

## ORIGINAL ARTICLE

# Domestic and family violence and associated maternal and perinatal outcomes: A population-based retrospective cohort study

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## Abstract

**Background:** Domestic family violence (DFV) is a global health concern affecting one in three women worldwide. Women are vulnerable to DFV throughout their life; however, pregnancy introduces an increased risk of experiencing DFV for millions of women and birthing people.

**Methods:** Routinely collected data from two hospitals in one local health district in New South Wales, Australia, were examined to determine the prevalence of DFV from 2010 to 2019. Demographics and outcome factors were compared by a reported history of DFV. Multivariable logistic regression was used to assess for predictors of DFV and to assess DFV as a predictor of adverse maternal and perinatal outcomes.

**Results:** One percent of women (538/52,469) experienced DFV in the past year. Women experiencing domestic violence were more likely to be younger and have previous children, and had higher Edinburgh Depression Scores. These women were more likely to experience stillbirth (1.5% vs. 0.6%,  $p = 0.005$ ). Maternal age < 25 years, cigarette smoking, alcohol use in pregnancy, mental health issues, and place of birth were associated with a recent history of DFV after adjusting for confounders. Recent DFV was associated with preterm birth and mental health issues but was not associated with admission to the neonatal nursery, small-for-gestational-age birthweight, or caesarean section after adjusting for confounders.

**Conclusion:** There was a relationship between DFV and poorer health outcomes for both women and their babies. This study highlighted that stillbirth is high among the population of women who experience DFV when compared to women who do not experience DFV.

## KEYWORDS

domestic and family violence, health outcomes, newborn, pregnancy, stillbirth

## 1 | INTRODUCTION

Domestic and family violence (DFV) has been recognized as a global health problem of pandemic proportions and globally affects one-third of all women.<sup>1</sup> A 2018 analysis of prevalence data from 2000 to 2018 across 161 countries conducted by the WHO found nearly one in three women have been subjected to physical and/or sexual violence.<sup>2</sup> Domestic and family violence is a broad term that encompasses violence between family members, intimate partners, and former partners. In Australia, domestic violence is defined as 'violent behaviour between current or former partners, typically where one partner tried to exert power and control over the other, usually through fear'.<sup>3</sup> It involves a pattern of behavior aimed to control and dominate a person through tactics of fear; coercion, isolation, threats and violence, including but not limited to emotional, verbal, social, economic, physical, sexual, and psychological abuse.<sup>4</sup>

Pregnancy has been described as a major life-changing event for women, and culturally, pregnancy is often viewed as a time of happiness and expectancy in people's lives. However, pregnancy can also be stressful and anxiety-provoking. Regrettably, pregnancy can also introduce an increased risk of experiencing DFV for millions of women of reproductive age worldwide. Research suggests two-thirds of pregnant women experienced violence from a current or former partner in 2018.<sup>4</sup> Domestic and Family Violence can have a severe and enduring effect on physical and mental health. Using a burden of disease methodology, DFV was found to be the leading risk factor contributing to death, disability and illness in women aged 25 to 44 years of age, in Australia.<sup>5</sup> The health costs associated with DFV are immense, as it not only includes the cost to treat the immediate physical and psychological trauma of violence but is associated with longer-term health costs such as depression and anxiety and substance abuse. In 2021/22 in Australia, the total cost of DFV against women and their children is estimated to be \$15.6 billion. The largest contributor is related to pain, suffering and premature mortality at 7.5 billion.<sup>6</sup> DFV during pregnancy is considered a complex issue influenced by a range of individual, relationship, community, and societal factors.<sup>2</sup> Research has identified several factors and reported risks for DFV during pregnancy include low level of education, women under 24 years of age, low income, limited social support. Women who have partner with a history of violence and abuse, or a history of unemployment are also at an increased risk of DFV during pregnancy.<sup>7-9</sup>

Adverse consequences range from acute injury to chronic health, including mental health issues, poor

pregnancy outcomes including preterm birth, miscarriage, low birth weight, maternal suicidality, and drug and alcohol abuse.<sup>9-11</sup>

Pregnancy is an important time for screening for DFV, as it presents an opportunity to identify DFV as the majority of pregnant women will have contact with a healthcare provider during pregnancy.<sup>12</sup> However, in Australia, data collection and reporting on DFV in pregnancy in Australia is inconsistent across and within jurisdictions.<sup>12</sup> While there is limited evidence for the efficacy of interventions to reduce DFV in pregnancy, some promising areas of practice are emerging.<sup>1</sup> In NSW routine DFV screening involves asking all women aged 16 years and over (and all antenatal clients and early childhood health service clients) presenting to key NSW Health services about recent experiences of domestic violence, regardless of whether or not there are signs of abuse, or whether domestic violence is suspected. Routine screening for DVF was carried out as per the NSW clinical guidelines by asking women a routine set of questions (see File S1). All midwives are expected to conduct mandatory routine DFV screening during the antenatal period.

This study aimed to determine the prevalence of DFV of women at the antenatal booking visit and investigate the association between DFV and maternal and perinatal outcomes.

## 2 | METHODS

### 2.1 | Study design and setting

This was a retrospective observational study of maternity services data from two hospitals located in one local health district in New South Wales (NSW), Australia.

The study population was women who attended the DFV screening at a booking visit at Royal Prince Alfred Hospital (RPAH) or Canterbury Hospital from January 2010 to December 2019. Both hospitals are located in metropolitan in Sydney, Australia, with RPAH providing care for 5000 pregnant women and Canterbury Hospital caring for 1800 pregnant women each year. Following the New South Wales policy on screening for DFV, pregnant women were screened as part of the routine antenatal care by the midwives. Screening was conducted in a sensitive and safe way by midwives who were trained to use the screening tool.

The study's primary outcome was reported 'recent DFV', which is defined as DFV within the past year. Following the preamble, the first screening question asked, "Within the last year have you been hit, slapped or hurt, in other ways by your partner or ex-partner"? Other outcomes included risk factors and adverse maternal and perinatal outcomes.

## 2.2 | Sample size and participants

### 2.2.1 | Inclusion criteria

All women who attended antenatal care and were screened for DFV by midwives in the antenatal clinic at the first antenatal booking visit and gave birth at the two maternity hospital sites between the years of 2010 and 2019.

### 2.2.2 | Exclusion criteria

Women who attended antenatal care between the years of 2010 and 2019 but were not screened for DFV and had no data for the question 'Are you frightened of your partner or ex-partner?'

Demographic and clinical data were collected from the electronic maternity database maintained by midwives. The data extracted were from women who were asked about a history of DFV and included variables such as the incidence of threatened premature labor, antepartum hemorrhage; psychosocial risks (evidence of DFV); depressive and anxiety symptoms, smoking and alcohol intake, substance use and birth details (such as gestation at birth, birth type), and neonatal outcomes (such as Apgar scores, birth weight, admission to neonatal intensive care unit).

Countries of birth were grouped into 'Western', 'South Asia', 'South East Asia', 'Middle East', 'Africa' or 'Other'. Psychosocial well-being screening was measured through the Edinburgh Depression Score. We manually reviewed the maternal medical records of those who experienced DFV and stillbirth.

The results were reported according to STROBE guidelines.<sup>14</sup>

## 2.3 | Statistical analysis

Demographics and other factors were compared by a history of DFV in the past year. Categorical outcome measures were compared by proportions using chi-squared tests. For normally distributed data, means were compared using *t* tests, and data were summarized using means and standard deviations. For non-normally distributed data, medians were compared using the Wilcoxon rank-sum test, and data were summarized using medians and interquartile ranges.

A planned logistic regression analysis was performed to assess for predictors of the primary outcome, DFV. Continuous variables that were not linearly related to the logit outcome were categorized. These variables, selected a-priori, were maternal age, body mass index,

cigarette smoking, alcohol use, recreational drug use, mental health issues, parity, and region of birth. Planned logistic analyses were also performed to assess DFV as a predictor of preterm birth, NICU admission, mental health issues, small-for-gestational-age infant, and caesarean section. Candidate co-variables were maternal age, body mass index, cigarette smoking, alcohol use, recreational drug use, mental health issues, parity, and region of birth. Complete case analyses were used. Co-variables with  $p > 0.05$  which did not substantially affect point estimates of the association between explanatory variables and the outcome variable were removed from the models. Following expert review, an additional logistic regression was performed to assess the association between DFV and stillbirth. We limited this analysis to 28 weeks gestational age or more to exclude terminations of pregnancy for fetal abnormalities.

Analyses were performed using Statistical Analysis Software (SAS/STAT) (version 9.4; SAS Institute, Cary, NC).

This study underwent institutional board review and received approval from the Sydney Local Health District ethics committee (Protocol No X20-0331) on 14th Jan 2021.

## 3 | RESULTS

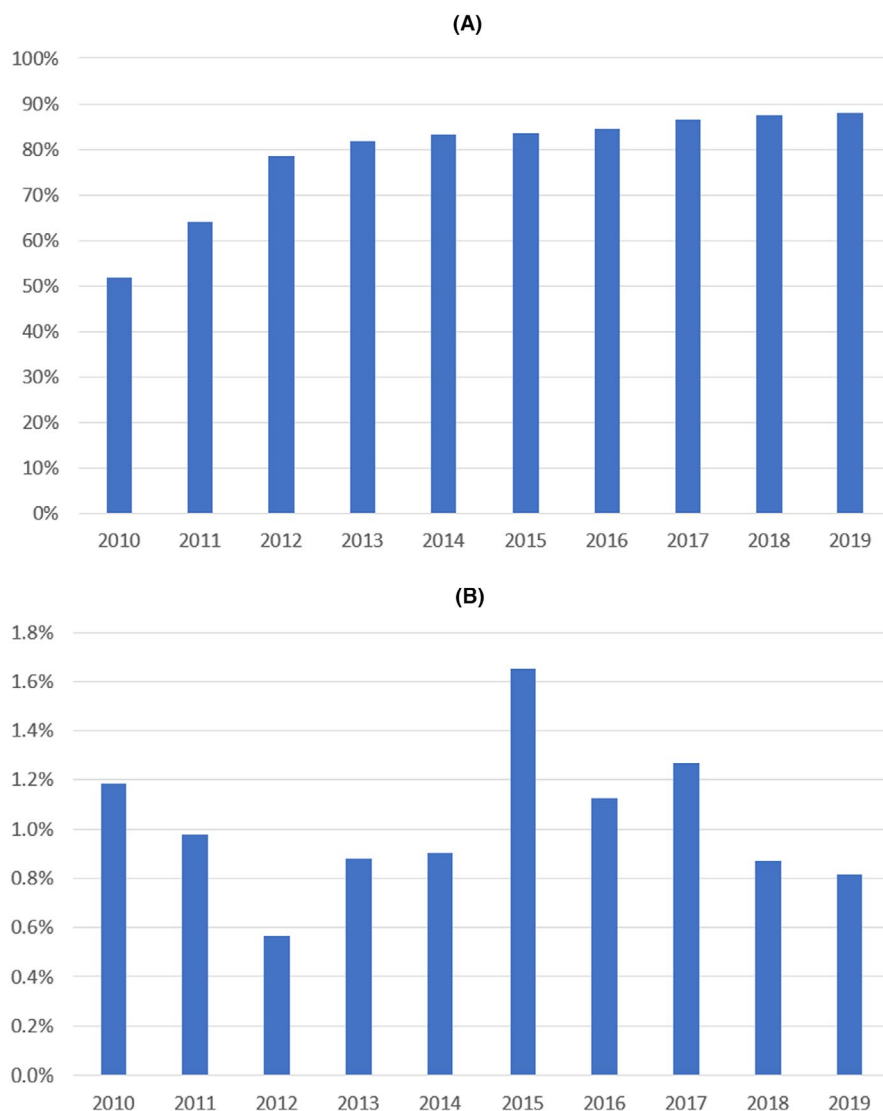
### 3.1 | Characteristics of the study population

In the 10 years from 2010 to 2019, there were 66,704 births in the two participating hospitals of whom 52,469 (79%) had a documented answer to the question about DFV within the preceding year. The question had a documented answer in 52% of women in 2010 which progressively increased to 88% of women in 2019 (Figure 1A). Overall, 538/52,469 (1.0%) women had experienced DFV with varying rates from year to year (Figure 1B).

### 3.2 | Characteristics of cases

Women with recent DFV were more likely to be younger, have had children in the past, to be born in South Asian or South East Asian countries, attend a midwifery or doctor-led public hospital clinic, have experienced a preterm birth or early pregnancy loss (<20 weeks), to have multiple pregnancies, to use cigarettes, alcohol or recreational drugs, to have had a sexually transmitted disease, or a small for gestational age baby (see Tables 1 and 2).

Women with recent DFV were less likely to have a planned pregnancy, more likely to be unhappy or



**FIGURE 1** (A) Documented answer to domestic violence question. (B) Answered 'Yes' to domestic violence question. [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1111/birt.12863)]

uncertain about the pregnancy, more likely to have mental health problems, and had higher Edinburgh Depression Scores (see Table 3). Women with recent DFV were more likely to experience preterm birth and less likely to have perineal trauma (see Table 4).

Stillbirth was more common among women with recent DFV (1.5% vs. 0.6%,  $p=0.005$ ) and on average, gave birth to infants with lower birth weights who were more likely to require resuscitation at birth, more likely to require admission to the neonatal intensive care unit and less likely to be breastfed at the time of discharge (see Table 5). Among the eight women with recent DFV who experienced stillbirth, one had preterm prelabor rupture of membranes at 20 weeks, four presented with symptoms of possible placental abruption (vaginal bleeding or abdominal pain at 20, 33, 34, and 38 weeks), one had acute twin-twin transfusion syndrome at 28 weeks, one had an unexplained fetal demise in utero at 39 weeks, and one had shoulder dystocia at 40 weeks gestational age.

Among 532 women with recent DFV, 468 (95%) reported that they were safe to be at home after their

appointment. Among 256 women with recent DFV with children, 99 (33%) women reported that their children had been hurt or witnessed violence. Twenty-eight of 281 (10%) reported that their children were not safe. The denominators are different because some women did not have a recorded answer to these questions.

Table 6 shows the results of the multivariable logistic regression for recent DFV as the outcome. Maternal age < 25 years, cigarette smoking, alcohol use in pregnancy, mental health issues, and place of birth were associated with a recent history of DFV.

In the logistic regression analyses for secondary outcomes, recent DFV was associated with preterm birth ( $n=27,873$ ; OR 1.5 [95% CI 1.03–2.1];  $p=0.03$ ) after adjusting for all of the candidate variables listed in the methods section except for maternal alcohol use; and it was associated with mental health issues ( $n=27,873$ ; OR 3.6 [95% CI 2.8–4.6];  $p<0.0001$ ) after adjusting for all of the candidate variables.

Recent DFV was not associated with NICU admission ( $p=0.25$ ) or small-for-gestational-age infants ( $p=0.36$ )

TABLE 1 Demographics.

Demographics	Domestic violence, <i>n</i> <sup>a</sup>		No Domestic Violence, <i>n</i> <sup>a</sup>		<i>p</i>
Age (years) (mean/SD)	538	31 (6.0)	51,931	32 (5.0)	<0.0001
BMI (median/IQR)	489	23 (20, 26)	47,844	22 (20, 26)	0.99
BMI category	489		47,844		0.56
<20		96 (20)		8569 (18)	
20–24		229 (47)		24,209 (51)	
25–29		110 (22)		9954 (21)	
30–34		37 (7.6)		3390 (7.1)	
35+		17 (3.5)		1722 (3.6)	
Country of birth	538		51,919		<0.0001
Western <sup>b</sup>		282 (52)		28,151 (54)	
South Asia		74 (14)		7372 (22)	
South East Asia		59 (11)		4939 (14)	
Middle East		19 (3.5)		2144 (4.1)	
Africa		21 (3.9)		856 (1.6)	
Other		34 (6.3)		1939 (3.7)	
Aboriginal/Indigenous	537	53 (9.9)	51,787	868 (1.7)	<0.0001
Nulliparous	535	237 (44)	51,721	26,667 (52)	0.0008
Model of care	507		49,390		<0.0001
Midwifery-led ANC		256 (50)		18,846 (38)	
Doctor-led ANC		106 (21)		7654 (15)	
Shared care		84 (17)		13,278 (27)	
Case-load midwifery		53 (10)		7515 (15)	
Private obstetrician		7 (1.4)		2063 (4.2)	
None		1 (0.2)		34 (0.1)	

Abbreviations: ANC, antenatal clinic; IQR, interquartile range; SD, standard deviation.

<sup>a</sup>Percentages in parentheses unless otherwise specified.

<sup>b</sup>Australia, New Zealand, Europe or North America. Uses Joseph et al.<sup>30</sup>

after adjusting for all candidate variables except maternal alcohol use; and it was not associated with caesarean sections ( $p=0.73$ ) after adjusting for all candidate variables except for maternal alcohol use, recreational drug use, and maternal mental health issues.

Among births at gestational ages of 28 weeks or more, recent DFV was associated with stillbirth after adjusting for gestational age group ( $n=47,567$ ; OR 3.4 [95% CI 1.4–8.0];  $p=0.006$ ). In this post-hoc analysis, a larger sample size was possible because there were minimal missing data for gestational age, the other variables being excluded in the stepwise regression.

## 4 | DISCUSSION

The main findings from our study indicate that maternal age <25 years, cigarette smoking, alcohol use in pregnancy, mental health issues, preterm birth <37 weeks and place of birth were associated with a recent history of DFV. Women experiencing DFV during pregnancy are

more likely to experience stillbirth and have their baby admitted to NICU although DFV did not predict NICU admission in the multivariable analysis. These findings are important because there is minimal evidence of the prevalence, trends and associated factors that impact DFV during pregnancy in an Australian setting. Our study found an overall prevalence of DFV of 1% which is lower than the estimated number across Australia of 5% (18 years and over) of women who encounter violence during pregnancy from their previous or current partner.<sup>12</sup> The overall rate of DFV screening during pregnancy at the two hospital sites improved from 52% in 2010 to 88% of women in 2019. Noteworthy, the disclosure rate quoted is for the point of screening at the first booking visit only and therefore does not include disclosures made in subsequent visits, which are not captured in the hospital's electronic maternity system.

The low disclosure rate should be of concern but it is not surprising. Due to the sensitivity of DFV, some women are unwilling to openly discuss their DFV experience and history at their very first antenatal booking appointment



Obstetric History	Domestic violence, <i>n</i> <sup>a</sup>		No domestic violence, <i>n</i> <sup>a</sup>		<i>p</i>
Previous caesarean section	538	108 (20)	51,907	9353 (18)	0.22
≥1 previous pregnancy under 20 weeks	536	248 (46)	51,742	18,201 (35)	<0.0001
Multiple pregnancy	538	22 (4.1)	51,914	1289 (2.5)	0.02
Cigarette smoking	473	98 (21)	46,053	1964 (4.3)	<0.0001
Alcohol	463	29 (6.3)	44,876	1203 (2.7)	<0.0001
Substance use (past or current)	401	16 (4.0)	35,846	284 (0.8)	<0.0001
Sexually transmitted disease	328	25 (7.6)	41,176	280 (0.7)	<0.0001
Small for gestational age (birthweight <10th centile) (>24 weeks only) <sup>b</sup>	534	66 (12)	51,664	5022 (9.7)	0.04

<sup>a</sup>Percentages in parentheses unless otherwise specified.

<sup>b</sup>Uses Joseph et al.<sup>30</sup>

Psychosocial	DFV, <i>n</i> <sup>a</sup>		No DFV, <i>n</i> <sup>a</sup>		<i>p</i>
Planned pregnancy	441	189 (43)	43,696	252 (57)	<0.0001
“Happy” about the pregnancy	437		43,657		<0.0001
Yes		424 (97)		43,409 (99)	
Uncertain		9 (2.1)		142 (0.3)	
No		4 (0.9)		106 (0.2)	
Had treatment for mental health problems	435	179 (41)	41,375	7233 (17)	<0.0001
Depressive and anxiety symptoms “Have you ever felt anxious or depressed for 2 or more weeks”	444	237 (53)	42,965	9210 (21)	<0.0001
Edinburgh Depression Score (median/IQR)	289	8 (4, 12)	26,889	4 (2,7)	<0.0001

<sup>a</sup>Percentages in parentheses unless otherwise specified.

due to a lack of trust (no relationship formed) or due to fear of their partner, fear of losing their children, lack of trust and or feelings of embarrassment or shame that some women experience.<sup>13</sup>

The association of DFV with stillbirth and preterm birth is a concern and requires further exploration. Possible reasons for stillbirth may have been traumatic abruption and abdominal trauma due to physical violence may have led to preterm labor. Another potential causation for the higher incidence of preterm birth may be associated factors such as cigarette smoking and substance misuse which are also associated with placental abruption. Previous international research has demonstrated the significant impact of DFV on women's health behaviors during pregnancy, including higher rates of smoking, alcohol and substance misuse.<sup>17,18</sup> Violence during pregnancy has been associated with increases in tobacco, alcohol and prescribed and illegal drugs.<sup>17,19</sup>

Secondary maternal and perinatal outcomes that DFV impacts may be the association of mental health issues (depression) and substance abuse. In this study, women who experienced DFV were less likely to have a planned pregnancy, more likely to be unhappy or uncertain about their pregnancy, more likely to have mental health problems, and higher Edinburgh Depression Scores. It is important to recognize that Edinburgh Postnatal Depression Scale is a tool developed to score women for depression over the previous 7 days and although validated for pregnancy and the postpartum period, it is not a tool designed to identify the presence of other psychosocial conditions. Nevertheless evidence suggests DFV during pregnancy contributes significantly to several mental health problems such as anxiety, depression, and post-traumatic stress disorder (PTSD).<sup>9,20</sup> DFV and maternal mental illness are bi-directional interconnected and remain a major source of maternal

TABLE 2 Obstetric and clinical characteristics.

TABLE 3 Psychosocial history.

TABLE 4 Labour, birth and postpartum period.

	DFV, <i>n</i> <sup>a</sup>		No DFV, <i>n</i> <sup>a</sup>		<i>p</i>
Gestational age at birth (median/IQR)	538	39 <sup>+0</sup> (38 <sup>+0</sup> , 40 <sup>+0</sup> )	51,931	39 <sup>+2</sup> (38 <sup>+3</sup> , 40 <sup>+1</sup> )	<0.0001
Gestational age group (weeks)	538		51,931		<0.0001
20 to <32		19 (3.5)		704 (1.4)	
32 to <37		50 (9.3)		3070 (5.9)	
37+		469 (87)		48,157 (93)	
Epidural <sup>b</sup>	442	147 (33)	43,582	15,604 (36)	0.27
Onset of labour	538		51,914		0.046
Spontaneous		254 (47)		27,300 (53)	
Induction of labour		188 (35)		16,285 (31)	
Prelabour caesarean section		96 (18)		8329 (16)	
Mode of Birth	538		51,917		0.73
Vaginal		293 (54)		28,871 (56)	
Instrumental		78 (14)		7750 (15)	
Caesarean		167 (31)		15,296 (29)	
Perineal trauma	538		51,906		0.002
None/1st degree		343 (64)		28,797 (55)	
2nd degree		180 (33)		21,213 (41)	
3rd degree		15 (2.8)		1814 (3.5)	
4th degree		0 (0)		82 (0.2)	
Episiotomy	538	71 (13)	51,906	7943 (15)	0.18
Estimated blood loss (mL) (median/IQR)	538	300 (200, 400)	51,914	300 (200, 450)	0.50
Postpartum hemorrhage (>500 mL)	538	120 (22)	51,914	12,371 (24)	0.41

Abbreviation: IQR, interquartile range.

<sup>a</sup>Percentages in parentheses unless otherwise specified.

<sup>b</sup>Among 54,376 women with spontaneous or induced onset of labour.

morbidities.<sup>9</sup> Howard and colleagues' systematic review found a three-fold increase in the odds of depression in the postnatal period for women who experienced DFV during pregnancy.<sup>9</sup>

Another Australian study by Dhaleen et al. 2020 explored the relationship between intimate partner violence in an ethnically diverse group of Australian pregnant women over 10 years. Similar to this study a disclosure of DFV at the antenatal booking appointment was associated with higher levels of psychosocial risks including higher Edinburgh Postnatal Depression Scores, history of anxiety and depression and threatened preterm labor,<sup>21</sup> confirming the association of DFV and increased association of psychosocial issues.

Screening for DFV typically occurs when a client is asked a series of questions that seek to determine if that person is experiencing, or is at risk of, violence in their intimate relationship. Screening may consist of a few short open-ended questions and be facilitated by the use of forms or other assessment tools.<sup>12</sup> In pregnancy screening for DFV in maternity settings provides an opportunity to identify DFV. Midwives and other healthcare

professionals working in perinatal and maternal and child health services can play a critical role in early intervention by identifying DFV and referring women and children to appropriate support agencies. However, overall data collection on the exact rates of DFV in pregnancy in Australia continues to be inadequate as there are no legislated guidelines or mandates to collect such data, and currently, each State has different DFV recommendations.<sup>15</sup>

Domestic family violence during pregnancy constitutes either a direct cause or a marker of complex interactions of related medical and social conditions that affect pregnancy. DFV is a significant risk factor for poor maternal health which may directly increase the risk of developing pregnancy-related complications, such as miscarriage, premature rupture of membranes and stillbirth. Similarly, several factors have been identified that act indirectly to increase the occurrence of adverse pregnancy outcomes, including but not limited to delayed antenatal care, and poor physical and mental health.<sup>16,17</sup>

Little is known regarding the mechanism of association between partner violence and substance use during pregnancy, other than some women may use substances

TABLE 5 Newborn outcomes.

	Domestic violence, <i>n</i> <sup>a</sup>		No domestic violence, <i>n</i> <sup>a</sup>		<i>p</i>
Stillbirth	538	8 (1.5)	51,931	296 (0.6)	0.005
5' Apgar Score (median/IQR)	538	9 (9, 9)	51,840	9 (9, 9)	0.006
5' Apgar Score <7	538	19 (3.5)	50,840	1326 (2.6)	0.16
Birthweight (kg) (median/IQR)	538	3.2 (2.9, 3.6)	51,902	3.3 (3.0, 3.6)	<0.0001
Female neonatal sex (undetermined excluded)	538	268 (50)	51,926	25,156 (48)	0.53
Neonatal resuscitation	538		51,884		0.0002
Cardiac massage		3 (0.6)		284 (0.5)	
Intubation		15 (2.8)		458 (0.9)	
IPPR		57 (11)		4582 (8.9)	
CPAP		4 (0.7)		381 (0.7)	
Oxygen		20 (3.7)		1871 (3.6)	
None		439 (82)		44,308 (85)	
Baby Admitted to NICU	538	93 (17)	51,931	5655 (11)	<0.0001
Infant feeding at discharge	514		50,862		<0.0001
Exclusive breast feeding		367 (71)		40,332 (79)	
Formula feeding		51 (9.9)		2162 (4.3)	
Mixed feeding		96 (19)		8368 (16)	

Abbreviations: CPAP, continuous positive airway pressure; IPPR, intermittent positive pressure respiration; IQR, interquartile range; NICU, neonatal intensive care unit.

<sup>a</sup>Percentages in parentheses unless otherwise specified.

including tobacco use as a coping mechanism or self-medicate.<sup>19</sup> Regardless, research indicates that substance use in pregnancy influences the growth rate of the fetus, yet it may not be realistic for women experiencing partner violence to abstain from harmful substances during pregnancy until the cause of the stress i.e. DFV is addressed.

Previous studies have suggested that scheduled repeated questioning about DFV during pregnancy may contribute to increased DFV detection<sup>13,20</sup>; however, so far, no interventional study has tested this. However, as the pregnancy proceeds, women may develop a relationship of trust with their midwife which, in turn, may help facilitate their disclosure. As a result of increasing vulnerability, women may be more likely to disclose their experiences of DFV in the middle or towards the end of their pregnancy than at the beginning. This suggests that a single screening episode early in pregnancy may not be enough for the detection of DFV.

Although there is some evidence that screening for DFV is becoming more accepted within acute healthcare settings, the precise benefits, and how often screening should occur remain open to debate. There are some contending that screening must wait until after a trusting relationship has been built, and avoid re-traumatization and a lack of engagement through apprehension.<sup>22</sup> An Australian study in 2016 highlighted how building up a relationship with

women over time acts as an enabler for addressing DFV in pregnancy.<sup>23</sup> Currently in NSW pregnant women are normally screened for DFV once usually at the first antenatal visit, however, asking once may not be enough. For pregnant or parenting adolescents, multiple screenings may be more beneficial because pregnancy and the postpartum period are times when DFV may commence or escalate.<sup>24</sup> In addition, consistent screening lets the pregnant woman know that midwives caring for them are concerned and that help is available should they require it.<sup>24,25</sup> Routine screening for DFV has been identified as an optimal time for health care professionals to detect and provide assistance to women who are experiencing DFV.<sup>13,24</sup>

Advocates of multiple screening suggest that screening should occur at the first antenatal visit, at least once per trimester, and at the postpartum check-up.<sup>26</sup> Australian States such as Queensland recommend midwives screen women during the engagement with maternity services at the first antenatal appointment, at 28 and 36 weeks.<sup>27</sup> However, future studies need to focus on determining the effectiveness of multiple screening during pregnancy, and whether this will increase self-disclosure rates and improve maternal and neonatal outcomes.

Previous research has identified midwives are reluctant to screen pregnant women for DFV if they do not feel skilled to respond to a positive disclosure of violence or



**TABLE 6** Multivariable logistic regression for factors associated with domestic violence among 27,873 women who gave birth between 2010 and 2019.

Factor	OR (95% CI)	p
Maternal age (years)		
<25	2.5 (1.7–3.5)	<0.0001
25–29	1.1 (0.82–1.6)	
30–34	0.9 (0.67–1.2)	
35+	1.0 <sup>a</sup>	
Parous <sup>b</sup>	1.3 (1.05–1.7)	0.02
Maternal cigarette smoking	3.8 (2.8–5.3)	<0.0001
Maternal alcohol use in pregnancy	1.7 (1.02–2.7)	0.04
Maternal mental health issues	3.6 (2.8–4.6)	<0.0001
Maternal place of birth		
Western <sup>c</sup>	1.0 <sup>a</sup>	<0.0001
South Asia	1.5 (1.02–2.4)	
South East Asia	2.0 (1.5–2.8)	
Middle East	1.3 (0.64–2.7)	
Africa	2.4 (1.1–5.2)	
Other	3.0 (1.9–4.8)	

Note: The explanatory variables in the model were: maternal age group, parity, maternal cigarette smoking during pregnancy, maternal alcohol use during pregnancy, maternal mental health issues, and maternal region of birth.

Abbreviation: CI, confidence interval.

<sup>a</sup>Referent group.

<sup>b</sup>At least one previous pregnancy to at least 20 weeks gestational age.

<sup>c</sup>Australia, New Zealand, North America, Europe.

believes a service does not have the resources to support a woman who discloses a history of DFV.<sup>23,25</sup> Hegarty et al. who conducted research on behalf of Australia's National Research Organization for Women's Safety (ANROWS) (Sustainability of identification and response to domestic violence in antenatal care: The SUSTAIN study) allowed them to explore six different antenatal clinics across Victoria and New South Wales.<sup>28</sup> Findings from the study confirmed that not all women feel safe to disclose a history of violence with only 26% of participants opening up to a doctor or midwife about being fearful of their partner. The research found varying differences across the two states of NSW and Victoria. For instance in Victoria where screening was recently introduced when the study was conducted less than 41% of women were asked about a history of DFV whereas in NSW where routine screening has been mandated for around a decade 82.4%–98.9% of women were screened.<sup>28</sup>

The SUSTAIN study identified clear gaps in the practice of DFV screening in antenatal settings in Australia which may in some part explain such low disclose rates

despite a high screening rate in NSW. As identified by Hegarty et al.<sup>28</sup> there is need for a whole system approach which includes a culture of gender equity, an awareness of trauma-informed principles, protocols, staff training, referral pathways, support for and the recognition that staff themselves may be experiencing DFV, DFV champions, environmental and financial infrastructure and evaluation.<sup>28</sup> Reassuringly only a small percentage of women around 4% thought health care providers should not ask about DFV, so midwives should confident that women are not offended by routine screening, they understand why midwives ask about DFV in pregnancy. Indeed, almost half of the women in Hegarty et al. research believed screening should occur at every visit, a third suggested at some visits and only 14 percent believed it should be asked at the first visit only. Importantly none of the women reported any adverse effects from DFV screening.<sup>28</sup>

## 4.1 | Limitations and strengths

### 4.1.1 | Limitations

Some of the limitations of the research included data entry of the woman's history and pregnancy outcomes. The original data entry was carried out by many different clinicians, which could lead to data inaccuracy and entry, which could bias the findings in any direction. The data were only collected from two hospitals within a region of NSW and the findings may not be generalizable. In addition, this is a descriptive study that does not explain or prove causation. Data were mainly collected from women utilizing the public health system and therefore many women who had maternity care through a private provider (approximately 13.5% of women will have their care provided by a private midwife or obstetrician)<sup>29</sup> and were not captured in the data. We were also unable to identify women who had more than one pregnancy in the cohort and some women may be represented in successive pregnancies. Similarly, we were not able to identify whether the episodes of violence disclosed had occurred specifically during pregnancy or prior to pregnancy. Finally, the logistic regression for stillbirth was a post-hoc analysis and stillbirth was not a primary outcome, raising the possibility of a type I error.

### 4.1.2 | Strengths

The main strength of this study includes the data were prospectively collected and nearly complete data for all births (public patients) over 10 years, in metropolitan Sydney. It also included women from different cultural groups,

variations of age and economic status. Other strengths included the large sample size and the ability to adjust for multiple confounders.


## 5 | CONCLUSION

Domestic family violence is associated with poor maternal and neonatal outcomes and reported rates were lower than the Australian average. In this particular study, the rate of stillbirth was high among the population of women who experienced DFV when compared to women who did not experience DFV. Strategies to maximize DFV screening by a known, skilled, knowledgeable and caring healthcare professional may increase self-disclosure rates, referral, and support for pregnant women.

## DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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