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Changing models of public antenatal care in Australia: is current practice meeting the needs of vulnerable populations?

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ABSTRACT

Objective To investigate women’s views and experiences of public antenatal care

Design Population-based survey in two states

Setting South Australia and Victoria, Australia

Participants 4366 women surveyed at 5-6 months postpartum

Results Of 8468 eligible women mailed the survey, 52% returned completed questionnaires. Fifty-seven percent of women (2496/4339) received public antenatal care. Of these, half attended a GP for some/all antenatal visits, 38% attended a public hospital clinic or midwives clinic, and 12% had primary midwife care, mostly in a midwifery group practice. Women with complex needs — young women, those experiencing multiple social health problems, women of non-English speaking background, and women at higher risk of complications in pregnancy - were the least likely to say that care met their needs. Women attending a GP or midwife as a primary caregiver were the most positive about their antenatal care: 69% and 74% respectively describing their antenatal care as ‘very good’.

Women attending a standard public hospital clinic were the least positive about their antenatal care with only 48% rating their care as ‘very good’. Women enrolling in GP shared care or attending a midwives clinic at a public hospital gave intermediate ratings.

Conclusion and implications for practice: Models of public antenatal care involving a designated lead primary caregiver (GP or midwife) came closest to meeting women’s need for information, individualised care and support.

Key words: antenatal care, patient experience, vulnerable populations
INTRODUCTION

Health systems in countries such as Australia, Canada, New Zealand and the UK are evolving rapidly, with implications for the way in which care is provided to women during pregnancy. In Australia, changes to the organisation of maternity services have been driven by medical and midwifery workforce shortages, the introduction of casemix funding for public hospitals, financial incentives for hospitals to transfer care to community-based medical practitioners funded via Medicare (Australia’s universal health insurance scheme), and an unexpected increase in the birth rate placing significant pressure on public hospital outpatient clinics. Australian women can access antenatal care in either the public or the private sector. Care in the public sector is funded by both state and commonwealth governments. Visits to a public hospital are free, but there may be upfront costs associated with screening tests conducted outside a public hospital. Antenatal visits with community-based general practitioners (GPs) are partially funded under Medicare – Australia’s universal health insurance scheme. It is possible for GPs to ‘bulk-bill’ patients in which case the GP receives 85% of the schedule fee and patients incur no out of pocket costs. In practice, many women attending GPs for antenatal care are required to cover the gap between the fee charged and the amount that is reimbursed under Medicare. They may also incur similar gap fees for some routine tests in pregnancy. The last decade has seen a marked increase in the provision of collaborative models of care in the public sector, involving different combinations of careproviders (midwives, general practitioners, obstetricians), sometimes co-located, but more often involving care being shared across community-based and hospital settings.

The implications of these changes for women’s experiences of antenatal care are not well understood, largely because of a lack of concurrent evaluation distinguishing between different models of public antenatal care. Australia has an excellent national perinatal
surveillance system, with data routinely collected by all states and territories, but identification of women attending different models of maternity care within this system has proved challenging.\textsuperscript{9} Community surveys provide another source of data for assessing the impact of changes to the organisation of maternity care, and have now been implemented in many countries.\textsuperscript{10-18} In Australia, the first published community survey of recent mothers was conducted in the late 1980s in conjunction with a Ministerial Review of Birthing Services in Victoria.\textsuperscript{15} Subsequent community surveys of women giving birth in Victoria, and most recently also in South Australia, were conducted in 1994, 2000 and 2008.\textsuperscript{16-19} Before implementing the second survey, substantial pilot work was undertaken to develop reliable procedures for ascertaining what type of antenatal care women received in pregnancy.\textsuperscript{20} This has enabled us to chart changes in the organisation of antenatal care over more than two decades, and provided a framework for assessing the impact of system-wide changes on women’s experiences of public and private maternity care.\textsuperscript{17,18}

This paper draws on findings of the most recent survey conducted in two Australian states - Victoria and South Australia - in 2008. Together, Victoria and South Australia account for approximately one third of the births in Australia each year, covering a geographic area that is five times the size of the United Kingdom.\textsuperscript{9} The aims of this paper are: (i) to investigate the views and experiences of women enrolled in different models of public sector antenatal care, and (ii) to consider implications of the findings for health system reform, with a particular focus on the capacity of current models of care to address the needs of vulnerable population groups.
METHODS

Procedure

All women who gave birth in South Australia and Victoria in an 8-week period in September/October 2007 were invited to take part in the study, excluding women who had had a stillbirth or a known neonatal death, and maternal deaths in the study period. Staff at public and private hospitals (n=109) and homebirth practitioners with births in the study period distributed questionnaires on behalf of the research team. Eligible women were sent an invitation to participate together with a copy of the questionnaire at six months postpartum. The limitations of our funding prevented us from translating the questionnaire into community languages other than English, or from implementing other strategies to encourage participation of non-English speaking women. Two reminders were sent at two-week intervals with a repeat copy of the questionnaire included in the final mail out. It was not possible to follow-up non-responders by telephone due to the conditions of our ethics approval. The timing of data collection at 5-6 months postpartum matches previous surveys of recent mothers in Victoria, and was chosen in order to avoid the potential for a ‘halo effect’ in the period soon after birth colouring women’s views of care.20

Questionnaire

The questionnaire covered women’s views and experiences of antenatal, intrapartum and postnatal care and was developed drawing on validated study instruments used in previous Victorian statewide surveys of recent mothers conducted in 1989, 1994 and 2000.15-20 Model of maternity care was ascertained from responses to a series of questions asking about where routine antenatal visits took place, care providers during pregnancy, hospital admission status (public or private) and place of birth. This information was triangulated with information provided by participating hospitals regarding models of care offered by
each hospital at the time of the survey. Five main models of public sector maternity care are reported on in this paper. These are: public clinic care, midwives clinic care, GP shared care, GP primary care, and midwife primary care. In public clinic care, antenatal, intrapartum and early postnatal care is provided by rostered doctors and midwives at a public hospital. Midwife clinic care is similar to public clinic care but all visits in pregnancy are with midwives unless referral to a specialist obstetrician is indicated. In GP shared care antenatal care is provided to women by a local community-based GP with scheduled visits to a public hospital clinic at key points in pregnancy, and intrapartum and early postnatal care provided by the same hospital. In GP primary care all antenatal care is provided by community-based medical practitioners (mainly GPs), with intrapartum and postnatal care provided by rostered doctors and midwives at a public hospital. In midwife primary care antenatal, intrapartum and early postnatal care is provided by a designated midwife/midwife team as lead care providers, with referral to a hospital-based obstetrician only if required. These definitions of the major public models of maternity care have been adopted by the Australian Government, and used in recent policy documents regarding the future of maternity services. As noted in the introduction, visits to midwives and doctors based at a public hospital incur no out of pocket costs. Visits to community-based GPs are partially or fully reimbursed by Medicare – Australia’s universal health insurance scheme. In general, only women at low to moderate risk of complications are accepted for GP shared care or midwife primary care. Women at higher risk of complications in pregnancy are more likely to attend a public hospital clinic.

Women’s views of antenatal care were assessed based on a combination of global and more specific questions asking about specific aspects of care. An overall rating of antenatal care was derived from a question that asked: *On balance, how would you describe your antenatal care?* Five response categories were provided: very good, good, mixed, poor, very poor.
Questions about specific aspects of care were also asked using a five point scale, and covered the extent to which caregivers: used words and explanations women could understand, listened to what women had to say, spent enough time with women at appointments, made an effort to get to know issues that were important to them, and remembered women between visits. As many women saw both community-based and hospital-based practitioners for pregnancy check-ups, participants were asked to provide feedback about experiences of care distinguishing between care provided by community-based GPs, and by hospital-based midwives and doctors (depending on whom they had seen when attending hospital visits).

Data on socio-demographic characteristics, past reproductive history and events in the current pregnancy were also collected. Women were categorised as being at higher or lower risk of complications based on their responses to a series of questions regarding their reproductive history and medical conditions prior to and during pregnancy. Women defined as being at higher medical risk included women with a prior history of medical complications such as preterm birth or pre-eclampsia, women who developed these problems during their pregnancy, and women with a range of medical conditions such as diabetes and asthma. Stressful life events and social health issues in the 12 months before the birth were assessed using a 23-item checklist, incorporating items from the PRAMS study, and additional items that were included after piloting. The 23 items included major life events, such as separation and divorce, moving house, losing your job, or the death of a close family member or friend, and social health issues such as having a lot of bills you couldn’t pay, not having enough money to buy food, being involved in a court case, family conflict or being homeless. Details about this instrument are available elsewhere.
Sample and study power

A four-week study period in Victoria and eight-week study period in South Australia (>8000 births) was chosen to ensure sub-groups of interest (e.g. major models of care, young women) were large enough for meaningful statistical analysis when combining data for both states and for comparisons within each state jurisdiction. Power calculations were conducted at the beginning of the study to assess the required sample size for testing study hypotheses regarding women’s experiences in different models of care. A priori power calculations showed that a sub-group size of 107 (e.g. for model of care) with a two-tailed alpha of 0.05 would have 80% power to detect a 20% difference in the proportion of women rating their antenatal care as ‘very good’ in different models of care (42% versus 62%). Assuming a response fraction between 50-60%, we anticipated that a total sample of greater than 8000 women would be required to ensure that there were at least 107 women in smaller models of care (e.g. midwife primary care) in each state jurisdiction.

Analysis

In order to assess representativeness of women responding to the survey, the social and obstetric characteristics of participants were compared with routinely collected South Australian and Victorian perinatal data for all women giving birth in the study period. For the purposes of statistical analysis, the variable measuring women’s overall rating of antenatal care was grouped into two categories: responses describing care as very good/all other categories. An a priori decision was taken to consider all responses other than ‘very good’ as indicating some level of dissatisfaction, i.e. that some aspect of care could have been better. This is consistent with the approach taken in previous Victorian surveys of recent mothers, which also surveyed women at 5-6 months postpartum. Women’s views of
specific aspects of pregnancy care were also dichotomised to compare the most positive category of response with all other ratings. Analyses involved calculation of odds ratios using univariable and multivariable regression. Multivariable logistic regression was used to examine the association between model of care and women’s overall rating of antenatal care, taking into account the potential confounding effects of maternal age, parity, risk of complications in pregnancy, stressful life events and social health issues, and maternal country of birth. All analyses were carried out using Stata version 11.23

RESULTS

The adjusted response fraction excluding questionnaires ‘returned to sender’, duplicate responses and women who gave birth outside the study period was 52% (4366/8468). Several hospitals reported difficulties with mail out processes: some did not mail all questionnaires and several mailed questionnaires to women who gave birth outside the study period (which rendered them ineligible for inclusion in the study). It is therefore likely that the denominator overstates the number of eligible women sent a copy of the survey, which means the true response fraction is probably higher than 52%.

Characteristics of participants

Study participants were aged between 16 and 46 years (mean=31). Two-fifths (1941/4366, 44%) were having their first baby. One in five (798/4319, 19%) were born outside Australia, and one in ten (526/4319, 12%) in countries where English is not the first language, and 0.8% (31/4082) were Aboriginal or Torres Strait Islanders. Comparisons with routinely collected data in both states indicated participants were largely representative in relation to parity, method of birth and infant birthweight, but included lower proportions of young women (<25 years), single women, women born overseas of non-English speaking
background (NESB) and Aboriginal and Torres Strait Islander women compared with routinely collected data for births in the study period. Further details regarding the sample characteristics are available in an earlier paper.19

**Model of maternity care**

Model of care was ascertained for over 99% of women in the study (<1% missing data, n=27). Fifty-seven percent of women (2496/4339) received public maternity care, and 42.5% (1843/4339) attended a private practitioner, in most cases a specialist obstetrician (i.e. private maternity care). As the focus of this paper is on women receiving public antenatal care, from hereon data are presented only for women who attended public models of care (n=2,496). Figure 1 shows the percentage of women attending different public sector models of care in the current study, and contrasts these data with previously published data from two earlier population-based surveys of women giving birth in Victoria conducted in 1994 and 2000.17 In the 2008 survey, 50% of women enrolling in public sector models of care attended a GP for some or all of their antenatal check-ups, 38% attended a public hospital clinic or midwives clinic, and 12% had a midwife as their designated lead caregiver (midwife primary care). This compares with 68% attending a GP for some or all visits, 25.6% attending a public hospital clinic or midwives clinic, and 6.1% attending a midwife/midwife team as their lead caregiver for antenatal and intrapartum care in the 1994 survey.

**Overall rating of antenatal care**

A majority of women enrolling in public models of care gave positive ratings of antenatal care: 61% described their antenatal care as ‘very good’, 28% as ‘good’, 10% as ‘mixed’, and 1% regarded their care as ‘poor’ or ‘very poor’. Table 1 shows the relationship between socio-demographic and reproductive characteristics and women’s overall rating of antenatal care for women enrolling in public models of antenatal care. Women having their first baby,
younger women (<25 years), women born overseas of non-English speaking background and women reporting multiple stressful life events or social health issues were less likely to give favourable ratings of their antenatal care. There were no differences in women’s overall ratings of public antenatal care associated with: maternal education, income, having a health care concession card, or relationship status.

Comparisons between models of care

Table 2 shows how women in different models of public antenatal care rated the care they received in pregnancy. Women attending a GP or midwife as a primary caregiver were the most positive about their antenatal care: 69% and 74% respectively describing their antenatal care as ‘very good’. Women attending a standard public hospital clinic were the least positive about their antenatal care with only 48% rating their care as ‘very good’. Women enrolling in GP shared care or attending a midwives clinic at a public hospital gave intermediate ratings. To account for potential confounders, a multivariable logistic regression model was fitted with a rating of antenatal care as other than ‘very good’ as the outcome variable. Parity was entered for a priori reasons related to its physiological significance in pregnancy, and social significance for the mother. The other variables entered into the model (risk of complications in pregnancy, maternal country of birth, maternal age, number of stressful life events and social health issues) were significantly associated with dissatisfaction at a univariable level. Compared with women enrolling in GP primary care (as the reference category), women attending a public clinic, midwives clinic or GP shared care had significantly raised odds of expressing some degree of dissatisfaction with their antenatal care after adjusting for other factors included in the model.
Women's views of specific aspects of care

Figures 2-6 report women’s experiences of specific aspects of antenatal care distinguishing between care provided by doctors and care provided by midwives in different models of care. Women were invited to rate each dimension of care on a five point likert scale (always, mostly, sometimes, rarely, never). In the case of GP shared care, where both community-based GPs and hospital-based doctors may be involved in providing antenatal care, the results reported are the ratings for community-based GPs. As very few women who received GP primary care saw midwives, and similarly, few women receiving midwife primary care saw a hospital doctor on more than one occasion, we have not reported these data. The least favourable feedback (on all measures) was given by women attending a public clinic, and the most favourable feedback, by women attending midwife primary care. In general, women were more positive about interactions with GPs and midwives, than about interactions with hospital doctors.

Women’s experience of care provided by their usual general practitioner

Table 3 reports analyses exploring the extent to which seeing a known GP for antenatal visits influences women’s views of care. Just over half the women in GP shared care and two-fifths of women enrolled in GP primary care reported the GP they saw for pregnancy care was their usual GP. Other women enrolling in GP shared care or GP primary care either didn’t have a GP prior to pregnancy or did not see their usual GP for antenatal care. Women who saw a GP other than their usual GP for shared care or GP primary care were more likely to express dissatisfaction with aspects of their antenatal care than women who saw their usual GP.
DISCUSSION

Who is providing maternity care?

Unlike the UK, Canada and New Zealand where the role of GPs in antenatal care has substantially diminished\(^{11,26,27}\), GPs in Australia continue to be major providers of pregnancy care. In the current study conducted in two Australian states accounting for one third of total births in Australia, fifty percent of women receiving public sector antenatal care attended a GP for some or all of their pregnancy check-ups. GPs have not played a major role as lead caregivers for intrapartum care in Australia since the early 1990s.\(^7\) The major change in Australia over the past decade has been an increase in the proportion of women seeing midwives as lead caregivers for pregnancy care, and a relative decline in the proportion of women attending GPs, notwithstanding the fact that half of women in the most recent survey saw GPs for all or some of their antenatal care. In contrast, 19% of women in the UK, and approximately one third of women in Canada saw a GP or family physician for at least one check-up in pregnancy.\(^{10,11}\) The proportion of pregnant women in New Zealand registering with a GP lead maternity caregiver decreased from 17.3% in 2001 to 1.6% of births in 2010.\(^{25}\) The nature of the New Zealand maternity reforms means that very few women see GPs for antenatal check-ups outside of these arrangements.\(^{5,26}\)

Women's experiences of care

The survey findings show wide variation in the overall rating of antenatal care between different models of public antenatal care and different caregiver groups (midwives, GPs, hospital based doctors). The proportion of women rating their care as ‘very good’ ranged from 74% among women enrolled in primary midwife care to 48% among women attending a public hospital clinic. Young women, women having their first baby, women of non-English speaking backgrounds, women at higher risk of complications in pregnancy and those
reporting multiple stressful life events and social health issues were the least likely to say that antenatal care met their needs.

There are complex challenges in providing high quality care to diverse and vulnerable populations. Concentration of risk – for example, when women and families experience multiple social health problems – requires additional time and effort by caregivers to integrate attention to issues such as family violence, limited English language proficiency, unemployment, single parenthood and low health literacy, with screening and treatment for medical complications. Standard 15 or 30-minute visits may not provide adequate time for caregivers to address complex co-morbidity and tailor care to individual circumstances. We were unable to assess length of consultations, but it is likely that models of care that achieved the best results had greater flexibility to offer longer consultations.

Areas of weakest system performance include the extent to which caregivers remembered women between visits, and the extent to which caregivers made an effort to know what issues were important to women. In the public clinic and midwives clinic setting, women gave particularly critical feedback regarding care provided by doctors. Midwife care was rated more favourably across all models of care, with the most positive feedback given in relation to midwife primary care, consistent with the findings of RCTs evaluating team midwifery care and caseload midwifery care. It is striking that primary midwife care was the only model of care in which more than seventy percent of women said caregivers took the time to get to know what issues were important to them.

**Strengths and limitations**

Major strengths of the study include: conduct of the survey in two Australian state jurisdictions that together account for one third of annual births in Australia; the capacity to
compare results with previous Victorian surveys facilitating assessment of the impact of changes to the organisation of maternity care over time; a large enough sample for meaningful statistical comparisons of women’s views of different models of care; and the ability to assess the representativeness of the sample compared with routinely collected perinatal data in both states. Consistent with the trend towards lower response rates in community surveys\textsuperscript{32}, the overall response from eligible women was lower than in previous Victorian surveys of recent mothers.\textsuperscript{17} As in previous surveys, younger women, women born overseas of non-English speaking background and Aboriginal and Torres Strait Islanders are under-represented. Other study designs are needed to facilitate the involvement of these harder to reach groups.\textsuperscript{33,34} While lower than anticipated, the response fraction is unlikely to have had a marked effect on estimates of association. Two recent studies provide robust evidence to support the assumption that estimates of association between variables remain reliable in studies with much lower response fractions than in the current study.\textsuperscript{35,36}

**Implications for future planning of maternity services**

The 2008 survey findings have three major implications for future planning of maternity services. First, they draw attention to the challenges of meeting the needs of vulnerable populations. Women with complex needs – young women, those experiencing multiple social health problems, women of non-English speaking background, and women at higher risk of complications in pregnancy – who arguably have the greatest need for high quality antenatal care, were the least likely to say that care met their needs. Second, the marked variation between the best performing and the weakest performing service models, even accounting for social and obstetric differences in patient characteristics, shows that service improvements are achievable, and gives some clues about models of care which may enable caregivers to work in ways that more effectively meet women’s needs. Models of care involving a designated lead primary caregiver (GP primary care, midwife primary care) came
closest to meeting women’s need for information, individualised care and support during pregnancy. Importantly, women who attended a GP known to them from before pregnancy were more likely to have positive experiences of antenatal care. Historically, Australia has not required patients to register with a designated GP practice, although this aspect of Australian primary care continues to be debated in the context of Australian health care reforms. The fact that women attending their usual GP for antenatal care had more positive experiences may be influenced by social characteristics such as age or geographic mobility, but model of care remains a powerful influence on women’s overall experience, notwithstanding the influence of these factors. Third, the 2008 survey findings underline the significant role that GPs continue to play in the provision of antenatal care in Australia. GPs are in a unique position as providers of antenatal and postnatal care. Unlike midwives and obstetricians, their contact with women and families is not time-limited to particular episodes of care. Health care reform in Australia has done little to foster the role of GPs as maternity caregivers, or to explore the potential for strengthening the capacity of local primary health care services to address complex social risk factors for poor maternal, newborn and child health outcomes in vulnerable populations. It is time that the window of opportunity for public health intervention in antenatal care to address social risk factors for poor maternal, newborn and child health outcomes got more firmly onto the policy agenda.
References


23. Stata Corporation: Stata Statistical Software Release 11 College Station, Texas.


Table 1. Relationship between women’s experiences of public antenatal care and reproductive and social characteristics (n = 2,430)*

<table>
<thead>
<tr>
<th>Overall rating of antenatal care</th>
<th>‘Very good’</th>
<th>Other than ‘very good’</th>
<th>Odds Ratio** (95% CI)</th>
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<tbody>
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<td></td>
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<td>%</td>
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<td>62.7</td>
<td>425</td>
</tr>
</tbody>
</table>

* Totals may vary because of missing values

**Odds ratio calculated for the odds of women rating their antenatal care as other than ‘very good’. Odds ratios that are bolded indicate statistically significant results (p<0.05)
*** ESB English speaking background NESB non-English speaking background

*** Equivalised household income = pretax family income adjusted for household size and composition according to modified OECD equivalence scale
Table 2. Women’s experience of antenatal care in public models of care (n= 2,382)*

<table>
<thead>
<tr>
<th>Model of care</th>
<th>Overall rating of antenatal care</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>‘Very good’</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>GP primary care</td>
<td>434 (67.8)</td>
</tr>
<tr>
<td>GP shared care</td>
<td>325 (58.0)</td>
</tr>
<tr>
<td>Midwives clinic</td>
<td>261 (58.1)</td>
</tr>
<tr>
<td>Public clinic</td>
<td>218 (48.0)</td>
</tr>
<tr>
<td>Midwife primary care</td>
<td>211 (74.0)</td>
</tr>
</tbody>
</table>

* Denominator excludes women with missing data

** Odds ratio has been calculated for the odds of women rating their care as other than ‘very good’, adjusted for maternal age, risk of complications in pregnancy, maternal country of birth, stressful life events and social health issues, and parity. Odds ratios that are bolded indicate statistically significant results (p<0.05).

Table 3. Women’s experience of antenatal care comparing women who saw their usual GP for check-ups with those who attended a GP unknown to them prior to pregnancy
<table>
<thead>
<tr>
<th>Attended usual GP for care</th>
<th>No.</th>
<th>(%)</th>
<th>No.</th>
<th>(%)</th>
<th>OR (95% CI)**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>390</td>
<td>70.0</td>
<td>167</td>
<td>30.0</td>
<td>1.00 ref</td>
</tr>
<tr>
<td>Attended unknown GP for care*</td>
<td>359</td>
<td>57.4</td>
<td>266</td>
<td>42.6</td>
<td>1.73 (1.4-2.2)</td>
</tr>
</tbody>
</table>

* No regular GP or not usual GP

** Odds ratio has been calculated for the odds of women rating their care as other than 'very good'. Odds ratios that are bolded indicate statistically significant results (p<0.05)
Contribution to authorship

The study was conceived and designed by SB and JY; JY supervised data collection; JY and GS are responsible for data management; JY and GS undertook analyses reported in the paper; SB wrote the manuscript. All authors contributed to interpretation of data and commented on drafts of the paper.

Details of ethics approval

The study was approved by the Human Research Ethics Committees of the Royal Childrens Hospital (27001A; 12 June 2007), the South Australian Department of Health (19 March 2007), the Victorian Department of Human Services (113/06; 19 January 2007) and several participating hospitals that required individual site ethics approval.

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Figure 1: % of women enrolled in public models of antenatal care

Figure 2: % women who said caregivers did not always use words and explanations they could understand

Figure 3: % women who said caregivers did not always really listen to what they had to say

Figure 4: % women who said caregivers did not always spend enough time with them

Figure 5: % women who said caregivers did not always make an effort to get to know what issues were important to them

Figure 6: % women who said caregivers did not always remember them between visits
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Brown, SJ; Sutherland, GA; Gunn, JM; Yelland, JS

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