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# BMJ Open

**The relationship between domestic and family violence reported at the first antenatal booking visit and obstetric and perinatal outcomes in pregnant women born in Australian and overseas: A population based study over 10 years**

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3 **The relationship between domestic and family violence reported at the first antenatal**  
4 **booking visit and obstetric and perinatal outcomes in pregnant women born in Australian**  
5 **and overseas: A population based study over 10 years**  
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## Abstract

**Objectives:** Domestic and family violence (DFV) is a global health issue affecting mainly women and is known to escalate during pregnancy and impact negatively on obstetric and perinatal outcomes. The aim of this study is to determine the incidence of DFV in a pregnant multicultural population and to determine the relationship between intimate partner violence reported at booking interview and maternal and perinatal outcomes

**Design:** This is a retrospective population based data study. We analysed routinely collected data (2006 to 2016) from the ObstetriX™ system on a cohort of pregnant women

**Setting and participants:** 33 542 women giving birth in a major health facility in Western Sydney

**Primary outcomes:** Incidence of DFV, association with DFV and other psychosocial variables and maternal and perinatal outcomes

**Result:** 4.3% of pregnant women reported a history of DFV when asked during the routine psychosocial assessment. Fifty four percent were not born in Australia and this had increased significantly over the decade. Women born in New Zealand (7.2%) and Sudan (9.1%) were most likely to report DFV at the antenatal booking visit, with women from China and India least likely to report DFV. Women who reported DFV were more likely to report additional psychosocial concerns including EPDS  $\geq 13$  (7.6%), thoughts of self-harm (2.4%), childhood abuse (23.6%) and a history of anxiety and depression (34.2%). Women who reported DFV were more likely to be Australian born, smoke and be multiparous and to have been admitted for threatened preterm labour (AOR 1.8, CI 1.28-2.39).

**Conclusions:** A report of DFV at the first antenatal booking visit is associated with a higher level of reporting on all psychosocial risks, higher antenatal admissions, especially for threatened preterm labour. More research is needed regarding the effectiveness of current DFV screening for women from other countries.

**Keywords:** intimate partner violence, domestic violence, family violence, migrant, obstetrics, perinatal, threatened preterm labour

## Strength and limitations of this study

### Strengths:

- This was an ethnically diverse population that included all women in one hospital over a 10 year period
- Detailed psychosocial and other important variables were available

### Limitations:

- We are unable to differentiate between migrants and refugees
- It is likely there is under-reporting of DFV by pregnant women, particularly in some cultural groups

**Funding statement:** This research received a partnership grant from Western Sydney University and NSW Health

**Competing interest statement:** None declared

## Background

Domestic and Family Violence (DFV) (physical, sexual or emotional) is a global health issue that affects mostly women (and some men) from different backgrounds and social groups. In 2016 the World Health Organisation (WHO) released a global plan of action to address interpersonal violence, in particular against women, girls and against children [1]. WHO stated that all forms of interpersonal violence lead to negative health outcomes and should be addressed by the health system and they identified health services as an appropriate entry point for addressing this [1]. The Australian Personal Safety Survey estimated 186 000 women had experienced violence by a current cohabiting partner. Of those who had been pregnant, one in five (21.7%) reported that violence occurred during the pregnancy and for almost two thirds of women (61.4%) this had been their first experience of violence in their relationship [2]. The prevalence of violence during pregnancy is estimated to be between 4-8% of pregnant women [3].

Global estimates of the prevalence of DFV range from 16.3% of ever partnered women experiencing violence in their lifetime in East Asia to 50% of women suffering violence in Sub Saharan Africa [4]. However, these figures may be higher as the stigma and shame associated with DFV means disclosure remains low and in some cultural groups taboos about discussing what are considered to be family problems remain [5].

Pregnant women exposed to DFV face many challenges, however migrant women who are pregnant and living in a different social-cultural environment experience additional stresses in their lives, such as conflicting cultural values, social isolation, language barriers, limited economic resources, discrimination and racism [6]. In many cultures DFV is socially accepted, abuse is not always considered criminal or even incorrect and the woman is seen as subservient to their male partner [6]. A lack of knowledge about the law regarding DFV and immigration represents a challenge for migrant women as they may fear losing custody of their child/children and their immigration status [7].

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3 A meta-analysis of risk factors for domestic violence during pregnancy found across 92  
4 studies that the average prevalence of emotional abuse was 28.4%, physical abuse was  
5 13.8% and sexual abuse was 8.0% [8]. The authors found that abuse before pregnancy and  
6 lower education level were strong predictors of abuse during pregnancy. A systematic review  
7 of domestic violence and perinatal mental health disorders including 67 papers found a  
8 three-fold increase in the odds of high level depressive symptoms in the postnatal period  
9 after having experienced domestic violence during pregnancy [9]. Post-Traumatic Stress  
10 Disorder (PTSD) symptoms were also associated with a history of DFV. No studies identified a  
11 link between puerperal psychosis or eating disorders and DFV [9].  
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15 The Australian government places a strong emphasis on supporting women who are  
16 pregnant with mental health and other psychosocial issues, with particular focus on early  
17 intervention, social inclusion and recovery and service access, coordination and continuity of  
18 care [10, 11]. The increased recognition that social and emotional problems in the perinatal  
19 period can impact negatively on outcomes for women and their babies has led a number of  
20 Australian States and Territories to introduce psychosocial assessment which includes  
21 depression screening as well as questions on DFV. This process has been supported by  
22 *beyondblue and the national perinatal depression initiative*, which has led to the production  
23 of perinatal clinical practice guidelines for health care professionals [12]. In addition, in NSW  
24 the Supporting Families Early Policy has integrated psychosocial risk assessment into routine  
25 care (Integrated Perinatal Care; IPC) during pregnancy and after the birth. The aim of this  
26 approach, is to provide a coordinated network of support for mothers and their babies [13,  
27 14]. All women when they book in for their pregnancy care in public hospitals (this is not  
28 routine in the private healthcare sector) receive a psychosocial assessment from midwives  
29 and then again from the child and family health nurse (CFHN) following birth and again at  
30 the 6–8 week postnatal check. The psychosocial screening tool includes the Edinburgh  
31 Postnatal Depression Screen (EPDS) and a series of questions that encompass seven key  
32 variables or areas of risk (Table 1). This routine screening of pregnant women is not without  
33 its concerns regarding the specific skills required in understanding, interpreting and  
34 responding appropriately to women's needs and the support provided to midwives to do this  
35 [14, 15]. This is an even more complex issue where migrant women are concerned and  
36 cultural understandings, taboos and language barriers could all have a significant influence  
37 [16].  
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46 The aim of this study was to determine the incidence of DFV in a pregnant multicultural  
47 population not born in Australia compared to Australian born women and to determine the  
48 relationship between DFV reported at booking interview and obstetric and perinatal  
49 outcomes  
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## Methods

### Study Design

This is a retrospective population based data study. We analysed routinely collected data from the ObstetriX™ system on a cohort of all pregnant women giving birth in a major health facility in Western Sydney over a ten year period (2006 to 2016) (n=33 542).

### Setting

Blacktown Hospital is located in Western Sydney, New South Wales, Australia and provides maternity services to over 3000 women per year. Blacktown is classified as a Level 4 Maternity Unit, meaning it cares for women of low to moderate obstetric risk. Western Sydney is a rapidly growing area in NSW. It has a diverse population with a high proportion of young families, multiculturalism (57 % not born in Australia) and significant socio-economic disadvantage [17]. Routine antenatal psychosocial assessment, which includes depression screening and questions on domestic violence, has been conducted routinely at this site since 2006 when it was introduced at Blacktown Hospital.

### Data sources

This study was a retrospective review of routinely collected data for a consecutive cohort of women who delivered babies at Blacktown Hospital between 01/01/2006 and 31/05/2016. Data was sourced from the Western Sydney Local Health District ObstetriX™ database, an information system that collects clinical data from first antenatal visit, through to discharge of mother and baby from the hospital.

### Variables

Variables of interest included (i) demographics, (ii) obstetric characteristics and medical risks, (iii) psychosocial risks, (iv) depressive and anxiety symptoms, (v) delivery details, and (vi) postnatal outcomes. The relationship between psychosocial risk and health outcomes were also examined.

The psychosocial screening tool questions are based on a series of known risk factors and are administered alongside the EPDS (Table 1). The booking midwife administers this screening tool in the privacy of the initial antenatal booking visit when women are around 12-20 weeks pregnant. Partners are asked not to be present or to leave when these questions are asked. If a NSW Health Interpreter was booked for the visit, the questions were asked verbally via the interpreter

### Analysis

Positive responses to the DFV questions, collected by clinical staff at the first antenatal visit, were grouped to form the dichotomous variable 'DFV' or 'no DFV' for all women. Women were grouped in non-Australian born and Australian born cohorts and for the non-Australian born cohort, the seven most commonly occurring countries of birth were examined independently. Pregnancy, labour and delivery events were then analysed utilising contingency tables and chi square results were calculated. Logistic regression techniques were applied and reported as unadjusted and adjusted odds ratios and 95 % confidence interval following adjustment for maternal age, gestation at birth, country of birth and smoking. Analysis was undertaken with IBM SPSS v.23™. Due to the number of statistical tests undertaken, a  $p$  value < 0.001 was set for significance.



Ethics approval was given by Western Sydney Local Health District (Protocol Number HREC2013/4/6.7(3697) AU RED LNR/13/WMEAD/98) and an amended approval given in 2017. A waiver of individual consent was obtained due to the de-identified nature of the data.

Table 1. Psychosocial risk variables I-IV. NSW Department of Health (2010)

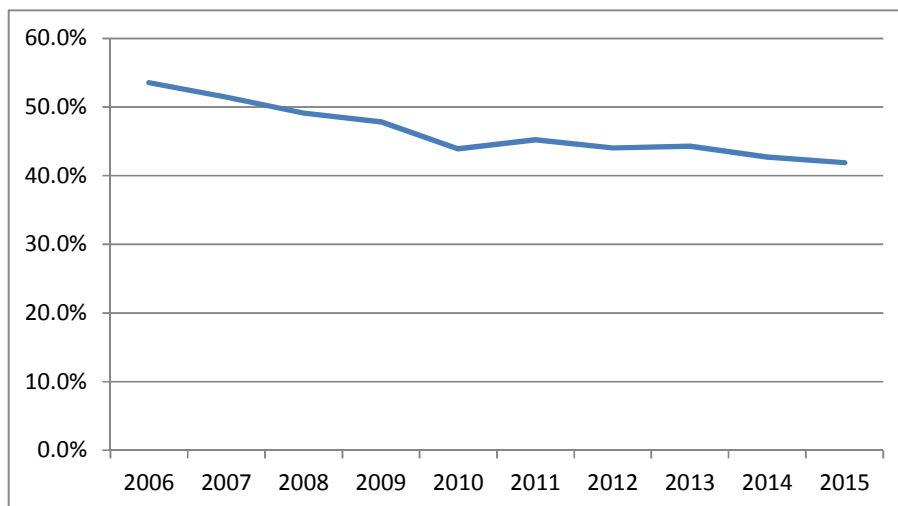
Variables (Risk Factors)	Suggested format for psychosocial assessment questions
I. Lack of support	1. Will you be able to get practical support with your baby? 2. Do you have someone you are able to talk to about your feelings or worries?
II. Recent major stressors in the last 12 months.	3. Have you had any major stressors, changes or losses recently (ie in the last 12 months) such as, financial problems, someone close to you dying, or any other serious worries?
III. Low self-esteem (including lack of self-confidence, high anxiety and perfectionistic traits)	4. Generally, do you consider yourself a confident person? 5. Does it worry you a lot if things get messy or out of place?
IV. History of anxiety, depression or other mental health problems	6a. Have you ever felt anxious, miserable, worried or depressed for more than a couple of weeks? 6b. If so, did it seriously interfere with your work and your relationships with friends and family? 7. Are you currently receiving, or have you in the past received, treatment for any emotional problems?
V. Couple's relationship problems or dysfunction (if applicable)	8. How would you describe your relationship with your partner? 9. a). <b>Antenatal:</b> What do you think your relationship will be like after the birth OR 9. b). <b>Postnatal (in Community Health Setting):</b> Has your relationship changed since having the baby?
VI. Adverse childhood experiences	10. Now that you are having a child of your own, you may think more about your own childhood and what it was like. As a child were you hurt or abused in any way (physically, emotionally, sexually)?
VII. Domestic violence. Questions must be asked only when the woman can be interviewed away from partner or family member over the age of three years. Staff must undergo training in screening for domestic violence before administering questions	11. Within the last year have you been hit, slapped, or hurt in other ways by your partner or ex-partner? 12. Are you frightened of your partner or ex-partner? <b>(If the response to questions 11 &amp; 12 is "No" then offer the DV information card and omit questions 13-18)</b> 13. Are you safe here at home? /to go home when you leave here? 14. Has your child/children been hurt or witnessed violence? 15. Who is/are your children with now? 16. Are they safe? 17. Are you worried about your child/children's safety? 18. Would you like assistance with this?
Opportunity to disclose further	19. Are there any other issues or worries you would like to mention?

## Results

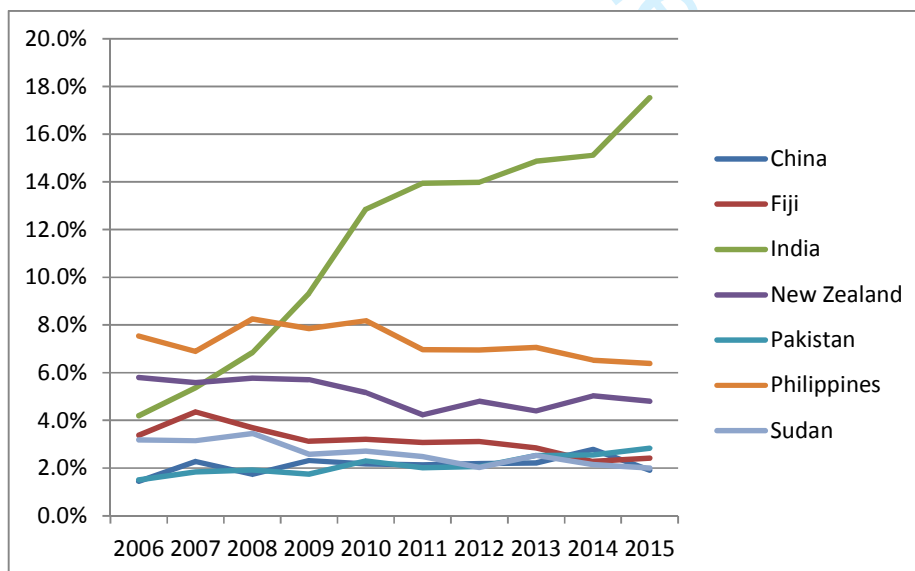
Over a ten period (2006-2016 inclusive) 33 542 women gave birth at the Western Sydney maternity unit. During this time there was a decrease in the number of women giving birth who were born in Australia over the ten year period (Figure 1). During the ten years the

increase in women born in India was most notable (4.2% to 25.7%) (Figure 2). Overall 4.3% of women reported a history of DFV. There were an additional 0.8% of women for whom screening was not undertaken due to refusal of their partner or other family member/s to leave the interview room.

**Figure 1 Changing profile of Australian born women expressed as a percentage of all births over time**



**Figure 2 Changing profile of non-Australian born women expressed as a percentage of all births over time**



There were differences in demographics between Australian and non-Australian women, with Australian women being younger, more likely to be under 20 years of age and less likely to be over 35 years of age. Australian born women were more likely to have a BMI $\geq$ 30 (Table 2).

**Table 2. Selected demographics of Australian-born and non-Australian-born women**

	Australian-born=15 459	Non-Australian-born n=18 083	p
Maternal age*	27.7 (5.75)	29.8 (5.11)	<0.001
Teenage pregnancy	7.9%	1.8%	<0.001
Pregnancy ≥35 years	13.0%	17.9%	<0.001
Nulliparous	25.0%	26.9%	<0.002
BMI≥30	28.2%	17.7%	<0.001
BMI≤18	3.0%	3.0%	0.02
Private patient	3.7%	3.4%	0.14

\*Mean and SD

During pregnancy, women born in Australia were more likely to smoke and have hypertensive disorders of pregnancy but they were less likely to have gestational diabetes and anaemia. In terms of birth outcomes women born in Australia were more likely to have a normal vaginal birth, have an epidural and give birth in the birth centre. There was a significantly higher stillbirth rate observed in women not born in Australia (Table 3).

**Table 3. Pregnancy events and outcomes of Australian-born and non-Australian-born women**

	Australian-born= 15 459	Non-Australian-born n= 18 083	p
Smoking	19.7%	4.3%	<0.001
Gestational Hypertension	2.6%	1.8%	<0.001
Gestational Diabetes	6.4%	13.6%	<0.001
Admitted for threatened premature labour	3.6%	2.8%	<0.002
Maternal anaemia	7.7%	10.2%	<0.001

Any APH	0.8%	0.9%	0.38
Gestation at delivery*	39.2 (2.01)	39.1 (1.98)	<0.001
Gestation grouped			
<28 weeks	0.6%	0.7%	N/S
29-32 weeks	0.4%	0.3%	
32-36 weeks	5.3%	5.0%	
37 week and greater	46.0	54.0%	
Normal vaginal delivery	66.4%	60.6%	<0.001
Assisted vaginal delivery	8.6%	11.2%	<0.001
Caesarean section	25.0%	28.2%	<0.001
Syntocinon usage	46.1%	53.9%	<0.001
Place of birth			
Birth Centre	9.2%	4.9%	<0.001
Born before Arrival	0.8%	0.6%	<0.001
Operating theatre	25.0%	28.2%	<0.001
Delivery Ward	65.0%	66.3%	<0.001
Amniotomy	51.9%	51.4%	0.36
Epidural usage**	19.8%	15.3%	<0.001
3 <sup>rd</sup> and 4 <sup>th</sup> degree tear**	0.5%	1.5%	<0.001
Episiotomy**	14.4%	22.6%	<0.001
PPH >1500mls	1.2%	1.4%	0.38
Birth weight*	3414 (588.22)	3290 (563.49)	<0.001
Admitted SCN/NICU	7.5%	8.6%	<0.001
Stillbirth Rate/1000 births	5.2	8.2	<0.001
5 minute Apgar <7	1.6%	1.6%	0.56
Fetal anomaly	0.8%	0.7%	0.38

\* Median, IQ range, Mann-Whitney U, \*\* as a % of vaginal births

Women who disclosed DFV at the first antenatal booking visit over this ten year period weighed slightly less and smoked more than twice as much compared to those who did not disclose DFV. These women were also more likely to be having a subsequent baby. During pregnancy they were more likely to have an admission with threatened premature labour (Table 4)

**Table 4. Maternal characteristics and perinatal outcomes for women who disclosed DFV at the first booking visit compared to those who have not**

	DFV n=1302	No DFV n=29 026	p
Maternal age*	28.7 (5.46)	28.6 (6.07)	0.29
BMI*	26.6 (6.54)	27.1 (7.17)	<0.001
Multiparous	82.7%	68.8%	<0.001
Smoking	26.8%	11.0%	<0.001
Hypertension diagnosed in pregnancy	1.5%	2.4%	0.04
Gestational Diabetes	9.4%	8.6%	0.96
Threatened premature labour	5.5%	3.1%	<0.001
Any APH	2.22%	1.55%	0.08
Antenatal admission	10.8%	8.6%	0.006
Gestation at delivery**	39.2 (1.96)	39.1 (1.90)	0.12
Delivery type			
Normal vaginal	66.7%	61.6%	
Instrumental	7.0%	10.9%	
Caesarean section	26.3%	27.5%	
Epidural usage***	29.7%	28.3%	0.36
3 <sup>rd</sup> and 4 <sup>th</sup> degree tear***	0.46%	1.3%	0.01
Episiotomy***	18.8%	25.5%	0.05
Postpartum blood transfusion	1.08%	0.83%	0.94
Birth weight*	3349 (568.0)	3344 (573.6)	0.77
Admitted SCN/NICU	8.6%	8.5%	0.88

Stillbirth Rate/1000 births	3.9	5.4	0.49
Feeding difficulty	38.6%	39.6%	0.49
Male gender	51.0%	51.3%	0.88
Fetal growth restriction	6.5%	4.8%	0.03

\* Mean, SD and t-test, \*\* Median, IQ range, Mann-Whitney U, \*\*\* as a % of vaginal births

Overall 4.3% of women reported a history (current partner 3.5%, previous partner 0.7%, other family member 0.1%) of DFV when asked during the routine psychosocial assessment at booking in for pregnancy care. Women born in New Zealand (7.2%) and Sudan (9.1%) were most likely to report DFV at the antenatal booking visit, with women from China and India least likely to report DFV. Missing data for variables relating to DFV equated to 8.7% (Table 5).

	Australia n=13 742	India n=3783	Philippines n=2193	NZ n=1520	Fiji n=939	Sudan n=784	Pakistan n=670	China n=655	Other n=6042	Total n=30 328
Domestic violence current partner	3.9%	1.6%	3.3%	6.2%	4.3%	8.2%	2.5%	1.4%	2.7%	3.5%
Domestic violence other family member	0.1%	0.1%	0.0%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	0.1%
Domestic violence previous partner	1.3%	0.2%	0.6%	0.6%	0.1%	0.9%	0.1%	0.2%	0.3%	0.8%
Domestic violence any	5.2%	1.8%	4.0%	7.2%	4.5%	9.1%	2.7%	1.5%	3.1%	4.3%
Deferred questions due to partner or family members present	1.0%	.3%	.6%	1.2%	0.7%	1.4%	1.0%	1.7%	1.1%	0.9%

**Table 5. DFV as expressed as a percentage of all women assessed**

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Women who reported DFV were more likely to report concerns when psychosocial screening was attended, including EPDS  $\geq 13$  (7.63%), thoughts of self-harm (2.4%), childhood abuse (23.6%) and anxiety and depression (34.2%). Women who reported DFV were more likely overall to be Australian born, smoke and be multiparous (Table 6).

**Table 6. Associated psychosocial issues for pregnant women reporting DFV compared to those who do not**

	DFV reported	No reported DFV	p	OR
EPDS $\geq 13$	7.6%	2.1%	<0.001	3.57 (2.84-4.47)
Thoughts of self harm	2.4%	0.5%	<0.001	5.55 (3.73-8.25)
Illegal drug use risk	4.30%	0.73%	<0.001	6.11 (4.52-8.24)
Childhood abuse	23.6%	7.6%	<0.001	3.74 (3.27-4.28)
Pregnancy related anxiety risk	5.9%	2.1%	<0.001	2.88 (2.26-3.67)
Work/relationship effect risk	23.0%	7.4%	<0.001	3.76 (3.28-4.30)
Anxiety/depression risk	34.2%	14.0%	<0.001	3.19 (2.84-3.60)
Worried about mess risk	34.3%	25.0%	<0.001	1.57 (1.39-1.76)
Positive response to 'are you generally confident' question	75.4%	84.6%	<0.001	0.24 (0.21-0.27)
Recent worry/stress risk	47.2%	22.2%	<0.001	3.20 (2.81-3.52)
Emotional support risk	8.6%	4.4%	<0.001	2.04 (1.67-2.50)
Mental health disorder	7.07%	1.72%	<0.001	4.36 (3.46-5.48)
Family history of mental health disorder	19.1%	10.7%	<0.001	1.97 (1.71-2.28)

We examined women reporting DFV at booking and the incidence of pregnancy conditions and events compared to women with no report of DFV adjusting for smoking, parity and gestational age and found significant associations with DFV and being born in Australia, smoking, being multiparous and having threatened premature labour. Women reporting DFV were however less likely to have hypertensive disease of pregnancy (Table 7).

**Table 7 Odds ratio calculations for women reporting DFV at booking and pregnancy conditions and events when compared to women not reporting DFV (ref category is DFV)**



	OR	AOR
Australian born	1.5 (1.31-1.64)	<b>1.3 (1.09-1.46)</b>
Smoking	3.0 (2.60-3.36)	<b>2.7 (2.30-3.20)</b>
Multiparous	2.3 (1.98-2.70)	<b>2.0 (1.68-2.49)</b>
GDM	1.0 (0.87-1.24)	1.1 (0.85-1.29)
HDP	0.6 (0.39-0.97)	<b>0.5 (0.32-0.91)</b>
TPL	1.8 (1.44-2.36)	<b>1.8 (1.28-2.39)</b>
APH	1.5 (1.04-2.11)	1.4 (0.95-2.19)
Vaginal	1.00	1.00
Instrumental	0.6 (0.49-0.76)	1.1 (0.90-1.25)
Caesarean section	1.1 (0.94-1.20)	
Born preterm	1.3 (1.04-1.60)	1.0 (0.71-1.33)
SCN/NICU admission	1.0 (0.77-1.16)	1.0 (0.82-1.23)
APGAR 2 (less than 7)	1.5 (1.00-2.12)	1.1 (0.64-1.80)
Breastfed	0.8 (0.73-0.93)	1.0 (0.86-1.20)

## Discussion

In this study we aimed to determine the incidence of DFV over 10 years in a pregnant multicultural population and to compare characteristics of those not born in Australia with those born in Australia. We also aimed to determine the relationship between DFV reported at the antenatal booking interview and selected obstetric and perinatal outcomes.

Australia has a large population of both economic and humanitarian migrants and there has been a steady increase in new arrivals over the past decade in some metropolitan locations, including the study site. Understanding the specific health care needs of migrant women in pregnancy and following birth is important to inform health service design and delivery and ensure the best health outcomes for women and babies. We found a dramatic increase in the number of women born overseas (2006 47% -2016 62%) with the largest increase being in women born in India. We also found differences in demographics and obstetric outcomes between Australian and non-Australian born women, with those not born in Australia tending to be older, less likely to have a BMI of  $\geq 30$  compared to those born in Australia. They are also much less likely to smoke and much more likely to have gestational diabetes. These differences were identified previously in our analyses of the state-wide population [18, 19].

Overall a low proportion of women disclosed DFV (4.3%). This is comparable with, or a little lower than other Australian [20] and international [3] studies that also estimated DFV prevalence to be between 4-8% of pregnant women. However, this is very likely to reflect under-reporting by women, as demonstrated by James, Brody and Hamilton (2013), the prevalence of DFV in pregnancy is close to 20% [21]. Furthermore, in NSW the DFV

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3 screening questions ask directly about physical abuse which was estimated to be around  
4 13.8% [22].  
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6 The Maternal Health Study conducted in one Australian state (Victoria) reported that the  
7 prevalence of domestic violence across the first postnatal year was 17% [20]. In the four  
8 year follow up, the authors found that 29% of women experienced DFV across the four  
9 years post birth. This included women who were subjected to physical and or emotional  
10 and/ or sexual abuse [23].  
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12 In our study, women who reported DFV were more likely overall to be Australian born. We  
13 found that of the non-Australian born cohort, women born in New Zealand and in Sudan  
14 were more likely to report DFV when asked. The NZ sample is likely to reflect the higher  
15 Maori and Pacific Islander population in this location (Western Sydney). New Zealand  
16 research has reported a higher prevalence of DFV amongst Maori women (20) and in some  
17 locations this is over 60% [24]. Studies also report that many Sudanese women experience  
18 DFV from their husbands prior to migration and this represents a significant factor in these  
19 women's pre-migration history [25].  
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23 In contrast, women born in India (the largest migrant group in the study location) and those  
24 born in China were the least likely to say they experienced DFV when asked. We suggest  
25 that this reflects significant under-reporting by these women. Previous studies have  
26 reported rates of 4% in China [26] and more recently James, Brody and Hamilton (2013)  
27 found a prevalence of 4.8% in China and a prevalence of 28% in India [21]. This under-  
28 reporting is likely due to cultural concerns about sharing with strangers what is considered  
29 to be family business, something that is accepted in their country of origin [27].  
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32 Women who reported DFV were more likely to report a raised EPDS  $\geq 13$  (7.63%), thoughts  
33 of self-harm (2.4%), and anxiety and depression (34.2%). These women were also more  
34 likely to worry, report stress and have a family history of mental illness. This means they are  
35 likely to have fewer social support systems in place that could buffer or protect them and  
36 their children from the effects of DFV [28]. A number of longitudinal studies of maternal  
37 well-being in Australia [23, 29] show a strong association between depressive symptoms in  
38 pregnancy and in the year after birth and poor partner relationship and DFV.  
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42 Another major concern reported when psychosocial screening was attended was childhood  
43 abuse (23.6%) which was significantly associated with DFV. Researchers have hypothesised  
44 that women with a history of childhood abuse may be at exceptionally high risk of re-  
45 victimisation in adulthood, including rape and DFV [37-39]. This has been demonstrated in  
46 international [36] and Australian studies. In the Maternal Health Study, childhood abuse was  
47 reported by a high number of women (41 %) and these women were more likely to  
48 experience DFV and poor mental health [29].  
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51 As noted women who reported DFV were more likely to be Australian born, they were more  
52 likely to smoke and be multiparous. During the pregnancy they were less likely to have  
53 hypertensive disease of pregnancy and more likely to have been admitted for threatened  
54 preterm labour (AOR 1.8 CI 1.28-2.39). Various studies have demonstrated a significant  
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3 impact of DFV on women's health behaviours during pregnancy, including higher rates of  
4 smoking, [20, 22, 23] alcohol and substance use [24-26]. Experiencing DFV is a significant life  
5 stress and higher rates of mental illness, seen in this study, also correlate with high smoking  
6 rates. One study found probable major depression and generalised anxiety disorder were  
7 associated with a 93% and 44% increased odds of being a current smoker respectively [27].  
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10 The impact of DFV on maternal mental health cannot be underestimated. During the  
11 pregnancy and the postpartum period DFV is associated with depression, anxiety and post-  
12 traumatic stress disorder (PTSD) [30-32]. Post-traumatic stress disorder (PTSD) rates  
13 associated with DFV range from anywhere between 19% and 84%. [31]. Around 40% of  
14 women who experience DFV report symptoms of depression [32, 33]. The most serious  
15 reported outcomes of DFV during pregnancy are homicide and suicide, with maternal injury  
16 a leading cause of maternal mortality [34, 35]. It has been estimated that 38% of murders of  
17 women are by an intimate partner or ex-partner [1].  
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21 In this study we found women who were multiparous were more likely to disclose DFV and  
22 this has been reported previously [40]. This is important to know as women may be more  
23 prepared to disclose with a subsequent pregnancy. This may be due to their realising the  
24 impact of DFV on the child but also they may be feeling more comfortable with and trusting  
25 of the service [33]. Another possibility is the relationship strains may also be taking a toll  
26 with the presence of children and escalation of DFV. In a study undertaken in Nigeria where  
27 a much higher DFV was found in multiparous women and the authors suggest lower  
28 socioeconomic status could be a factor in this as well as this is associated with larger families  
29 [40].  
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33 A number of studies have reported that women who suffer DFV during pregnancy are twice  
34 as likely to miss antenatal visits appointments or initiate antenatal care early [41-43].  
35 Women with a history of DFV are more likely to miss three or more antenatal visits  
36 compared with their non-abused counterparts (45% vs. 28%) [44]. In addition there are  
37 increased numbers of hospitalisation reported for these women [45]. In our study we found  
38 women were more likely to be hospitalised with threatened preterm birth if they had a  
39 history of DFV. Several studies have reported a link between insufficient antenatal care  
40 associated with DFV and adverse birth outcomes, including preterm birth and low birth  
41 weight (LBW) and small for gestational age (SGA) [46-48]. While we did not find an actual  
42 increase in preterm birth in this study it is well known that preterm birth and LBW are the  
43 primary causes of neonatal morbidity and mortality [49].  
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## 50 **Health Services**

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52 The WHO has identified health services as an appropriate entry point for addressing DFV, in  
53 particular against women and girls [1] who bear the vast burden of DFV [50]. Women who  
54 experience DFV are more likely to use health services than those who do not even though  
55 they rarely explicitly disclose violence as the underlying reason [1, 51]. This is even more the  
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3 case when they are pregnant and midwives and doctors are the front line health care  
4 providers in this case. Unfortunately health and other services are slow to recognise and  
5 address this violence, either because they don't recognise the signs, do not have appropriate  
6 services in place or they are simply at capacity [1]  
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9 Currently the Australian Government has a clear aim to reduce the incidence of DFV against  
10 women through public education and health promotion. However, more is required from  
11 health providers than simply asking the question. Spangaro et al. (2015) found multiple  
12 pathways to disclosure with no single factor necessarily sufficient for a decision to disclose  
13 [52]. While being asked the question was important in women disclosing DFV, the way the  
14 question was asked (with interest and being non-judgmental) were found to be key  
15 conditions [52]. With the increasing use of computers to guide questions and document  
16 women's responses to sensitive questions included in psychosocial screening [53], questions  
17 are raised as to how effective this will be if a trusting relationship is important in disclosure.  
18 A recent ethnographic study of psychosocial assessment and depression screening in  
19 pregnancy and following birth, found that some midwives and child and family health nurses  
20 were reticent to ask questions related to DFV as well as childhood abuse, at times avoiding  
21 asking these questions, rewording the question or minimising women's responses [14, 34].  
22 Midwives and nurses also indicated that many women from non-English speaking  
23 backgrounds did not always understand the question being asked of them and interpreters  
24 were not always available [14, 34]. This suggests that we have less knowledge of how to  
25 screen for DFV among diverse cultural and linguistic groups. We also have limited  
26 information about how many women who report DFV are provided with appropriate  
27 referrals and whether they take up the referral. Our study also raises important questions  
28 around the need to have a higher level of awareness and vigilance regarding possible DFV  
29 when women report childhood abuse and other commonly gathered antenatal information.  
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### 38 **Strengths and Limitations**

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40 There are several limitations with this study and these include that it involves only one  
41 hospital Western Sydney and so may not be generalisable to other areas with different  
42 populations. Also we were unable to determine ethnicity as the variable provided is country  
43 of birth and we could not distinguish between refugees and migrants. Other outcomes not  
44 reported here because of the nature of the dataset include urinary and faecal incontinence  
45 [35]. The division of non-Australian born women into the seven countries dilutes the data  
46 pool and limits conclusions about individual groups. There is missing data for the DFV  
47 variable as already reported and this is more frequent in the first few years of the data set  
48 when psychosocial screening was being introduced. The advantages of using the ObstetriX™  
49 database are the large number of variables available compared to the other state-wide  
50 routine data bases, such as the Perinatal Data Collection (PDC) and Admitted Patient Data  
51 Collection (APDC). Socioeconomic factors which affect health such as body mass index,  
52 psychosocial risk factors, marital status, education level, occupation, are not collected in the  
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latter and adjustment for these variables cannot be undertaken when modelling statistical interactions with these databases and the use of Obstetrix provides this advantage.

## Conclusion

There appears to be a relationship between psychosocial risks identified at the antenatal booking visit and a history of DFV; in particular this is seen in women who have a history of anxiety and depression and childhood abuse. This provides maternity health care providers with more evidence for incorporating routine psychosocial screening during antenatal care and providing appropriate services. The fact that women with a history of DFV had more antenatal admissions, particularly for threatened preterm labour, could provide another potential warning sign for midwives and doctors. More research is needed regarding the effectiveness of current DFV screening for women from other countries.

## Contributors:

HD designed the study, assisted with analysis and wrote the paper; AM undertook a review of the literature and helped access the data for analysis; VS Consulted on the study and contributed to the writing of the paper; CT analyses the data and assisted in writing the paper.

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**Competing interests:** Nil declared. All authors have completed the ICMJE uniform disclosure form.

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**Data Sharing:** We do not have ethics permission to share the data.

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Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	3
<b>Introduction</b>			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	5
<b>Methods</b>			
Study design	4	Present key elements of study design early in the paper	1, 3, 6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	N/A
		(b) For matched studies, give matching criteria and number of exposed and unexposed	N/A
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-7
Data sources/measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6-7
Bias	9	Describe any efforts to address potential sources of bias	6-7
Study size	10	Explain how the study size was arrived at	N/A
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6-7
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	6-7
		(b) Describe any methods used to examine subgroups and interactions	6-7
		(c) Explain how missing data were addressed	6-7
		(d) If applicable, explain how loss to follow-up was addressed	n/a
		(e) Describe any sensitivity analyses	N/A
<b>Results</b>			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	n/a



		(b) Give reasons for non-participation at each stage	n/a
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Page - Table
		(b) Indicate number of participants with missing data for each variable of interest	Page – Table 1
		(c) Summarise follow-up time (eg, average and total amount)	n/a
Outcome data	15*	Report numbers of outcome events or summary measures over time	All tables and figures
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Table 7
		(b) Report category boundaries when continuous variables were categorized	Not applicable
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	Not relevant
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	6-7
<b>Discussion</b>			
Key results	18	Summarise key results with reference to study objectives	7-14
<b>Limitations</b>			
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	15-19
Generalisability	21	Discuss the generalisability (external validity) of the study results	18
<b>Other information</b>			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	19

# BMJ Open

## The relationship between intimate partner violence reported at the first antenatal booking visit and obstetric and perinatal outcomes in pregnant women born in Australia and overseas: A population based study over 10 years

Journal:	<i>BMJ Open</i>
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Secondary Subject Heading:	Epidemiology, Health services research, Mental health, Obstetrics and gynaecology
Keywords:	intimate partner violence, domestic violence, family violence, migrant, OBSTETRICS, perinatal

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3 **The relationship between Intimate Partner Violence reported at the first antenatal**  
4 **booking visit and obstetric and perinatal outcomes in pregnant women born in Australia**  
5 **and overseas: A population based study over 10 years**  
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## Abstract

**Objectives:** Intimate partner violence (IPV) is a global health issue affecting mainly women and is known to escalate during pregnancy and impact negatively on obstetric and perinatal outcomes. The aim of this study is to determine the incidence of IPV in a pregnant multicultural population and to determine the relationship between intimate partner violence reported at booking interview and maternal and perinatal outcomes

**Design:** This is a retrospective population based data study. We analysed routinely collected data (2006 to 2016) from the ObstetriX™ system on a cohort of pregnant women

**Setting and participants:** 33 542 women giving birth in a major health facility in Western Sydney.

**Primary outcomes:** Incidence of IPV, association with IPV and other psychosocial variables and maternal and perinatal outcomes

**Result:** 4.3% of pregnant women reported a history of IPV when asked during the routine psychosocial assessment. Fifty four percent were not born in Australia and this had increased significantly over the decade. Women born in New Zealand (7.2%) and Sudan (9.1%) were most likely to report IPV at the antenatal booking visit, with women from China and India least likely to report IPV. Women who reported IPV were more likely to report additional psychosocial concerns including EPDS  $\geq 13$  (7.6%), thoughts of self-harm (2.4%), childhood abuse (23.6%) and a history of anxiety and depression (34.2%). Women who reported IPV were more likely to be Australian born, smoke and be multiparous and to have been admitted for threatened preterm labour (AOR 1.8, CI 1.28-2.39).

**Conclusions:** A report of IPV at the first antenatal booking visit is associated with a higher level of reporting on all psychosocial risks, higher antenatal admissions, especially for threatened preterm labour. More research is needed regarding the effectiveness of current IPV screening for women from other countries.

**Keywords:** intimate partner violence, domestic violence, family violence, migrant, obstetrics, perinatal, threatened preterm labour

**Word count:** 4470

## Strength and limitations of this study

### Strengths:

- This was an ethnically diverse population that included all women in one hospital over a 10 year period
- Detailed psychosocial and other important variables were available

### Limitations:

- We are unable to differentiate between migrants and refugees
- It is likely there is under-reporting of IPV by pregnant women, particularly in some cultural groups

**Funding statement:** This research received a partnership grant from Western Sydney University and NSW Health

**Competing interest statement:** None declared

## Background

Intimate partner violence (IPV) (physical, sexual or emotional) is a global health issue that affects mostly women (and some men) from different backgrounds and social groups. In 2016 the World Health Organisation (WHO) released a global plan of action to address interpersonal violence, in particular against women, girls, and against children [1]. WHO stated that all forms of interpersonal violence lead to negative health outcomes and should be addressed by the health system. WHO identified health services as an appropriate entry point for addressing this [1]. The Australian Personal Safety Survey estimated 186 000 women had experienced violence by a current cohabiting partner. Of those who had been pregnant, one in five (21.7%) reported that violence occurred during the pregnancy and for almost two thirds of women (61.4%) this had been their first experience of violence in their relationship [2]. The prevalence of violence during pregnancy is estimated to be between 4-8% of pregnant women [3].

Global estimates of the prevalence of IPV range from 16.3% of ever partnered women experiencing violence in their lifetime in East Asia to 50% of women suffering violence in Sub Saharan Africa [4]. However, these figures may be higher as the stigma and shame associated with IPV means disclosure remains low and in some cultural groups taboos about discussing what are considered to be family problems remain [5].

Pregnant women exposed to IPV face many challenges; however migrant women who are pregnant and living in a different social-cultural environment experience additional stresses in their lives, such as conflicting cultural values, social isolation, language barriers, limited economic resources, discrimination and racism [6]. In many cultures IPV is socially accepted, abuse is not always considered criminal or even incorrect and the woman is seen as subservient to their male partner [6]. A lack of knowledge about the law regarding IPV and immigration represents a challenge for migrant women as they may fear losing custody of their child/children and their immigration status [7].

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3 A meta-analysis of risk factors for domestic violence during pregnancy found across 92  
4 studies that the average prevalence of emotional abuse was 28.4%, physical abuse was  
5 13.8% and sexual abuse was 8.0% [8]. The authors found that abuse before pregnancy and  
6 lower education level were strong predictors of abuse during pregnancy. A systematic review  
7 of domestic violence and perinatal mental health disorders including 67 papers found a  
8 three-fold increase in the odds of high level depressive symptoms in the postnatal period  
9 after having experienced domestic violence during pregnancy [9]. Post-Traumatic Stress  
10 Disorder (PTSD) symptoms were also associated with a history of IPV. No studies identified a  
11 link between puerperal psychosis or eating disorders and IPV [9].  
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15 The Australian government places a strong emphasis on supporting women who are  
16 pregnant with mental health and other psychosocial issues, with particular focus on early  
17 intervention, social inclusion and recovery and service access, coordination and continuity of  
18 care [10, 11]. The increased recognition that social and emotional problems in the perinatal  
19 period can impact negatively on outcomes for women and their babies has led a number of  
20 Australian States and Territories to introduce psychosocial assessment which includes  
21 depression screening as well as questions on IPV. This process has been supported by  
22 *beyondblue* and the *national perinatal depression initiative*, which has led to the production  
23 of perinatal clinical practice guidelines for health care professionals [12]. In addition, in New  
24 South Wales (NSW) the Supporting Families Early Policy has integrated psychosocial risk  
25 assessment into routine care (Integrated Perinatal Care; IPC) during pregnancy and after the  
26 birth. The aim of this approach, is to provide a coordinated network of support for mothers  
27 and their babies [13, 14]. All women when they book in for their pregnancy care in public  
28 hospitals (this is not routine in the private healthcare sector) receive a psychosocial  
29 assessment from midwives and then again from the child and family health nurse (CFHN)  
30 following birth and again at the 6–8 week postnatal check. The psychosocial screening tool  
31 includes the Edinburgh Postnatal Depression Screen (EPDS) and a series of questions that  
32 encompass seven key variables or areas of risk (Table 1). This routine screening of pregnant  
33 women is not without its concerns regarding the specific skills required in understanding,  
34 interpreting and responding appropriately to women's needs and the support provided to  
35 midwives to do this [14, 15]. This is an even more complex issue where migrant women are  
36 concerned and cultural understandings, taboos and language barriers could all have a  
37 significant influence [16].  
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46 The aim of this study was to determine the incidence of IPV in a pregnant multicultural  
47 population not born in Australia compared to Australian born women and to determine the  
48 relationship between IPV reported at booking interview and obstetric and perinatal  
49 outcomes  
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## Methods

### Study Design

This is a retrospective population based data study. We analysed routinely collected data from the ObstetriX™ system on a cohort of all pregnant women giving birth in a major health facility in Western Sydney over a ten year period (2006 to 2016) (n=33 542).

### Setting

Blacktown Hospital is located in Western Sydney, New South Wales, Australia and provides maternity services to over 3000 women per year. Blacktown is classified as a Level 4 Maternity Unit, meaning it cares for women of low to moderate obstetric risk. Western Sydney is a rapidly growing area in NSW. It has a diverse population with a high proportion of young families, multiculturalism (57 % not born in Australia) and significant socio-economic disadvantage [17]. Routine antenatal psychosocial assessment, which includes depression screening and questions on domestic violence, has been conducted routinely at this site since 2006 when it was introduced at Blacktown Hospital.

### Data sources

This study was a retrospective review of routinely collected data for a consecutive cohort of women who delivered babies at Blacktown Hospital between 01/01/2006 and 31/05/2016. Data was sourced from the Western Sydney Local Health District ObstetriX™ database, an information system that collects clinical data from first antenatal visit, through to discharge of mother and baby from the hospital.

### Variables

Variables of interest included (i) demographics (age, country of birth and private health insurance status), (ii) baseline health, obstetric characteristics and medical risks (parity, Body Mass Index (BMI), smoking, diagnosis of hypertension, diabetes, incidence of threatened premature labour, ante-partum haemorrhage, (iii) psychosocial risks (evidence of IPV, (iv) depressive and anxiety symptoms, (v) delivery details (gestation at birth, birth type perineal status and (vi) postnatal outcomes (Apgar scores, birth weight, admission to Neonatal Intensive Care Unit. The relationship between IPV and above listed health outcomes were also examined.

The psychosocial screening tool questions are based on a series of known risk factors and are administered alongside the Edinburgh postnatal Depression Scale (EPDS) (Table 1). The booking midwife administers this screening tool in the privacy of the initial antenatal booking visit when women are around 12-20 weeks pregnant. Partners are asked not to be present or to leave when these questions are asked. If a NSW Health Interpreter was booked for the visit, the questions were asked verbally via the interpreter.

### Analysis

Positive responses to the IPV questions, collected by clinical staff at the first antenatal visit, were grouped to form the dichotomous variable 'IPV' or 'no IPV' for all women. Women were grouped in non-Australian born and Australian born cohorts and for the non-Australian born cohort with the seven most commonly occurring countries of birth were examined independently. Pregnancy, labour and delivery events were then analysed utilising contingency tables and chi square results were calculated. Logistic regression techniques were applied and reported as unadjusted and adjusted odds ratios and 95 %



confidence interval following adjustment for maternal age, gestation at birth, country of birth and smoking. Analysis was undertaken with IBM SPSS v.23™. Due to the number of statistical tests undertaken, a  $p$  value < 0.001 was set for significance.

Ethics approval was given by Western Sydney Local Health District (Protocol Number HREC2013/4/6.7(3697) AU RED LNR/13/WMEAD/98) and an amended approval given in 2017. A waiver of individual consent was obtained due to the de-identified nature of the data.

Table 1. Psychosocial risk variables I-IV. NSW Department of Health (2010)

Variables (Risk Factors)	Suggested format for psychosocial assessment questions
I. Lack of support	1. Will you be able to get practical support with your baby? 2. Do you have someone you are able to talk to about your feelings or worries?
II. Recent major stressors in the last 12 months	3. Have you had any major stressors, changes or losses recently (ie in the last 12 months) such as, financial problems, someone close to you dying, or any other serious worries?
III. Low self-esteem (including lack of self-confidence, high anxiety and perfectionistic traits)	4. Generally, do you consider yourself a confident person? 5. Does it worry you a lot if things get messy or out of place?
IV. History of anxiety, depression or other mental health problems	6 a) Have you ever felt anxious, miserable, worried or depressed for more than a couple of weeks? 6 b) If so, did it seriously interfere with your work and your relationships with friends and family? 7. Are you currently receiving, or have you in the past received, treatment for any emotional problems?
V. Couple's relationship problems or dysfunction (if applicable)	8. How would you describe your relationship with your partner? 9. a) Antenatal: What do you think your relationship will be like after the birth OR b) Postnatal (in Community Health Setting): Has your relationship changed since having the baby?
VI. Adverse childhood experiences	10. Now that you are having a child of your own, you may think more about your own childhood and what it was like. As a child were you hurt or abused in any way (physically, emotionally, sexually)?
VII. Domestic violence Questions must be asked only when the woman can be interviewed away from partner or family member over the age of 3 years. Staff must undergo training in screening for domestic violence before administering questions	11. Within the last year have you been hit, slapped, or hurt in other ways by your partner or ex-partner? 12. Are you frightened of your partner or ex-partner? (If the response to questions 11 and 12 is "No" then offer the DV information card and omit questions 13–18) 13. Are you safe here at home?/to go home when you leave here? 14. Has your child/children been hurt or witnessed violence? 15. Who is/are your children with now? 16. Are they safe? 17. Are you worried about your child/children's safety? 18. Would you like assistance with this?
Opportunity to disclose further	19. Are there any other issues or worries you would like to mention?

## Results

Over a ten period (2006-2016 inclusive) 33 542 women gave birth at the Western Sydney maternity unit. During this time there was a decrease in the number of women giving birth who were born in Australia (Figure 1). During the ten years the increase in women born in India was most notable (4.2% to 25.7%) (Figure 2). Overall 4.3% of women reported a history of IPV. There were an additional 0.8% of women for whom screening was not undertaken due to refusal of their partner or other family member/s to leave the interview room.

There were differences in demographics between Australian and non-Australian women, with Australian women being younger, more likely to be under 20 years of age and less likely to be over 35 years of age. Australian born women were more likely to have a BMI $\geq$ 30 (Table 2).

**Table 2. Selected demographics of Australian-born and non-Australian-born women**

	Australian-born=15 459	Non-Australian-born n=18 083	p
Maternal age*	27.7 (5.75)	29.8 (5.11)	<0.001
Teenage pregnancy	7.9%	1.8%	<0.001
Pregnancy $\geq$ 35 years	13.0%	17.9%	<0.001
Nulliparous	25.0%	26.9%	<0.002
Body Mass Index $\geq$ 30	28.2%	17.7%	<0.001
Body Mass Index $\leq$ 18	3.0%	3.0%	0.02
Private patient	3.7%	3.4%	0.14

\*Mean and SD

During pregnancy, women born in Australia were more likely to smoke and have hypertensive disorders of pregnancy but they were less likely to have gestational diabetes and anaemia. In terms of birth outcomes women born in Australia were more likely to have a normal vaginal birth, have an epidural and give birth in the birth centre. There was a significantly higher stillbirth rate observed in women not born in Australia (Table 3).

**Table 3. Pregnancy events and outcomes of Australian-born and non-Australian-born women**

	Australian-born= 15 459	Non-Australian-born n= 18 083	p
Smoking	19.7%	4.3%	<0.001
Gestational Hypertension	2.6%	1.8%	<0.001
Gestational Diabetes	6.4%	13.6%	<0.001
Admitted for threatened premature labour	3.6%	2.8%	<0.002
Maternal anaemia	7.7%	10.2%	<0.001
Any Ante Partum Haemorrhage	0.8%	0.9%	0.38
Gestation at delivery*	39.2 (2.01)	39.1 (1.98)	<0.001
Gestation grouped			
<28 weeks	0.6%	0.7%	N/S
29-32 weeks	0.4%	0.3%	
32-36 weeks	5.3%	5.0%	
37 week and greater	93.7%	94.0%	
Normal vaginal delivery	66.4%	60.6%	<0.001
Assisted vaginal delivery	8.6%	11.2%	<0.001
Caesarean section	25.0%	28.2%	<0.001
Syntocinon usage	46.1%	53.9%	<0.001
Place of birth			
Birth Centre	9.2%	4.9%	<0.001
Born before Arrival	0.8%	0.6%	<0.001
Operating theatre	25.0%	28.2%	<0.001
Delivery Ward	65.0%	66.3%	<0.001
Amniotomy	51.9%	51.4%	0.36
Epidural usage**	19.8%	15.3%	<0.001
3 <sup>rd</sup> and 4 <sup>th</sup> degree tear**	0.5%	1.5%	<0.001

Episiotomy**	14.4%	22.6%	<0.001
Post Partum Haemorrhage >1500mls	1.2%	1.4%	0.38
Birth weight*	3414 (588.22)	3290 (563.49)	<0.001
Admitted Special Care Nursery/Neonatal Intensive Care Unit	7.5%	8.6%	<0.001
Stillbirth Rate/1000 births	5.2	8.2	<0.001
5 minute Apgar <7	1.6%	1.6%	0.56
Fetal anomaly	0.8%	0.7%	0.38

\* Median, IQ range, Mann-Whitney U, \*\* as a % of vaginal births

Women who disclosed IPV at the first antenatal booking visit over this ten year period weighed slightly less and smoked more than twice as much compared to those who did not disclose IPV. These women were also more likely to be having a subsequent baby. During pregnancy they were more likely to have an admission with threatened premature labour (Table 4)

**Table 4. Maternal characteristics and perinatal outcomes for women who disclosed IPV at the first booking visit compared to those who have not**

	IPV reported n=1302	IPV not reported n=29 026	p
Maternal age*	28.7 (5.46)	28.6 (6.07)	0.29
Body Mass Index*	26.6 (6.54)	27.1 (7.17)	<0.001
Multiparous	82.7%	68.8%	<0.001
Smoking	26.8%	11.0%	<0.001
Hypertension diagnosed in pregnancy	1.5%	2.4%	0.04
Gestational Diabetes	9.4%	8.6%	0.96
Threatened premature labour	5.5%	3.1%	<0.001
Any Ante Partum Haemorrhage	2.22%	1.55%	0.08
Antenatal admission	10.8%	8.6%	0.006
Gestation at delivery**	39.2 (1.96)	39.1 (1.90)	0.12

Delivery type			
Normal vaginal	66.7%	61.6%	
Instrumental	7.0%	10.9%	
Caesarean section	26.3%	27.5%	
Epidural usage***	29.7%	28.3%	0.36
3 <sup>rd</sup> and 4 <sup>th</sup> degree tear***	0.46%	1.3%	0.01
Episiotomy***	18.8%	25.5%	0.05
Postpartum blood transfusion	1.08%	0.83%	0.94
Birth weight*	3349 (568.0)	3344 (573.6)	0.77
Admitted Special Care Nursery/Neonatal Intensive Care Unit	8.6%	8.5%	0.88
Stillbirth Rate/1000 births	3.9	5.4	0.49
Feeding difficulty	38.6%	39.6%	0.49
Male gender	51.0%	51.3%	0.88
Fetal growth restriction	6.5%	4.8%	0.03

\* Mean, SD and t-test, \*\* Median, IQ range, Mann-Whitney U, \*\*\* as a % of vaginal births

Overall 4.3% of women reported a history (current partner 3.5%, previous partner 0.7%, other family member 0.1%) of IPV when asked during the routine psychosocial assessment at booking in for pregnancy care. Women born in New Zealand (7.2%) and Sudan (9.1%) were most likely to report IPV at the antenatal booking visit, with women from China and India least likely to report IPV. Missing data for variables relating to IPV equated to 8.7% (Table 5).

	Australia n=13 742	India n=3783	Philippines n=2193	NZ n=1520	Fiji n=939	Sudan n=784	Pakistan n=670	China n=655	Other n=6042	Total n=30 328
Domestic violence current partner	3.9%	1.6%	3.3%	6.2%	4.3%	8.2%	2.5%	1.4%	2.7%	3.5%
Domestic violence other family member	0.1%	0.1%	0.0%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	0.1%
Domestic violence previous partner	1.3%	0.2%	0.6%	0.6%	0.1%	0.9%	0.1%	0.2%	0.3%	0.8%
Domestic violence any	5.2%	1.8%	4.0%	7.2%	4.5%	9.1%	2.7%	1.5%	3.1%	4.3%
Deferred questions due to partner or family members present	1.0%	.3%	.6%	1.2%	0.7%	1.4%	1.0%	1.7%	1.1%	0.9%

**Table 5. IPV as expressed as a percentage of country of birth for the most commonly occurring countries of birth of all women assessed**

Women who reported IPV were more likely to report concerns when psychosocial screening was attended, including EPDS  $\geq 13$  (7.63%), thoughts of self-harm (2.4%), childhood abuse (23.6%) and anxiety and depression (34.2%). Women who reported IPV were more likely overall to be Australian born, smoke and be multiparous (Table 6).

**Table 6. Associated psychosocial issues for pregnant women reporting IPV compared to those who do not**

	IPV reported	IPV Not reported	p	OR
Edinburgh Postnatal Depression Scale $\geq 13$	7.6%	2.1%	<0.001	3.57 (2.84-4.47)
Thoughts of self harm	2.4%	0.5%	<0.001	5.55 (3.73-8.25)
Illegal drug use risk	4.30%	0.73%	<0.001	6.11 (4.52-8.24)
Childhood abuse	23.6%	7.6%	<0.001	3.74 (3.27-4.28)
Pregnancy related anxiety risk	5.9%	2.1%	<0.001	2.88 (2.26-3.67)
Work/relationship effect risk	23.0%	7.4%	<0.001	3.76 (3.28-4.30)
Anxiety/depression risk	34.2%	14.0%	<0.001	3.19 (2.84-3.60)
Worried about mess risk	34.3%	25.0%	<0.001	1.57 (1.39-1.76)
Positive response to 'are you generally confident' question	75.4%	84.6%	<0.001	0.24 (0.21-0.27)
Recent worry/stress risk	47.2%	22.2%	<0.001	3.20 (2.81-3.52)
Emotional support risk	8.6%	4.4%	<0.001	2.04 (1.67-2.50)
Mental health disorder	7.07%	1.72%	<0.001	4.36 (3.46-5.48)
Family history of mental health disorder	19.1%	10.7%	<0.001	1.97 (1.71-2.28)

We examined women reporting IPV at booking and the incidence of pregnancy conditions and events compared to women with no report of IPV adjusting for smoking, parity and gestational age and found significant associations with IPV and being born in Australia, smoking, being multiparous and having threatened premature labour. Women reporting IPV were however less likely to have hypertensive disease of pregnancy (Table 7).

**Table 7 Odds ratio calculations for women reporting IPV at booking and pregnancy conditions and events when compared to women not reporting IPV (ref category is non-IPV)**

	OR	AOR
Australian born	1.5 (1.31-1.64)	<b>1.3 (1.09-1.46)</b>
Smoking	3.0 (2.60-3.36)	<b>2.7 (2.30-3.20)</b>
Multiparous	2.3 (1.98-2.70)	<b>2.0 (1.68-2.49)</b>
Gestational Diabetes Mellitus	1.0 (0.87-1.24)	1.1 (0.85-1.29)
Hypertensive Disorders of Pregnancy	0.6 (0.39-0.97)	<b>0.5 (0.32-0.91)</b>
Threatened Premature Labour	1.8 (1.44-2.36)	<b>1.8 (1.28-2.39)</b>
Ante Partum Haemorrhage	1.5 (1.04-2.11)	1.4 (0.95-2.19)
Vaginal	1.00	1.00
Instrumental	0.6 (0.49-0.76)	1.1 (0.90-1.25)
Caesarean section	1.1 (0.94-1.20)	
Born preterm	1.3 (1.04-1.60)	1.0 (0.71-1.33)
Special Care Nursery/Neonatal Intensive Care Unit admission	1.0 (0.77-1.16)	1.0 (0.82-1.23)
APGAR 2 (less than 7)	1.5 (1.00-2.12)	1.1 (0.64-1.80)
Breastfed	0.8 (0.73-0.93)	1.0 (0.86-1.20)

## Discussion

In this study we aimed to determine the incidence of IPV over 10 years in a pregnant multicultural population and to compare characteristics of those not born in Australia with those born in Australia. We also aimed to determine the relationship between IPV reported at the antenatal booking interview and selected obstetric and perinatal outcomes.

Australia has a large population of both economic and humanitarian migrants and there has been a steady increase in new arrivals over the past decade in some metropolitan locations, including the study site. Understanding the specific health care needs of migrant women in pregnancy and following birth is important to inform health service design and delivery and ensure the best health outcomes for women and babies. We found a dramatic increase in the number of women born overseas (2006 47% -2016 62%) with the largest increase being in women born in India. We also found differences in demographics and obstetric outcomes between Australian and non-Australian born women, with those not born in Australia tending to be older, less likely to have a BMI of  $\geq 30$  compared to those born in Australia. They are also much less likely to smoke and much more likely to have gestational diabetes. These differences were identified previously in our analyses of the state-wide population [18, 19].



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3 Overall a low proportion of women disclosed IPV (4.3%). This is comparable with, or a little  
4 lower than other Australian [20] and international [3] studies that also estimated IPV  
5 prevalence to be between 4-8% of pregnant women. However, this is very likely to reflect  
6 under-reporting by women, as demonstrated by James, Brody and Hamilton (2013), the  
7 prevalence of IPV in pregnancy is close to 20% [21]. Furthermore, in NSW the IPV screening  
8 questions ask directly about physical abuse which was estimated to be around 13.8% [22].  
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11 The Maternal Health Study conducted in one Australian state (Victoria) reported that the  
12 prevalence of domestic violence across the first postnatal year was 17% [20]. In the four  
13 year follow up, the authors found that 29% of women experienced IPV across the four years  
14 post birth. This included women who were subjected to physical and or emotional and/ or  
15 sexual abuse [23].  
16

17  
18 In our study, women who reported IPV were more likely overall to be Australian born. We  
19 found that of the non-Australian born cohort, women born in New Zealand and in Sudan  
20 were more likely to report IPV when asked. The NZ sample is likely to reflect the higher  
21 Maori and Pacific Islander population in this location (Western Sydney). New Zealand  
22 research has reported a higher prevalence of IPV amongst Maori women and in some  
23 locations this is over 60% [24]. Studies also report that many Sudanese women experience  
24 IPV from their husbands prior to migration and this represents a significant factor in these  
25 women's pre-migration history [25].  
26

27  
28 In contrast, women born in India (the largest migrant group in the study location) and those  
29 born in China were the least likely to say they experienced IPV when asked. We suggest that  
30 this reflects significant under-reporting by these women. Previous studies have reported  
31 rates of 4% in China [26] and more recently James, Brody and Hamilton (2013) found a  
32 prevalence of 4.8% in China and a prevalence of 28% in India [21]. This under-reporting is  
33 likely due to cultural concerns about sharing with strangers what is considered to be family  
34 business, something that is accepted in their country of origin [27].  
35

36  
37 Women who reported IPV were more likely to report a raised EPDS  $\geq 13$  (7.63%), thoughts of  
38 self-harm (2.4%), and anxiety and depression (34.2%). These women were also more likely  
39 to worry, report stress and have a family history of mental illness. This means they are likely  
40 to have fewer social support systems in place that could buffer or protect them and their  
41 children from the effects of IPV [28]. A number of longitudinal studies of maternal well-  
42 being in Australia [23, 29] show a strong association between depressive symptoms in  
43 pregnancy and in the year after birth and poor partner relationship and IPV.  
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47 Another major concern reported when psychosocial screening was attended was childhood  
48 abuse (23.6%) which was significantly associated with IPV. Researchers have hypothesised  
49 that women with a history of childhood abuse may be at exceptionally high risk of re-  
50 victimisation in adulthood, including rape and IPV [30-33]. In the Maternal Health Study,  
51 childhood abuse was reported by a high number of women (41 %) and these women were  
52 more likely to experience IPV and poor mental health [29].  
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3 As noted women who reported IPV were more likely to be Australian born, they were more  
4 likely to smoke and be multiparous. During the pregnancy they were less likely to have  
5 hypertensive disease of pregnancy and more likely to have been admitted for threatened  
6 preterm labour (AOR 1.8 CI 1.28-2.39). Various studies have demonstrated a significant  
7 impact of IPV on women's health behaviours during pregnancy, including higher rates of  
8 smoking, [34-36] alcohol and substance use [37-39]. Experiencing IPV is a significant life  
9 stress and higher rates of mental illness, seen in this study, also correlate with high smoking  
10 rates. One study found probable major depression and generalised anxiety disorder were  
11 associated with a 93% and 44% increased odds of being a current smoker respectively [40].  
12 Likewise the higher number of multiparous women reporting IPV would impact on the  
13 higher rates of normal birth seen in this group as well the lower episiotomy rate and  
14 severe perineal trauma rate.  
15

16  
17 The impact of IPV on maternal mental health cannot be underestimated. During the  
18 pregnancy and the postpartum period IPV is associated with depression, anxiety and post-  
19 traumatic stress disorder (PTSD) [41-43]. Post-traumatic stress disorder (PTSD) rates  
20 associated with IPV range from anywhere between 19% and 84% [44, 45]. Around 40% of  
21 women who experience IPV report symptoms of depression [45, 46]. The most serious  
22 reported outcomes of IPV during pregnancy are homicide and suicide, with maternal injury a  
23 leading cause of maternal mortality [47, 48]. It has been estimated that 38% of murders of  
24 women are by an intimate partner or ex-partner [1].  
25

26  
27 In this study we found women who were multiparous were more likely to disclose IPV and  
28 this has been reported previously [49]. This is important to know as women may be more  
29 prepared to disclose with a subsequent pregnancy. This may be due to their realising the  
30 impact of IPV on the child but also they may be feeling more comfortable with and trusting  
31 of the service [50]. Another possibility for this higher rate of disclosure of IPV with  
32 multiparous women may be due to the fact that hopes that a coercive partner may reform  
33 once the baby has arrived are not realised. Perhaps also motherhood shifts loyalty from a  
34 non-supportive partner to a baby and energy and affection is channelled more to the baby.  
35 This in turn may make reporting easier but may also lead to an escalation of IPV. It is really  
36 important more research is done to help understand this. It is also possible that relationship  
37 strains may be taking a toll with the presence of children and escalation of IPV. In a study  
38 undertaken in Nigeria where a much higher IPV was found in multiparous women and the  
39 authors suggest lower socioeconomic status could be a factor in this as well as this is  
40 associated with larger families [49].  
41

42  
43 A number of studies have reported that women who suffer IPV during pregnancy are twice  
44 as likely to miss antenatal visits appointments or initiate antenatal care early [51, 52].  
45 Women with a history of IPV are more likely to miss three or more antenatal visits compared  
46 with their non-abused counterparts (45% vs. 28%) [53]. In addition there are increased  
47 numbers of hospitalisation reported for these women [54]. In our study we found women  
48 were more likely to be hospitalised with threatened preterm birth if they had a history of  
49 IPV. Several studies have reported a link between insufficient antenatal care associated with  
50 IPV and adverse birth outcomes, including preterm birth and low birth weight (LBW) and  
51 small for gestational age (SGA) [55-57]. While we did not find an actual increase in preterm  
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3 birth in this study it is well known that preterm birth and LBW are the primary causes of  
4 neonatal morbidity and mortality [58].  
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### 8 **Health Services**

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10 The WHO has identified health services as an appropriate entry point for addressing IPV, in  
11 particular against women and girls [1] who bear the vast burden of IPV. Women who  
12 experience IPV are more likely to use health services than those who do not even though  
13 they rarely explicitly disclose violence as the underlying reason [1]. This is even more the  
14 case when they are pregnant and midwives and doctors are the front line health care  
15 providers in this case. Unfortunately health and other services are slow to recognise and  
16 address this violence, either because they don't recognise the signs, do not have appropriate  
17 services in place or they are simply at capacity [1]  
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20 Currently the Australian Government has a clear aim to reduce the incidence of IPV against  
21 women through public education and health promotion. However, more is required from  
22 health providers than simply asking the question. Spangaro et al. (2015) found multiple  
23 pathways to disclosure with no single factor necessarily sufficient for a decision to disclose  
24 [59]. While being asked the question was important in women disclosing IPV, the way the  
25 question was asked (with interest and being non-judgmental) were found to be key  
26 conditions [59]. With the increasing use of computers to guide questions and document  
27 women's responses to sensitive questions included in psychosocial screening [60], questions  
28 are raised as to how effective this will be if a trusting relationship is important in disclosure.  
29 A recent ethnographic study of psychosocial assessment and depression screening in  
30 pregnancy and following birth, found that some midwives and child and family health nurses  
31 were reticent to ask questions related to IPV as well as childhood abuse, at times avoiding  
32 asking these questions, rewording the question or minimising women's responses [14, 61].  
33 Midwives and nurses also indicated that many women from non-English speaking  
34 backgrounds did not always understand the question being asked of them and interpreters  
35 were not always available [14, 61]. This suggests that we have less knowledge of how to  
36 screen for IPV among diverse cultural and linguistic groups. We also have limited information  
37 about how many women who report IPV are provided with appropriate referrals and  
38 whether they take up the referral. Our study also raises important questions around the  
39 need to have a higher level of awareness and vigilance regarding possible IPV when women  
40 report childhood abuse and other commonly gathered antenatal information.  
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49 There are current discussions amongst health workers and government services that  
50 screening women for IPV initially at booking and again during the third trimester could be  
51 advisable as IPV may escalate and/or women may feel more comfortable and trusting of  
52 their care provider as the pregnancy advances. This may be even more useful in continuity  
53 of care models where women are cared for by a trusted midwife who they get to know and  
54 trust. Others suggest that questions about IPV should not be asked at the first visit as is  
55 currently done as no relationship has been developed. There is little evidence as to what  
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3 might be the best approach. There is debate about both the effectiveness of IPV enquiry  
4 and the most appropriate time to conduct assessments in pregnancy and after birth[62]. A  
5 number of authors report that when asked, women may choose not to disclose about the  
6 abuse at the initial time of asking, for fear of their own safety but asking signifies that she  
7 can disclose at a later contact [63]. As a result of this debate there is inconsistent and at  
8 times poor uptake of screening in antenatal services in Australia [64].  
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### 10 11 **Strengths and Limitations**

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13 There are several limitations with this study and these include that it involves only one  
14 hospital Western Sydney and so may not be generalisable to other areas with different  
15 populations. Also we were unable to determine ethnicity as the variable provided is country  
16 of birth and we could not distinguish between refugees and migrants. Other outcomes not  
17 reported here because of the nature of the dataset include urinary and faecal incontinence  
18 [65]. The division of non-Australian born women into the seven countries dilutes the data  
19 pool and limits conclusions about individual groups. There is missing data for the IPV  
20 variable as already reported and this is more frequent in the first few years of the data set  
21 when psychosocial screening was being introduced. The advantages of using the ObstetriX™  
22 database are the large number of variables available compared to the other state-wide  
23 routine data bases, such as the Perinatal Data Collection (PDC) and Admitted Patient Data  
24 Collection (APDC). Socioeconomic factors which affect health such as body mass index,  
25 psychosocial risk factors, marital status, education level, occupation, are not collected in the  
26 latter and adjustment for these variables cannot be undertaken when modelling statistical  
27 interactions with these databases and the use of Obstetrix provides this advantage.  
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### 34 **Conclusion**

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36 There appears to be a relationship between psychosocial risks identified at the antenatal  
37 booking visit and a history of IPV; in particular this is seen in women who have a history of  
38 anxiety and depression and childhood abuse. This provides maternity health care providers  
39 with more evidence for incorporating routine psychosocial screening during antenatal care  
40 and providing appropriate services. The fact that women with a history of IPV had more  
41 antenatal admissions, particularly for threatened preterm labour, could provide another  
42 potential warning sign for midwives and doctors. More research is needed regarding the  
43 effectiveness of current IPV screening for women from other countries.  
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### 49 **Contributors:**

50  
51 HD designed the study, assisted with analysis and wrote the paper; AM undertook a review  
52 of the literature and helped access the data for analysis; VS Consulted on the study and  
53 contributed to the writing of the paper; CT analyses the data and assisted in writing the  
54 paper.  
55

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**Data Sharing:** We do not have ethics permission to share the data.

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#### 47 Figure Legend

48  
49 Figure 1 Changing profile of Australian born women expressed as a percentage of all births over time

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52 Figure 2 Changing profile of non-Australian born women expressed as a percentage of all births over time

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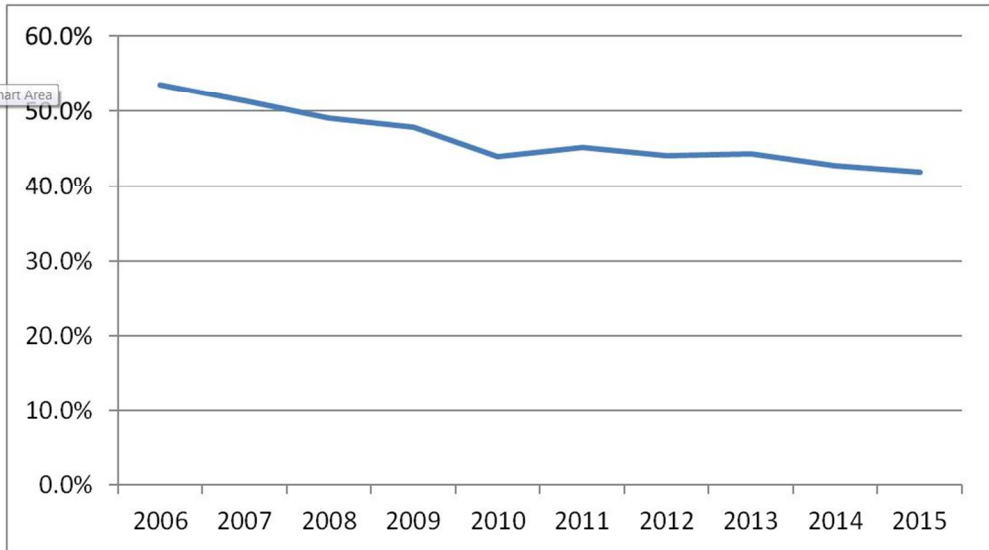
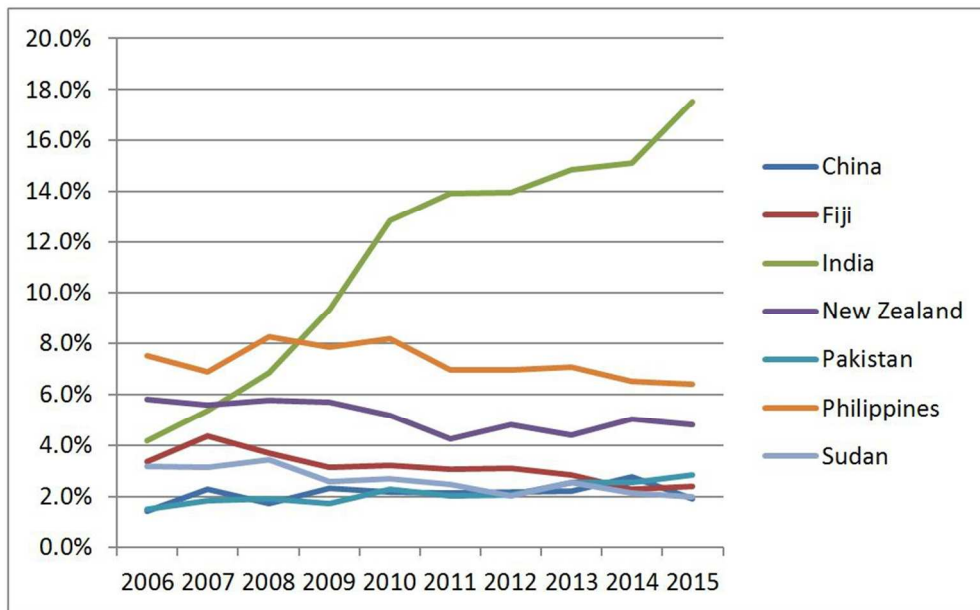


Figure 1 Changing profile of Australian born women expressed as a percentage of all births over time

92x52mm (300 x 300 DPI)

Review only



89x55mm (300 x 300 DPI)

Review only

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	3
<b>Introduction</b>			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	5
<b>Methods</b>			
Study design	4	Present key elements of study design early in the paper	1, 3, 6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	N/A
		(b) For matched studies, give matching criteria and number of exposed and unexposed	N/A
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-7
Data sources/measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6-7
Bias	9	Describe any efforts to address potential sources of bias	6-7
Study size	10	Explain how the study size was arrived at	N/A
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6-7
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	6-7
		(b) Describe any methods used to examine subgroups and interactions	6-7
		(c) Explain how missing data were addressed	6-7
		(d) If applicable, explain how loss to follow-up was addressed	n/a
		(e) Describe any sensitivity analyses	N/A
<b>Results</b>			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	n/a

		(b) Give reasons for non-participation at each stage	n/a
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Page - Table
		(b) Indicate number of participants with missing data for each variable of interest	Page – Table 1
		(c) Summarise follow-up time (eg, average and total amount)	n/a
Outcome data	15*	Report numbers of outcome events or summary measures over time	All tables and figures
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Table 7
		(b) Report category boundaries when continuous variables were categorized	Not applicable
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	Not relevant
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	6-7
<b>Discussion</b>			
Key results	18	Summarise key results with reference to study objectives	7-14
<b>Limitations</b>			
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	15-19
Generalisability	21	Discuss the generalisability (external validity) of the study results	18
<b>Other information</b>			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	19

# BMJ Open

**The relationship between Intimate Partner Violence reported at the first antenatal booking visit and obstetric and perinatal outcomes in an ethnically diverse group of Australian pregnant women: A population based study over 10 years**

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2017-019566.R2
Article Type:	Research
Date Submitted by the Author:	17-Jan-2018
Complete List of Authors:	Dahlen, Hannah; University of Western Sydney, School of Nursing and Midwifery ; Ingham Institute, CANR Munoz, Ana Maria; Blacktown Mount Druitt Hospitals , Women's and Children's Health Schmied, V; Western Sydney University, School of Nursing and Midwifery Thornton , Charlene ; Flinders University Faculty of Medicine Nursing and Health Sciences, College of Nursing and Health Sciences
<b>Primary Subject Heading</b>:	Obstetrics and gynaecology
Secondary Subject Heading:	Epidemiology, Health services research, Mental health, Obstetrics and gynaecology
Keywords:	intimate partner violence, domestic violence, family violence, migrant, OBSTETRICS, perinatal

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Manuscripts

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3 **The relationship between Intimate Partner Violence reported at the first antenatal**  
4 **booking visit and obstetric and perinatal outcomes in an ethnically diverse group of**  
5 **Australian pregnant women: A population based study over 10 years**  
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## Abstract

**Objectives:** Intimate partner violence (IPV) is a global health issue affecting mainly women and is known to escalate during pregnancy and impact negatively on obstetric and perinatal outcomes. The aim of this study is to determine the incidence of IPV in a pregnant multicultural population and to determine the relationship between intimate partner violence reported at booking interview and maternal and perinatal outcomes

**Design:** This is a retrospective population based data study. We analysed routinely collected data (2006 to 2016) from the ObstetriX™ system on a cohort of pregnant women

**Setting and participants:** 33 542 women giving birth in a major health facility in Western Sydney.

**Primary outcomes:** Incidence of IPV, association with IPV and other psychosocial variables and maternal and perinatal outcomes

**Result:** 4.3% of pregnant women reported a history of IPV when asked during the routine psychosocial assessment. Fifty four percent were not born in Australia and this had increased significantly over the decade. Women born in New Zealand (7.2%) and Sudan (9.1%) were most likely to report IPV at the antenatal booking visit, with women from China and India least likely to report IPV. Women who reported IPV were more likely to report additional psychosocial concerns including EPDS  $\geq 13$  (7.6%), thoughts of self-harm (2.4%), childhood abuse (23.6%) and a history of anxiety and depression (34.2%). Women who reported IPV were more likely to be Australian born, smoke and be multiparous and to have been admitted for threatened preterm labour (AOR 1.8, CI 1.28-2.39).

**Conclusions:** A report of IPV at the first antenatal booking visit is associated with a higher level of reporting on all psychosocial risks, higher antenatal admissions, especially for threatened preterm labour. More research is needed regarding the effectiveness of current IPV screening for women from other countries.

**Keywords:** intimate partner violence, domestic violence, family violence, migrant, obstetrics, perinatal, threatened preterm labour

**Word count:** 4470



## Strength and limitations of this study

### Strengths:

- This was an ethnically diverse population that included all women in one hospital over a 10 year period
- Detailed psychosocial and other important variables were available

### Limitations:

- We are unable to differentiate between migrants and refugees
- It is likely there is under-reporting of IPV by pregnant women, particularly in some cultural groups

**Funding statement:** This research received a partnership grant from Western Sydney University and NSW Health

**Competing interest statement:** None declared

## Background

Intimate partner violence (IPV) (physical, sexual or emotional) is a global health issue that affects mostly women (and some men) from different backgrounds and social groups. In 2016 the World Health Organisation (WHO) released a global plan of action to address interpersonal violence, in particular against women, girls, and against children [1]. WHO stated that all forms of interpersonal violence lead to negative health outcomes and should be addressed by the health system. WHO identified health services as an appropriate entry point for addressing this [1]. The Australian Personal Safety Survey estimated 186 000 women had experienced violence by a current cohabiting partner. Of those who had been pregnant, one in five (21.7%) reported that violence occurred during the pregnancy and for almost two thirds of women (61.4%) this had been their first experience of violence in their relationship [2]. The prevalence of violence during pregnancy is estimated to be between 4-8% of pregnant women [3].

Global estimates of the prevalence of IPV range from 16.3% of ever partnered women experiencing violence in their lifetime in East Asia to 50% of women suffering violence in Sub Saharan Africa [4]. However, these figures may be higher as the stigma and shame associated with IPV means disclosure remains low and in some cultural groups taboos about discussing what are considered to be family problems remain [5].

Pregnant women exposed to IPV face many challenges; however migrant women who are pregnant and living in a different social-cultural environment experience additional stresses in their lives, such as conflicting cultural values, social isolation, language barriers, limited economic resources, discrimination and racism [6]. In many cultures IPV is socially accepted, abuse is not always considered criminal or even incorrect and the woman is seen as subservient to their male partner [6]. A lack of knowledge about the law regarding IPV and immigration represents a challenge for migrant women as they may fear losing custody of their child/children and their immigration status [7].

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3 A meta-analysis of risk factors for domestic violence during pregnancy found across 92  
4 studies that the average prevalence of emotional abuse was 28.4%, physical abuse was  
5 13.8% and sexual abuse was 8.0% [8]. The authors found that abuse before pregnancy and  
6 lower education level were strong predictors of abuse during pregnancy. A systematic review  
7 of domestic violence and perinatal mental health disorders including 67 papers found a  
8 three-fold increase in the odds of high level depressive symptoms in the postnatal period  
9 after having experienced domestic violence during pregnancy [9]. Post-Traumatic Stress  
10 Disorder (PTSD) symptoms were also associated with a history of IPV. No studies identified a  
11 link between puerperal psychosis or eating disorders and IPV [9].  
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15 The Australian government places a strong emphasis on supporting women who are  
16 pregnant with mental health and other psychosocial issues, with particular focus on early  
17 intervention, social inclusion and recovery and service access, coordination and continuity of  
18 care [10, 11]. The increased recognition that social and emotional problems in the perinatal  
19 period can impact negatively on outcomes for women and their babies has led a number of  
20 Australian States and Territories to introduce psychosocial assessment which includes  
21 depression screening as well as questions on IPV. This process has been supported by  
22 *beyondblue* and the *national perinatal depression initiative*, which has led to the production  
23 of perinatal clinical practice guidelines for health care professionals [12]. In addition, in New  
24 South Wales (NSW) the Supporting Families Early Policy has integrated psychosocial risk  
25 assessment into routine care (Integrated Perinatal Care; IPC) during pregnancy and after the  
26 birth. The aim of this approach, is to provide a coordinated network of support for mothers  
27 and their babies [13, 14]. All women when they book in for their pregnancy care in public  
28 hospitals (this is not routine in the private healthcare sector) receive a psychosocial  
29 assessment from midwives and then again from the child and family health nurse (CFHN)  
30 following birth and again at the 6–8 week postnatal check. The psychosocial screening tool  
31 includes the Edinburgh Postnatal Depression Screen (EPDS) and a series of questions that  
32 encompass seven key variables or areas of risk (Table 1). This routine screening of pregnant  
33 women is not without its concerns regarding the specific skills required in understanding,  
34 interpreting and responding appropriately to women's needs and the support provided to  
35 midwives to do this [14, 15]. This is an even more complex issue where migrant women are  
36 concerned and cultural understandings, taboos and language barriers could all have a  
37 significant influence [16].  
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46 The aim of this study was to determine the incidence of IPV in a pregnant multicultural  
47 population not born in Australia compared to Australian born women and to determine the  
48 relationship between IPV reported at booking interview and obstetric and perinatal  
49 outcomes  
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## Methods

### Study Design

This is a retrospective population based data study. We analysed routinely collected data from the ObstetriX™ system on a cohort of all pregnant women giving birth in a major health facility in Western Sydney over a ten year period (2006 to 2016) (n=33 542).

### Setting

Blacktown Hospital is located in Western Sydney, New South Wales, Australia and provides maternity services to over 3000 women per year. Blacktown is classified as a Level 4 Maternity Unit, meaning it cares for women of low to moderate obstetric risk. Western Sydney is a rapidly growing area in NSW. It has a diverse population with a high proportion of young families, multiculturalism (57 % not born in Australia) and significant socio-economic disadvantage [17]. Routine antenatal psychosocial assessment, which includes depression screening and questions on domestic violence, has been conducted routinely at this site since 2006 when it was introduced at Blacktown Hospital.

### Data sources

This study was a retrospective review of routinely collected data for a consecutive cohort of women who delivered babies at Blacktown Hospital between 01/01/2006 and 31/05/2016. Data was sourced from the Western Sydney Local Health District ObstetriX™ database, an information system that collects clinical data from first antenatal visit, through to discharge of mother and baby from the hospital.

### Variables

Variables of interest included (i) demographics (age, country of birth and private health insurance status), (ii) baseline health, obstetric characteristics and medical risks (parity, Body Mass Index (BMI), smoking, diagnosis of hypertension, diabetes, incidence of threatened premature labour, ante-partum haemorrhage, (iii) psychosocial risks (evidence of IPV, (iv) depressive and anxiety symptoms, (v) delivery details (gestation at birth, birth type perineal status and (vi) postnatal outcomes (Apgar scores, birth weight, admission to Neonatal Intensive Care Unit. The relationship between IPV and above listed health outcomes were also examined.

The psychosocial screening tool questions are based on a series of known risk factors and are administered alongside the Edinburgh postnatal Depression Scale (EPDS) (Table 1). The booking midwife administers this screening tool in the privacy of the initial antenatal booking visit when women are around 12-20 weeks pregnant. Partners are asked not to be present or to leave when these questions are asked. If a NSW Health Interpreter was booked for the visit, the questions were asked verbally via the interpreter.

### Analysis

Positive responses to the IPV questions, collected by clinical staff at the first antenatal visit, were grouped to form the dichotomous variable 'IPV' or 'no IPV' for all women. Women were grouped in non-Australian born and Australian born cohorts and for the non-Australian born cohort with the seven most commonly occurring countries of birth were examined independently. Pregnancy, labour and delivery events were then analysed utilising contingency tables and chi square results were calculated. Logistic regression techniques were applied and reported as unadjusted and adjusted odds ratios and 95 %

confidence interval following adjustment for maternal age, gestation at birth, country of birth and smoking. Analysis was undertaken with IBM SPSS v.23™. Due to the number of statistical tests undertaken, a  $p$  value < 0.001 was set for significance.

Ethics approval was given by Western Sydney Local Health District (Protocol Number HREC2013/4/6.7(3697) AU RED LNR/13/WMEAD/98) and an amended approval given in 2017. A waiver of individual consent was obtained due to the de-identified nature of the data.

Table 1. Psychosocial risk variables I-IV. NSW Department of Health (2010)

Variables (Risk Factors)	Suggested format for psychosocial assessment questions
I. Lack of support	1. Will you be able to get practical support with your baby? 2. Do you have someone you are able to talk to about your feelings or worries?
II. Recent major stressors in the last 12 months	3. Have you had any major stressors, changes or losses recently (ie in the last 12 months) such as, financial problems, someone close to you dying, or any other serious worries?
III. Low self-esteem (including lack of self-confidence, high anxiety and perfectionistic traits)	4. Generally, do you consider yourself a confident person? 5. Does it worry you a lot if things get messy or out of place?
IV. History of anxiety, depression or other mental health problems	6 a) Have you ever felt anxious, miserable, worried or depressed for more than a couple of weeks? 6 b) If so, did it seriously interfere with your work and your relationships with friends and family? 7. Are you currently receiving, or have you in the past received, treatment for any emotional problems?
V. Couple's relationship problems or dysfunction (if applicable)	8. How would you describe your relationship with your partner? 9. a) Antenatal: What do you think your relationship will be like after the birth OR b) Postnatal (in Community Health Setting): Has your relationship changed since having the baby?
VI. Adverse childhood experiences	10. Now that you are having a child of your own, you may think more about your own childhood and what it was like. As a child were you hurt or abused in any way (physically, emotionally, sexually)?
VII. Domestic violence Questions must be asked only when the woman can be interviewed away from partner or family member over the age of 3 years. Staff must undergo training in screening for domestic violence before administering questions	11. Within the last year have you been hit, slapped, or hurt in other ways by your partner or ex-partner? 12. Are you frightened of your partner or ex-partner? (If the response to questions 11 and 12 is "No" then offer the DV information card and omit questions 13–18) 13. Are you safe here at home?/to go home when you leave here? 14. Has your child/children been hurt or witnessed violence? 15. Who is/are your children with now? 16. Are they safe? 17. Are you worried about your child/children's safety? 18. Would you like assistance with this?
Opportunity to disclose further	19. Are there any other issues or worries you would like to mention?

## Results

Over a ten period (2006-2016 inclusive) 33 542 women gave birth at the Western Sydney maternity unit. During this time there was a decrease in the number of women giving birth who were born in Australia (Figure 1). During the ten years the increase in women born in India was most notable (4.2% to 25.7%) (Figure 2). Overall 4.3% of women reported a history of IPV. There were an additional 0.8% of women for whom screening was not undertaken due to refusal of their partner or other family member/s to leave the interview room.

There were differences in demographics between Australian and non-Australian women, with Australian women being younger, more likely to be under 20 years of age and less likely to be over 35 years of age. Australian born women were more likely to have a BMI $\geq$ 30 (Table 2).

**Table 2. Selected demographics of Australian-born and non-Australian-born women**

	Australian-born=15 459	Non-Australian-born n=18 083	p
Maternal age*	27.7 (5.75)	29.8 (5.11)	<0.001
Teenage pregnancy	7.9%	1.8%	<0.001
Pregnancy $\geq$ 35 years	13.0%	17.9%	<0.001
Nulliparous	25.0%	26.9%	<0.002
Body Mass Index $\geq$ 30	28.2%	17.7%	<0.001
Body Mass Index $\leq$ 18	3.0%	3.0%	0.02
Private patient	3.7%	3.4%	0.14

\*Mean and SD

During pregnancy, women born in Australia were more likely to smoke and have hypertensive disorders of pregnancy but they were less likely to have gestational diabetes and anaemia. In terms of birth outcomes women born in Australia were more likely to have a normal vaginal birth, have an epidural and give birth in the birth centre. There was a significantly higher stillbirth rate observed in women not born in Australia (Table 3).

**Table 3. Pregnancy events and outcomes of Australian-born and non-Australian-born women**

	Australian-born= 15 459	Non-Australian-born n= 18 083	p
Smoking	19.7%	4.3%	<0.001
Gestational Hypertension	2.6%	1.8%	<0.001
Gestational Diabetes	6.4%	13.6%	<0.001
Admitted for threatened premature labour	3.6%	2.8%	<0.002
Maternal anaemia	7.7%	10.2%	<0.001
Any Ante Partum Haemorrhage	0.8%	0.9%	0.38
Gestation at delivery*	39.2 (2.01)	39.1 (1.98)	<0.001
Gestation grouped			
<28 weeks	0.6%	0.7%	N/S
29-32 weeks	0.4%	0.3%	
32-36 weeks	5.3%	5.0%	
37 week and greater	93.7%	94.0%	
Normal vaginal delivery	66.4%	60.6%	<0.001
Assisted vaginal delivery	8.6%	11.2%	<0.001
Caesarean section	25.0%	28.2%	<0.001
Syntocinon usage	46.1%	53.9%	<0.001
Place of birth			
Birth Centre	9.2%	4.9%	<0.001
Born before Arrival	0.8%	0.6%	<0.001
Operating theatre	25.0%	28.2%	<0.001
Delivery Ward	65.0%	66.3%	<0.001
Amniotomy	51.9%	51.4%	0.36
Epidural usage**	19.8%	15.3%	<0.001
3 <sup>rd</sup> and 4 <sup>th</sup> degree tear**	0.5%	1.5%	<0.001

Episiotomy**	14.4%	22.6%	<0.001
Post Partum Haemorrhage >1500mls	1.2%	1.4%	0.38
Birth weight*	3414 (588.22)	3290 (563.49)	<0.001
Admitted Special Care Nursery/Neonatal Intensive Care Unit	7.5%	8.6%	<0.001
Stillbirth Rate/1000 births	5.2	8.2	<0.001
5 minute Apgar <7	1.6%	1.6%	0.56
Fetal anomaly	0.8%	0.7%	0.38

\* Median, IQ range, Mann-Whitney U, \*\* as a % of vaginal births

Women who disclosed IPV at the first antenatal booking visit over this ten year period weighed slightly less and smoked more than twice as much compared to those who did not disclose IPV. These women were also more likely to be having a subsequent baby. During pregnancy they were more likely to have an admission with threatened premature labour (Table 4)

**Table 4. Maternal characteristics and perinatal outcomes for women who disclosed IPV at the first booking visit compared to those who have not**

	IPV reported n=1302	IPV not reported n=29 026	p
Maternal age*	28.7 (5.46)	28.6 (6.07)	0.29
Body Mass Index*	26.6 (6.54)	27.1 (7.17)	<0.001
Multiparous	82.7%	68.8%	<0.001
Smoking	26.8%	11.0%	<0.001
Hypertension diagnosed in pregnancy	1.5%	2.4%	0.04
Gestational Diabetes	9.4%	8.6%	0.96
Threatened premature labour	5.5%	3.1%	<0.001
Any Ante Partum Haemorrhage	2.22%	1.55%	0.08
Antenatal admission	10.8%	8.6%	0.006
Gestation at delivery**	39.2 (1.96)	39.1 (1.90)	0.12

Delivery type			
Normal vaginal	66.7%	61.6%	
Instrumental	7.0%	10.9%	
Caesarean section	26.3%	27.5%	
Epidural usage***	29.7%	28.3%	0.36
3 <sup>rd</sup> and 4 <sup>th</sup> degree tear***	0.46%	1.3%	0.01
Episiotomy***	18.8%	25.5%	0.05
Postpartum blood transfusion	1.08%	0.83%	0.94
Birth weight*	3349 (568.0)	3344 (573.6)	0.77
Admitted Special Care Nursery/Neonatal Intensive Care Unit	8.6%	8.5%	0.88
Stillbirth Rate/1000 births	3.9	5.4	0.49
Feeding difficulty	38.6%	39.6%	0.49
Male gender	51.0%	51.3%	0.88
Fetal growth restriction	6.5%	4.8%	0.03

\* Mean, SD and t-test, \*\* Median, IQ range, Mann-Whitney U, \*\*\* as a % of vaginal births

Overall 4.3% of women reported a history (current partner 3.5%, previous partner 0.7%, other family member 0.1%) of IPV when asked during the routine psychosocial assessment at booking in for pregnancy care. Women born in New Zealand (7.2%) and Sudan (9.1%) were most likely to report IPV at the antenatal booking visit, with women from China and India least likely to report IPV. Missing data for variables relating to IPV equated to 8.7% (Table 5).



	Australia n=13 742	India n=3783	Philippines n=2193	NZ n=1520	Fiji n=939	Sudan n=784	Pakistan n=670	China n=655	Other n=6042	Total n=30 328
Domestic violence current partner	3.9%	1.6%	3.3%	6.2%	4.3%	8.2%	2.5%	1.4%	2.7%	3.5%
Domestic violence other family member	0.1%	0.1%	0.0%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	0.1%
Domestic violence previous partner	1.3%	0.2%	0.6%	0.6%	0.1%	0.9%	0.1%	0.2%	0.3%	0.8%
Domestic violence any	5.2%	1.8%	4.0%	7.2%	4.5%	9.1%	2.7%	1.5%	3.1%	4.3%
Deferred questions due to partner or family members present	1.0%	.3%	.6%	1.2%	0.7%	1.4%	1.0%	1.7%	1.1%	0.9%

**Table 5. IPV as expressed as a percentage of country of birth for the most commonly occurring countries of birth of all women assessed**

Women who reported IPV were more likely to report concerns when psychosocial screening was attended, including EPDS  $\geq 13$  (7.63%), thoughts of self-harm (2.4%), childhood abuse (23.6%) and anxiety and depression (34.2%). Women who reported IPV were more likely overall to be Australian born, smoke and be multiparous (Table 6).

**Table 6. Associated psychosocial issues for pregnant women reporting IPV compared to those who do not**

	IPV reported	IPV Not reported	p	OR
Edinburgh Postnatal Depression Scale $\geq 13$	7.6%	2.1%	<0.001	3.57 (2.84-4.47)
Thoughts of self harm	2.4%	0.5%	<0.001	5.55 (3.73-8.25)
Illegal drug use risk	4.30%	0.73%	<0.001	6.11 (4.52-8.24)
Childhood abuse	23.6%	7.6%	<0.001	3.74 (3.27-4.28)
Pregnancy related anxiety risk	5.9%	2.1%	<0.001	2.88 (2.26-3.67)
Work/relationship effect risk	23.0%	7.4%	<0.001	3.76 (3.28-4.30)
Anxiety/depression risk	34.2%	14.0%	<0.001	3.19 (2.84-3.60)
Worried about mess risk	34.3%	25.0%	<0.001	1.57 (1.39-1.76)
Positive response to 'are you generally confident' question	75.4%	84.6%	<0.001	0.24 (0.21-0.27)
Recent worry/stress risk	47.2%	22.2%	<0.001	3.20 (2.81-3.52)
Emotional support risk	8.6%	4.4%	<0.001	2.04 (1.67-2.50)
Mental health disorder	7.07%	1.72%	<0.001	4.36 (3.46-5.48)
Family history of mental health disorder	19.1%	10.7%	<0.001	1.97 (1.71-2.28)

We examined women reporting IPV at booking and the incidence of pregnancy conditions and events compared to women with no report of IPV adjusting for smoking, parity and gestational age and found significant associations with IPV and being born in Australia, smoking, being multiparous and having threatened premature labour. Women reporting IPV were however less likely to have hypertensive disease of pregnancy (Table 7).

**Table 7 Odds ratio calculations for women reporting IPV at booking and pregnancy conditions and events when compared to women not reporting IPV (ref category is non-IPV)**

	OR	AOR
Australian born	1.5 (1.31-1.64)	<b>1.3 (1.09-1.46)</b>
Smoking	3.0 (2.60-3.36)	<b>2.7 (2.30-3.20)</b>
Multiparous	2.3 (1.98-2.70)	<b>2.0 (1.68-2.49)</b>
Gestational Diabetes Mellitus	1.0 (0.87-1.24)	1.1 (0.85-1.29)
Hypertensive Disorders of Pregnancy	0.6 (0.39-0.97)	<b>0.5 (0.32-0.91)</b>
Threatened Premature Labour	1.8 (1.44-2.36)	<b>1.8 (1.28-2.39)</b>
Ante Partum Haemorrhage	1.5 (1.04-2.11)	1.4 (0.95-2.19)
Vaginal	1.00	1.00
Instrumental	0.6 (0.49-0.76)	1.1 (0.90-1.25)
Caesarean section	1.1 (0.94-1.20)	
Born preterm	1.3 (1.04-1.60)	1.0 (0.71-1.33)
Special Care Nursery/Neonatal Intensive Care Unit admission	1.0 (0.77-1.16)	1.0 (0.82-1.23)
APGAR 2 (less than 7)	1.5 (1.00-2.12)	1.1 (0.64-1.80)
Breastfed	0.8 (0.73-0.93)	1.0 (0.86-1.20)

## Discussion

In this study we aimed to determine the incidence of IPV over 10 years in a pregnant multicultural population and to compare characteristics of those not born in Australia with those born in Australia. We also aimed to determine the relationship between IPV reported at the antenatal booking interview and selected obstetric and perinatal outcomes.

Australia has a large population of both economic and humanitarian migrants and there has been a steady increase in new arrivals over the past decade in some metropolitan locations, including the study site. Understanding the specific health care needs of migrant women in pregnancy and following birth is important to inform health service design and delivery and ensure the best health outcomes for women and babies. We found a dramatic increase in the number of women born overseas (2006 47% -2016 62%) with the largest increase being in women born in India. We also found differences in demographics and obstetric outcomes between Australian and non-Australian born women, with those not born in Australia tending to be older, less likely to have a BMI of  $\geq 30$  compared to those born in Australia. They are also much less likely to smoke and much more likely to have gestational diabetes. These differences were identified previously in our analyses of the state-wide population [18, 19].

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3 Overall a low proportion of women disclosed IPV (4.3%). This is comparable with, or a little  
4 lower than other Australian [20] and international [3] studies that also estimated IPV  
5 prevalence to be between 4-8% of pregnant women. However, this is very likely to reflect  
6 under-reporting by women, as demonstrated by James, Brody and Hamilton (2013), the  
7 prevalence of IPV in pregnancy is close to 20% [21]. Furthermore, in NSW the IPV screening  
8 questions ask directly about physical abuse which was estimated to be around 13.8% [22].  
9

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11 The Maternal Health Study conducted in one Australian state (Victoria) reported that the  
12 prevalence of domestic violence across the first postnatal year was 17% [20]. In the four  
13 year follow up, the authors found that 29% of women experienced IPV across the four years  
14 post birth. This included women who were subjected to physical and or emotional and/ or  
15 sexual abuse [23].  
16

17  
18 In our study, women who reported IPV were more likely overall to be Australian born. We  
19 found that of the non-Australian born cohort, women born in New Zealand and in Sudan  
20 were more likely to report IPV when asked. The NZ sample is likely to reflect the higher  
21 Maori and Pacific Islander population in this location (Western Sydney). New Zealand  
22 research has reported a higher prevalence of IPV amongst Maori women and in some  
23 locations this is over 60% [24]. Studies also report that many Sudanese women experience  
24 IPV from their husbands prior to migration and this represents a significant factor in these  
25 women's pre-migration history [25].  
26

27  
28 In contrast, women born in India (the largest migrant group in the study location) and those  
29 born in China were the least likely to say they experienced IPV when asked. We suggest that  
30 this reflects significant under-reporting by these women. Previous studies have reported  
31 rates of 4% in China [26] and more recently James, Brody and Hamilton (2013) found a  
32 prevalence of 4.8% in China and a prevalence of 28% in India [21]. This under-reporting is  
33 likely due to cultural concerns about sharing with strangers what is considered to be family  
34 business, something that is accepted in their country of origin [27].  
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36  
37 Women who reported IPV were more likely to report a raised EPDS  $\geq 13$  (7.63%), thoughts of  
38 self-harm (2.4%), and anxiety and depression (34.2%). These women were also more likely  
39 to worry, report stress and have a family history of mental illness. This means they are likely  
40 to have fewer social support systems in place that could buffer or protect them and their  
41 children from the effects of IPV [28]. A number of longitudinal studies of maternal well-  
42 being in Australia [23, 29] show a strong association between depressive symptoms in  
43 pregnancy and in the year after birth and poor partner relationship and IPV.  
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47 Another major concern reported when psychosocial screening was attended was childhood  
48 abuse (23.6%) which was significantly associated with IPV. Researchers have hypothesised  
49 that women with a history of childhood abuse may be at exceptionally high risk of re-  
50 victimisation in adulthood, including rape and IPV [30-33]. In the Maternal Health Study,  
51 childhood abuse was reported by a high number of women (41 %) and these women were  
52 more likely to experience IPV and poor mental health [29].  
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3 As noted women who reported IPV were more likely to be Australian born, they were more  
4 likely to smoke and be multiparous. During the pregnancy they were less likely to have  
5 hypertensive disease of pregnancy and more likely to have been admitted for threatened  
6 preterm labour (AOR 1.8 CI 1.28-2.39). Various studies have demonstrated a significant  
7 impact of IPV on women's health behaviours during pregnancy, including higher rates of  
8 smoking, [34-36] alcohol and substance use [37-39]. Experiencing IPV is a significant life  
9 stress and higher rates of mental illness, seen in this study, also correlate with high smoking  
10 rates. One study found probable major depression and generalised anxiety disorder were  
11 associated with a 93% and 44% increased odds of being a current smoker respectively [40].  
12 Likewise the higher number of multiparous women reporting IPV would impact on the  
13 higher rates of normal birth seen in this group as well the lower episiotomy rate and  
14 severe perineal trauma rate.  
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17 The impact of IPV on maternal mental health cannot be underestimated. During the  
18 pregnancy and the postpartum period IPV is associated with depression, anxiety and post-  
19 traumatic stress disorder (PTSD) [41-43]. Post-traumatic stress disorder (PTSD) rates  
20 associated with IPV range from anywhere between 19% and 84% [44, 45]. Around 40% of  
21 women who experience IPV report symptoms of depression [45, 46]. The most serious  
22 reported outcomes of IPV during pregnancy are homicide and suicide, with maternal injury a  
23 leading cause of maternal mortality [47, 48]. It has been estimated that 38% of murders of  
24 women are by an intimate partner or ex-partner [1].  
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27 In this study we found women who were multiparous were more likely to disclose IPV and  
28 this has been reported previously [49]. This is important to know as women may be more  
29 prepared to disclose with a subsequent pregnancy. This may be due to their realising the  
30 impact of IPV on the child but also they may be feeling more comfortable with and trusting  
31 of the service [50]. Another possibility for this higher rate of disclosure of IPV with  
32 multiparous women may be due to the fact that hopes that a coercive partner may reform  
33 once the baby has arrived are not realised. Perhaps also motherhood shifts loyalty from a  
34 non-supportive partner to a baby and energy and affection is channelled more to the baby.  
35 This in turn may make reporting easier but may also lead to an escalation of IPV. It is really  
36 important more research is done to help understand this. It is also possible that relationship  
37 strains may be taking a toll with the presence of children and escalation of IPV. In a study  
38 undertaken in Nigeria where a much higher IPV was found in multiparous women and the  
39 authors suggest lower socioeconomic status could be a factor in this as well as this is  
40 associated with larger families [49].  
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44 A number of studies have reported that women who suffer IPV during pregnancy are twice  
45 as likely to miss antenatal visits appointments or initiate antenatal care early [51, 52].  
46 Women with a history of IPV are more likely to miss three or more antenatal visits compared  
47 with their non-abused counterparts (45% vs. 28%) [53]. In addition there are increased  
48 numbers of hospitalisation reported for these women [54]. In our study we found women  
49 were more likely to be hospitalised with threatened preterm birth if they had a history of  
50 IPV. Several studies have reported a link between insufficient antenatal care associated with  
51 IPV and adverse birth outcomes, including preterm birth and low birth weight (LBW) and  
52 small for gestational age (SGA) [55-57]. While we did not find an actual increase in preterm  
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3 birth in this study it is well known that preterm birth and LBW are the primary causes of  
4 neonatal morbidity and mortality [58].  
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### 8 **Health Services**

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10 The WHO has identified health services as an appropriate entry point for addressing IPV, in  
11 particular against women and girls [1] who bear the vast burden of IPV. Women who  
12 experience IPV are more likely to use health services than those who do not even though  
13 they rarely explicitly disclose violence as the underlying reason [1]. This is even more the  
14 case when they are pregnant and midwives and doctors are the front line health care  
15 providers in this case. Unfortunately health and other services are slow to recognise and  
16 address this violence, either because they don't recognise the signs, do not have appropriate  
17 services in place or they are simply at capacity [1]  
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20 Currently the Australian Government has a clear aim to reduce the incidence of IPV against  
21 women through public education and health promotion. However, more is required from  
22 health providers than simply asking the question. Spangaro et al. (2015) found multiple  
23 pathways to disclosure with no single factor necessarily sufficient for a decision to disclose  
24 [59]. While being asked the question was important in women disclosing IPV, the way the  
25 question was asked (with interest and being non-judgmental) were found to be key  
26 conditions [59]. With the increasing use of computers to guide questions and document  
27 women's responses to sensitive questions included in psychosocial screening [60], questions  
28 are raised as to how effective this will be if a trusting relationship is important in disclosure.  
29 A recent ethnographic study of psychosocial assessment and depression screening in  
30 pregnancy and following birth, found that some midwives and child and family health nurses  
31 were reticent to ask questions related to IPV as well as childhood abuse, at times avoiding  
32 asking these questions, rewording the question or minimising women's responses [14, 61].  
33 Midwives and nurses also indicated that many women from non-English speaking  
34 backgrounds did not always understand the question being asked of them and interpreters  
35 were not always available [14, 61]. This suggests that we have less knowledge of how to  
36 screen for IPV among diverse cultural and linguistic groups. We also have limited information  
37 about how many women who report IPV are provided with appropriate referrals and  
38 whether they take up the referral. Our study also raises important questions around the  
39 need to have a higher level of awareness and vigilance regarding possible IPV when women  
40 report childhood abuse and other commonly gathered antenatal information.  
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49 There are current discussions amongst health workers and government services that  
50 screening women for IPV initially at booking and again during the third trimester could be  
51 advisable as IPV may escalate and/or women may feel more comfortable and trusting of  
52 their care provider as the pregnancy advances. This may be even more useful in continuity  
53 of care models where women are cared for by a trusted midwife who they get to know and  
54 trust. Others suggest that questions about IPV should not be asked at the first visit as is  
55 currently done as no relationship has been developed. There is little evidence as to what  
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3 might be the best approach. There is debate about both the effectiveness of IPV enquiry  
4 and the most appropriate time to conduct assessments in pregnancy and after birth[62]. A  
5 number of authors report that when asked, women may choose not to disclose about the  
6 abuse at the initial time of asking, for fear of their own safety but asking signifies that she  
7 can disclose at a later contact [63]. As a result of this debate there is inconsistent and at  
8 times poor uptake of screening in antenatal services in Australia [64].  
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### 10 11 **Strengths and Limitations**

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13 There are several limitations with this study and these include that it involves only one  
14 hospital Western Sydney and so may not be generalisable to other areas with different  
15 populations. Also we were unable to determine ethnicity as the variable provided is country  
16 of birth and we could not distinguish between refugees and migrants. Other outcomes not  
17 reported here because of the nature of the dataset include urinary and faecal incontinence  
18 [65]. The division of non-Australian born women into the seven countries dilutes the data  
19 pool and limits conclusions about individual groups. There is missing data for the IPV  
20 variable as already reported and this is more frequent in the first few years of the data set  
21 when psychosocial screening was being introduced. The advantages of using the ObstetriX™  
22 database are the large number of variables available compared to the other state-wide  
23 routine data bases, such as the Perinatal Data Collection (PDC) and Admitted Patient Data  
24 Collection (APDC). Socioeconomic factors which affect health such as body mass index,  
25 psychosocial risk factors, marital status, education level, occupation, are not collected in the  
26 latter and adjustment for these variables cannot be undertaken when modelling statistical  
27 interactions with these databases and the use of Obstetrix provides this advantage.  
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### 34 **Conclusion**

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36 There appears to be a relationship between psychosocial risks identified at the antenatal  
37 booking visit and a history of IPV; in particular this is seen in women who have a history of  
38 anxiety and depression and childhood abuse. This provides maternity health care providers  
39 with more evidence for incorporating routine psychosocial screening during antenatal care  
40 and providing appropriate services. The fact that women with a history of IPV had more  
41 antenatal admissions, particularly for threatened preterm labour, could provide another  
42 potential warning sign for midwives and doctors. More research is needed regarding the  
43 effectiveness of current IPV screening for women from other countries.  
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### 49 **Contributors:**

50  
51 HD designed the study, assisted with analysis and wrote the paper; AM undertook a review  
52 of the literature and helped access the data for analysis; VS Consulted on the study and  
53 contributed to the writing of the paper; CT analyses the data and assisted in writing the  
54 paper.  
55

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#### 47 Figure Legend

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49 Figure 1 Changing profile of Australian born women expressed as a percentage of all births over time

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52 Figure 2 Changing profile of non-Australian born women expressed as a percentage of all births over time

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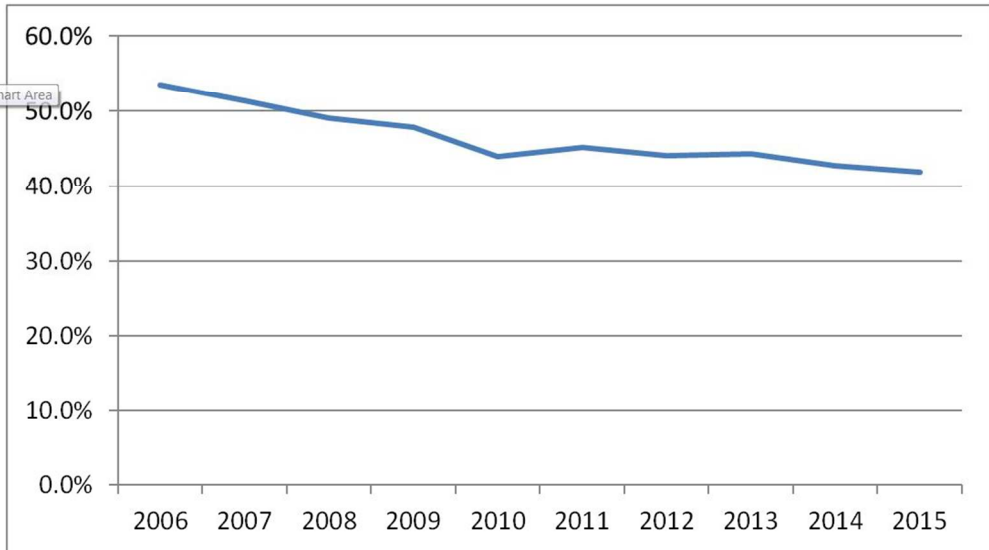
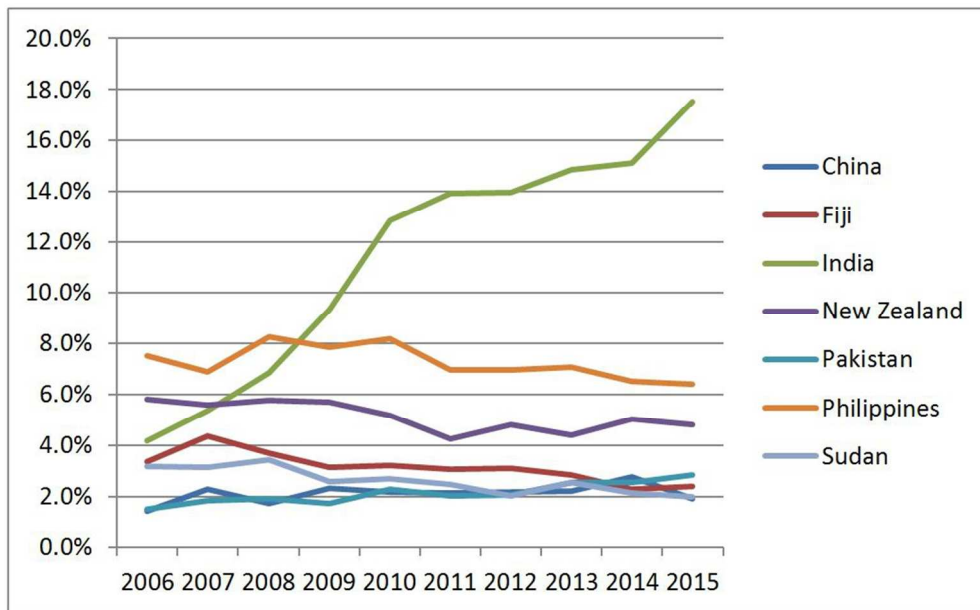


Figure 1 Changing profile of Australian born women expressed as a percentage of all births over time

92x52mm (300 x 300 DPI)

Review only



89x55mm (300 x 300 DPI)

Review only

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	3
<b>Introduction</b>			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	5
<b>Methods</b>			
Study design	4	Present key elements of study design early in the paper	1, 3, 6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	N/A
		(b) For matched studies, give matching criteria and number of exposed and unexposed	N/A
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-7
Data sources/measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6-7
Bias	9	Describe any efforts to address potential sources of bias	6-7
Study size	10	Explain how the study size was arrived at	N/A
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6-7
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	6-7
		(b) Describe any methods used to examine subgroups and interactions	6-7
		(c) Explain how missing data were addressed	6-7
		(d) If applicable, explain how loss to follow-up was addressed	n/a
		(e) Describe any sensitivity analyses	N/A
<b>Results</b>			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	n/a

		(b) Give reasons for non-participation at each stage	n/a
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Page - Table
		(b) Indicate number of participants with missing data for each variable of interest	Page – Table 1
		(c) Summarise follow-up time (eg, average and total amount)	n/a
Outcome data	15*	Report numbers of outcome events or summary measures over time	All tables and figures
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Table 7
		(b) Report category boundaries when continuous variables were categorized	Not applicable
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	Not relevant
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	6-7
<b>Discussion</b>			
Key results	18	Summarise key results with reference to study objectives	7-14
<b>Limitations</b>			
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	15-19
Generalisability	21	Discuss the generalisability (external validity) of the study results	18
<b>Other information</b>			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	19