

## Prenatal care in Brazil

### Assistência pré-natal no Brasil

### El cuidado prenatal en Brasil

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#### Abstract

*This study aims to describe prenatal care provided to pregnant users of the public or private health services in Brazil, using survey data from Birth in Brazil, research conducted from 2011 to 2012. Data was obtained through interviews with postpartum women during hospitalization and information from hand-held prenatal notes. The results show high coverage of prenatal care (98.7%), with 75.8% of women initiating prenatal care before 16 weeks of gestation and 73.1% having six or more number of appointments. Prenatal care was conducted mainly in primary health care units (89.6%), public (74.6%), by the same professional (88.4%), mostly physicians (75.6%), and 96% received their hand-held prenatal notes. A quarter of women were considered at risk of complications. Of the total respondents, only 58.7% were advised about which maternity care service to give birth, and 16.2% reported searching more than one health service for admission in labour and birth. Challenges remain for improving the quality of prenatal care, with the provision of effective procedures for reducing unfavourable outcomes.*

*Prenatal Care; Maternal and Child Health; Maternal-Child Health Services*

#### Resumo

*O estudo tem por objetivo analisar a assistência pré-natal oferecida às gestantes usuárias de serviços de saúde públicos e/ou privados utilizando dados da pesquisa Nascer no Brasil, realizada em 2011 e 2012. As informações foram obtidas por meio de entrevista com a puérpera durante a internação hospitalar e dados do cartão de pré-natal. Os resultados mostram cobertura elevada da assistência pré-natal (98,7%) tendo 75,8% das mulheres iniciado o pré-natal antes da 16ª semana gestacional e 73,1% compareceram a seis ou mais consultas. O pré-natal foi realizado, sobretudo, em unidades básicas (89,6%), públicas (74,6%), pelo mesmo profissional (88,4%), em sua maioria médicos (75,6%), e 96% receberam o cartão de pré-natal. Um quarto das gestantes foi considerado de risco. Do total das entrevistadas, apenas 58,7% foram orientadas sobre a maternidade de referência, e 16,2% procuraram mais de um serviço para a admissão para o parto. Desafios persistem para a melhoria da qualidade dessa assistência, com a realização de procedimentos efetivos para a redução de desfechos desfavoráveis.*

*Cuidado Pré-Natal; Saúde Materno-Infantil; Serviços de Saúde Materno-Infantil*

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## Introduction

Prenatal care is an important component of health care for women during pregnancy. Practices routinely performed during this care are associated with better perinatal outcomes<sup>1,2</sup>. According to recommendations of the Ministry of Health<sup>3</sup>, prenatal care should be through the incorporation of welcoming reception; development of educational and preventive actions without unnecessary interventions, early detection of diseases and identification of gestational risk; establishment of the link between prenatal care and place of birth, and easy access to quality health services from primary care to hospital care of high risk women.

National studies have demonstrated the existence of gaps in prenatal care, such as difficulties in access, late booking, inadequate number of prenatal visits and incomplete realization of the recommended procedures, affecting the quality and effectiveness of care<sup>4,5,6</sup>. The lack of linkage between the services providing prenatal and delivery care is another problem identified, resulting in the pilgrimage of pregnant women in labour in search of a place for hospitalization, bringing additional health risks to the pregnant woman and her newborn<sup>7,8</sup>.

Nationwide data about prenatal care in Brazil is scarce. The information from the Information System on Live Births (SINASC) demonstrate an increase in prenatal coverage in the country, reaching values close to 100% in 2011 (Health Informatics Department. <http://www.datasus.gov.br>, accessed on 01/Jul/2013). However, this system only allows the analysis of the number of appointments conducted, and is restricted to pregnancies that resulted in a live birth. The System of Information of the Program for the Humanization of Prenatal and Birth Care – SispreNatal (<http://sisprenatal.datasus.gov.br/SIS-PRENATAL/index.php>), implemented in the year 2000, allows access to other information, such as gestational age at onset of prenatal care, routine exams, anti-tetanus vaccination, number of prenatal visits and postpartum appointments. However, this data is not available for regular consultation and presents problems with underreporting<sup>9</sup>. The only study that evaluated prenatal care using data from this system for the entire country was conducted with pregnant women enrolled in the first two years of the program (2001 - 2002) when less than 30% of expectant mothers were enrolled<sup>10</sup>.

Specific studies, such as the *Brazilian National Survey of Demographic and Health* (PNDS), also provide data on prenatal care in the country. The most recent one, held in 2006<sup>11</sup>, found 80.9%

prenatal care coverage, with six or more appointments, high performance of exams and provision of hand-held prenatal notes. However, this study is only based on interviews with women without checking the prenatal records, which is subject to more recall bias, because it includes pregnancies that occurred in the last five years.

Whereas it is important that national data allow a better assessment of the care provided, the objective of this study is to analyze the prenatal care provided to pregnant women in the public and/or private health services in Brazil, considering their suitability according to some predefined parameters of the Ministry of Health<sup>12</sup>, their organization and relationship with other services of the health system as well as the profile of the users of prenatal services.

## Methodology

*Birth in Brazil* is a Brazilian national, hospital-based study of women who have recently given birth and their newborns, conducted from February 2011 to October 2012. The sample was selected in three stages. The first stage consisted of hospitals with 500 or more deliveries/year, stratified by the five geographical regions of the country, location (capital or non-capital), and type of hospital (private, public and mixed). The second stage was composed of days (minimum of seven days in a hospital) and the third stage by postpartum women. In each of the 266 hospitals sampled, 90 postpartum women were selected, totalling 23,940 participants interviewed. More information about the sample design is detailed in Vasconcellos et al.<sup>13</sup>. In the first stage of the study face-to-face interviews were conducted with postpartum women during hospitalization and data was extracted from their medical records and of their newborn, and hand-held prenatal notes were photographed. Telephone interviews were conducted before six months and at twelve months after birth to collect data on maternal and neonatal outcomes. Detailed information on data collection is reported in do Carmo Leal et al.<sup>14</sup>.

While the main study is a cohort, this paper will present only the results of the first stage of the research, through a sectional cut.

To review the prenatal care, we investigated the coverage of this care (performing at least one prenatal appointment); reasons for not attending prenatal care, the proportion of women with early onset of prenatal care (up the 16th gestational week) and the reasons stated for this late start, number of prenatal care visits, the proportion of pregnant women with their hand-held

prenatal notes upon admission for delivery and results of routine tests recorded (blood, urine and ultrasound scan), receiving information about delivery and the identification of signs of risk in pregnancy, and information about breastfeeding. For women who had their hand-held prenatal notes, we considered the gestational age at first prenatal care visit and the total number of registered appointments. For women who did not have their hand-held prenatal notes, we used the information obtained during the postpartum interview<sup>15</sup>.

We also verified the way of prenatal care is structured according to the source of payment (public or private), type of health care facility where women made most of their prenatal visits (primary care or hospital outpatient), professional cadre providing prenatal care in most visits (doctor or nurse) and continuity of provider (same professional throughout the prenatal care or not).

The integration of prenatal care services to other services in the health care network was measured by the proportion of pregnant women considered at risk referred to specialist services, the proportion of women informed about their place of hospitalization for childbirth, the proportion who were attended in these services, and the need to search for more than one service at the time of hospitalization for childbirth (i.e. Pilgrimage for childbirth).

Variables related to prenatal care were analyzed according to maternal characteristics: region of residence (North, Northeast, South, Southeast and Central), age (10-14 years 15-19 years 20-34 years 35 years and more), education (incomplete primary education, completed primary education, secondary education, higher education or more), race/ethnicity classified by self-reported colour of skin (white, black, brown, yellow, indigenous), marital status (living or not with partner), previous pregnancies (0, 1, 2, 3 or more) and the occurrence of adverse outcomes in previous pregnancies (defined as the occurrence of at least one of the following conditions: stillbirth, neonatal deaths, preterm birth, low birth weight, hypertension and/or diabetes, 3 or more miscarriages).

Variables related to the planning of the current pregnancy and the satisfaction of women with this pregnancy were also used for the analysis of outcomes coverage of prenatal care, reasons for not attending prenatal care visits, early booking and reasons for late booking of prenatal care.

Not knowing that she was pregnant; personal problems (not wanting pregnancy, not knowing that prenatal care is important for health, financial hardship, hardship related to work/school, and lack of support to attend the service) and

access barriers (difficulty for booking appointments, problems with health service and health professionals, and transportation difficulties) were the main categories used to explain the non-attendance to prenatal care and the late booking.

Data from hand-held prenatal notes and information received prenatally were analysed only according to the region of residence of the respondent.

The weighting of the data was calculated by the inverse of the probability of inclusion of each postpartum women in the sample. To ensure that the estimates were similar to the number of births in the population sampled in 2011, a calibration procedure was used in each selection stratum. Thus, the results presented are estimates for the population studied (2,337,476 births), based on the sample of 23,894 postpartum women interviewed.

An analysis for complex sampling to include design effects, given that cluster sampling was used, applying the chi-square statistical test with a significance level of 0.05, to check for differences between proportions. The software used was SPSS version 17 (SPSS Inc., Chicago, USA).

This study was approved by the Ethics Committee for Research at Public Health National School, Oswaldo Cruz Foundation (ENSP/Fiocruz), number 92/2010. Every effort has been adopted to ensure anonymity and confidentiality of information. Before the completion of each interview, consent was obtained after digital reading of the free and informed consent statement.

## Results

Of the eligible postpartum women selected to participate in the study, 5.7% were not interviewed, and the major causes were refusal or early discharge, being replaced by others of the same unit, resulting in the interview 23,894 women.

The interviewed women had a mean age of 25.7 years, 18.2% were adolescents and 10.5% were women of 35 or more years of age. Most referred race/ethnicity of mixed-race (Brown skin colour), with yellow and indigenous representing a very small proportion of the total sample (1.1% and 0.4%, respectively). Half of the respondents had only primary education and 8.9% higher education. More than 80% reported living with a partner, 41.5% were in their first pregnancy and 15% had three or more previous pregnancies. For women who had been pregnant previously, approximately one third had negative outcomes in previous pregnancies. Less than half of the women said they planned their current pregnancy,

9.6% revealed they were dissatisfied when they learned they were pregnant and 2.3% reported having tried to interrupt the current pregnancy (Table 1).

The attendance of prenatal care in Brazil was 98.7%, higher than 90% independent of maternal characteristics. Lowest coverage was observed in postpartum women living in the North region, indigenous women, less educated, unmarried and with higher number of previous pregnancies. Women with previous negative pregnancy outcomes did not want to get pregnant, were dissatisfied with their current pregnancy, and reported having tried to terminate the pregnancy also had lower coverage of prenatal care (Table 1).

Nationwide, 75.8% of women initiated prenatal care before the 16th gestational week and 73.1% had six minimum visits recommended by the Ministry of Health (Table 1).

The proportion of women with early initiation of prenatal care and with sufficient number of visits was similar to that observed for prenatal coverage: lower for residents in the North and Northeast, in women with less education, without a partner, with the largest number of previous pregnancies, who did not wish to become pregnant, dissatisfied with their current pregnancy and those who tried to interrupt their pregnancy. Women with previous negative outcomes in pregnancy initiated prenatal care later and had fewer visits than women who did not have these outcomes. Adolescents and women of black race/skin colour also showed a lower proportion of early initiation of prenatal care and lower number of prenatal care visits.

Access barriers and personal problems were the most frequent reasons for not attending prenatal care (43.2% and 40.6%, respectively). Women living in the North and Northeast regions, and for women with less education the access barriers were predominant, while women without partners and those who tried to interrupt pregnancy reported more personal problems as reasons to not have attended prenatal care. Although not statistically significant, indigenous women presented three times higher proportion of access barriers than women of white race/colour (Table 2).

The difficulty for the diagnosis of pregnancy was the main reason cited for the late booking of prenatal care (46.6%), followed by personal problems (30.1%) and access barriers (23.2%) (Table 3). The reasons for the late booking of prenatal care varied according to the characteristics of women. Access barriers were three times higher in indigenous women than for white women, and also three times higher for residents in the North compared to the South and Southeast regions.

There was also a gradient in the barriers to access by level of education and number of pregnancies, higher in women with lower education and greater number of pregnancies. Personal problems were reported more frequently by women without a partner, who did not want to get pregnant, dissatisfied with their current pregnancy or who tried to interrupt the pregnancy. High proportion of primigravidae stating the reason "did not know I was pregnant" initiated prenatal care later (Table 3).

Although more than 90% of women said receiving their hand-held prenatal notes during their prenatal care, only 72.1% had it in the hospital admission for delivery, with the lowest proportions observed in the North and Central. Over 80% of the analyzed hand-held prenatal notes had the first routine tests (blood glucose and urine), while the result of the second blood glucose test was only observed in 39.2% of cases. The North and Northeast had the lowest proportion of records of all the tests (Table 4).

Nationwide, 98.2% of the women reported having ultrasound exam in the prenatal period, with the smallest proportion observed in the North. The proportion of recording of the outcome in the prenatal notes was lower, and was available in 62.8% of hand held records tested, with a quarter of ultrasonography exams performed before the 14th gestational week. The largest proportions of recorded ultrasonography exams performed early in pregnancy were observed in the South and Southeast regions (Table 4).

In relation to the information received in prenatal care (Table 4), the guidance for breastfeeding and early detection of signs of risk in pregnancy were reported by more than 60% of the women, while guidance on beneficial practices for labour were cited by 41.1%. Women living in the South and to a lesser extent, by residents in the North, most frequently mentioned receiving information about signs of early labour and risk signs. Information about beneficial practices for childbirth was more frequent in the Central region, with the Northeast region having the highest proportions of information on breastfeeding.

As to the source of service financing for prenatal care (Table 5), it was found that the majority of visits were made in the public health services and prenatal attendance was more frequent in these services for residents in the North and Northeast regions, women of lower age, lower education level, race/ethnicity of black skin colour or indigenous, living without a partner, with more pregnancies and previous negative pregnancy outcomes.

Table 1

Proportional distribution of maternal characteristics according to the coverage of prenatal care, early booking and number of visits in a national sample of postpartum women. Brazil, 2011-2012 \*.

Exposure/Outcome	Interviews	Prenatal care	p-value	Early booking	p-value	Number of prenatal visits			p-value
						1-3	4-5	≥ 6	
Region									
North	9.6	97.5		64.4		16.2	26.4	57.3	
Northeast	28.9	98.5		73.7		11.3	23.2	65.6	
Southeast	42.5	98.8		78.5		7.1	13.1	79.7	
South	12.5	99.5		78.8		7.4	14.8	77.8	
Central	6.5	98.7	0.006	78.0	< 0.001	6.3	17.3	76.4	< 0.001
Age (years)									
10-14	1.0	97.2		51.7		26.0	22.3	51.7	
15-19	18.2	98.5		66.7		13.5	24.1	62.4	
20-34	70.4	98.7		77.5		8.2	16.7	75.2	
35 or more	10.5	98.7	0.304	82.0	< 0.001	6.9	13.6	79.4	< 0.001
Race/Ethnicity/Skin colour									
White	33.8	99.2		80.8		7.3	12.9	79.8	
Black	8.6	98.1		69.2		13.4	19.6	67.1	
Brown	56.1	98.5		73.8		9.6	20.5	69.9	
Yellow (Asian)	1.1	98.3		76.6		7.7	16.8	75.5	
Indigenous	0.4	95.0	0.001	70.3	< 0.001	19.7	14.3	66.0	< 0.001
Mother's level of education									
Incomplete Primary School	26.6	96.9		64.2		16.4	26.2	57.4	
Complete Primary School	25.6	98.8		72.0		9.5	20.5	70.0	
Complete Secondary School	39.0	99.5		82.3		5.8	12.8	81.5	
University and further	8.9	100.0	< 0.001	91.8	< 0.001	2.2	6.9	90.9	< 0.001
Conjugal status									
Without partner	18.6	96.9		64.2		15.4	21.0	63.5	
With partner	81.4	99.1	< 0.001	78.4	< 0.001	7.8	17.0	75.2	< 0.001
Previous pregnancies									
None	41.5	99.4		79.6		7.0	16.0	77.0	
1	28.0	98.9		77.9		8.7	16.1	75.2	
2	15.5	99.0		71.9		11.0	19.3	69.7	
3 or more	15.0	95.9	< 0.001	64.9	< 0.001	14.3	24.4	61.3	< 0.001
Previous negative outcomes									
No	72.2	98.4		74.0		9.9	18.7	71.4	
Yes	27.8	97.4	0.025	70.5	0.002	12.8	20.1	67.2	0.002
Wanted to get pregnant									
Wanted to get pregnant	44.6	99.5		84.7		5.6	13.7	80.7	
Wanted to wait longer	25.5	98.9		74.0		8.6	19.3	72.1	
Did not want to get pregnant	29.9	97.2	< 0.001	63.7	< 0.001	15.1	22.7	62.2	< 0.001
Feelings towards pregnancy									
Satisfied	69.4	99.2		80.9		6.8	15.3	77.9	
More or less satisfied	21.0	97.8		65.7		12.5	24.0	63.5	
Dissatisfied	9.6	96.6	< 0.001	60.2	< 0.001	19.2	22.0	58.9	< 0.001
Tried to terminate the pregnancy									
No	97.7	98.8		76.3		8.9	17.6	73.5	
Yes	2.3	94.2	< 0.001	53.4	< 0.001	20.9	27.8	51.3	< 0.001
<b>Total (national sample)</b>	<b>100.0</b>	<b>98.7</b>		<b>75.8</b>		<b>9.2</b>	<b>17.8</b>	<b>73.1</b>	

\* Values are weighted according to sample design.

Table 2

Proportional distribution of mother's characteristics and the main reasons for no enrolment for prenatal care in a national sample of postpartum women in Brazil, 2011-2012\*.

Exposure/Outcome	Main reasons for no enrolment for prenatal care			p-value
	Did not know she was pregnant	Personal problems	Access barrier	
Region				
North	7.0	24.5	68.4	
Northeast	15.3	29.3	55.4	
Southeast	18.4	55.7	25.9	
South	24.2	54.2	21.6	
Central	25.5	38.6	35.9	< 0.001
Age (years)				
10-14	20.3	20.5	59.2	
15-19	10.0	31.3	58.7	
20-34	17.2	44.7	38.1	
35 or more	20.5	34.9	44.5	0.293
Race/Ethnicity/Skin colour				
White	27.0	42.0	31.0	
Black	14.5	30.9	54.6	
Brown	14.0	42.0	44.0	
Yellow (Asian)	-	77.9	22.1	
Indigenous	-	14.5	85.5	0.317
Mother's level of education				
Incomplete Primary School	10.9	37.3	51.8	
Complete Primary School	19.1	43.1	37.8	
Complete Secondary School	33.6	50.2	16.2	
University and further	-	-	-	0.009
Conjugal status				
Without partner	16.4	59.4	24.2	
With partner	15.6	27.2	57.2	< 0.001
Number of previous pregnancies				
None	22.2	37.5	40.3	
1	15.0	38.1	46.9	
2	17.4	37.7	44.9	
3 or more	14.2	43.9	41.9	0.944
Previous negative outcomes				
No	9.5	42.4	48.2	
Yes	23.5	39.5	36.9	0.118
Wanted to get pregnant				
Wanted to get pregnant	8.4	41.9	49.6	
Wanted to wait longer	18.7	36.4	44.8	
Did not want to get pregnant	16.7	42.3	41.0	0.686
Feelings towards pregnancy				
Satisfied	15.7	33.9	50.4	
More or less satisfied	16.3	42.4	41.4	
Dissatisfied	17.0	49.1	33.9	0.607
Tried to terminate the pregnancy				
No	17.8	37.4	44.8	
Yes	-	73.3	26.7	0.004
<b>Total (national sample)</b>	<b>16.2</b>	<b>40.6</b>	<b>43.2</b>	

\* Values are weighted according to sample design.

Table 3

Proportional distribution of mothers' characteristics and the main reasons for late booking of the first prenatal visit in a national sample of postpartum women in Brazil, 2011-2012 \*.

Exposure/Outcome	Main reasons for late booking of the first prenatal visit			p-value
	Did not know she was pregnant	Personal problems	Access barrier	
Region				
North	29.7	27.1	43.2	
Northeast	43.6	32.6	23.7	
Southeast	52.8	32,1	15.1	
South	61.3	25.9	12.8	
Central	49.5	24.5	26.0	< 0.001
Age (years)				
10-14	36.0	44.7	19.3	
15-19	46.6	30.6	22.8	
20-34	46.2	29.9	23.9	
35 or more	54.7	25.2	20.0	0.497
Race/Ethnicity/Skin colour				
White	54.8	29.6	15.5	
Black	41.2	35.6	23.2	
Brown	44.3	29.6	26.1	
Yellow (Asian)	43.9	14.6	41.5	
Indigenous	35.9	18.0	46.1	0.003
Mother's level of education				
Incomplete Primary School	37.7	32.7	29.6	
Complete Primary School	49.5	30.1	20.5	
Complete Secondary School	60.8	25.5	13.7	
University and further	75.9	15.6	8.4	< 0.001
Conjugal status				
Without partner	46.1	38.9	15.0	
With partner	46.9	26.1	27.0	< 0.001
Previous pregnancies				
None	53.4	27.2	19.4	
1	51.1	26.3	22.5	
2	43.4	33.2	23.4	
3 or more	35.7	35.5	28.8	0.002
Previous negative outcomes				
No	41.7	34.3	24.0	
Yes	47.7	24.8	27.5	0.021
Wanted to get pregnant				
Wanted to get pregnant	37.9	26.8	35.2	
Wanted to wait longer	52.0	27.1	20.9	
Did not want to get pregnant	47.0	33.1	19.9	< 0.001
Feelings towards pregnancy				
Satisfied	50.5	23.1	26.4	
More or less satisfied	47.0	30.7	22.3	
Dissatisfied	35.3	48.3	16.4	< 0.001
Tried to terminate the pregnancy				
No	48.1	28.6	23.2	
Yes	20.5	56.5	22.9	< 0.001
<b>Total (national sample)</b>	<b>46.6</b>	<b>30.1</b>	<b>23.2</b>	

\* Values are weighted according to sample design.

Table 4

Percentage of women receiving and presenting hand-held prenatal notes to record the results of exams and implementation of educational practices during prenatal care per region in a national sample of postpartum women. Brazil, 2011-2012\*.

Variables	Region					p-value	Total (national sample)
	North	Northeast	Southeast	South	Central		
Has hand-held prenatal notes							
No	2.1	5.1	3.7	2.9	5.8		4.0
Yes	97.9	94.9	96.3	97.1	94.2	0.130	96.0
Presented hand-held prenatal notes							
No	35.6	31.6	21.8	20.0	54.8		27.9
Yes	64.4	68.4	78.2	80.0	45.2	< 0.001	72.1
Record of result of 1st blood glucose							
No record	21.8	22.7	16.0	10.9	16.5		17.6
Recorded	78.2	77.3	84.0	89.1	83.5	< 0.001	82.4
Record of result of 2nd blood glucose							
No record	67.4	71.5	58.4	44.2	61.1		60.0
Recorded	32.6	28.5	41.6	55.8	38.9	< 0.001	39.2
Record of results of urinalysis							
No record	21.7	17.2	13.6	7.6	14.9		14.5
Recorded	78.3	82.8	86.4	92.4	85.1	< 0.001	85.5
Record of results of ultrasonography scan							
No record	55.3	43.2	28.5	26.9	60.3		37.2
Recorded < 14 weeks	12.3	17.6	33.3	35.2	18.0		26.0
Recorded ≥ 14 weeks	32.4	39.2	38.1	37.8	21.7	< 0.001	36.8
Performing ultrasonography scan							
No	7.0	2.1	0.6	1.3	1.5		1.8
Yes	93.0	97.9	99.4	98.7	98.5	< 0.001	98.2
Received information on:							
Onset of labour							
No	53.5	49.1	51.5	42.5	46.1		49.5
Yes	46.5	50.9	48.5	57.5	53.9	0.002	50.5
Signs of risk during pregnancy							
No	43.2	39.0	38.6	28.9	36.5		37.8
Yes	56.8	61.0	61.4	71.1	63.5	< 0.001	62.2
Activities to facilitate childbirth							
No	60.5	56.9	61.3	57.0	53.2		58.9
Yes	39.5	43.1	38.7	43.0	46.8	0.020	41.1
Breastfeeding in the 1st hour of life							
No	34.1	29.4	42.1	34.7	30.9		36.0
Yes	65.9	70.6	57.9	65.3	69.1	< 0.001	64.0

\* Values are weighted according to sample design.

Prenatal visits were held primarily in primary health care units (89.6%). A greater proportion of prenatal care visits held in hospitals were observed in women of older age and of higher level of education, and with previous unfavourable pregnancy outcome.

As for the professional cadre who conducted most prenatal consultations, 75.6% of pregnant women were seen by a medical professional, and

we can notice the existence of a gradient according to age and education: the higher the age of the woman and her schooling, greater the proportion of care by physicians. In contrast, in the North and Northeast regions, half of the women had prenatal care consultation provided by non-medical professional. Women with three or more previous pregnancies and adverse pregnancy outcomes were seen to a greater extent by



Table 5

Proportional distribution of mothers' characteristics according to the source of payment and the profile of care provided in most prenatal visits on a national sample of postpartum women. Brazil, 2011-2012 \*.

Exposure/Outcome	Source of financing		p-value	Type of health facility		p-value	Professional cadre		p-value	Continuity of provider	p-value
	Public	Private		Primary care	Hospital outpatient		Physician	Nurse Midwife			
Region											
North	88.1	11.9		93.3	6.7		49.6	50.4		86.3	
Northeast	78.0	22.0		87.2	12.8		48.4	51.6		91.1	
Southeast	71.5	28.5		90.1	9.9		91.9	8.1		88.4	
South	67.4	32.6		89.5	10.5		95.2	4.8		86.4	
Central	74.9	25.1	< 0.001	90.8	9.2	0.104	89.4	10.6	< 0.001	82.9	0.003
Age (years)											
10-14	94.9	5.1		91.3	8.7		58.2	41.8		91.0	
15-19	92.1	7.9		91.0	9.0		64.1	35.9		86.5	
20-34	72.3	27.7		89.8	10.2		77.5	22.5		88.6	
35 or more	58.6	41.4	< 0.001	83.4	16.6	< 0.001	83.9	16.1	< 0.001	89.8	0.007
Race/Ethnicity/Skin colour											
White	61.3	38.7		89.6	10.4		86.6	13.4		89.1	
Black	89.3	10.7		88.6	11.4		70.3	29.7		86.4	
Brown	80.4	19.6		89.8	10.2		69.7	30.3		88.3	
Yellow (Asian)	72.6	27.4		84.0	16.0		76.4	23.6		89.6	
Indigenous	86.0	14.0	< 0.001	87.5	12.5	0.446	64.4	35.6	< 0.001	81.9	0.094
Mother's level of education											
Incomplete Primary School	94.8	5.2		91.7	8.3		59.9	40.1		86.3	
Complete Primary School	88.6	11.4		89.9	10.1		73.6	26.4		86.9	
Complete Secondary school	65.2	34.8		87.7	12.3		82.5	17.5		89.4	
University and further	18.4	81.6	< 0.001	83.1	16.9	< 0.001	96.4	3.6	< 0.001	94.2	< 0.001
Conjugal status											
Without partner	83.7	16.3		89.7	10.3		73.4	26.6		87.8	
With partner	72.6	27.4	< 0.001	89.5	10.5	0.829	76.1	23.9	0.017	88.5	0.386
Previous pregnancies											
None	70.5	29.5		89.9	10.1		76.3	23.7		89.1	
1	71.1	28.9		90.1	9.9		77.9	22.1		88.7	
2	79.3	20.7		89.9	10.1		75.3	24.7		88.1	
3 or more	88.3	11.7	< 0.001	87.7	12.3	0.076	69.4	30.6	< 0.001	86.0	0.014
Previous negative outcomes											
No	76.3	23.7		90.4	9.6		76.1	23.9		88.1	
Yes	80.9	19.1	< 0.001	86.8	13.2	< 0.001	72.5	27.5	0.006	87.3	0.433
<b>Total (national sample)</b>	<b>74.6</b>	<b>25.4</b>		<b>89.6</b>	<b>10.4</b>		<b>75.6</b>	<b>24.4</b>		<b>88.4</b>	

\* Values are weighted according to sample design.

nurses and midwives, compared to those with fewer pregnancies and without adverse outcomes (Table 5).

Analyzing the continuity of provider in prenatal care, it was found that 11.6% of women reported having not been accompanied by the same professional throughout gestation. Again, a gradient in relation to schooling could be noticed:

women with higher educational level had greater proportion of care provided by the same professional. Adolescents aged 10 to 14 years, women with fewer pregnancies and residents in the Northeast region also showed higher proportion of attendance by the same health professional. Although we found no significant difference, it is noteworthy that the same professional did not

accompany almost a fifth of indigenous women during pregnancy (Table 5).

Table 6 presents the associated risks during the prenatal and delivery and the factors relating to network for care in the country. A quarter of the postpartum women interviewed said that their pregnancy was classified as "at risk", especially those belonging to the extreme age (adolescents under 15 years old and women aged 35 or more years of age) with 3 or more previous pregnancies, and those with previous unfavourable outcome. When a woman needs more complex care in a referral service, although the majority of pregnant women considered at risk reported that they achieved that level of care, 11.5% said they achieved this care with difficulty.

Approximately 60% of women were advised on maternity referral to hospital for delivery. Women living in the North and Northeast regions, adolescents, especially those with 10-14 years of age, and women of lower educational level were the ones that least reported receiving this advice, while white primiparous women were the main recipients of this care (Table 6). Of those receiving guidance, 84.5% had their delivery attended in the maternity hospital indicated. Women residing in the Southern region, with higher level of education, older age, living with partner and with more pregnancies were the one who most gave birth in the maternity indicated, this value being almost 100% among indigenous women.

Before getting to the hospital where the delivery was attended, 16.2% of women sought care at another hospital (Table 6). Most of these women sought only one service, but 15% reported having sought two to six health units before getting admission. The main reasons cited were lack of health service conditions (40%), lack of doctors, lack of supplies and equipment, there was no vacancy for the mother and/or the baby (29.5%) and clinical risk and/or obstetric risk (19.4%). Other issues such as the health care unit does not provide delivery care (3%), poor quality of care, including reports of abuse and mistreatment (2.7%), the health care unit profile sought, with restrictions of the health service according to the characteristics of the pregnant woman, as for example, a pregnant adolescent or primiparous women (4%) were also mentioned but less frequently (data not shown in table). In Table 6, data shows that the pilgrimage of women at admission for delivery was more frequent among residents in the Northeast region of the country, of brown, black or yellow race/ethnicity or skin colour, in adolescents, women with lower level of education, those without a partner; and those who were in their first pregnancy.

## Discussion

The results of this study show that the coverage of prenatal care in Brazil is almost universal, with high attendance in all regions of the country and in women of different demographic, social and reproductive characteristics. However, the appropriateness of such care is still low: 75.8% of women began prenatal care before the 16th gestational week and only 73.1% had the minimum number of visits for gestational age at delivery, results also observed in other national studies<sup>5,6,9,10,16,17</sup>. Using the current recommendation of the Stork Network programme of the Ministry of Health<sup>18</sup>, also adopted in other countries<sup>19,20</sup>, that the initiation prenatal visits is performed until the 12<sup>th</sup> gestational week, early booking is reduced to 60.6%. When other parameters are included, such as carrying out routine prenatal tests and information about delivery and breastfeeding, it was found that less than 10% of women received the recommended procedures (data not shown in table), similar to that found in other studies adopting similar evaluation parameters<sup>5,6,9</sup>.

Several barriers for not attending prenatal care or early booking were identified, highlighting the social inequalities that persist in the country, with less access to indigenous and black women<sup>21</sup>, those with less education<sup>4,7,11</sup>, with higher number of pregnancies<sup>4,7,22</sup>, and residents in the North and Northeast region<sup>11,23</sup>.

The high proportion of postpartum women who justified not having initiated prenatal care early for not knowing they were pregnant indicates difficulties in the diagnosis of pregnancy and the need to facilitate women's access to diagnostic methods, preferably immediate results, allowing faster uptake of pregnant women for prenatal care.

More than half of the women interviewed did not want to get pregnant at that time and a third showed negative or ambivalent feelings towards the current pregnancy. About 2.3% of respondents, representing more than 50,000 women in the expanded sample, said they had tried to interrupt the current pregnancy. These women with unwanted pregnancies, and women without a partner had lower prenatal care coverage and late booking of care, a fact already reported by Bassani et al.<sup>24</sup> in their study. Among the reasons given, we highlight the high proportion of personal problems as justification for these results, indicating that improving prenatal care depends on other actions, such as the expansion of family planning.

Pregnant adolescents, especially the very young<sup>25</sup>, under 15 years old also demonstrated

Table 6

Proportional distribution of mothers' characteristics according to pregnancy risk and delivery care network in a national sample of postpartum women. Brazil, 2011-2012 \*.

Exposure/Outcome	Pregnancy risk	p-value	Attended in the referred hospital		p-value	Guidance on maternity reference	p-value	Delivery in maternity indicated	p-value	Pilgrimage for childbirth	p-value	
			No	Yes, with difficulty								Yes, without difficulty
Region												
North	22.3		10.6	9.7	79.8	49.4		86.9		16.9		
Northeast	25.0		7.9	14.4	77.7	54.7		80.8		25.1		
Southeast	24.6		10.1	10.3	79.6	61.8		83.7		12.8		
South	25.4		6.3	8.1	85.7	64.0		92.3		6.5		
Central	22.5	0.820	10.8	17.9	71.2	0.275	59.7	0.001	86.0	< 0.001	16.5	< 0.001
Age (years)												
10-14	42.6		6.8	10.1	83.0	48.1		78.9		21.2		
15-19	20.4		9.4	12.4	78.2	52.5		82.2		21.3		
20-34	22.9		9.6	11.3	79.1	60.0		84.5		15.4		
35 or more	39.1	< 0.001	6.9	12.1	81.0	0.931	61.9	< 0.001	87.9	0.005	12.5	< 0.001
Race/Ethnicity/Skin colour												
White	24.7		10.9	12.9	76.2	62.7		87.6		12.2		
Black	27.0		9.0	10.2	80.8	55.5		79.6		19.6		
Brown	23.8		8.2	11.1	80.7	56.9		83.2		18.1		
Yellow (Asian)	29.0		2.8	39.0	93.4	57.8		77.4		19.8		
Indigenous	28.9	0.268	-	24.3	75.7	0.537	53.8	< 0.001	98.1	< 0.001	9.4	< 0.001
Mother's level of education												
Incomplete Primary School	25.9		12.9	10.3	76.8	52.1		82.5		20.7		
Complete Primary School	23.8		6.4	10.3	83.3	56.3		81.9		18.5		
Secondary School Complete	24.1		8.7	12.7	78.6	62.2		84.6		14.0		
University and further	23.5	0.368	4.2	15.5	80.4	0.128	70.8	< 0.001	94.2	< 0.001	5.9	< 0.001
Conjugal status												
Without partner	24.4		13.4	13.0	73.7	56.7		80.7		18.1		
With partner	24.5	0.938	8.1	11.2	80.8	0.164	59.2	0.078	85.3	0.001	15.8	0.042
Previous pregnancies												
None	19.8		8.1	12.9	79.1	59.8		83.8		17.6		
1	22.8		10.4	10.0	79.6	59.1		83.7		15.1		
2	28.1		8.6	13.3	78.1	57.5		87.5		14.6		
3 or more	36.0	< 0.001	9.2	10.1	80.8	0.826	56.2	0.036	85.1	0.030	16.1	0.012
Previous negative outcomes												
No	22.1		8.7	10.1	81.2	57.5		85.7		14.8		
Yes	40.5	< 0.001	10.4	11.7	77.8	0.607	58.9	0.305	83.4	0.070	16.3	0.121
<b>Total (national sample)</b>	<b>24.4</b>		<b>9.0</b>	<b>11.5</b>	<b>79.5</b>		<b>58.7</b>		<b>84.5</b>		<b>16.2</b>	

\* Values are weighted according to sample design.

a delayed booking of care and fewer visits, results also observed in other studies <sup>22</sup>, demonstrating the importance of differentiated strategies for this age group. Prenatal care itself should be viewed with an opportunity guidance to prevent a recurrent unplanned pregnancy in adolescents <sup>26</sup>.

Women with greater reproductive risk, with negative outcomes in previous pregnancies had lower prenatal coverage, late booking and had fewer prenatal care visits than women without a history of obstetric risk. Unaware that she was pregnant was a reported more often by these women, when compared to those with no repro-

ductive risk, indicating problems in the diagnosis of pregnancy and the uptake of prenatal care services. Similar results were observed in other national studies<sup>7,28</sup> and reinforce the need for services to have mechanisms to identify those women who are the ones who would benefit most from early and appropriate monitoring.

The proportion of women who received hand-held prenatal notes during their prenatal care was high and similar to that found in the PNDS 2006<sup>11</sup>. However, the proportion of women who had hand-held prenatal notes on admission for delivery was less than that observed in other studies nationwide<sup>29</sup> and is probably due to the inclusion of private services in this study, as were women with greater education showed less hand-held prenatal notes (data not shown in table).

Despite the results of the first line routine tests being recorded is high, it failed to reach 100% in all of the regions of the country, similar to that found in PNDS 2006<sup>11</sup>, with the filling of the second line exams very low, less than 40% and only the region South having a slightly better performance (55.8%). It is emphasized that the main goal of prenatal care routine tests is to identify complications in pregnancy with timely interventions to preserve the health of the woman and the fetus, and the prenatal care notes is one of the main instruments of communication between teams of prenatal care and delivery care, regarding the complications identified and procedures adopted. The lowest proportion of results of the ultrasonography scan recorded on the hand-held prenatal care notes, in relation to that referred by the women, suggests problems in recording these results, which are possibly common to recording other prenatal test results. Despite the high coverage of ultrasonography scan, a very small proportion of exams were performed before the 14<sup>th</sup> week of pregnancy, when this test has greater accuracy in the calculation of gestational age, essential for monitoring the progress of the pregnancy and any related decisions for interruption of pregnancy<sup>19</sup>.

The low proportion of information received during prenatal care highlights the role of inadequate prenatal care in preparing women for childbirth and breastfeeding. Guidance on practices to facilitate the delivery are of importance for the promotion of normal birth had the lowest frequency, mostly prioritized the guidance on identification of signs of risk, strengthening the biomedical nature of care.

As to the organization of prenatal care, it appears that it occurs primarily in public health services and primary care units, with only 10.4% of women cared for in outpatient hospital units.

Prenatal care provided by nurses and midwives is restricted in the country, with the highest concentration in the North and Northeast and among indigenous women, probably due to lower availability of doctors in these regions, especially in the inner cities. According to the *Law Decree no. 94406/87*<sup>30</sup> about the *Law of Professional Nursing Practice*, prenatal care for low-risk pregnancies can be fully provided by nurses<sup>3</sup>. Moreover, one of the guidelines for prenatal care established by *National Policy for the Humanization of Prenatal and Birth Care* (PHPN)<sup>12</sup> and the Stork Network (Rede Cegonha)<sup>18</sup> is the participation of the nurse midwife as a member of the healthcare team who provides direct care to women during pregnancy, labour and birth.

Almost 90% of the postpartum women reported that they had been cared by the same health professional during prenatal care, indicating the continuity of provider is fundamental to the development of bonding and trust between the professional and the pregnant woman and the best monitoring of pregnancy. The fragmentation of care with consultations by different professionals has been associated with poor prenatal care quality<sup>31</sup>. In the present study, we noted that among women with higher education, doctors provided prenatal care almost exclusively in private health care services with the same health care professional monitoring throughout pregnancy, reflecting the pattern of organization in this sector.

The relationship of prenatal care with other health care services network indicated problems – no provision of care, or care with difficulty – a fifth of pregnant women at risk being referred to health services. Although statistically significant difference was not found, it is noteworthy that women with a poor obstetric history with a greater risk for new unfavorable outcomes were those that reported more difficulties in accessing the health care services. These women also had their prenatal care provided in greater proportion by nurses and midwives, revealing problems in the organization of care. These are the women who would most benefit from specialized care by physicians, revealing problems of the service network to ensure the most appropriate level of care according to the needs of women.

Another failure was observed in the interaction between prenatal care services and childbirth care services. There were a low proportion of women receiving guidance on maternity reference hospital for delivery, reported by less than 60% of informants. The pilgrimage for childbirth care was high, higher than that found in the PNDS 2006<sup>11</sup>, being mainly observed in residents in the Northeast, in women with lower educational lev-

el and adolescents, who were also the least likely to receive guidance about hospital reference and fewer were admitted in the indicated health service. The findings in this study reflect a deficiency in the hospital referral system for care during birth, causing risks to women's and baby's health. According to Menezes et al.<sup>8</sup>, the situation becomes even more serious when considering that most women who wandered seeking hospital care at another hospital by their own means. In their study conducted in the city of Rio de Janeiro, only one fifth of the women were transported by ambulance.

The results of this study relate to women having a hospital birth, in health care units with more than 500 deliveries per year, representing nearly 80% of women in the country. It is likely that the results of prenatal care for women having their delivery at home or in transit, as well as those occurring in hospitals with lower volume of hospitalizations, exhibit characteristics different from those presented, and expected an even more limited access to adequate care.

## Conclusion

As a conclusion, we can say that Brazil was successful in expanding access to prenatal care, reaching almost all of Brazilian women. Challenges remain, however, for improving the quality of such care with the completion of all procedures

considered effective for reducing unfavourable outcomes. Reducing maternal mortality and the high rate of caesarean section, the prevention of injuries and preventable deaths, will not be achieved without overcoming the barriers to early diagnosis of pregnancy, early prenatal care booking in the first weeks of pregnancy, especially for pregnant women with greater reproductive risk, and use of contacts with health care services for the provision of effective care such as diagnosis and treatment of diseases and the promotion of health.

The integration of prenatal care with other health care services in the health care network through the establishment of an integrated network of reference and counter-reference with guaranteed inpatient beds by means of a central regulation of vacancies is essential for timely care to pregnant women at risk who were at increased risk of negative outcomes.

Although the linkage of pregnant women to the maternity of reference for childbirth care is regulated since 2007 (*Law no. 11,634* of December 27, 2007<sup>32</sup>), and is a recommendation of the Stork Network<sup>18</sup> for the integration of prenatal care services and delivery care, targeting the reception of pregnant women and ensuring hospital beds for hospitalization, improvements are needed in order to prevent the pilgrimage for childbirth of the women and families, still common in many parts of the country.

## Resumen

*El estudio tiene por objetivo describir el cuidado prenatal ofrecido a las embarazadas por parte de los servicios de salud públicos o privados en Brasil, utilizando los datos de la encuesta Nacer en Brasil, realizada en 2011 y 2012. La información se obtuvo mediante entrevistas con las mujeres después del parto, durante la hospitalización, y la ficha prenatal. Los resultados indican una alta cobertura (98,7%), con un 75,8% de las mujeres que comenzaron la atención prenatal antes de las 16 semanas de gestación y un 73,1% que tuvieron seis o más consultas. La atención prenatal se llevó a cabo en las unidades básicas de atención (89,6%), públicas (74,6%), por un mismo profesional (88,4%), la mayoría médicos (75,6%) y el 96% recibió una ficha prenatal. Una cuarta parte de las mujeres se consideraba en riesgo. Del total, sólo el 58,7% estaban orientadas sobre la unidad de maternidad de referencia, y el 16,2% dice que han buscado más de un servicio para el parto. Sigue habiendo problemas para mejorar la calidad de la atención, y es necesaria la realización de procedimientos efectivos para reducir los resultados desfavorables.*

*Atención Prénatal; Salud Materno-Infantil; Servicios de Salud Materno-Infantil*

## Contributors

E. F. Viellas, R. M. S. M. Domingues, and M. C. Leal participated in the design of the article, all stages of production and were responsible for the final version. M. A. B. Dias, S. G. N. Gama, M. M. Theme Filha, J. V. Costa and M. H. Bastos participated in the critical revision and approval of the final version.

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