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Identification and evaluation of models of antenatal care in Australia - a review of the evidence

Abstract

Background Antenatal care has been routine practice throughout the world since early in the 20th century, and in most developed countries, antenatal care consists of a scheduled program of individual consultations with a healthcare practitioner, using a doctor or midwife. Women seek antenatal care that provides a physical review of the health and development of their unborn baby, the reassurance and ability to be listened to and the opportunity for their partner to be involved in their care. **Aims** To identify the types of antenatal care services that are available to Australian women and investigate the views and opinions of Australian women related to these services. **Materials and Methods** A systematic literature review using Scopus and Medline databases was used to find appropriate journal articles in January 2013. Articles were restricted to those in the Australian setting from the past 10 years with a focus on different models of antenatal care and the views and experiences of women during their antenatal care. **Results** Eighteen relevant peer-reviewed journal articles were included. Emerging forms of antenatal care that are showing increasing levels of satisfaction from Australian women include continuity of carer, the midwifery-led care and group- or community-led care. These approaches are proving to be safe and successful. **Conclusion** Newer models of antenatal care in Australia may offer benefits over standard practice.

Keywords

Antenatal care, indigenous, models, pregnancy, review

Disciplines

Medicine and Health Sciences | Social and Behavioral Sciences

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Identification and evaluation of models of antenatal care in Australia – a review of the evidence

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Abstract

Background: Antenatal care has been routine practice throughout the world since early in the 20th Century and in most developed countries, antenatal care consists of a scheduled programme of individual consultations with a health-care practitioner, using a doctor or midwife. Women seek antenatal care that provides a physical review of the health and development of their unborn baby, the reassurance and ability to be listened to and the opportunity for their partner to be involved in their care.

Aims: To identify the types of antenatal care services that are available to Australian women and investigate the views and opinions of Australian women related to these services.

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databases were used to find appropriate journal articles in January 2013. Articles were restricted to those in the Australian setting from the past 10 years with a focus on different models of antenatal care and the views and experiences of women during their antenatal care.

Results: Eighteen relevant peer-reviewed journal articles were included. Emerging forms of antenatal care that are showing increasing levels of satisfaction from Australian women include continuity of carer, the midwifery-led care and group or community- led care. These approaches are proving to be safe and successful.

Conclusion: Newer models of antenatal care in Australia may offer benefits over standard practice.

Keywords: antenatal care, models, indigenous, pregnancy, review

Introduction

Antenatal care has been routine practice throughout the world since the early 20th Century.¹

In most developed countries, antenatal care consists of a scheduled programme of individual consultations with a health-care practitioner, using a doctor or midwife.¹

Antenatal care includes an obstetric risk assessment along with screening and management of any underlying problems. Many women also undertake childbirth education programmes or 'antenatal classes', where they receive information about pregnancy, labour, birth and parenting.¹ Good outcomes of a pregnancy require attention to the entire spectrum of care during the pregnancy, including intra-partum and post-partum care.²

Concerns have been raised in Australia and abroad about the effectiveness of current models of antenatal care.² Much of antenatal care has evolved in an ad hoc manner, based on tradition and expert opinion. Criticism of conventional antenatal care is not uncommon, particularly in relation to prolonged waiting times, lack of continuity of caregiver and hurried staff.¹

Women seek antenatal care that provides a physical review of the health and development of their unborn baby, the reassurance and ability to be listened to and the opportunity for their partner to be involved in their care.¹ Since the early 1990's in Australia there has been a shift from private to public obstetric care, resulting in a decrease in the number of general practitioners undertaking obstetric care.³ In Australia most public sector antenatal services are provided in hospitals.⁴ Despite an increase in the range of public sector options for pregnancy care, many women have expressed dissatisfaction with public hospital antenatal care.⁵ Women are seen by a variety of clinicians including midwives, obstetricians, junior medical staff and midwifery and medical students.⁴

High quality antenatal care is seen as a fundamental right of all women and a means of protecting their health and the health of their infants.⁶ The latest National Health and Medical Research Council (NHMRC) Antenatal Care guidelines provide evidence-based recommendations for the care of women during pregnancy.^{7,8} However, consistency with providing quality antenatal care within the range of models available depends not only on clearly defined standards for screening, intervention and referral but also matching of services with specific needs of sociocultural groups.⁹

This literature review aims to describe models of antenatal care that are available to Australian women and to identify whether novel models of care report improved success over conventional services with regard to health service access, patient satisfaction and birth outcomes. A second aim was to identify whether antenatal services targeted specifically to indigenous women differed in their approach and whether these had been evaluated.

Methods

Searches were conducted using the databases Scopus and Science Direct with a combination of terms, including care, model, pregnan*, antenatal and Australia (Table 1). Inclusion criteria for journal articles included; studies conducted within the Australian setting between 2003 and 2013; trial or report of antenatal models of care; and peer reviewed status. Exclusion criteria were risk factors for birth outcomes, specific disease states of pregnant mothers, and drug trials conducted during pregnancy. The third literature search using Scopus did not result in any new articles being obtained. Articles were checked using Ulrich's Web (available at: <http://library.dialog.com/bluesheets/html/bl0480.html>) for peer-reviewed status. A citation search resulted in one additional relevant article.

All retrieved studies were rated using the NHRMC hierarchy levels of evidence¹⁰ (NHRMC 2000), and randomised controlled trials were also quality rated as either high, medium, or low, according to NHMRC criteria.

Results

A total of 18 papers that had been published in the past 10 years and were related to models of antenatal care for Australian women were found using the defined search strategy (Figure 1). An additional paper was identified that did not appear in the three database searches, probably due to keywords in that article referring to Caesarian section,

but is highly relevant to the topic and has therefore been included.¹¹ Main findings from the cited articles are provided according to themes below.

Situational analysis (Table 1)

Scherman et al (2008)¹² reported on the outcomes of the midwifery led unit at Mareeba District Hospital (MDH) in Cairns. Within this unit, low risk women gave birth at their local hospital with care provided by a midwife and outpatient antenatal care, while inpatient intrapartum and postpartum care was provided by the midwives on a 24-hour basis.¹² During the first year of operation, 78% of women who were booked into the MDH gave birth at the unit, and antenatal and intrapartum transfer rates to Cairns Base Hospital for further care were lower than those reported by similar units in Australia.¹²

Clinical outcomes of different models of care (Table 2)

Bai et al (2008)² conducted a retrospective cohort analysis of population birth data across six hospitals in the Sydney South West Area Health Service. Many different types of antenatal care were examined. It was concluded that no one service performed better than others, and that pregnant women received adequate and safe antenatal care provided that their risk factors during pregnancy were taken into consideration in the allocation of type of care.²

Midwifery Group Practice (MGP) is a continuity of midwifery care model for women in all risk groups that is available at a tertiary metropolitan hospital in Sydney, Australia.

Midwives employed in MGP are divided into group practices of six full-time midwives with one managerial position. Each midwife is responsible for the care of up to 40 women per

year, which is the number of women that has been suggested as appropriate both in Australia and elsewhere.¹³ Clinical outcomes and women's satisfaction of care with the MGP model of care were evaluated and compared to standard models of antenatal care.^{13,14} Women receiving care under MGP had statistically significantly lower rates of labour inductions and use of epidural analgesia than in other models of care, across all risk categories. The percentage of women who were hospitalised for antenatal care and/or attended emergency care was significantly lower for low and moderate risk women receiving MGP care. The babies of women receiving MGP care were less likely to be admitted to the special care baby unit and neonatal intensive care units.¹³

McLachlan et al (2012)¹¹ investigated the effect of caseload midwifery care on caesarean section rate compared with standard maternity care at a tertiary-care women's hospital in Melbourne, Australia. Women who were randomised to the caseload group received antenatal care from a primary midwife with some care provided by 'back-up' midwives while women randomised to standard care received either midwifery or obstetric-trainee care with varying levels of continuity or community-based general practitioner care.¹¹ It was found that caseload midwifery for low-risk women reduced the caesarean section rate compared with standard maternity care. Reductions were reported for epidural pain relief for labour, episiotomy, maternal postpartum length of stay, infant special care nursery or neonatal ICU admissions and proportion of low-birthweight babies.¹¹ *Women's views and experiences of antenatal care* (Table 3)

The MGP model of care provided a 24 hour 'on call' system for midwifery consultations. This aspect of the model was described by many women as reassuring, as it resulted in feelings of security to know that help was close at hand. The friendly manner and attitude of all

midwives involved in the MGP was reported to be a popular descriptor used by women.

Women described their experiences of their antenatal care as being personalised, professional, individualised, family-centred and comprehensive.¹⁴

Bruinsma et al (2003)¹⁵ assessed the satisfaction of women's antenatal care in Victoria from 1989 to 2000. In 1989, 58.6% (n = 460/785) of women rated their antenatal care as 'very good' compared with 62.4% (n = 830/1,300) in 1994 and 66.5% (n = 1,071/1,609) in 2000. Overall ratings for care improved for women enrolled in either private or public models of care, although the improvement was larger for women in private care. Two-thirds in 1989, 71% in 1994, and 72% in 2000 gave the highest rating for intrapartum care. Postnatal care was reported consistently at a lower rating across the same period (52% and 51% of women in 1994 and 2000, respectively, rated postnatal care in hospital as 'very good').¹⁵

Another study evaluating a midwifery model of care was conducted by Biro et al (2003)¹⁶, who assessed whether a team midwifery model that included both high and low risk women was associated with greater satisfaction for women than the standard model of maternity care. The care team of the intervention group comprised seven full-time midwives who provided antenatal, intrapartum and postpartum care to the same group of women, in consultation and collaboration with medical staff.¹⁶ Women in the standard care group received antenatal, intrapartum and postpartum care from a variety of midwives and doctors within available care options, which included obstetric staff, shared care and midwife care.¹⁶ Team midwifery care increased women's satisfaction with maternity care compared with the standard care offered at this centre, with team care women giving a more positive rating of their care in all measures compared to standard care women.¹⁶

Team care women reported that caregivers provided greater emotional support, kept them better informed and involved them more in decisions about their care, compared to women receiving standard care.¹⁶

CenteringPregnancy is a model of antenatal care that combines assessment, education and support in group settings. It had been widely implemented and evaluated in the USA and its reported successes led to the development of an Australian CenteringPregnancy pilot study. CenteringPregnancy provided more time for mothers to be spent with the health-care provider. Sixteen hours was spent in group care, which combined assessment, education and support, as opposed to 3 to 4 hours spent in a traditional one-to-one form of care. More opportunities were available for additional information about pregnancy, labour, birth and parenting to be discussed, and for women to learn from and support one another. The first reported evaluation of the implementation of the CenteringPregnancy model in Australia demonstrated that women identified that the type of care they received was positive and satisfying.¹ Women were able to develop supportive relationships with both their peers and midwives and had enhanced information from sharing experiences of their pregnancy, labour and birth.

Views and experiences of healthcare professionals (Table 4)

Homer et al¹⁷ conducted research as part of a commissioned national research project to articulate the scope of practice of Australian midwives and to develop national competency standards. The key elements required of a midwife to provide sound antenatal care were found to be: woman centredness, providing safe and supportive care and working in collaboration with others when it was necessary to do so. Having respect for women's time,

their families, their fears and their need for information was also reported to be part of the essence of the role of the midwife.¹⁷

A pilot programme was trialled to assess the provision of antenatal services in the environment of a general practice.¹⁸ This trial was conducted as part of a National Consensus Framework for Rural Maternity Services, in order to expand the role of general practice nurses to enable them to deliver safe antenatal care. The programme consisted of an online learning programme, clinical placement and assessment tasks.¹⁸ It found that nurses faced many hurdles to their participation and only three nurses were able to complete all components. One of the biggest hurdles for these nurses was arranging to go on clinical placement, due to the low availability of placements, as well as the resistance of midwives to provide clinical experience to the general practice nurses. Mills et al¹⁸ recommended that the education programme be modified to confirm clinical placements on enrolment.

Patterson & Logan-Sinclair (2003)¹⁹ investigated the effects of the woman held antenatal record card (PCN2) on the continuity of maternity care received when women presented within the acute rural setting among maternity consumers and healthcare professionals. There was a significant difference between healthcare professionals and maternity consumers with 60% of women indicating that the PCN2 had no effect on the care they received whilst midwives and GP's consistently identified that the PCN2 had a vital role when planning maternity care for a woman presenting to hospital. The authors recommend future use of the woman held antenatal card to have ongoing education and support as a lack of compliance and standardisation made the positive effects experienced by the healthcare professionals for the maternity consumers void.

Aboriginal and Torres Strait Islander Care (Table 5)

Kildea et al²⁰ evaluated and compared the clinical pregnancy outcomes of Indigenous women who attended a specialist antenatal clinic (Murri Antenatal Clinic) for Australian and Torres Strait Islander women with those of Indigenous women attending standard antenatal care at the same hospital. The majority of women who attended the Murri Clinic felt understood and respected by the staff. Compared to Indigenous women attending standard care, women who attended the Murri Clinic were statistically less likely to experience perineal trauma, undergo an elective caesarean operation or have a baby admitted to the neonatal intensive care unit. However the limited clinic opening hours were insufficient to meet demand, which presented a barrier to attendance for women.²⁰

Panaretto et al⁶ evaluated the impact of a community-based, collaborative, shared antenatal care intervention (the Mums and Babies program) for Indigenous women in Townsville. This program was based on continuity of care, cultural currency and a family-friendly environment. Women attending the program were seen by Aboriginal health workers, midwives/child health nurses, doctors, obstetric team and an Indigenous outreach health worker. Women in the intervention group had significantly more antenatal care visits, improved timeliness of the first visit and fewer pregnancies with inadequate care compared to the control group.⁶ There were also significantly fewer preterm births in the intervention group. The use of the Mums and Babies antenatal care service increased significantly over time with 60% of Townsville-based pregnant Indigenous women attending by 2003 after the commencement of the program in 2000. This study showed that integrated services delivered in a culturally aware and 'safe' environment increased access to antenatal care in the Indigenous community. The increased access to antenatal care

represents an improved opportunity for health care services to establish a relationship with pregnant women in Indigenous communities, who may then continue to be seen through to the early childhood years of their infants. It is possible for this model to be adapted to other urban centres that have significant Indigenous populations, community-controlled health services and multiple providers of antenatal care.⁶

Another community-based culturally appropriate service that addressed the antenatal care needs of Aboriginal and Torres Strait Islander women was the Malabar Community Midwifery Link Service in suburban Sydney.²¹ In this service each pregnant woman was allocated a primary midwife who worked with an Aboriginal Health Education Officer and the wider maternity care team at the local hospital. Individualised continuity of care was provided throughout the pregnancy, labour and birth, and home visits were provided during the early weeks following birth, together with access to necessary medical, hospital and community services. The service prioritised women from Aboriginal and Torres Strait Islander communities and from a range of local communities who were most at risk of poor perinatal outcomes and social isolation.²¹ The service aimed to address inequities in health outcomes by providing a safe, collaborative, accessible and culturally appropriate service. An evaluation incorporating mothers' feedback on the Malabar service during its first two years of operation found that the continuity of care was the most valued aspect of the service. The midwives and Aboriginal Health Workers were seen as friendly, supportive, engaged and approachable. The development of trust was a recurring theme during the evaluation.²¹ Malabar was considered to provide more than just a maternity service, with women stating that it also helped to establish social networks and play groups.

The Malabar service incorporated a number of key goals of the Australian National Indigenous Health Equality Targets including: presentation for the first antenatal assessment within the first trimester; reduction in smoking habits; and the development of health promotion programs targeting smoking and alcohol consumption in pregnancy. The antenatal service provided at Malabar also recognised the range of social determinants that may impact on health outcomes for women and their families.²¹

In contrast, an audit conducted by telephone interview in Western Australia that explored the usage, frequency and characteristics of antenatal services identified significant gaps in publicly funded antenatal services for Aboriginal women in metropolitan, rural and remote regions in Western Australia. The audit found that around three quarters of the antenatal services used by Aboriginal women had not achieved a model of service delivery consistent with the principles of culturally responsive care.²²

Factors influencing care (Table 6)

Early commencement of antenatal care is imperative in the detection and treatment of adverse pregnancy related outcomes.^{23,24} Factors that influence late entry to antenatal care have been reported as young maternal age, migrants from developing countries, Aboriginal and Torres Strait Islander women, multiparous women (3 or more births) and tobacco and alcohol use.^{2, 23,24 25} Conversely, factors associated with a reduced risk of late entry to antenatal care include maternal age of 40+y, having had previous caesarean births, having had a multiple pregnancy, being Caucasian and the presence of pre-existing conditions that may cause complications within the pregnancy.^{23, 25}

Socioeconomic factors have also been shown to affect the model of antenatal care received. Women who were at greatest risk of social and economic disadvantage were significantly less likely to receive primary midwife care than public clinic care.²⁶ Primary midwife care occurs when the same midwife or group of midwives provide antenatal care for the duration of pregnancy, and was one of the most highly rated models of care.²⁴ Women who opted for private care by an obstetrician were more likely to be covered by private health insurance, booked into their care earlier, married, employed and with a supportive partner.²

Discussion

This literature review identified that in the past two decades in Australia there has been increasing interest in the implementation of midwifery continuity-of-care models for women during pregnancy, childbirth and the postpartum period.¹³ Group antenatal care combines traditional elements of antenatal care assessment with antenatal education and social support from peers.¹ Designing health-care provision for groups instead of individuals is a relatively new concept that has increasingly attracted attention and has proven to be preferred by Australian women.¹

Combining multi-agency resources to increase continuity of carer, culturally responsive care, capacity building, education and training has been identified as a desirable strategy to provide successful antenatal care to Australian women.² However this has rarely been achieved in the area of maternity service provision, either in Australia²⁰ or elsewhere.²⁹ Promising outcomes have been reported in other countries for newer models of care that lead to improved experiences for mothers,^{28,29} as well as better birth outcomes, particularly

in relation to midwifery-led care.^{30,31,10} This is consistent with other studies of antenatal care^{32,33} however these studies are few in number. Further evidence is needed to shape and model future developments in antenatal care.^{13, 14, 34}

This review identified a few examples of effective models of antenatal care for Aboriginal women. These findings were encouraging, as differences continue to occur in reproductive health outcomes between Australian Indigenous and non-Indigenous women, with significantly higher maternal and perinatal morbidity and mortality rates amongst the Australian Indigenous population.²⁰ The provision of culturally appropriate antenatal care has been identified as key to improving birth outcomes for Aboriginal women.³²

A common feature of Indigenous-specific services that are acknowledged to be successful is community-control or working within a community mode²⁰ Providing perinatal care services that are community based has been advocated as fundamental to improving obstetric outcomes in Indigenous communities.⁶ Such culturally appropriate care has also been identified in other countries such as Canada.³⁵

Improvements in antenatal care should target those women who are least likely to attend in a manner that maximises their birthing outcomes. Women who are most disadvantaged in terms of sociodemographic status do not access antenatal care or attend irregularly. They tend to be younger, unmarried, unemployed and not covered by private health insurance.² Smaller sub-groups that are at risk of pregnancy complications due to late booking-in for antenatal care are young mothers, typically adolescents, women who use tobacco and alcohol, migrants from overseas and women with three or more previous pregnancies.

Women of a lower socioeconomic status have also been shown to be less satisfied with their care which was generally provided through the public sector.

Results from this literature review suggest that delivering antenatal care in a group format, with continuity of caregiver and also taking cultural considerations into account would assist in optimising antenatal care provided in Australia. Providing targeted and responsive antenatal care, together with screening and treatment for specific conditions of concern, would help improve perinatal outcomes for Aboriginal and Torres Strait Islander women.²² These changes to practice would however require additional training of midwives and healthcare providers, as well as development of new frameworks.

The scope of this literature review may be limited by the use of only two databases and by the inclusion of only studies published in the peer-reviewed literature. Restriction of articles pertaining to Australian women, while being informative locally, may have excluded examples of successful models of antenatal care used in other countries. It is well documented that publication bias favours studies that report positive outcomes,³⁶ and that this error may be compounded in a systematic review process.³⁷ Indeed, all of the evaluative papers included in this review showed improved outcomes related to alternative models of antenatal care. Whilst we followed the guidelines of the PRISMA statement³⁸ in the execution of this systematic review, the heterogeneity of methods used and variety of outcome measures within each of the retrieved papers necessitated adoption of a qualitative, rather than quantitative approach to the synthesis of the findings. This was particularly pertinent in studies that evaluated women's level of satisfaction with their antenatal care. Future studies should adopt a more standardised approach to allow for meaningful comparisons between models of care. Quality rating of the papers, together with the non-experimental and mostly observational study designs, indicate a low level of evidence. With the exception of two RCTs which

were ranked as level II, all other studies were ranked as low quality with high risk of bias. An additional limitation is that only one study included the private sector which may offer a higher degree of continuity of care than public antenatal services. This is an under-researched group, despite approximately 30% of Australian women choosing to access private obstetric care.³⁹ Nevertheless, systematic reviews of this nature are valuable because they guide both research and policy regarding improved antenatal care services in the local context.

Conclusion

The new Australian antenatal care clinical guidelines provide evidence of best practice. However, this literature review has identified a need to also identify the experiences of women who access antenatal services, in order to optimise models of care within various sectors of the population. This review also identified that provided there is adequate collaboration between all health care providers, different models of antenatal care can meet the needs of pregnant women and support achievement of positive birth outcomes whilst also improving the health of future generations.

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Results

Table 1 – Situational Analysis (n = 1)

Reference	Location	Sample	Design	Level of Evidence^a	Main Findings
Scherman et al 2008 ⁸	Cairns, Australia	203 women booked into Mareeba District Hospital (MDH) 170 women were categorised as low risk and able to deliver at MDH.	Prospective cohort analysis	III-3	<p>158 of the 203 women booked in MDH (78%) gave birth at MDH.</p> <p>The antenatal and intrapartum transfer rates to Cairns Base Hospital for further care were lower than those reported by similar units in Australia.</p> <p>The success of this model was due to a dedicated and experience midwifery team that was committed to implementing a new model of care.</p>

^aStudies ranked using NHMRC (2002) Levels of Evidence Hierarchy⁹ where I is a systematic review (highest ranking) and IV is a case series or cross sectional study (lowest ranking).

Table 2 - Clinical outcomes of different models of care (n = 3)

Reference	Location	Sample	Design	Level of Evidence ^a	Main Findings
Bai et al 2008 ²	Six hospitals in the Sydney South-west Area Health Service (SSWAHS) Western Zone. These included Liverpool, Bankstown, Fairfield, Campbelltown, Camden and Bowral Hospitals	67,675 singleton births	Historical cohort analysis.	III-3	<p>Categories of Care</p> <p>26.8% doctors clinic 28.3% midwives clinic 12.8% private obstetrician 26.9% shared care 2.3% birth centre 2.4% Caseload midwifery model 0.5% no antenatal care</p> <p>Pregnant women can be safely allocated to different models of maternity care provided there is adequate collaboration between all the health-care providers. Women have different needs depending on their risk factors. It is essential that to ensure the best maternity outcomes pregnant women are assigned to appropriate models of care and that there is flexibility and mobility between models.</p>
Turnbull et al 2009 ¹³	Tertiary Metropolitan Hospital in Australia.	618 women receiving care under Midwifery Group Practice (MGP) and 3548 women receiving 'other' modes of care.	Comparisons of clinical outcomes were made between women who received care under (MGP) and those receiving 'other' modes of care over a 15-month period.	III-3	<p>Differences in mode of birth for low and moderate risk groups. In the moderate risk group there were less assisted deliveries in MGP.</p> <p>Statistically significant lower rates of labour inductions and use of epidural analgesia in MGP across all risk categories.</p> <p>Attendance at emergency care was statistically significantly lower for the Low and Moderate risk women in MGP.</p> <p>Similar results were found for women and babies in terms of admission to Special Care</p>

					baby unit and to the neonatal intensive care unit for both groups.
McLachlan et al 2012 ¹⁰	Melbourne, Australia	2314 low-risk pregnant women	Randomised controlled trial	II Study Quality Rating: C	<p>Caseload midwifery for low-risk women reduced the caesarean section rate compared with standard maternity care.</p> <p>Reductions were seen in epidural pain relief for labour, episiotomy, maternal postpartum length of stay, infant special care nursery or neonatal ICU admissions and proportion of low-birthweight babies.</p>

^aStudies ranked using NHMRC (2002) Levels of Evidence Hierarchy⁹ where I is a systematic review (highest ranking) and IV is a case series or cross sectional study (lowest ranking).

Table 3 - Women's views and experiences of antenatal care (n = 4)

Reference	Location	Sample	Design	Level of Evidence ^a	Main Findings
Biro et al 2003 ¹⁶	Monash Medical Centre in Melbourne, Australia	1000 low and high risk women	Randomised controlled trial	II Study Quality Rating: C	More team care women had visits with both midwife and doctor. Team care women saw more midwives and fewer doctors for their antenatal visits than women in standard care. Women in both trial groups waited more than 1 hour on average to see a doctor and women in team care waited less time. Team midwifery care had the most significant impact on satisfaction with antenatal care. In all measures team care women gave more positive ratings of their care than standard care women.
Bruinsma et al 2003 ¹⁵	Victoria, Australia	790 women in 1989 1,336 women in 1994 1,616 women in 2000	Cross sectional postal survey of all women who gave birth in 1-week period in 1989, and 2-week period in 1993 and 1999. Questionnaires sent 5-8 months post-partum.	IV	In 1989, 58.6% of women rated their antenatal care as 'very good' compared with 62.4% in 1994 and 66.5% in 2000. Overall ratings for care improved for women enrolled in private and public models of care, although the improvement was larger for women in private care. 67% in 1989 gave the highest rating for intrapartum care. 71% in 1994 and 72% in 2000. Postnatal received poorer ratings in 1994 and 2000. Only 52% of women in

					94 and 51% in 2000 described postnatal care in hospital as 'very good'.
Fereday et al 2009 ¹⁴	Tertiary metropolitan hospital in Australia.	84 women who received care from Midwifery Group Practice (MGP)	Cross sectional survey using questionnaires	IV	<p>Women identified continuity of care as the primary aspect of MGP that they 'liked'. The MGP model of care provides a 24-hr 'on-call' system for midwifery consultation which reassured women as help was only 'a phone-call away'. The 'friendly' attitude was a popular descriptor of not only the lead midwife, but of all the midwives involved in MGP.</p> <p>Overall satisfaction levels of women were very high and care from the MGP midwives was described as personalised, professional, individualised, family-centred and comprehensive.</p>
Teate et al 2011 ¹	2 metropolitan hospitals in Sydney, Australia.	33 pregnant women.	Cross sectional descriptive study using clinical information from hospital records.	III-3	<p>Most women chose group antenatal care in order to obtain friendship and support. Almost all respondents indicated that their care was nine or higher on a scale of 0 -10. (mean = 9.2) None of the women rated their care lower than a 7.</p> <p>Most women reported being very satisfied with the information and explanation provided in the groups.</p>

^aStudies ranked using NHMRC (2002) Levels of Evidence Hierarchy⁹ where I is a systematic review (highest ranking) and IV is a case series or cross sectional study (lowest ranking).

Table 4- Views and experiences of healthcare professionals (n = 4)

Author	Location	Sample	Design	Level of Evidence ^a	Main Findings
Patterson and Logan-Sinclair 2003 ¹⁹	Rural NSW public hospital	50 women who were inpatients receiving antenatal care or postnatal care, 12 midwives, 13 general practitioners.	Qualitative open-ended questionnaires	IV	<p>Women stated they received their PCN2 between 6 and 40 weeks gestation with the average being 23 weeks. 60% of women indicated their view of the PCN2 as having <i>no effect</i> on the care received.</p> <p>Midwives and GP's consistently identified that the PCN2 had a vital role when planning maternity care for a woman presenting to hospital. 13/15 respondents identified the PCN2 as an effective way of improving communication between caregivers. 14/15 respondents perceived that women who carried their PCN2 throughout their pregnancy achieved a 'positive effect' on their continuity of care.</p>
Mills et al 2010 ¹⁸	Rural remote Australia.	10 Registered nurses	Evaluation of a pilot study (quasi-experimental, no control group)	IV	<p>Nurses found it very difficult to arrange a clinical placement with the local midwife.</p> <p>The motivating force behind GP's facilitation of registered nurses participation in the pilot programme was the potential for increasing client access to services.</p>
Sutherland et al 2009 ²⁶	Public and private hospitals with maternity services in SA	35 hospitals in SA 75 hospitals in Victoria	Clinical audit	IV	Results show that GP's working in the community are major providers of primary maternity care in SA and

	and Victoria				VIC.
Homer et al 2009 ¹⁷	Australia	32 midwives 28 postpartum women	A mixed-methods study with qualitative data collected from surveys with women and interviews with midwives.	III-3	Midwives and women identified a series of key elements that were required of a midwife. These included: being women centred, providing safe and supportive care and working in collaboration with others when necessary.

^aStudies ranked using NHMRC (2002) Levels of Evidence Hierarchy⁹ where I is a systematic review (highest ranking) and IV is a case series or cross sectional study (lowest ranking).

Table 5 - Aboriginal and Torres Strait Islander Care (n = 4)

Author	Location	Sample	Design	Level of Evidence ^a	Main Findings
Kildea et al 2012 ²⁰	Tertiary Australian Hospital	367 Indigenous women attending Murri Clinic 414 Indigenous women receiving standard care	Clinical audit to compare clinical outcomes in two models of care	III-3	Indigenous women attending the Murri Clinic were statistically less likely to experience perineal trauma, have an epidural, and have a baby admitted to NICU. Multivariate analysis found higher normal birth rates amongst women attending the Murri Clinic.
Panaretto et al 2005 ⁶	Townsville, Queensland, Australia	456 women in the mums and babies (MB) program 84 women attending Townsville Aboriginal and Islander Health Service (TAIHS)	Prospective cohort study	III-3	Significantly more antenatal care visits, improved timeliness of the first visit and fewer pregnancies with inadequate care among the (mums and babies (MB)) intervention group. Among the MB group there were significant positive trends in recorded care planning, smoking cessation advice and antenatal educational activities. There were significantly fewer preterm births in the MB group compared with the historical and contemporary control groups.
Reibel and Walker 2010 ²²	Western Australia	42 health services	Audit of services by telephonic interview	IV	Of the 42 audited services, 18 were specifically for Aboriginal women and 24 non-specific. Of the 42 services reporting use by aboriginal women only 9 were identified as providing culturally responsive service delivery. Results demonstrated significant gaps in

					publically funded antenatal services for Aboriginal women in WA. About 75% of services used by Aboriginal women have not yet achieved a model of service delivery consistent with the principles of culturally responsive care.
Homer et al 2012 ²¹	Suburban Sydney, Australia	353 women who gave birth at the Malabar Community Midwifery Link Service	Descriptive study using mixed methods (qualitative and quantitative approaches)	III-3	Importance of continuity of caregiver was highlighted. Women valued having someone they could call for help instead of being 'a number in a hospital'. The women trusted the midwives because they came from Malabar. The midwives were reported to be non-judgemental, professional and easy to talk to. The Malabar service addresses a number of key goals of the Australian National Indigenous Health Equality Targets.

^aStudies ranked using NHMRC (2002) Levels of Evidence Hierarchy⁹ where I is a systematic review (highest ranking) and IV is a case series or cross sectional study (lowest ranking).

Table 6 - Factors influencing care (n=4)

Reference	Location	Sample	Design	Level of Evidence ^a	Key Findings
Trinh and Rubin 2006 ²³	New South Wales, Australia	85,034 women who gave birth after 2004.	Retrospective analysis of NSW Midwives database	III-3	Factors related to late antenatal care were younger age, being a migrant, being Aboriginal or Torres Strait Islander, living in Western Sydney, having more previous pregnancies and a history of smoking.

					Factors associated with reduced risk of late entry to antenatal care were age 40 and older, living outside of Sydney, having previous caesarean delivery and having a multiple pregnancy.
Humphrey and Keating 2004 ²⁵	Cairns Base Hospital, Australia	16,176 women who gave birth at Cairns Base Hospital.	Retrospective observational study	III-3	Women who did not access antenatal care were more likely to be of high parity (5 or more viable births), low maternal age (25 or less), indigenous, use tobacco and alcohol.
Sutherland et al 2012 ²⁶	South Australia and Victoria	109 hospitals from both South Australia and Victoria	Cross sectional postal survey 5-6 months postpartum.	IV	<p>Across all social and economic indicators, women at greatest risk of disadvantage were significantly less likely to receive primary midwife care than public clinic care.</p> <p>61% of women in the public health care system rated their pregnancy care as 'very good', 28% rated their care as 'good', 10% rated their care as 'mixed' and 1% rated their care as either 'poor' or 'very poor'.</p>
Robinson et al 2012 ²⁴	Campbelltown Hospital, Australia	1520 deliveries at Campbelltown hospital	Comparison of timing of first antenatal visit by mothers of Aboriginal and non-Aboriginal infants, assessed by questionnaire.	IV	<p>It was found that the majority of mothers presented for hospital-based antenatal care between 10 and 20 weeks gestation with very few presenting after 30 weeks.</p> <p>Three characteristics remained associated with timing of presentation to antenatal services when all other factors were adjusted for: maternal smoking, paid employment and SEIFA quintile.</p>

^aStudies ranked using NHMRC (2002) Levels of Evidence Hierarchy⁹ where I is a systematic review (highest ranking) and IV is a case series or cross sectional study (lowest ranking).