

# Differences in tobacco smoking and alcohol consumption among 57,757 women from early to late pregnancy: A state-representative study in Queensland, Australia

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## INTRODUCTION

- Tobacco and alcohol use during pregnancy remain common in Australia, with nearly 1 in 4 women smoking and over 1 in 3 consuming alcohol while pregnant, posing serious risks to maternal and child health<sup>1,2</sup>.
- Alcohol and tobacco are linked to significant complications such as low birth weight, preterm delivery, stillbirth, and long-term developmental and behavioural challenges in children, including fetal alcohol spectrum disorder (FASD)<sup>3-12</sup>.
- Findings from two Australian longitudinal birth cohorts suggest that patterns of alcohol and tobacco use change across pregnancy, with many women reducing or stopping after learning they are pregnant<sup>13-15</sup>. However, a significant proportion continue alcohol and tobacco use into later stages of pregnancy.

## AIM

- The aim of this study was to compare tobacco smoking and alcohol consumption from early (<20 weeks) to late (≥20 weeks) pregnancy in a state-representative cohort of Queensland women using administratively collected aggregate perinatal data.
- We also aimed to investigate sociodemographic characteristics associated with continued alcohol and tobacco use in early and late pregnancy.

	SMOKING	
	RELATIVE RISK (95%CI)	
	Early pregnancy (<20 weeks gestation)	Late pregnancy (≥20 weeks gestation)
Nulliparous	<b>0.70 (0.65-0.74)</b>	<b>0.90 (0.84-0.98)</b>
Born in Australia or New Zealand	<b>1.27 (1.13-1.42)</b>	<b>1.28 (1.09-1.50)</b>
Lived outside of the capital city (Brisbane)	<b>1.44 (1.36-1.52)</b>	<b>1.22 (1.15-1.30)</b>
Recorded mental health condition(s)	<b>1.56 (1.48-1.65)</b>	<b>1.53 (1.44-1.63)</b>
≥14 weeks gestation at first antenatal visit	<b>1.94 (1.83-2.07)</b>	<b>2.10 (1.97-2.25)</b>
Edinburgh Postnatal Depression Scale score ≥11	<b>2.45 (2.28-2.62)</b>	<b>2.43 (2.25-2.62)</b>
Not married or partnered	<b>3.00 (2.84-3.17)</b>	<b>2.97 (2.79-3.16)</b>
Young pregnancy (<20 years old)	<b>3.54 (3.15-3.98)</b>	<b>3.23 (2.83-3.67)</b>
<2 antenatal visits throughout pregnancy	<b>8.57 (6.70-10.96)</b>	<b>9.52 (7.39-12.25)</b>

  

	ALCOHOL CONSUMPTION	
	RELATIVE RISK (95%CI)	
	Early pregnancy (<20 weeks gestation)	Late pregnancy (≥20 weeks gestation)
Lived outside of the capital city (Brisbane)	<b>0.77 (0.72-0.83)</b>	0.95 (0.78-1.16)
Born in Australia or New Zealand	1.08 (0.98-1.18)	1.17 (0.84-1.62)
≥14 weeks gestation at first antenatal visit	<b>1.15 (1.05-1.26)</b>	<b>1.87 (1.50-2.33)</b>
Nulliparous	<b>1.19 (1.10-1.28)</b>	<b>0.78 (0.62-0.98)</b>
Young pregnancy (<20 years old)	<b>1.40 (1.15-1.70)</b>	1.50 (0.90-2.53)
Edinburgh Postnatal Depression Scale score ≥11	<b>1.43 (1.29-1.57)</b>	<b>2.64 (2.02-3.44)</b>
Recorded mental health condition(s)	<b>1.49 (1.39-1.60)</b>	<b>1.47 (1.22-1.79)</b>
Not married or partnered	<b>1.52 (1.41-1.64)</b>	<b>1.98 (1.63-2.42)</b>
<2 antenatal visits throughout pregnancy	<b>2.62 (1.79-3.84)</b>	<b>14.75 (9.31-23.38)</b>

## KEY FINDINGS

- 57,757 women gave birth across Queensland in 2022-23.
- 10.7% of women smoked in early pregnancy vs 7.9% in late pregnancy (Absolute Risk Reduction [ARR]=2.8%, 95%CI 2.5-3.1%).
- 6.0% of women consumed alcohol in early pregnancy vs 0.7% in late pregnancy (ARR=5.1%, 95%CI 4.9-5.3%).
- Women who were single, had fewer than two antenatal visits, started antenatal care late (≥14 weeks), or had mental health conditions were significantly more likely to continue smoking and drinking during pregnancy.
- Having **<2 antenatal visits was the strongest predictor of continued substance use**, increasing the risk of continued smoking in late pregnancy by ~10-times and continued alcohol use by ~15-times.
- Antenatal care initiation ≥14 weeks also increased risk** of continued smoking in late pregnancy by over 2-times and continued alcohol use by 1.87-times.

## SCIENTIFIC AND CLINICAL SIGNIFICANCE

- Substance use declines during pregnancy, but not uniformly:** Smoking decreased by 2.8% and alcohol by 5.1% from early to late pregnancy, suggesting greater responsiveness to alcohol-related messaging.
- Smoking is harder to quit:** The smaller reduction in smoking may reflect stronger nicotine dependence and less targeted public health messaging compared to alcohol.
- Antenatal care is critical:** Women with <2 antenatal visits had the highest risk of continued smoking and alcohol use during pregnancy, highlighting the importance of early, frequent, and culturally responsive antenatal care.
- Mental health and social factors matter:** Single women, those with mental health conditions, and those who began antenatal care late (≥14 weeks gestation) were significantly more likely to continue both smoking and consuming alcohol, underscoring the need for integrated psychosocial support.
- Policy implications:** Strengths-based, non-judgmental care models and targeted public health campaigns are needed to address persistent substance use and improve outcomes for underserved pregnant populations.
- First Nations data not reported:** The study did not report differences for First Nations women due to the absence of culturally appropriate variables and to avoid reinforcing deficit-based comparisons. This aligns with Indigenous data sovereignty principles and highlights the need for change to current administrative health data collection and reporting practices.



Scan the QR code to read the full study online.

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