

Inequalities on coverage of prenatal assistance in Brazil: a nationwide study

Desigualdades na cobertura da assistência pré-natal no Brasil: um estudo de abrangência nacional

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Abstract *This article aims to evaluate the coverage and inequalities in prenatal assistance. Data from the Brazilian National Health Survey cross-sectional study in 2013. Prenatal assistance assessed through indicators: counseling, guidance received, procedures, and exams performed during the pregnancy. An asset index constructed, the Slope Index of Inequality (SII) and Concentration Index (CIX) were used to measure. About 90% received counseling on healthy eating, not smoking and drinking, 80% not to use dye/hair straightening, and all the advice. Approximately 70% received guidance on delivery and signs of risk and 83.4% for breastfeeding and 60% all the guidelines. About 80% had the measure of pressure and weight checked, the measure of the abdomen and the auscultation of the heart of the baby, only 36.7% had their breasts examined e 33.4% all procedures performed. More than 90% held for HIV and urine and 77.9% for syphilis, 81.4% of women have carried out all the exams and 21.7% all the indicators. No significant absolute differences (SII) found. CIX evidenced in counseling for healthy eating and guidance for breastfeeding. There were no marked inequalities in prenatal assistance.*

Key words *Maternal Health, Healthcare Disparities, Quality Indicators, Brazil, Cross-Sectional Studies*

Resumo *O objetivo deste artigo é avaliar a cobertura e as desigualdades na assistência pré-natal. Dados do estudo transversal da Pesquisa Nacional de Saúde do Brasil em 2013. Assistência pré-natal foi avaliada por meio de indicadores: aconselhamento, orientações recebidas, procedimentos e exames realizados durante a gravidez. Para mensuração foram utilizados dois índices: Slope Index (SII) e o Concentration Index (CIX). Cerca de 90% receberam aconselhamento sobre alimentação saudável, não fumar e beber, 80% para não usar alisamento de tintura/cabelo e todos os aconselhamentos. Aproximadamente 70% receberam orientações sobre parto e sinais de risco e 83,4% para amamentação e 60% todas as orientações. Cerca de 80% tiveram a medida de pressão e peso verificada, a medida da barriga (fundo do útero) e a ausculta do coração do bebê, apenas 36,7% tiveram os seios examinados e 33,4% todos os procedimentos realizados. Mais de 90% fizeram exame para HIV e urina e 77,9% para sífilis, 81,4% das mulheres realizaram todos os exames e 21,7% todos os indicadores. Não foram encontradas diferenças absolutas significativas (SII). Com o CIX observou-se diferença para aconselhamento para alimentação saudável e orientações para amamentação. Não houve desigualdades acentuadas na assistência pré-natal.*

Palavras-chave *Saúde Materna, Disparidades em Saúde, Indicadores de Qualidade, Brasil, Estudos Transversais*

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Introduction

Brazil is a country with marked inequalities in health¹. Despite the advances attributed to the programs that have implemented, which have contributed to the expansion of access to and improvement of the quality of health services, such as the implementation of the Family Health Strategy (FHS), some health disparities persist^{1,2}. In this context, it is worth noting the existing inequalities about prenatal assistance, which is a reality faced by many women in the country, and which still represents a challenge to be overcome²⁻⁵.

Prenatal care policies have been implemented in Brazil aiming to ensure for pregnant universal access of excellent quality on prenatal care^{6,7}. Prenatal assistance with quality can help reduce fetal and maternal morbidity and even mortality^{8,9}. On this, some measures to qualify the prenatal assistance model have been implemented and strengthened, such as the Prenatal and Birth Humanization Program (PHPN), the Pact for Reducing Maternal Mortality and the Stork Network. Also noteworthy is the CountDown to 2015 initiative, which included some countries, including Brazil¹⁰, and aims to monitor progress in women's and children's health¹¹.

In the 2006 National Survey of Demography and Health of Children and Women (NSDH), the prevalence of at least six prenatal consultations was 80.9%⁶. A 2017 study, which evaluated prenatal care in the primary care network using data from the Program for Improving Access and Quality (*PMAQ-AB*), identified that about 90% of women consulted six times or more during prenatal assistance⁵. In this same study, 24% of women reported received all the physical examination procedures, 60% the guidelines, and 69% performed all the complementary exams. But, only 15% of the interviewees received prenatal assistance appropriately, considering all the actions evaluate⁵. The NSDH does not have data on the guidelines and counseling performed during prenatal care, nor about the examinations and procedures requested.

Some publications have evaluated social inequalities in prenatal assistance^{5,6,12,13}. As a summary of these studies, the conclusions are that there are social, regional and socioeconomic inequalities about prenatal assistance, that is, women with a lower socioeconomic level are more susceptible to less prenatal visits, as well as receiving a low-quality service¹⁴.

However, a nationally based study such as the *Pesquisa Nacional de Saúde* (Brazilian National

Health Survey - *PNS*)¹⁵, which provides an overview of the country's situation about inequalities through indicators of prenatal care has not yet realized. This study will make an essential contribution to the literature on this subject, using robust techniques to evaluate socioeconomic inequalities. This study aimed to assess the coverage and disparities in prenatal assistance of Brazilian women.

Materials and methods

This study analyzed data from the *PNS*, which was conducted in 2013, by the *Instituto Brasileiro de Geografia e Estatística* (IBGE) in partnership with the Ministry of Health¹⁵. This sample is representative of permanent residents, located in urban or rural areas of municipalities of the five major geographic regions, distributed in the 26 Federal Units (UF) and more in the Federal District. The project was submitted to the National Ethics Commission in Research and was approved. All the participants signed the free and informed consent form, preserving the ethical principles.

The sampling process was carried out in three stages. First, the census tracts were selected, after the households and, finally, the individuals with 18 years or more. The survey included 64,348 households, of which 1,918 women answered the filter question, "The last time you were pregnant, did you do prenatal care?" located in the *Module S* of the questionnaire. Of these women, 1,851 responded positively to the question. The section of the questionnaire, included in this study, could only be answered by women who had a birth in the period from July 28, 2011, to July 27, 2013, being considered only the last childbirth¹⁵.

Data collection was done by trained interviewers who used personal digital assistants (PDA) for data storage. The *PNS* questionnaire consisted of three parts. Initially, household variables were collected; the second part referred to the general characteristics of all residents of the household, including education, work, income, disabilities, health plan coverage, use of health services, elderly health, mammography coverage and characteristics of children under age two years old; in the third part, questions about other aspects of work and social support, perception of health status, accidents and violence, lifestyles, chronic diseases, women's health, prenatal care, oral health, and medical care directed to a resident adult (18 years of age or older), randomly

selected. Further methodological details of PNS are available elsewhere¹⁵.

The prenatal care assessed by indicators of counseling and guidance received during the consultations, as well as procedures and examinations performed during the pregnancy period. Participants asked whether received any of the following advice during prenatal meetings: as a) maintain a healthy diet, do not smoke, do not drink, and do not use dye/hair straightening; indicators of guidelines consisted of b) signs of delivery and risks in pregnancy and breastfeeding; also, information regarding the procedures performed by the professionals during the consultations was used, which were: c) measurement of blood pressure, weight, and abdomen height (fundal of uterine), auscultation of the baby's heart and breast examination; finally, mothers were questioned about: d) syphilis, HIV, and urine exams.

A socioeconomic status index was created based on the presence/absence of the bathroom in the house, automobile, motorcycle, refrigerator, washing machine, DVD player, television, telephone, computer, and microwave. These were the items with the possibility of creation of score according to the criteria of the *Associação Brasileira de Estudos Populacionais (ABEP)* of 2016¹⁶. This analysis results in the household wealth level, where individuals classified according to the total household score and, afterward, there is a categorization in quintiles (1st quintile referring to the most deficient 20% and the 5th quintile to the wealthiest 20%).

To identify possible inequalities, two indices calculated: the Slope Index of Inequality (SII) the Concentration Index (CIX)^{17,18}. The SII shows the absolute difference in percentage points between the extreme coverage, that is, the richest and poorest quintile, using a logistic regression model. The CIX based on a scale ranging from -1 to +1, where zero represents a distribution without inequalities in the goods index. Positive CIX values indicate that the delivery is in favor of the rich. The SII presents absolute disparities, whereas the CIX shows relative inequality.

All analyses were carried out in Stata® 12.1 (StataCorp. College Station), considering the sample design of the study. Initially, a description of the sample was performed, obtaining the prevalence and 95% confidence intervals (95%CI). The prevalence (coverage) and 95%CI of each of the indicators evaluated also identified. Also, the magnitude of the inequalities of each sign was estimated about the variable the asset index using the SII and CIX, as well as their 95%CI.

Results

Of the 1,918 women eligible for the prenatal questionnaire, 1,851 reported having performed prenatal care in the last gestation. Regarding the characteristics of the sample, 50.8% reported brown skin color, and 58.2% reported being single. Most of the women had high school (54.6%), 23.2% belonged to the 5th quintile (richest). Little more than 30% of women reported six prenatal visits (Table 1).

Among the most prevalent counseling were healthy eating habits (96.8%) and non-drinking (91.1%), whereas, for the most common guidelines, breastfeeding was the most frequent (83.4%). Approximately 90% of women had their abdomen and blood pressure measured during prenatal. As for the request for exams, only 77.9% of pregnant women performed the

Table 1. Description of the sample of women who performed prenatal in their last pregnancy. National Health Survey, Brazil. (n = 1,851).

Variables	N (%)	CI95%
Skin color*		
White	733 (40.3)	38.0; 42.5
Black	162 (8.9)	7.6; 10.2
Brown	925 (50.8)	48.5; 53.1
Marital Status		
Married/with companion	592 (33.1)	30.9; 35.3
Separated or divorced	86 (4.9)	3.8; 5.8
Widow	68 (4.8)	2.9; 4.7
Single	1.042 (58.2)	56.0; 60.6
Education level		
No education	5 (0.4)	0.004; 0.7
Elementary School	357 (26.6)	24.3; 29.0
High school	732 (54.6)	51.9; 57.3
Higher education	247 (18.4)	16.3; 20.5
Asset index		
1 st quintile (poorer)	263 (14.2)	12.6; 15.8
2 nd quintile	391 (21.1)	19.3; 23.0
3 rd quintile	349 (18.9)	17.1; 20.6
4 th quintile	418 (22.6)	20.7; 24.5
5 th quintile (richest)	430 (23.2)	21.3; 25.2
Number of prenatal consultations		
0 - 6 consults	625 (33.8)	31.6; 35.9
7 or + consults	1,226 (66.2)	64.1; 68.4

*Skin color: yellow and indigenous represented less than 1% of the sample.

syphilis test (Figure 1). The prevalence of all the indicators used in this study to evaluate prenatal assistance was 21.7% (95%CI 19.6; 23.9).

The analysis of inequalities showed a certain homogeneity for the indicators subsets of prenatal assistance when comparing the coverage of the first and fifth quintiles (Figure 2). Among the indicators of prenatal care that investigated, three

showed the lowest absolute differences: weight measurement (-0.006 pp), HIV test (-0.007 pp) urine test (-0.05 pp), and showed a smaller gap for all counseling (-0.001 pp), however, not statistically significant. For the relative inequalities (CIX), the similarity identified in the indicators, except for advice for healthy eating (0.022) and orientation for breastfeeding (0.013). A slightly

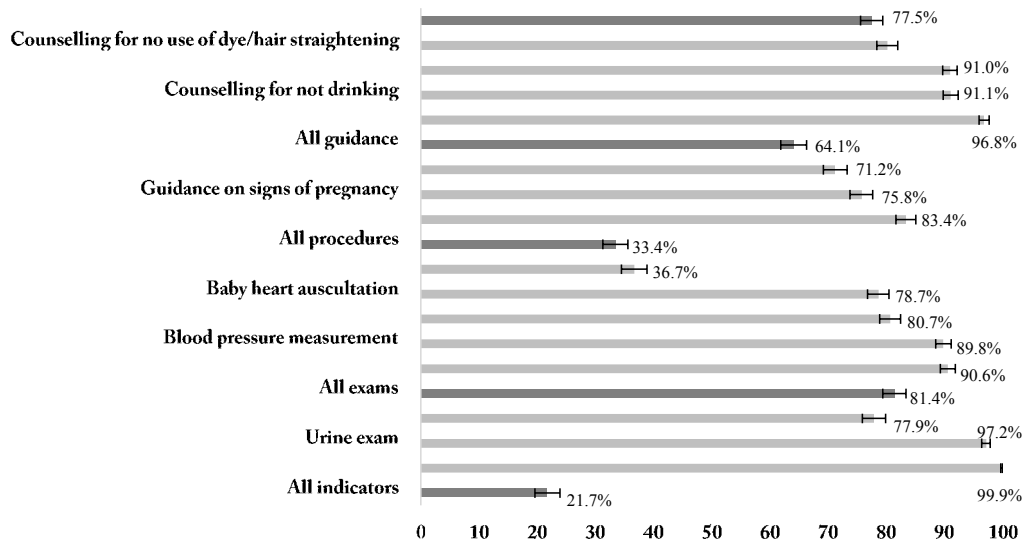


Figure 1. Prevalence of counseling, guidance, procedures, exams, and all indicators performed during the prenatal care of Brazilian women. National Health Survey, 2013 (n = 1,851).

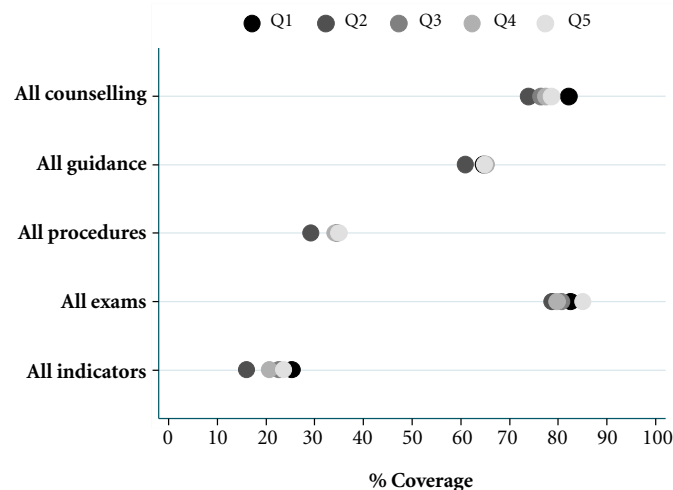


Figure 2. Coverage (%) of indicators subsets of prenatal care according to the asset index. Brazil, 2013 (n = 1,851).

higher relative difference detected, compared to the others, for pooled indicators of all orientations (2.93 p.p.) and all the exams (4.49 p.p.), but not significant (Table 2).

Discussion

The findings showed that about two in ten women received all counseling and guidance and carried procedures and exams, the indicators of prenatal care, investigated by this study. Also, it identified that a little more than a third of the women reported having their breasts examined by health professionals during the prenatal period, being lower than that evidenced by other studies^{5,19,20} where approximately 50% of the women reported breast examination.

Most prenatal assistance indicators are basic processes for a consultation for this purpose and are widely used to quality prenatal care and, moreover, do not commit much of the time spent in contact with the pregnant^{4-7,12,21}. In view of this, the improvements implemented in the area of prenatal care should be highlighted^{2,4,6}, which

can be reinforced by the findings in this study, even with some persistent gaps such as low coverage of breast examination and completion of all procedures, and receipt of all indicators.

In all indicators, the coverage was higher than 70%, except for the breast exam. However, when all of them observed one-third of the women had all the procedures performed, less than 80% received all the guidelines and counseling, and 81% performed all the exams, which may be considered as undesirable coverage or acceptable for these indicators. The of syphilis test, for example, is very important, because if positive can lead to severe congenital sequelae for the baby, also, failure to perform the of syphilis test is a neglect of the health service, since this disease has a treatment cheap and effective service that can do with basic care⁴.

Even with the offer of counseling and guidance that affected most of the women identified in this study, it believed that advice and guidance should be directed at the entire universe of women who perform prenatally. It should be noted, for example, that about 20% of women did not receive guidance for breastfeeding, even this theme

Table 2. Inequality index (SII and CIX) for each indicator of prenatal assistance. Brazil, 2013 (n = 1,851).

Indicators of prenatal assistance	Slope Index of Inequality (%)	CI95%	Concentration Index	CI95%
All counselling	0.02	-0.64; 0.68	- 0.001	-0.015; 0.013
Counselling for healthy eating	0.23	-0.02; 0.5	0.022	0.007; 0.009
Counselling for not smoking	0.38	-0.06; 0.82	0.005	-0.003; 0.013
Counselling for not drinking	0.28	-0.15; 0.70	0.005	-0.002; 0.013
Counselling for no use of dye/hair straightening	0.13	-0.50; 0.76	0.002	-0.010; 0.015
All guidance	2.93	-0.48; 11.7	0.008	-0.011; 0.028
Guidance on delivery	0.36	-0.37; 11.0	0.008	-0.009; 0.025
Guidance on signs of pregnancy	0.41	-0.28; 11.0	0.007	-0.008; 0.022
Guidance on breastfeeding	0.66	0.06; 12.6	0.013	0.002; 0.025
All procedures	3.8	-0.39; 11.4	0.011	-0.026; 0.048
Blood pressure measurement	0.34	-0.15; 0.83	0.006	-0.003; 0.015
Weight measurement	-0.006	-0.49; 0.47	0.0004	-0.008; 0.009
Abdomen measurement	0.16	-0.47; 0.78	0.005	-0.008; 0.018
Baby heart auscultation	0.12	-0.54; 0.78	0.002	-0.012; 0.016
Breast exam	0.45	-0.32; 12.3	0.024	-0.011; 0.058
All exams	4.49	-0.24; 11.4	0.009	-0.004; 0.023
Syphilis examination	0.42	-0.27; 11.1	0.008	-0.006; 0.023
HIV test	-0.007	-0.03; 0.02	-0.0001	-0.0005; 0.0003
Urine exam	-0.05	-0.32; 0.21	-0.001	-0.006; 0.003
All indicators	0.04	-0.73; 0.80	0.009	-0.050; 0.067

being well-publicized in relation to the benefits of breastfeeding to maternal and child health²²⁻²⁴. Other studies performed in primary care and among mothers users of the Unified Health System (*Sistema Único de Saúde - SUS*)^{5,21,25}, who also evaluated breastfeeding guidance, found prevalence for this recommendation between 85 and 95%, emphasizing that the observed in the present study is not yet the most desirable.

In a study carried out in 2003, it evidenced that women with lower schooling, black or brown skin color, without a partner and with lower income had a higher risk of not having an adequate prenatal¹⁹, which shows the advances that were achieved over time being evidenced by the results of the present study. In this study, although the results showed some homogeneity in the visual inspection of the figure of inequalities, for some indicators more excellent coverage identified among those women who had a higher asset index, showing that the socioeconomic level still represents an essential determinant for the receiving of quality assistance^{1,2,13,26}. However, it is possible that the inequalities in receiving the indicators have not been so marked due to advances to ensure universality in the access and use of health services by pregnant women, making high the frequency of prenatal, with attendance based on protocols which ensure better quality care at the national level^{4,6,27}.

There were observed absolutes or significant relative inequalities in most indicators, except for counseling for healthy eating and guidance on breastfeeding. This result may represent an essential contribution to the literature, because it shows a more similar distribution of most of, many of the indicators among the population, and can be considered a significant advance for maternal and child health that suggests principal reductions of inequalities². Improvements in prenatal assistance may be attributed to the strengthening of the *Estratégia de Saúde da Família* (ESF) in the primary care network, whose purpose is

to structure and organize maternally and child health care in the country.

Still, even if it is not the objective of this study, it should be emphasized that 3.7% of the women did not perform prenatal in the last gestation in the previous two years, and this portion of the population is the most vulnerable in terms of assistance and inequalities that were not possible to measure in this study. In this context, there is much to be done about this group of women who must undoubtedly be prioritized in prenatal care⁸ and which may distort, to some extent, estimates that there are no marked inequalities in prenatal assistance.

As limitations of the study, the recall period of the questions about prenatal care that were carried out only for the last gestation of the women in the period of up to two years is highlighted, which could lead in a bias of reminder to those who had had the last pregnancy two years before the interview. However, it is believed that even with the possibility of this bias, the prenatal period is remarkable, in addition to having more than one query which guarantees the opportunities of accomplishment of these indicators⁴.

In general, no marked inequalities found in the indicators used to evaluate prenatal assistance, possibly due to the expansion of access to health services and the creation of programs aimed at improving the quality of services offered to this population and consequent increase in the coverage of these indicators. However, there are still problems with inadequate coverage of the breast exam, and the receipt of all the signs, demonstrating the need for specific strategies to increase this coverage, as well as improving the quality of assistance offered by the services and health professionals. It suggested that more studies with stratification by type of service used (public/private) be carried out to assess possible inequalities within socioeconomic level groups and to analyze where there is a need for higher interventions, programs, and improvement policies.

Collaborations

TR Flores idealized the study, prepared the database, and analyzed the data, described the results, participated in the writing of the complete manuscript. RG Neves assisted in the analysis of the data, in the writing of the methods and discussion and reviewed the final version. GI Mielke and AD Bertoldi participated in review rounds and the final version of the manuscript. BP Nunes prepared the database and assisted in the analysis of the data and reviewed the final version of the manuscript.

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