

# Improving Aboriginal Women's Experiences of Antenatal Care: Findings from the Aboriginal Families Study in South Australia

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**ABSTRACT: Background:** Aboriginal and Torres Strait Islander families experience markedly worse maternal and child health outcomes than non-Aboriginal families. The objective of this study was to investigate the experiences of women attending Aboriginal Family Birthing Program services in South Australia compared with women attending mainstream public antenatal care. **Method:** Population-based survey of mothers of Aboriginal babies giving birth in urban, regional, and remote areas of South Australia between July 2011 and June 2013. **Results:** A total of 344 women took part in the study around 4–9 months after giving birth; 93 percent were Aboriginal and/or Torres Strait Islanders, and 7 percent were non-Aboriginal mothers of Aboriginal babies. Of these, 39 percent of women lived in a major city, 36 percent in inner or outer regional areas, and 25 percent in remote areas of South Australia. Compared with women attending mainstream public antenatal care, women attending metropolitan and regional Aboriginal Family Birthing Program services had a higher likelihood of reporting positive experiences of pregnancy care (adjOR 3.4 [95% CI 1.6–7.0] and adjOR 2.4 [95% CI 1.4–4.3], respectively). Women attending Aboriginal Health Services were also more likely to report positive experiences of care (adjOR 3.5 [95% CI 1.3–9.4]). **Conclusions:** In the urban, regional, and remote areas where the Aboriginal Family Birthing Program has been implemented, the program has expanded access to culturally responsive antenatal care for Aboriginal women and families. The positive experiences reported by many women using the program have the potential to translate into improved outcomes for Aboriginal families. (BIRTH 2015)

**Key words:** Aboriginal maternal and child health, health inequalities, social determinants of health

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## Background

Australian Aboriginal and Torres Strait Islander families experience markedly worse maternal and child health outcomes than non-Aboriginal families. Aboriginal and Torres Strait Islander women are three times more likely to die during childbirth compared with other Australian women, and two to three times more likely to have a stillbirth or neonatal death, preterm birth, and/or low birthweight infant (1–6). Despite long-standing recognition of these health differentials, there has been limited progress toward improving maternal and perinatal outcomes for Aboriginal and Torres Strait Islander families.

From a policy perspective, the magnitude and enduring nature of inequalities in health outcomes for Aboriginal and Torres Strait Islander families presents a major challenge for health system reform. This challenge is compounded by a lack of research evidence to inform policy and program initiatives aiming to improve maternal and child health outcomes for Aboriginal families (7). Only a small number of studies have evaluated specific programs and initiatives designed to improve Aboriginal maternal and child health outcomes in most cases reporting on small-scale programs operating out of a single hospital, community-based health service, or regional health service (8–20).

Individual state and territory jurisdictions within Australia have adopted different policy and service approaches toward improving Aboriginal maternal and child health outcomes. In South Australia, the state government has implemented the Aboriginal Family Birthing Program (AFBP) in six regional locations, and in the major metropolitan center of Adelaide. The AFBP builds on two small-scale regional programs—the Anangu Bibi Family Birthing Program and the Tjurni Miminis Birthing Program—that aimed to provide culturally focused perinatal care to Aboriginal families in the regional towns of Port Augusta and Whyalla (13). The program has several core elements including: community consultation and engagement in the establishment of the program; creation of a new Aboriginal Maternal Infant Care (AMIC) worker position in a leadership role within maternity services; partnerships and skill exchange between AMIC workers and midwives; education and training for AMIC workers in antenatal, intrapartum, and postpartum care; and a commitment to providing both high-quality primary health care and continuity of caregiver for women and families. Similar statewide Aboriginal maternal and child health programs have been implemented in the states of New South Wales and Victoria, although each state jurisdiction has adopted a different model (10,19).

Evaluation of statewide and regional programs is complicated by several factors. The Aboriginal and Torres Strait Islander population outside the Northern Territory comprises between 0.9 and 4.7 percent of the total population in each state and territory. Aboriginal people are also widely dispersed across urban, regional, and remote areas of Australia (4). Although pregnancy and childbirth are common reasons for families to access health services, the number of Aboriginal and Torres Strait Islander families using individual programs or services is relatively low. Most program evaluation has focused on individual services and relied on the use of historical controls and/or been limited to the use of routinely collected data to monitor shifts in perinatal outcomes over time (7,21). Very few studies have sought to gather information from Aboriginal women themselves about their experiences of pregnancy and birthing services (10,15,22).

The Aboriginal Families Study is a cross-sectional population-based study that investigated the views and experiences of mothers having an Aboriginal baby in South Australia between July 2011 and June 2013. The study was designed to compare the experiences and views of women attending standard (mainstream) care with those of women attending AFBP services in urban and regional areas. The primary objectives of this paper are as follows: 1) to describe the social and obstetric characteristics of women attending different models of antenatal care; and 2) to compare the experiences of women attending metropolitan and regional AFBP services with those of women attending other public models of antenatal care.

## Methods

The study was developed in partnership with the Aboriginal Health Council of South Australia Inc. The Council is the peak body representing Aboriginal Community Controlled Health Services throughout South Australia and has played a key role in all stages of designing, conducting, and interpreting the research.

Details about the community consultations and consultations with policy makers that preceded the development of the study protocol are outlined in a previous paper (23). Briefly, community consultations were undertaken in urban, regional, and remote communities in South Australia from late 2007 to early 2009. Feedback from participants in the community consultation identified the importance of:

1. providing opportunities for Aboriginal women's voices to inform strengthening of services for Aboriginal families;
2. the involvement of Aboriginal researchers in the conduct and interpretation of the research;

3. respecting the diversity of Aboriginal cultural and childrearing practices; and
4. ensuring that younger women are given opportunities to participate in the research.

In addition, it was repeatedly stressed that the research should focus on the impact of social health issues on women's health during and after pregnancy, and that the research needed to lead to improvements in services and support for Aboriginal families.

An Aboriginal Advisory Group—established under the auspices of the Aboriginal Health Council of South Australia—guided the community consultation and worked with the researchers to design the research study. It was agreed that to maximise the likelihood of the study findings influencing health policy and system reform at a statewide level, it was desirable for the study to hear from women living in urban, regional, and remote areas of South Australia, and for the sample to be large enough to compare the views and experiences of women attending different models of maternity care. It was also agreed that the method of data collection would be based on a structured interview booklet, with women offered a choice to be interviewed by an Aboriginal or non-Aboriginal research interviewer, or to complete the interview booklet as a self-administered questionnaire if they preferred. The choice to use a structured interview booklet was based on feedback from the consultation, suggesting that many Aboriginal women preferred a structured interview booklet to a more open-ended digitally recorded interview.

The primary aims of the study were: 1) to compare experiences and views of women attending standard (mainstream) models of antenatal care with those accessing care via the AFBP; 2) to assess factors contributing to early and continued engagement with antenatal care; and 3) to use this information to inform the strengthening of services for Aboriginal families.

#### *Study Population*

All women who gave birth to an Aboriginal and/or Torres Strait Islander baby in South Australia between July 2011 and June 2013, excluding women under 14 years of age, were eligible to take part in the study. We aimed to achieve a representative sample of around 300 women from urban, regional, and remote areas of South Australia. We invited women to complete the interview booklet when their baby was between 4 and 12 months of age to facilitate collection of information about postpartum, antenatal, and intrapartum experiences.

#### *Recruitment and Conduct of the Interviews*

A team of 12 Aboriginal research interviewers and one non-Aboriginal interviewer recruited women and conducted interviews. Women were recruited via public hospitals, Aboriginal community controlled health services, community organizations, community events, and via the interviewers' own community networks and through study participants referring other women to the study. Information about the study was circulated by means of community newsletters, information brochures and posters in community agencies, and by community radio.

Women who expressed interest in taking part were given a participant information sheet providing information about the purpose of the study. Women chose whether they wanted to complete the interview booklet with an interviewer or to complete the interview booklet themselves and arrange a time for the interviewer to collect it. Women under 18 years of age were able to provide written or verbal consent to participate, but were encouraged to discuss the project with another family member, parent, or legal guardian before deciding to take part. However, parental or guardian consent was not a requirement for participation. After completing the interview booklet, women were provided with a gift voucher in appreciation of their participation in the study.

#### *Interview Booklet*

The interview booklet (available on the study website) consisted of 44 pages divided into 8 sections (24). Questions were initially pretested with 16 women in 2010, and then modified and retested with a further 8 women. Several modifications were made to simplify language and ensure that the questions were acceptable to diverse groups of women: including younger and older women; women living in urban, regional, and remote areas; and women with differing levels of formal education.

Our prespecified study hypotheses were that: 1) women attending AFBP services will be more likely to report positive experiences of antenatal care compared with women attending mainstream public care; and 2) women attending AFBP services will be more likely to receive support from health professionals in relation to social health issues during pregnancy compared with women attending mainstream public care (23).

#### *Self-Report Measures and Definitions*

Women who reported serious health problems (e.g., diabetes, hypertension, bleeding, and urinary tract infection) or prior reproductive complications, such as

a prior stillbirth or preterm birth, were categorized as being at higher risk of complications during pregnancy. Women were also asked to indicate if they had experienced specific stressful events or social health issues (e.g., death of a family member, housing problems, having to go to court, and drug and alcohol problems) during pregnancy. Both sets of questions were study-designed measures developed in consultation with the Aboriginal Advisory Group and pilot-tested with Aboriginal women to assess acceptability and ease of completion. The Australian Geographical Classification System was used to classify women as living in a major city, regional, or a remote area.

Women were identified as attending one of the six main models of antenatal care based on their responses to a series of questions about: where the pregnancy checkup took place (i.e., hospital, health service, or home), health professionals providing antenatal care, the hospital where women gave birth, and health insurance status. Three models of care focus specifically on providing culturally appropriate services for Aboriginal families, including opportunities for women to be cared for by AMIC workers and Aboriginal Health Workers. These are: the AFBP services in the metropolitan area of Adelaide, AFBP services in regional areas, and Aboriginal Health Services providing antenatal care to women (outside the AFBP). Other care options in the public sector include: midwifery group practice (where women see the same midwife for care throughout pregnancy), public clinic care (where all visits are at a public hospital, and women generally see different caregivers at each visit), shared care between a public hospital and a community-based general practitioner/local doctor, and public general practitioner care (where all antenatal care is provided by a community-based general practitioner/local doctor). Private care is also available from private specialist obstetricians, mostly practicing in the metropolitan area. For the purpose of analysis, we grouped together public clinic care, shared care, and public general practitioner care under the heading "mainstream public care."

An overall rating of women's experiences of antenatal care was obtained from a question that asked: "So if you think about the whole time you were pregnant, and the care you got, how was the care overall? Was it ... 'very good,' 'good,' 'mixed,' 'poor' or 'very poor'?" In addition, women were asked a number of more specific questions about their experiences of antenatal care. These included questions assessing the extent to which health professionals asked about and provided support with "things happening in your life." As we were interested in whether or not women received *consistent* support with social health issues, women's responses were dichotomized to compare women indicating that they "always" received support, with those saying that they only "sometimes" or "never" received support.

### *Data Management and Analysis*

Participant recruitment and follow-up was managed using a secure, web-based database (25). Data were analyzed using Stata version 13 (26). Simple frequencies and proportions were used to summarize categorical data. Univariable and multivariable logistic regression was used to assess associations between the model of antenatal care and women's overall rating of antenatal care, accounting for differences in social and obstetric characteristics of women attending different models of care.

Ethics approval was obtained from: Aboriginal Health Research Ethics Committee of South Australia; South Australian Department of Health; Women's and Children's Health Network, Adelaide; Lyell McEwin Hospital, Adelaide; and Royal Children's Hospital, Melbourne.

## **Results**

### *Characteristics of Study Participants*

Overall, 418 women expressed interest in the study and provided their contact details and consent for researchers to contact them. We were unable to contact 57 of the women who had provided their contact details, mostly because they had moved or the phone number provided was no longer connected. Thirteen women who had initially expressed interest in the study decided not to take part, generally because they were "too busy" or there were "too many things happening" at the time. A total of 348 women completed the interview booklet: 83 percent of women who initially expressed interest in taking part. One woman was excluded because she had all of her pregnancy care outside South Australia and three women were excluded because they had incomplete consent forms. The final sample for analysis comprised 344 women: 178 women (52%) were interviewed by an Aboriginal research interviewer and 166 women (48%) chose to self-complete the interview booklet. The average age of the index child at the time women completed the interview booklet was 7 months (SD 3, range 1–17 months).

Most study participants (90%, 311 women) identified as Aboriginal. A small number of women identified as Aboriginal and Torres Strait Islander (1%, 4 women) or Torres Strait Islander (1%, 4 women), while 7 percent of the participants (25 women) were non-Aboriginal mothers who had recently given birth to an Aboriginal baby. Participants named over 20 Aboriginal languages and community groups in South Australia and over 15 other Aboriginal languages and communities with whom they had connections.

Social characteristics of study participants are shown in Table 1. Sixteen percent of women in the study were less than 20 years of age at the time of giving birth, and 57 percent were less than 25 years of age. The mean age of study participants was 25 years (SD 6, range 15–43 years). About 42 percent of participants had recently given birth to their first child and 58 percent had recently given birth to a second or subsequent child (range 2–10 children). Five women had another baby during the recruitment period and completed an interview booklet for two pregnancies. Approximately 39 percent of participants resided in Adelaide at the time of completing the questionnaire, 36 percent resided in regional areas, and 25 percent lived in remote areas of South Australia. Over half of the participants (52%, 177/344) had their baby at a metropolitan hospital, 47 percent (162/344) at a regional hospital, and 5 (1%) women had their baby at home or on the way to the hospital. Most study participants had a health care card providing cheaper access to medical services and pharmaceuticals. Just over half of the women used their own car to travel to a pregnancy checkup.

Participant characteristics were compared with data collected by the South Australian Pregnancy Outcome Unit for all births to Aboriginal mothers in 2011 (6). This showed that participants were largely representative in relation to maternal age. However, women having their first baby appeared to be slightly overrepresented (42% of participants vs 34.3% of recorded births to Aboriginal mothers in 2011 data), and women giving birth at metropolitan hospitals slightly underrepresented (53% of participants vs 59% of recorded births to Aboriginal mothers in 2011 data).

The characteristics of study participants with respect to social and medical risk factors for complications during pregnancy are reported in Table 2. About 56 percent of participants reported three or more stressful life events and social health issues during pregnancy, and 51 percent reported serious medical conditions or adverse events in a previous pregnancy placing them at higher risk of complications in the current pregnancy. The proportion of women reporting three or more social issues was higher in the urban area than in regional and remote areas. Similarly, the proportion of women reporting

**Table 1. Social Characteristics of Study Participants During Pregnancy, South Australia, 2011-2013\***

	<i>All study participants</i> No. (%)	<i>Place of residence</i>		
		<i>Major city</i> (n = 134) No. (%)	<i>Regional</i> (n = 123) No. (%)	<i>Remote</i> (n = 87) No. (%)
<b>Mother's age when baby born</b>				
15–19 years	55 (16.0)	20 (14.9)	20 (16.3)	15 (17.2)
20–24 years	140 (40.7)	53 (39.6)	54 (43.9)	33 (37.9)
25–29 years	91 (26.5)	36 (26.9)	29 (23.6)	26 (29.9)
30 + years	58 (16.9)	25 (18.7)	20 (16.3)	13 (14.9)
<b>Number of children</b>				
1	145 (42.2)	61 (45.5)	53 (43.1)	31 (35.6)
2–3	127 (36.9)	45 (33.6)	47 (38.2)	35 (40.2)
4–10	72 (20.9)	28 (20.9)	23 (18.7)	21 (24.1)
<b>Highest educational qualification</b>				
Less than year 12	134 (39.0)	36 (26.9)	55 (44.7)	43 (49.4)
Year 12	33 (9.6)	17 (12.7)	11 (8.9)	5 (5.7)
Certificate/Traineeship	155 (45.1)	68 (50.7)	52 (42.3)	35 (40.2)
Diploma/Degree	22 (6.4)	13 (9.7)	5 (4.1)	4 (4.6)
<b>Health care card</b>				
No	44 (12.9)	17 (12.8)	20 (16.7)	7 (8.0)
Yes	296 (87.1)	116 (87.2)	100 (83.3)	80 (92.0)
<b>Own car for getting to checkups during pregnancy</b>				
Yes	191 (55.8)	78 (58.2)	66 (54.1)	47 (54.7)
No	151 (44.2)	56 (41.8)	56 (45.9)	39 (45.3)

\*Denominators vary as a result of missing values; missing values only shown where > 5%.

serious medical conditions appears to be higher in the urban and regional areas compared with women living in remote areas. Just under half of all study participants reported smoking cigarettes during pregnancy, 9 percent of women reported having a drug or alcohol problem, and 20 percent reported that their partner had a drug or alcohol problem with similar proportions of women affected across urban, regional, and remote areas. Almost 16 percent of women said they had been “pushed, shoved or assaulted” while pregnant, and 27 percent had left home because of a family argument, with a higher proportion of women affected in urban areas. Housing problems were also

extremely common, affecting around 40 percent of women living in urban, regional, and remote areas.

#### *Characteristics of Women in Different Models of Antenatal Care*

The majority of women in the study (241/308, 78%) reported that they attended antenatal care in the first trimester of pregnancy (< 14 weeks). A relatively small number (56/308, 18%) reported that they had their first visit between 14 and 26 weeks, five women (1.6%) reported that they attended their first visit after

**Table 2. Self-Reported Social and Medical Risk Factors for Complications During Pregnancy, South Australia, 2011-2013\***

	<i>Place of residence</i>			
	<i>All study participants</i> No. (%)	<i>Major city</i> (n = 134) No. (%)	<i>Regional</i> (n = 123) No. (%)	<i>Remote</i> (n = 87) No. (%)
Stressful life events and social health issues				
None	46 (13.4)	11 (8.2)	19 (15.4)	16 (18.4)
1–2 issues	105 (30.5)	40 (29.9)	43 (35.0)	22 (25.3)
3–11 issues	193 (56.1)	83 (61.9)	61 (49.6)	49 (56.3)
Risk of complications during pregnancy, e.g., serious medical condition, prior stillbirth <sup>†</sup>				
No	165 (48.8)	61 (46.2)	56 (46.7)	48 (55.8)
Yes	173 (51.2)	71 (53.8)	64 (53.3)	38 (44.2)
Smoking cigarettes during pregnancy				
No	175 (51.6)	75 (56.0)	60 (49.6)	40 (47.6)
Yes	164 (48.4)	59 (44.0)	61 (50.4)	44 (52.4)
Housing problems during pregnancy				
No	194 (57.4)	68 (51.5)	78 (65.0)	48 (55.8)
Yes	144 (42.6)	64 (48.5)	42 (35.0)	38 (44.2)
Drug or alcohol problem during pregnancy				
No	307 (91.1)	121 (91.7)	110 (91.7)	76 (89.4)
Yes	30 (8.9)	11 (8.3)	10 (8.3)	9 (10.6)
Partner had drug or alcohol problem during pregnancy				
No	251 (73.0)	97 (75.8)	91 (78.4)	63 (81.8)
Yes	70 (20.4)	31 (24.2)	25 (21.6)	14 (18.2)
Missing/prefer not to answer	23 (6.6)			
Pushed, shoved or assaulted during pregnancy				
No	280 (84.1)	103 (79.8)	107 (87.7)	70 (85.4)
Yes	53 (15.9)	26 (20.2)	15 (12.3)	12 (14.6)
Had to leave home because of a family argument or fight during pregnancy				
No	248 (73.4)	89 (67.4)	93 (76.9)	66 (77.6)
Yes	90 (26.6)	43 (32.6)	28 (23.1)	19 (22.4)

\*Denominators vary as a result of missing values; missing values shown where > 5%. <sup>†</sup>Medical conditions include: diabetes, hypertension, preeclampsia, anemia, urinary tract infections, renal disease, heart disease, thyroid condition, intrauterine growth restriction, and antepartum hemorrhage.

26 weeks, and six women (1.7%) had no antenatal care. About 36 women had missing data for this item (10.5%).

Just over half of the women in the study attended AFBP services: 48 women (14%) attended metropolitan AFBP services, and 128 women (38%) attended one of the six regional AFBP services. A further 23 women (7%) attended an Aboriginal Health Service for antenatal care, not in conjunction with the AFBP. About 115 women (34%) attended mainstream public antenatal care and 19 women (6%) attended a midwifery group practice. Five women (1%) attended a private specialist obstetrician and were excluded from the remaining analyses reported in the paper.

The social and obstetric characteristics of women in five models of public antenatal care are reported in Table 3. Women attending metropolitan AFBP services were more likely to have a health care card (OR 9.3 [95% CI 1.2–71.6]) and to report three or more stressful events and social health issues during pregnancy (OR 4.4 [95% CI 2.0–9.8]) compared with women attending mainstream public antenatal care services. A significantly higher proportion of women attending metropolitan AFBP services reported that their partner had a drug or alcohol problem (OR 3.9 [95% CI 1.7–8.9]), or that they had been “pushed, shoved or assaulted” during pregnancy (OR 2.1 [95% CI 0.9–4.6], borderline), or had to leave home because of a family argument (OR 2.9 [95% CI 1.4–6.1]) compared with women attending mainstream public antenatal care. Differences were also

apparent comparing women attending regional AFBP services with women attending mainstream public care. For example, significantly higher proportions of women attending regional AFBP services had not completed high school (OR 2.7 [95% CI 1.4–5.0]), reported that they smoked cigarettes during pregnancy (OR 1.7 [95% CI 1.0–2.8]), or that their partner had a drug or alcohol problem (OR 2.2 [95% CI 1.1–4.4]). There were no significant differences in risk of complications during pregnancy related to serious medical conditions or prior reproductive history comparing women in different models of care. The characteristics of women attending Aboriginal Health Services outside the AFBP appear to be similar to the characteristics of women attending the AFBP services. In contrast, women attending a midwifery group practice appear to be more like women attending mainstream public models of care. No comparisons are reported for women attending private care as the number was too small for meaningful analyses.

#### *Women's Views of Different Models of Public Antenatal Care*

Overall, 50 percent (168/335) of women described their antenatal care as “very good,” 30 percent (101/335) said it was “good,” 18 percent (59/335) said it was mixed, and 2 percent (7/335) said it was “poor” or “very poor.” Responses were dichotomized to compare

**Table 3. Social and Obstetric Characteristics of Women with Different Models of Public Antenatal Care, South Australia, 2011-2013**

	<i>Mainstream public care No. (%)</i>	<i>Midwifery group practice No. (%)</i>	<i>Aboriginal health service No. (%)</i>	<i>AFBP metropolitan No. (%)</i>	<i>AFBP regional No. (%)</i>
Maternal age at birth of baby < 25 years	73 (63.5)	10 (52.6)	15 (65.2)	28 (58.3)	62 (48.4)*
Primiparous (first baby)	59 (51.3)	12 (63.2)	10 (43.5)	21 (43.8)	36 (28.1)*
Completed less than 12 years of education	78 (67.8)	11 (57.9)	16 (69.6)	35 (72.9)	108 (85.0)***
Health care card holder	96 (83.5)	12 (70.6)	21 (91.3)	47 (97.9)*	112 (88.9)
Use of own car to travel to checkup during pregnancy	72 (62.6)	15 (78.9)	12 (52.2)	18 (37.5)**	68 (54.0)
First visit for antenatal care during first trimester	79 (76.7)	14 (77.8)	13 (76.5)	11 (75.0)	97 (79.5)
Higher risk of complications during pregnancy	54 (47.0)	13 (68.4)	11 (47.8)	24 (50.0)	66 (51.6)
Three or more social health issues during pregnancy	53 (46.1)	12 (63.2)	14 (60.9)	38 (79.2)***	72 (56.3)
Smoking cigarettes during pregnancy	50 (43.5)	5 (26.3)	11 (50.0)	24 (50.0)	70 (56.5)*
Drug or alcohol problem during pregnancy	7 (6.2)	1 (5.3)	1 (4.3)	5 (10.6)	16 (12.9)
Partner had drug or alcohol problem	14 (13.1)	3 (15.8)	7 (30.4)*	17 (37.0)**	29 (24.8)*
Pushed, shoved, or assaulted during pregnancy	18 (16.5)	4 (21.1)	1 (4.5)	14 (29.2)	15 (12.0)
Left home because of family argument during pregnancy	23 (20.2)	6 (31.6)	6 (26.1)	20 (42.6)**	33 (26.6)

\*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001 (based on comparison with mainstream care). AFBP = Aboriginal Family Birthing Program.

women who rated their care as “very good” with women who said their care was less than “very good.”

Women who received antenatal care from an Aboriginal Health Service, metropolitan AFBP service, or regional AFBP service were more likely to rate their care as “very good” than women attending mainstream public antenatal care services (Table 4). Social characteristics associated with positive experiences of antenatal care were aged 30 years or older and finishing 12 years of education. No association was found in univariable analyses between women’s overall rating of antenatal care and timing of first visit, parity, risk of complications during pregnancy or number of stressful events, and social health issues women experienced during pregnancy.

To provide a more precise estimate of the association between model of antenatal care and women’s overall rating of antenatal care, taking into account potential confounding by social characteristics, we developed a multivariable model with overall rating of care as the outcome variable (“very good”/less than “very good”). Maternal age and parity were included in the model for a priori reasons associated with their social and physiological implications for the mother during pregnancy. Smoking during pregnancy was also included for a priori reasons related to the potential for women to experience social stigma associated with their smoking behavior. Maternal education was included in the model based on the observed association with women’s overall rating of antenatal care in univariable analyses.

**Table 4. Odds Ratios for Rating of Antenatal Care as ‘Very Good’ by Model of Care, South Australia, 2011-2013**

	<i>Rated antenatal care as “very good” n (%)</i>	<i>Unadjusted odds ratio (95% CI)</i>	<i>Adjusted odds ratio (95% CI),<sup>†</sup></i>
<b>Public model of antenatal care</b>			
Mainstream public care	114 (36.0)	1.0 (reference)	1.0 (reference)
Midwifery group practice	19 (52.6)	2.0 (0.7, 5.3)	1.9 (0.7, 5.2)
Aboriginal health service	23 (65.2)	<b>3.3 (1.3, 8.5)*</b>	<b>3.5 (1.3, 9.4)*</b>
AFBP metropolitan	48 (62.5)	<b>3.0 (1.5, 6.0)**</b>	<b>3.4 (1.6, 7.0)**</b>
AFBP regional	126 (54.0)	<b>2.1 (1.2, 3.5)**</b>	<b>2.4 (1.4, 4.3)**</b>
<b>Mother’s age when baby born</b>			
15–19 years	52 (46.2)	1.0 (0.5, 1.9)	1.4 (0.7, 2.8)
20–24 years	133 (46.6)	1.0 (reference)	1.0 (reference)
25–29 years	88 (48.9)	1.1 (0.7, 1.9)	1.0 (0.6, 1.9)
30+ years	57 (61.4)	1.9 (1.0, 3.5)	1.8 (0.9, 3.8)
<b>Number of children</b>			
1	137 (48.2)	1.0 (reference)	1.0 (reference)
2–3	123 (48.8)	1.0 (0.6, 1.6)	1.0 (0.6, 1.7)
4–10	70 (54.3)	1.2 (0.7, 2.2)	0.9 (0.4, 2.0)
<b>Secondary education</b>			
Yes	84 (60.7)	1.0 (reference)	1.0 (reference)
No	245 (45.7)	<b>0.5 (0.3, 0.8)**</b>	<b>0.5 (0.3, 0.8)**</b>
<b>Smoked any cigarettes during pregnancy</b>			
No	167 (49.7)	1.0 (reference)	1.0 (reference)
Yes	159 (49.1)	0.9 (0.6, 1.4)	1.1 (0.7, 1.7)
<b>Stressful life events and social health issues</b>			
0–2 issues	143 (49.7)	1.0 (reference)	1.0 (reference)
3+ issues	187 (49.7)	1.0 (0.6, 1.5)	1.0 (0.6, 1.6)
<b>Risk of complications during pregnancy, e.g. serious medical condition, prior stillbirth<sup>‡</sup></b>			
No	163 (50.9)	1.0 (reference)	1.0 (reference)
Yes	167 (48.5)	0.9 (0.6, 1.4)	0.9 (0.6, 1.4)

\* $p < 0.05$ , \*\* $p < 0.01$ . <sup>†</sup>Odds ratios are for the odds of rating care as “very good” adjusted for all the characteristics described in the table.

<sup>‡</sup>Medical conditions include: diabetes, hypertension, preeclampsia, anemia, urinary tract infections, renal disease, heart disease, thyroid condition, intrauterine growth restriction, and antepartum hemorrhage. AFBP = Aboriginal Family Birthing Program.

Results showed that women attending AFBP services and Aboriginal Health Services (outside the AFBP) had a higher likelihood of reporting positive experiences of antenatal care compared with women attending mainstream public services, taking into account a range of potential confounders. Adjusting for covariates resulted in amplification of odds ratios for women in these three models of care, compared with unadjusted analyses. Women attending regional or metropolitan AFBP services had adjusted odds of rating their antenatal care positively that were two to three times higher than women attending mainstream public services. The small group of women who attended an Aboriginal Health Service outside the AFBP also had markedly higher adjusted odds of rating their antenatal care favorably.

#### *Supporting Women with Social Health Issues During Pregnancy*

To test the hypothesis that women attending AFBP services are more likely to receive consistent support with social health issues during pregnancy compared with women attending mainstream public care, we compared what women said about support from midwives, doctors, and AMIC workers in each model of care. These data are shown in Table 5. Women attending AFBP services were significantly more likely to say that midwives always asked and supported them with things happening in their lives compared with women attending mainstream public care. A similar trend was

evident for women attending AFBP services in relation to support provided by medical practitioners. In the AFBP services, AMIC workers also provided support to women with social health issues.

## **Discussion**

### *Key Findings*

Just over half of the women in the study had accessed antenatal care via AFBP services, and just under half had not, which reflects the fact that the program is not available in all areas of South Australia, and even in areas where services are available, not all Aboriginal families can be accommodated.

Only 36 percent of women receiving mainstream public care described their antenatal care as “very good” compared with 65 percent of women attending an Aboriginal Health Service, 63 percent of women receiving care from a metropolitan AFBP service, 54 percent of women attending a regional AFBP service, and 53 percent of women receiving care from a midwifery group practice. Adjusting for differences in the social and obstetric characteristics of women in different models of public antenatal care did not alter the finding that women were markedly more likely to rate their care favorably when they attended metropolitan or regional AFBP services, or an Aboriginal Health Service for antenatal care. All three of these models of public antenatal care provide opportunities for Aboriginal

**Table 5. Women’s Views About Support from Health Professionals During Pregnancy, South Australia, 2011-2013**

	<i>Mainstream public care (n = 115) No. (%)</i>	<i>AFBP services (n = 176) No. (%)</i>	<i>Odds ratio (95% CI)<sup>†</sup></i>
<i>Women who saw AMIC workers for antenatal care:</i>			
<i>AMIC worker always asked about things happening in your life</i>	Not applicable	103/168 (61.3)	
<i>AMIC worker always supported you with things happening in your life</i>		109/168 (65.1)	
<i>Women who saw midwives for antenatal care:</i>			
<i>Midwife always asked about things happening in your life</i>	52/91 (57.1)	119/171 (69.6)	1.7 (1.0, 2.9)*
<i>Midwife always supported you with things happening in your life</i>	37/91 (41.1)	110/171 (64.3)	2.6 (1.5, 4.4)***
<i>Women who saw doctors for antenatal care:</i>			
<i>Doctor always asked about things happening in your life</i>	55/103 (53.4)	86/156 (55.1)	1.1 (0.7, 1.8)
<i>Doctor always supported you with things happening in your life</i>	39/103 (37.9)	74/155 (47.7)	1.5 (0.9, 2.5)

\*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001. <sup>†</sup>Odds ratios compare women attending AFBP services with women attending mainstream public care, and show the odds of women attending the AFBP services “always” receiving support from midwives and doctors. AFBP = Aboriginal Family Birthing Program; AMIC = Aboriginal Maternal Infant Care.

women to be cared for by Aboriginal women—either as AMIC workers or Aboriginal health workers.

Mostly small differences in the characteristics of women attending different models of care were present. Overall women attending AFBP services or Aboriginal health services were more likely to have social characteristics that may place them at higher risk of adverse maternal and child health outcomes, compared with women attending mainstream public services. For example, women attending metropolitan AFBP services had higher odds of reporting that they had experienced physical violence, left home because of a family argument, or had a partner with a drug or alcohol problem compared with women attending mainstream services. The very high rates of social health issues reported by Aboriginal women in all models of care, but particularly among women attending metropolitan AFBP services, are important findings from this study. As hypothesized, women attending AFBP services are more likely to receive support with social health issues than women attending mainstream services.

#### *Strengths and Limitations*

The Aboriginal Families Study is underpinned by strong community, research and policy partnerships, and a commitment to providing avenues for the voices of Aboriginal women to inform strengthening of services for Aboriginal families (23). In the planning stages, we paid particular attention to ways of ensuring that the research would be robust from both a community and academic perspective. Decisions about research methods—such as the use of a structured interview booklet; recruitment of women to the study and conduct of interviews by a small team of Aboriginal researchers with the option of filling in the booklet if preferred; what questions would and would not be included—were all taken based on feedback from community consultations and discussions between members of the Aboriginal Advisory Group and researchers. The Aboriginal Health Council of South Australia played a key role in promoting the study and facilitating links between the research interviewers and Aboriginal community-controlled health services in South Australia.

All of these factors contribute to the robustness of the study findings. Approximately a quarter of all Aboriginal women who gave birth in South Australia over a 2-year period took part in the study. The achievement of a sample that is largely representative in relation to the age of Aboriginal women giving birth in South Australia and includes so many young women is a testament to the skills of the Aboriginal research interviewers who recruited women across the state.

As with all studies there are limitations. We did not include fathers or other family members, a decision that was largely based on funding constraints. South Australia covers a vast geographic area, approximately four times the size of the UK, and it was not possible for us to cover all areas of the state. The timing of data collection introduces the potential for recall bias, although several studies demonstrate that women have excellent recall of pregnancy and birth events over an extended timeframe (27–30). Other limitations include the decisions not to collect data on income, relationship status, and alcohol use, which were seen as potentially uncomfortable questions for the interviewers to ask women.

#### *Implications for Policy and Services*

Antenatal care provides a “window of opportunity” to address social determinants of poor maternal and child health outcomes. However, public maternity services are often underresourced and lack systems to provide culturally responsive care that meet the needs of women experiencing multiple social health issues during pregnancy. Our findings show that a dedicated focus on improving care for Aboriginal women can make a positive difference to women’s views and experiences of public antenatal care. The AFBP—offered in six regional areas and at several metropolitan sites—has resulted in more women having good experiences of antenatal care and receiving greater support with social health issues known to influence perinatal outcomes, notwithstanding the necessary caveats about attribution of causality in observational studies.

While it is not possible for us to unpack the precise factors leading to more positive experiences, the factors that the AFBP services and Aboriginal health services (which also achieved positive ratings) have in common are as follows: the tailoring of services to meet the specific needs of Aboriginal families, the involvement of Aboriginal women health workers in the delivery of services, partnerships between hospitals and community-based agencies, flexibility to provide outreach services and transport, and integration of clinical care with primary health care. Other studies have identified the same factors as critical to the achievement of improvements in perinatal morbidity and mortality in Aboriginal populations. (15,19,31).

#### **Conclusion**

In the urban, regional, and remote areas where the AFBP has been implemented, the program has expanded access to culturally responsive antenatal care for Aboriginal women and families. The positive

experiences reported by many women using the program have the potential to translate into improved outcomes for Aboriginal families.

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