboriginal and/or Torres Strait Islander mothers, integrates with other services in an Australian urban setting and how to improve this. This qualitative study used individual and group interviews to explore the barriers and enablers to interagency service integration. Interviews were conducted using a culturally appropriate yarning method with clients, families and Elders and semi-structured interview guide for staff. Seventy-six participants were interviewed: 26 clients, 47 staff and 3 Elders/family members. Three themes were identified as barriers: 1) confusion around program scope; 2) duplication of care; and 3) tensions over 'ownership' of clients. Another three were identified as existing and potential enablers: 1) knowledge and promotion of the program; 2) cultural safety; and 3) case coordination, co-location and partnership forums. The authors provided practical recommendations for effective service integration to maximise access and acceptability of the ANFPP.

6. **O'Malley, D., Chiang, D. F., Siedlik, E. A., Ragon, K., Dutcher, M., & Templeton, O. (2021). A promising approach in home visiting to support families affected by maternal substance use. *Maternal & Child Health Journal, 25*(1), 42-53. doi:10.1007/s10995-020-03015-0**

This US study examined the Team for Infants Exposed to Substance abuse (TIES) Program which provides a holistic, multi-disciplinary, community-based model to address the complex needs of families with young children affected by maternal substance use. A multi-year implementation study of the model yielded results that indicate the effectiveness of this home-based family support intervention. The model focuses on reducing maternal alcohol and other drug use, increasing positive parenting, promoting child and maternal health, and improving family income and family housing. A key component of the model is establishing a mutual, trusting relationship between the home visiting specialists and the family. Foundational to the TIES model is a family-centered, culturally competent, trauma-informed approach that includes formal interagency community partnerships. Key elements of the model are described that lead to high retention and completion rates and family goal attainment.

7. **Troop, C. (2021). Beyond birth program: exploring a substance use treatment program for postpartum women. *Journal of Applied Rehabilitation Counseling, 52*(4), 252-265. doi:10.1891/JARC-D-19-00016**

This US study explored how a holistic substance use treatment program at a large, southern academic medical center provides 'wraparound' care for postpartum women with illicit drug use problems and their children, using a medical-home model. A one hour focus group was conducted with seven women receiving services at the program. The feedback was positive, with women indicating the services they received supported decrease in their drug use and improvement in interactions with their children. The authors note that incorporating rehabilitation counselors into this holistic, medical-home approach is currently planned.

8. **Yonemoto, N., Nagai, S., & Mori, R. (2021). Schedules for home visits in the early postpartum period. *The Cochrane Database of Systematic Reviews, 7*, CD009326. doi:10.1002/14651858.CD009326.pub**

This Japanese review assessed the effects of different home-visiting schedules on maternal and newborn mortality during the early postpartum period. The review focused on the frequency of home visits (how many home visits in total), the timing of when visits started (e.g., within 48 hours of the birth), duration and intensity, and different types of home-visiting interventions. The review included 16 randomized trials with data for 12,080 women in both high- and low-resource settings across a number of countries. In all but four of the included studies, postnatal care at home was delivered by healthcare professionals. The aim of all interventions was broadly to assess the well-being of mothers and babies, and to provide education and support. The authors concluded that the evidence is very uncertain about the effect of home visits on

maternal and neonatal mortality. They note that individualised care as part of a package of home visits probably improves depression scores at four months and increasing the frequency of home visits may improve exclusive breastfeeding rates and infant healthcare utilisation. Maternal satisfaction may also be better with home visits compared to hospital check-ups. Overall, the certainty of evidence was found to be low and findings were not consistent among studies and comparisons, thus they suggest that well designed randomized controlled trials evaluating this complex intervention will be required to formulate the optimal package.

5. Other – stigma, ethical issues, and systemic approaches

1. **Aiton, N. (2021). Neglect of Fetal Alcohol Spectrum Disorder must end. *BMJ, 375*, n2969. https://doi.org/10.1136/bmj.n2969**

This UK editorial commented on the FASD Health Needs Assessment and how FASD has been historically neglected in the UK due to the complex relationship with alcohol, lack of professional training, stigma and concerns over maternal rights, and the challenges with diagnosis. Lessons from Canada, Australia, and Scotland could be adopted, including through the development of an umbrella organization for FASD in England to promote partnerships between professions and professional organizations, support the development of clinical services and networks, and propel research, policy, and prevention.

2. **Aspler, J., Bogossian, A., & Racine, E. (2021). "It's ignorant stereotypes": Key stakeholder perspectives on stereotypes associated with Fetal Alcohol Spectrum Disorder, alcohol, and pregnancy. *Journal of Intellectual & Developmental Disability*, *47*(1), 53 – 64. https://doi.org/10.3109/13668250.2020.1865649**

This Canadian qualitative study sought to understand the role of media portrayals on stigma that people with FASD, caregivers, and professionals experience. Twelve focus groups were conducted with the three stakeholder groups and themes were identified using framework analysis. Stereotypes about FASD (i.e., negative life trajectories), alcohol and pregnancy (i.e., 'bad' mothers), and caregivers were identified. Participants further identified the effects of FASD and alcohol and pregnancy stereotypes, including on interactions in individuals' day-to-day lives. This research aligns with previous findings and demonstrates how narratives in the media must be advanced.

3. **Carroll, J. J., El-Sabawi, T., & Ostrach, B. The harms of punishing substance use during pregnancy. *International Journal of Drug Policy*, *98*, 103433.**

This commentary from US authors reviewed the impacts of punitive policies that punish pregnant and parenting individuals who use substances have adverse effects on both parents and their children. While some punitive policies may appear to be guided by public health approaches, they have failed to address the significant barriers to accessing substance use treatment. Rather, families would benefit from greater access to affordable and evidence-based substance use treatment as well as services that address the structural and interconnected issues that underpin substance use. Future policies should be non-stigmatizing and prioritize keeping families together.

4. **Deutsch, S. A., Donahue, J., Parker, T., Paul, D., & De Jong, A. R. (2021). Supporting mother-infant dyads impacted by prenatal substance exposure. *Child and Youth Services Review, 129*, 106191, https://doi.org/10.1016/j.childyouth.2021.106191**

This US narrative review described public health approaches to address health and psychosocial concerns for mother-infant dyads affected by prenatal alcohol exposure. The review explores health and psychosocial adversities related to prenatal substance exposure, the Five Points of Family Intervention Framework to prevent, identify, support and treat mother-infant dyads at five touchpoints: pre-pregnancy; prenatal; birth; neonatal, infancy and postpartum; and childhood and adolescence. The authors additionally describe Plans of Safe Care and Family First legislation as two approaches to help bridge gaps in meeting the needs of mother-infant dyads. Further research is required to explore how policy and practice can support dyad health and safety.

5. **Gonzales, K. L., Jacob, M. M., Mercier, A., Heater, H., Nall Goes Behind, L., Joseph, J., & Kuerschner, S. (2021). An Indigenous framework of the cycle of Fetal Alcohol Spectrum Disorder risk and prevention across the generations: Historical trauma, harm and healing. *Ethnicity & Health, 26*(2), 280 – 298. https://doi.org/10.1080/13557858.2018.1495320**

This US study explored knowledge and attitudes about FASD, understandings of FASD risk factors, and culturally appropriate to FASD prevention and healthcare. The authors analyzed data from focus groups conducted with American Indian and Alaskan Native people ($n = 74$). The findings reinforced the importance of community values, healing, and understanding the broader context of systemic factors as a means of address FASD. Multilevel preventions should prioritize Indigenous culture, support intergenerational healing, and focus on non-stigmatizing approaches as a means to reduce future alcohol-exposed pregnancies.

6. **Green, C. R., Kaminsky, K. J., Tough, S., Roberts, N., Nagpal, T. S., Cook, J. C. (2021). Perspectives of Canadian health care providers on Fetal Alcohol Spectrum Disorder: Has anything changed in 15 years? A brief report. *Journal of Obstetrics and Gynaecology Canada, 43*(9), 1086 – 1089.**

This Canadian study explored two cross-sectional datasets with healthcare providers perspectives of the adverse health outcomes associated with alcohol use in pregnancy. In 2002 and 2017, two samples of healthcare providers received a survey evaluating knowledge of FASD, background considerations, prevention and diagnostic information. Compared to 2002, in 2017 more healthcare providers were neutral, agreed, or strongly agreed that the effect of alcohol was unclear; however, this finding was not reflective of obstetricians and gynaecologists, who agreed/strongly agreed that alcohol's effects on fetal development was unclear in 2002 compared to 2017. Further, in 2017 fewer healthcare providers indicated that the rates of FASD were significantly different across cultures and ethnic groups. The findings from these surveys may inform ongoing education initiatives, including those that support healthcare providers in screening for alcohol use in pregnancy and FASD diagnosis.

7. **Harding, K. D., Whittingham, L., McGannon, K. R. (2021). #sendwine: An analysis of motherhood, alcohol use, and #winemom culture on Instagram. *Substance Abuse: Research and Treatment.* https://doi.org/10.1177/11782218211015195**

This Canadian study examined the role of wine mom culture in the discourses of 'good' and 'bad' motherhood in gendered spaces. The authors sampled Instagram posts ($n = 40$) with the #winemom hashtag. Using reflexive thematic analysis two interconnected ideas of wine being used for social belonging and as part of socially acceptable self-care and the commodification of the wine mom were connected to the central theme of alcohol being consumed as part of being a 'modern mother'. The pervasiveness and normalization of wine mom culture may have health and sociocultural implications on women's alcohol use.

8. **Jones, H. E., Hairston, E., Lensch, A. C.,Keyser Marcus, L., Heil, S. H. Challenges and opportunities during the COVID-19 pandemic: Treating patients for substance use disorders during the perinatal period. *Preventive Medicine, 152*(Pt 2), 106742. doi: 10.1016/j.ypmed.2021.106742**

This US commentary described the impacts and unique challenges of COVID-19 on pregnant and postpartum patients with substance use disorders. Virtual platforms have presented opportunities for treatment and have helped reduce transportation and childcare barriers. The authors describe the importance of studying different virtual care models and the various ways they have been implemented.

9. **MacIvor Thompson, L. (2021). "The offspring of drunkards": Gender, welfare, and the eugenic politics of birth control and alcohol reform in the United States. *Journal of Law, Medicine & Ethics, 49*(3), 357-364. doi: 10.1017/jme.2021.54**

This US symposium described the historical context and intersections linking prohibition, birth control, and alcohol reform in the US. The author link to early understandings of the teratogenic effects of alcohol use in pregnancy and how liquor and birth control were framed as a form of eugenics to reduce unexpected and alcohol-exposed pregnancies among certain populations. This early framing and alignment is seen to have prompted a narrative of moral responsibility surrounding alcohol use in pregnancy. Examining the historical contexts behind birth control, prohibition, and alcohol reform can be helpful in understanding how to respond to reproductive and future welfare policy initiatives; as well as given helpful indicators as to how to address intersections of gender, race, and class.

10. **Matebese, S., Macleod, C. I., Tsetse, N. (2021). The shame of drinking alcohol while pregnant: The production of avoidance and ill-health. *Affilia: Feminist Inquiry in Social Work, 36*(4), 629 – 646. https://doi.org/10.1177/0886109920985139**

This South African study assessed how shame is operationalized in pregnant women who use alcohol by their families and the institutions they are associated with. The authors interviewed thirteen (*n* = 13) women who consumed alcohol while pregnant. Alcohol use in pregnancy and drinking out of wedlock resulted in shame and judgement, where women were perceived to be 'bad' mothers. Women managed the shame through concealment or were avoided by families and institutions as a way of distancing themselves from immoral behaviour. Underpinning these narratives were cultural and religious discourses. The mechanisms in which shame operationalized did not reduce alcohol use in pregnancy but rather propelled concealment and avoidance among women's support networks. Further work is needed to respond to the contexts of pregnant women's lives.

11. **Mitchell-Foster, S. M., Emon, C. E., Bouwer, M., Duncan, L., & King, J. (2021). Disconnected perspectives: Patient and care provider's experiences of substance use in pregnancy. *International Journal of Gynecology & Obstetrics, 155*(2), 170 – 178. https://doi.org/10.1002/ijgo.13919**

This Canadian study explored perceptions of maternity-care providers with women who used substances during pregnancy. Patient journey maps (*n* = 3) and semi-structured interviews (*n* = 20) with care providers were conducted. The findings demonstrated women's experiences of hurt, loss, judgement, and anger. Providers expressed their own gaps in knowledge around harm reduction and substance use in pregnancy. While providers perceived themselves to be providing care without judgement, the patient journey maps suggested otherwise. Further training on trauma-informed practice and cultural humility is needed to help reduce harm during patient interactions.

12. **Reid, N., Hawkins, E., Liu, W., Page, M., Webster, H., Katsikitis, M., Shelton, D.,... Shanley, D. (2021). Yarning about Fetal Alcohol Spectrum Disorder: Outcomes of a community-based workshop. *Research in Developmental Disabilities, 108*, 103810. doi: 10.1016/j.ridd.2020.**

This Australian article described a workshop developed to support community-based professional support and co-create a novel FASD assessment. This mixed-methods study involves qualitative (narrative analysis of a video recording and small group discussions) and quantitative data (self-report questionnaires on practitioner knowledge, attitudes, and intentions for future practice). The findings highlighted the ongoing impacts of colonialism and the importance of imbedding First Nations knowledge and expertise in practice. The quantitative data found that while knowledge and practice was enhanced after attending the workshop, only a small number of practitioners reported on their intention for future practice. The findings from the study highlight the need for co-development and collaboration in the adaptation and implementation of evidence-based practice in the local context.

13. **Roberts, S. C. M., Thompson, T-A., & Taylor, K. J. (2021). Dismantling the legacy of failed policy approaches to pregnant people's use of alcohol and drugs. *International Review of Psychiatry, 33,* 502 – 513. https://doi.org/10.1080/09540261.2021.1905616**

This US commentary discussed pregnancy-specific substance use policies on adverse birth outcomes and how they are connected to birth control politics, racism, the 'War on Drugs', and the application and implementation of evidenced approaches. Strategies are proposed that support the health of wellbeing of pregnant people who use substances and their kids, including involving those with lived and living experiences in policy and practice. The authors further suggest research funding that supports the development of policies and practices that support the wellbeing of pregnant people who use substances. Such approaches have wide-reaching implications, including the effects on other policy areas.

14. **Sufrin, C. B. & Knittel, A. (2021). Health care and social justice implication of incarceration for pregnant people who use drugs. *International Review of Psychiatry, 33*(6), 557 – 571. doi: 10.1080/09540261.2021.1887097**

This review from US authors describes the prevalence of SUDs among pregnant incarcerated people and the contexts that led to their incarceration. Despite a dearth of data on pregnant people with SUDs who are incarcerated, there are strong interconnections with mental health challenges, and experiences of violence and trauma. Further systemic considerations are intertwined, including the role of the child welfare system, racism, and mass incarceration. Understanding the drivers can help contextualize the development and delivery of clinical care on incarcerated pregnant people who use substances.

15. **Szewczyk, Z., Holliday, E., Dean, B., Collins, C., & Reeves, P. (2021). A systematic review of economic evaluations of antenatal nutrition and alcohol interventions and their associated implementation interventions. *Nutrition Reviews, 79*(3), 261 – 273. doi: 10.1093/nutrit/nuaa015**

This Australian study involved two systematic reviews to examined how economic evaluations have been applied to 1) prenatal nutrition and alcohol interventions and 2) associated prenatal public health interventions. Six databases were and 12 interventions focusing on nutrition (*n* = 10) and alcohol (*n* = 2) were included in the first review. No interventions were eligible for inclusion for the second review. The findings demonstrate that prenatal alcohol and nutrition programs have the potential to considerably reduce healthcare costs. Incorporating economic evaluation and principles into health promotion efforts has the capacity to inform decision-making and how to derive value from investment in healthcare.

16. **Wolfson, L., Schmidt, R. A., Stinson, J., & Poole, N. (2021). Examining barriers to harm reduction and child welfare services for pregnant women and mothers who use substances using a stigma action framework. *Health & Social Care in the Community, 29*(3), 589 – 601. https://doi.org/10.1111/hsc.13335**

This scoping review from Canadian authors sought to understand how stigma impacts access, retention, and outcomes of harm reduction and child welfare services for pregnant women and mothers who use substances. Forty-two (*n* = 42) articles were analyzed using the Action Framework for Building an Inclusive Health System to demonstrate the ways in which stigma and other barriers are enacted and experienced at the individual, interpersonal, institutional, and population levels. Many articles highlighted multilevel barriers, including fear and mistrust of child welfare services (i.e., individual), external/familial influences on accessing substance use treatment (i.e., interpersonal), organizational expectations (i.e., institutional), and stereotypes and racism (i.e., population) that women experience. Further, the findings demonstrated the pervasive ways that institutional and population-level stigma percolates into the individual and interpersonal levels. There is additional focus needed to address how systems can respond to these barriers.

17. **Yousefi, N. & Chaufan, C. (2021). 'Think before you drink': Challenging narratives on foetal alcohol spectrum disorder and indigeneity in Canada. *Health: An Interdisciplinary Journal for the Social study of Health, Illness, and Medicine*. https://doi.org/10.1177/1363**

This Canadian study explored the production of colonial and capitalist discourses in FASD research. The authors used critical discourse analysis and organized government publications, public health campaigns, legal proceedings, and articles on alcohol consumption during pregnancy using communities of discourse. The authors found that current research on FASD research frames settler colonialism as in the past, negating contemporary forms of settler colonialism. Further, narratives underexplored the sociohistorical factors associated with alcohol use in pregnancy or systemic changes that may be required to reduce inequities and meet the needs of individuals, families, and communities. Further efforts are required to change public discourse and address inequities associated with FASD at the root.

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, and influences and factors associated with, drinking in pregnancy					
n = 35	Addila et al.	Determinants of hazardous alcohol use among pregnant women attending antenatal care at public health facilities in Gondar town, Northwest Ethiopia: A nested case-control study	Case control	Ethiopia	4
	Addila et al.	Individual and community-level predictors of maternal alcohol consumption during pregnancy in Gondar town, Northwest Ethiopia: A multi-level logistic regression	Cross-sectional	Ethiopia	4
	Addila et al.	The effects of maternal alcohol consumption during pregnancy on adverse fetal outcomes among pregnant women attending antenatal care at public health facilities in Gondar town, Northwest Ethiopia: a prospective cohort study	Prospective cohort	Ethiopia	4
	Adebiyi & Mukumbang	Perspectives of policymakers and service providers on why Fetal Alcohol Spectrum Disorders remain unabated in South Africa: A qualitative study.	Qualitative	South Africa	4
	Agiresaasi et al.	Alcohol use during pregnancy in post-conflict northern Uganda: pregnant women's experiences and provider perceptions	Qualitative (thematic analysis)	Uganda	5
	Albright et al.	Pregnancy and binge drinking: An intersectionality theory perspective using veteran status and racial/ethnic identity	Cross-sectional	US	5
	Boing et al.	Individual and contextual variables associated with smoking and alcohol consumption during pregnancy	Cross-sectional	Brazil	5
	Breunis et al.	Objective assessment of alcohol consumption in early pregnancy using phosphatidylethanol: A cross-sectional study	Cross-sectional	The Netherlands	5
	Cook	Alcohol use during pregnancy and fetal alcohol spectrum disorder in Canada: who, what, where?	Editorial	Canada	6
	De Jong et al.	A scoping review of the determinants of Fetal Alcohol Spectrum Disorder in South Africa: An intersectional perspective	Scoping review	South Africa	6
	Fetene et al.	Magnitude and associated factors of substance use among pregnant women attending antenatal care in public hospitals of eastern Ethiopia	Case control	Ethiopia	6
	Finager et al.	Phosphatidylethanol as blood biomarker of alcohol consumption in early pregnancy: An observational study in 4,067 pregnant women	Cross-sectional	The Netherlands	6
	Hasken et al.	Gestational age and birth growth parameters as early predictors of fetal alcohol spectrum disorders	Cross-sectional	South Africa	6
	Hebert & Sarche	Pre-pregnancy and prenatal alcohol use among American Indian and Alaska Native and Non-Hispanic White Women: Finding from PRAMS in five states	Cross-sectional	US	7
	Hen-Herbst et al.	Pregnant women's alcohol consumption and knowledge about its risks: An Israeli survey	Cross-sectional	Israel	7
	Jorda et al.	Protective factors against tobacco and alcohol use among pregnant women from a tribal nation in the Central United States	Cross-sectional	US	7
	Leggat et al.	Changes in alcohol consumption during pregnancy and over the transition towards parenthood	Cohort	Australia	8
	Lyall et al.	"The problem is that we hear a bit of everything…": A qualitative systematic review of factors associated	Systematic review	Australia & Canada	8

		with alcohol use, reduction, and abstinence in pregnancy			
	Lynch et al.	Diagnosis and treatment of substance use disorder among pregnant women in three state Medicaid programs from 2013 to 2016	Cross-sectional	US	8
	Macleod et al.	Alcohol use during pregnancy: prevalence and patterns in selected Buffalo City areas, South Africa	Cross-sectional	South Africa	8
	Marlow et al.	Alcohol use during pregnancy in rural Lesotho: "There is nothing else except alcohol"	Qualitative (thematic analysis)	Lesotho	9
	Martinelli et al.	Alcohol Consumption During Pregnancy in Brazil: Elements of an Interpretive Approach	Mixed methods	Brazil	9
	May et al.	Estimating the community prevalence, child traits, and maternal risk factors of fetal alcohol spectrum disorders (FASD) from a random sample of school children	Mixed methods	US	9
	Murakami et al.	Maternal personality and alcohol use during pregnancy in Japan: The Tohoku Medical Megabank Project Birth and Three-Generation Cohort Study	Cohort	Japan	10
	Murakami et al.	Associations of education and work status with alcohol use and cessation among pregnant women in Japan: the Tohoku Medical Megabank Project Birth and Three-Generation Cohort Study	Cohort	Japan	10
	Oh et al.	Prenatal exposure to alcohol, tobacco, and coffee: Associated congenital complications and adverse birth outcomes	Cross-sectional	South Korea	10
	Popova et al.	Maternal alcohol use, adverse neonatal outcomes and pregnancy complications in British Columbia, Canada: A population-based study	Cross-sectional	Canada	10
	Persson et al.	Alcohol and illicit and non-medical prescription drug use before and during pregnancy in Stockholm, Sweden: A cross-sectional study	Cross-sectional	Sweden	11
	Racine et al.	Pathways from maternal adverse childhood experiences to substance use in pregnancy: Findings from the All Our Families cohort	Cohort	Canada	11
	Rockcliffe et al.	Factors influencing health behaviour change during pregnancy: a systematic review and meta-synthesis	Systematic review & meta-analysis	UK	11
	Stanhope et al.	Chronic Stress and Preconception Health Among Latina Women in Metro Atlanta	Cross-sectional	US	11
	Thompson et al.	Discordance between perinatal alcohol use among women and provider counseling for alcohol use: An assessment of the Pregnancy Risk Assessment Monitoring System	Cross-sectional	US	12
	Thompson et al.	Cognitions and behaviors related to risk for alcohol-exposed pregnancies among young adult women	Longitudinal cohort	US	12
	Wynn et al.	Alcohol use during pregnancy in Rakai, Uganda	Cross-sectional	Uganda	12
	Zhang et al.	Intimate partner violence, prenatal stress, and substance use among pregnant Black women	Cross-sectional	US	12
Level 1 Prevention					
n = 9	Adebiyi et al.	Policy requirements for the prevention and management of Fetal Alcohol Spectrum Disorder in South Africa: A policy brief	Policy brief	South Africa	13
	Atkins et al.	The impact of state-level substance use policies on infant foster care entry in the United States	Cross-sectional	US	13
	Bulut & Kennedy	Measuring and understanding public awareness of fetal alcohol spectrum disorders in Alberta, Canada	Cross-sectional	Canada	13

	Feeny et al.	Protecting women and girls from tobacco and alcohol promotion	Analysis	UK, Switzerland Malaysia & Australia	13
	Naja et al.	Development of national dietary and lifestyle guidelines for pregnant women in Lebanon	Mixed methods	Lebanon	14
	Parackal et al.	Dynamic transactional model: A framework for communicating public health messages via social media	Qualitative (content analysis)	New Zealand	14
	Reynolds et al.	A digital campaign to increase awareness of alcohol-exposed pregnancy	Descriptive	UK	14
	Reynolds et al.	We do things differently here: The Greater Manchester approach to preventing alcohol-exposed pregnancy	Descriptive	UK	14
	Tsakiridis et al.	Substance Use During Pregnancy: A Comparative Review of Major Guidelines	Review	Greece	15
Level 2 Prevention					
n = 26	Bakhivera et al.	You didn't drink during pregnancy, did you?	Cross-sectional	US	15
	Chambers et al.	Rigorous evaluation of a substance use and teen pregnancy prevention program for American Indian girls and their female caregivers: A study protocol for a randomized controlled trial	Study protocol	US	15
	D'Angelo et al.	Challenges for Midwives' Healthcare Practice in the Next Decade: COVID-19–Global Climate Changes–Aging and Pregnancy–Gestational Alcohol Abuse	Review	Italy	16
	Deutsch et al.	Where there's a will, there's a way? Strategies to reduce or abstain from alcohol use developed by Northern Plains American Indian women participating in a brief, alcohol-exposed pregnancy preconceptual intervention	Qualitative (thematic analysis)	US	16
	Hanson et al.	A culturally tailored intervention to reduce risk of alcohol-exposed pregnancies in American Indian communities: Rationale, design, and methods	Study protocol	US	16
	Hayes et al.	The effectiveness of smoking cessation, alcohol reduction, diet and physical activity interventions in improving maternal and infant health outcomes: A systematic review of meta-analyses	Systematic review & meta-analysis	UK	16
	Hernandez et al.	Health decisions amidst controversy: Prenatal alcohol consumption and the unequal experience of influence and control in networks	Qualitative	US	17
	Högberg et al.	Two screening instruments for collecting alcohol-related information from expectant mothers and fathers: Testing the reliability of the Parent Alcohol Screening Questionnaire and the Social Support for an Alcohol-Free Pregnancy Questionnaire	Cohort	Review	17
	Kennedy et al.	Codeveloping a multibehavioural mobile phone app to enhance social and emotional well-being and reduce health risks among Aboriginal and Torres Strait Islander women during preconception and pregnancy: a three-phased mixed-methods study	Mixed methods	Australia	17
	Khan & Cescutti-Butler	Enhancing undergraduate midwifery: Using drug and alcohol baby simulators in education	Qualitative (thematic analysis)	UK	18
	Munoz et al.	Knowledge and attitudes of maternity nurses and ancillary team members about substance use addiction during pregnancy and postpartum	Cross-sectional	US	18
	Nawabi et al.	Health literacy among pregnant women in a lifestyle intervention trial: Protocol for an explorative study on	Study protocol	Germany	18

		the role of health literacy in the perinatal service setting			
	Patel et al.	Heterogeneity in prenatal substance use screening despite universal screening recommendations: Findings from the Pregnancy Risk Assessment Monitoring System, 2016 – 2018	Cross-sectional	US	18
	Reid et al.	Preconception interventions to reduce the risk of alcohol-exposed pregnancies: A systematic review	Systematic review	Australia, UK & US	19
	Reynolds et al.	We do things differently here: The Greater Manchester approach to preventing alcohol-exposed pregnancy	Descriptive	UK	15
	Sawami et al.	Efficacy of psychological interventions to reduce alcohol consumption among pregnant and postpartum women: A systematic review	Systematic review	UK & South Africa	19
	Schölin et al.	Midwives' views on alcohol guidelines: A qualitative study of barriers and facilitators to implementation in UK antenatal care	Qualitative (thematic analysis)	UK	19
	Shah et al.	Racial/ethnic differences in prenatal and postnatal counseling about maternal and infant health-promoting practices among teen mothers	Cross-sectional	US	20
	Sijpkens et al.	Change in lifestyle behaviors after preconception care: a prospective cohort study	Prospective cohort	The Netherlands	20
	Silang et al.	eHealth interventions to treat substance use in pregnancy: A systematic review and meta-analysis.	Systematic review	Canada	20
	Smith et al.	Barriers and enablers of implementation of alcohol guidelines with pregnant women: A cross-sectional survey among UK midwives	Cross-sectional	UK	20
	Stahl & Matthews	Caring for parturients with substance use disorders	Review	US	21
	Thompson et al.	Discordance between perinatal alcohol use among women and provider counseling for alcohol use: An assessment of the Pregnancy Risk Assessment Monitoring System	Cross-sectional	US	12
	Townsel et al.	The Term Newborn: Prenatal Substance Exposure.	Statement	US	21
	Ulrich et al.	Implementation of a universal screening process for substance use in pregnancy	Implementation study	US	21
	Walker et al.	Preconception women's views of promoting preconception women's health in Australia	Qualitative	Australia	21
Level 3 Prevention					
n = 7	Cidro et al.	Putting them on a strong spiritual path: Indigenous doulas responding to the needs of Indigenous mothers and communities	Qualitative (thematic analysis)	Canada	22
	Hubberstey et al.	Wraparound programmes for pregnant and parenting women with substance use concerns in Canada: Partnerships are essential	Qualitative	Canada	22
	Kelty et al.	Pharmacotherapies for the Treatment of Alcohol Use Disorders During Pregnancy: Time to Reconsider?	Review	New Zealand	22
	Nagpal et al.	Physical activity may be an adjuvant treatment option for substance use disorders during pregnancy: A scoping review	Scoping review	Canada	23
	Patton et al.	Integrated substance use and prenatal care delivery in the era of COVID-19	Review	US	23
	Raffi et al.	Low barrier perinatal psychiatric care for patients with substance use disorder: Meeting patients across the perinatal continuum where they are	Review	US	23
	Rayment-Jones et al.	Project20: Does continuity of care and community-based antenatal care improve maternal and neonatal birth outcomes for women with social risk factors? A prospective, observational study	Qualitative	UK	23

Level 4 Prevention					
n = 8	Adams et al.	"A good mother": Impact of motherhood identity on women's substance use and engagement in treatment across the lifespan	Qualitative	US	24
	Barnett et al.	Difficult binds: A systematic review of facilitators and barriers to treatment among mothers with substance use disorders	Systematic review	US	24
	Cidro et al.	Putting them on a strong spiritual path: Indigenous doulas responding to the needs of Indigenous mothers and communities	Qualitative (thematic analysis)	Canada	22
	Hubberstey et al.	Wraparound programmes for pregnant and parenting women with substance use concerns in Canada: Partnerships are essential	Qualitative	Canada	22
	Massi et al.	Improving interagency service integration of the Australian Nurse Family Partnership Program for First Nations women and babies: A qualitative study	Qualitative	Australia	25
	O'Malley et al.	A promising approach in home visiting to support families affected by maternal substance use	Implementation study	US	25
	Troop	Beyond birth program: exploring a substance use treatment program for postpartum women	Qualitative	US	25
	Yonemoto et al.	Schedules for home visits in the early postpartum period	Cochrane review	Japan	25
Other – stigma, ethical issues, and systemic approaches					
n = 17	Aiton	Neglect of Fetal Alcohol Spectrum Disorder must end	Editorial	UK	26
	Aspler et al.	"It's ignorant stereotypes": Key stakeholder perspectives on stereotypes associated with Fetal Alcohol Spectrum Disorder, alcohol, and pregnancy	Qualitative (framework analysis)	Canada	26
	Carroll et al.	The harms of punishing substance use during pregnancy	Commentary	US	26
	Deutsch et al.	Supporting mother-infant dyads impacted by prenatal substance exposure	Narrative review	US	26
	Gonzales et al.	An Indigenous framework of the cycle of Fetal Alcohol Spectrum Disorder risk and prevention across the generations: Historical trauma, harm and healing	Qualitative	US	27
	Green et al.	Perspectives of Canadian health care providers on Fetal Alcohol Spectrum Disorder: Has anything changed in 15 years? A brief report	Cross-sectional	Canada	27
	Harding et al.	#sendwine: An analysis of motherhood, alcohol use, and #winemom culture on Instagram	Qualitative (thematic analysis)	Canada	27
	Jones et al.	Challenges and opportunities during the COVID-19 pandemic: Treating patients for substance use disorders during the perinatal period	Commentary	US	27
	MacIvor Thompson	"The offspring of drunkards": Gender, welfare, and the eugenic politics of birth control and alcohol reform in the United States	Symposium	US	27
	Matebese et al.	The shame of drinking alcohol while pregnant: The production of avoidance and ill-health	Qualitative	South Africa	28
	Mitchell-Foster et al.	Disconnected perspectives: Patient and care provider's experiences of substance use in pregnancy	Qualitative	Canada	28
	Reid et al.	Yarning about Fetal Alcohol Spectrum Disorder: Outcomes of a community-based workshop	Mixed methods	Australia	28
	Roberts et al.	Dismantling the legacy of failed policy approaches to pregnant people's use of alcohol and drugs	Commentary	US	28
	Sufrin & Knittel	Health care and social justice implication of incarceration for pregnant people who use drugs	Review	US	28

	Szewczyk et al.	A systematic review of economic evaluations of antenatal nutrition and alcohol interventions and their associated implementation interventions	Systematic review	Australia	29
	Wolfson et al.	Examining barriers to harm reduction and child welfare services for pregnant women and mothers who use substances using a stigma action framework	Scoping review	Canada	29
	Yousefi & Chaufan	'Think before you drink': Challenging narratives on foetal alcohol spectrum disorder and indigeneity in Canada	Qualitative (critical discourse analysis)	Canada	29