

Assessment of the completeness of filling the pregnant woman's card from the Ministry of Health: a national, cross-sectional study

Lívia de Rezende de Mello (<https://orcid.org/0000-0001-6841-3678>)¹
Daniele Marano (<https://orcid.org/0000-0001-6985-941X>)¹
Maria Elisabeth Lopes Moreira (<https://orcid.org/0000-0002-2034-0294>)¹
Rosa Maria Soares Madeira Domingues (<https://orcid.org/0000-0001-5722-8127>)²
Ana Carolina Carioca da Costa (<https://orcid.org/0000-0002-9456-3319>)¹
Marcos Augusto Bastos Dias (<https://orcid.org/0000-0003-1386-7001>)¹

Abstract *This article aims to evaluate the completeness of the pregnant woman's card filling according to a model standardized by the Ministry of Health. Hospital based, nationwide, cross-sectional study conducted between 2011 and 2012, evaluated data from pregnant women's cards. Variables related to personal, obstetric history and current pregnancy data were used to assess completeness. We used the Kotelchuck index for quantitative evaluation. We analysed 6,577 cards, equivalent to 39% of the cards presented at the time of delivery. The mean completeness was overall "bad" in Brazil and macro-regions, except in the Southern region. Nationwide, the mean completion was "regular" for personal antecedents, "good" for obstetric history, and "bad" for fields related to the current pregnancy. Prenatal care was adequate for 58% of pregnant women. We observed a reduced use of the card recommended by the Ministry of Health and failures in the completeness of filling valuable information of the pregnant woman's card, related to the current pregnancy.*

Key words *Maternal and child health, Prenatal care, Evaluation of processes and results in health care, Quality of health care, Pregnant women*

¹Instituto Nacional de Saúde da Mulher, da Criança e do Adolescente Fernandes Figueira, Fundação Oswaldo Cruz (Fiocruz). Av. Rui Barbosa 716, Flamengo. 22250-020 Rio de Janeiro RJ Brasil. liviabrezende@gmail.com

²Instituto Nacional de Infectologia Evandro Chagas, Fiocruz. Rio de Janeiro RJ Brasil.

Introduction

In 1988, the implementation of the Unified Health System (SUS), brought along principles and guidelines to emphasize the importance of information on managerial and epidemiological indicators to comply with federal, state, and municipal attributions. Thus, the production, management and dissemination of health information are fundamental, especially in a country with a large territorial dimension such as Brazil¹.

To produce health information, regarding prenatal care, different criteria can be used to address quantitative or qualitative data, for instance, number of prenatal consultations and content of care. In addition, several sources can be used such as interviews with women, companions, family members, medical record files and, pregnant women's card².

The pregnant woman's card provides essential parameters for assessing the quality of prenatal care, as it allows the evaluation of compliance to scheduled exams, consultations, and procedures through the completeness of the card fields. In addition, this tool encompasses, and permeates the care and facilitates its continuity, favouring communication between professionals and health services involved in women's care. It also serves as an important source of data for epidemiological studies³.

The Ministry of Health (MS), through the Technical Manuals of Prenatal Care, recommends the use of the pregnant woman's card to record procedures of each type of care and, singles out the conditions for effective provision of prenatal care and completion of this instrument³⁻⁵. The MS recommends the use of the same standardised model throughout the country, to allow the comparison of care offered in various contexts, the interpretation of results and the planning of actions to meet the needs of each locality^{6,7}.

Previous studies stated that the provision of the card has been properly implemented in the country. The lower presentation of the card occurs among women assisted in the private sector⁸⁻¹⁰, where this tool is not valued for continuity of care and, prenatal and childbirth care are mostly performed by the same professional.

Regarding the different evaluation parameters, quantitative and qualitative, the Kotelchuck index¹¹ proposes the evaluation of the use of prenatal care through quantitative aspects. However, national studies have also demonstrated the need for evaluation of qualitative aspects, using criteria to assess the content of the care offered, because

even with increased access to prenatal care, negative perinatal outcomes persist¹²⁻¹⁵.

When different criteria were compared, it revealed a disparity in the results of the evaluation of prenatal care. Cristofaro¹⁵ observed 89.5% adequacy of prenatal care according to the Kotelchuck index. However, when evaluating parameters of the Prenatal and Birth Humanization Program (PHPN), only 22% scored adequate prenatal care. In that same study, the completeness of filling the pregnant woman's card was evaluated as "bad" based on the Romero and Cunha score¹⁶. The disparity in the results can be explained by the fact that the Kotelchuck index favours quantitative aspects, while the qualitative evaluation also includes the content of care.

Therefore, if the pregnant woman's card is adequately filled out, it will provide data to evaluate prenatal care through indicators that allow strengthening surveillance and health care processes, fundamental to the organisation and planning of services^{17,18}.

The evaluation of the completeness of the pregnant woman's card is essential to understand its potential as a source of health information, while incomplete data do not adequately represent the studied reality and make it impossible to evaluate other dimensions of quality of care^{6,15,16}.

A systematic review showed that 80% of the studies that evaluated the completeness of data in Health Information Systems in Brazil adopted the Romero and Cunha score¹⁶. However, studies that evaluated the completeness of the pregnant woman's card are scarce and disparate regarding the applied evaluation, besides being local in scope^{14,15,18-22}.

The present study aims to evaluate, the completeness of filling the pregnant woman's card model standardised by the Ministry of Health for the country and macro-regions, using qualitative and quantitative criteria.

Methods

We adopted STROBE Initiative criteria²³ (Strengthening the Reporting of Observational studies in Epidemiology). It consists of a checklist of 22 items related to information that should be present in the title, abstract, introduction, methods, and results, encompassing recommendations to improve the quality of the description of observational studies²⁴.

We used data from "Birth in Brazil: National Survey on Labour and Childbirth", a cross-sec-

tional study, nationwide and hospital-based, conducted with puerperal women and their newborn between February/2011 and October/2012.

This research was conducted in 266 health facilities, with more than 500 deliveries/year, located in the five Brazilian macro-regions. All women admitted for the delivery of a live birth, with any weight or gestational age, or a stillbirth with more than 500 grams or 22 gestational weeks, were considered eligible for the study. We used the probability sampling design, in three stages: health establishments, data collection days and puerperal women. The details of the sample design and applied tools are described in Vasconcelos *et al.*²⁵ and Leal *et al.*²⁶.

For the present analysis, were considered eligible the puerperal women assisted in the public health network who presented a pregnant woman's card standardised by the Ministry of Health, either the model in force at the time of the study or one of the two models prior to the research. These models include fields of identification, socioeconomic data, (family, personal, and obstetric antecedents), data on the current pregnancy (vaccination status, clinical and laboratory tests, ultrasound (US)), register of each consultation, charts to be completed during prenatal period (uterine height/gestational age curve and nutritional follow up), as well as information on the delivery and the newborn.

In the research "Birth in Brazil", the cards of pregnant women presented at admission for delivery were photographed in full and some data used subsequently. Personal identification data were encrypted to maintain the confidentiality of the participants. Considering the obtained and the information described in PHPN²⁷ and Technical Manual of Prenatal Care⁵, the following variables were used to assess qualitative completeness: (1) personal history: diabetes mellitus, arterial hypertension and pelvic surgery; (2) obstetric history: number of pregnancies, abortions, vaginal deliveries, caesarean sections, children born alive, stillbirth and low birth weight (LBW); (3) data of the current pregnancy, divided into i) procedures performed at the consultation: previous weight, height, date of last menstruation (DLM), estimated due date (EDD), date of first visit, weight at first visit, gestational age at the first consultation and ii) test results: first routine of tests composed of blood glucose dosage, serology for syphilis, HIV serology and urine test (EAS); (4) ultrasound (USG) before 20 weeks and results of the second routine of tests composed of blood glucose dosage, second serol-

ogy for syphilis and second serology for HIV. For the variables, "abortion", "vaginal delivery", "caesarean section", "live born child", "stillborn" and "previous LBW" women who had filling "zero" or "one" in the variable "gestation" (gesta), since the absence of filling these fields would not be a failure. Moreover, in the variables "second blood glucose test", "second serology for syphilis" and "second HIV serology", women who had delivery before 34 weeks were excluded, as we assumed that there was no time to register the test result requested in the third trimester of pregnancy. For the variable "previous weight", when it was not filled out, we considered the weight value of the first consultation, given that it was recorded before the 14th week.

The records were considered dichotomous variables: filled or unfilled. We adopted the Romero and Cunha's score¹⁶ to evaluate the completeness of the information on pregnant women's cards for the country and macro-regions (North, Northeast, Southeast, South and Midwest). This score uses the proportion of missing information resulting in different classifications: "excellent" (incompleteness <5%), "good" (incompleteness of 5% to 10%), "regular" (incompleteness of 10% to 20%), "bad" (incompleteness of 20% to 50%) and "very bad" (incompleteness >50%).

For the quantitative evaluation, we used the Kotelchuck index¹¹, which is built on two dimensions: gestational age at the beginning of prenatal care and percentage of adequacy of the number of consultations corrected for gestational age at delivery. Gestational age was calculated by an algorithm developed by Pereira *et al.*²⁸.

The adequacy of the number of consultations considered the PHPN recommendation, a standard norm in place during the data collection, being at least six prenatal consultations, one in the first gestational trimester, two in the second and three in the third. For premature birth, the expected number of consultations was adjusted for gestational age at delivery.

If the prenatal care started after the 16th week and/or with a percentage of adequacy of the number of consultations lower than 50%, it was classified as "inadequate prenatal care". When prenatal care started until the 16th week, the classification varied according to the percentage of adequacy of the number of consultations: partially adequate (50-79%), adequate (80-109%) and more than adequate (110% or more).

In the descriptive analysis, we presented the absolute relative frequencies, and the respective 95% confidence intervals for the percentages of

incomplete information extracted from the cards of pregnant women. We used the chi-square test to evaluate whether there were differences in the incompleteness of filling in the pregnant woman's card among macro-regions, with the statistical significance level set at 5%. All analyses were performed using the Software Statistical Package for the Social Sciences (SPSS) for Windows, version 22, employing procedures for complex sampling, including the sample weight of the puerperal women and design effect.

The main study was approved by the Research Ethics Committee of the Sergio Arouca National School of Public Health (ENSP)/Fiocruz (Appraisal 92/10-CAAE: 0096.0.031.000-10). We took all safety measures to ensure secrecy and confidentiality of the information. Before each interview, digital consent was obtained after reading the free and informed consent form. The present study obtained a letter of exemption of evaluation (Number 2099/VDP/2018) from the Ethics Committee on Research with Human Beings (CEP/IFF) because it was covered in the main study.

Results

From the total number of puerperal women included in the study "Birth in Brazil" (23,894), we excluded those who did not undergo prenatal follow-up (1.2%), who did not present a pregnant woman's card (27.3%), who did not present the MH standardised card model (41.8%) and women who presented the pregnant woman's card with a model standardized by the MH, but did not undergo prenatal care in the public network (2.12%). Thus, 6,577 puerperal women were included in the analysis, representing 27.5% of the total sample.

Tables 1, 2 and 3 contain the percentages of incompleteness of filling fields of the pregnant woman's card for the country and macro-regions (North, Northeast, Southeast, South and Midwest).

The completion of the information regarding the section of the pregnant woman's card on personal history, "diabetes mellitus, arterial hypertension and pelvic/uterine surgery" was "regular" in Brazil and in the regions, except for the Northern region ("good"). The segment on obstetric history "excellent" in Brazil ranging from 0% to 4.7% of incompleteness in the fields "gesta", "abortion", "vaginal delivery" and "caesarean section" (Table 1).

As for the data concerning the current pregnancy (procedures completed during individual consultation), the completeness of "previous weight" and "height" were "bad" in the country and macro regions. The field "date of the first consultation" had "excellent" completeness score in Brazil, while "weight in the first consultation" scored "very bad" (Table 2).

Regarding the tests, the registration of "US up to 20 weeks" obtained "regular" score in Brazil, and worse scores in the North and Midwest regions ("bad"). The first routine of laboratory tests obtained "regular" score in the fields "EAS", "glycemia" and "serology for syphilis", while HIV serology presented "poor" completeness score. In the second laboratory routine, all tests presented "very bad" score, reaching 80.0% of incomplete information in the field "second serology for HIV" (Table 3).

Overall, the section analysis for Brazil revealed a mean "regular" completion (13.4%) for personal history, "good" for obstetric antecedents (7.0%), and "bad" for the records of the current pregnancy/procedures performed in the consultation (21.6%) and for the card fields referring to the current pregnancy/test results (37.6%). Considering all the evaluated fields (25 variables), the completeness of the card in the country was "bad", with 21.5% of incomplete filling. All regions presented "bad" filling, except for the South region, where the card was "regular".

The quantitative analysis showed that 58% of prenatal care in Brazil was "adequate" or "more than adequate" with significant differences in the North and Northeast regions, which presented worse results (Table 4).

Discussion

In this nationwide study, there was low use of the prenatal card model recommended by the Ministry of Health and "poor" filling of the analysed fields.

The supply and use of the pregnant woman's card as a recording instrument are recommended by the MS since the Manual of Prenatal Care was published in 1988 and even today the last manuals published by them reinforces the importance of this instrument³⁻⁵. The MS reiterates the value of its use through PHPN for aggregating on the card the information that contemplates the minimum list of prenatal care procedures²⁷. In contrast, supplementary health only dealt with it in 2014 with the mandatory supply and use of the

Table 1. Evaluation of the incompleteness of filling personal and obstetric antecedents on the pregnant woman's card by macro-region, 2011-2012.

| | Brazil | North | Northeast | Southeast | South | Midwest | p |
|--------------------------|---------------------------------------|-----------------------------------|-------------------------------------|-------------------------------------|----------------------------------|----------------------------------|-------|
| Personal history | | | | | | | |
| Diabetes mellitus | 6,577 [887] 13.5 (11.4-6.0%) | 978 [78] 8.0 (6.4-10.1%) | 2,482 [305] 12.3 (9.5-15.8%) | 2,557 [419] 16.4 (12.1-21.8%) | 260 [36] 14.0 (5.7-30.4%) | 300 [50] 16.4 (11.5-22.8%) | 0.069 |
| Hypertension | 6,577 [880] 13.4 (11.3-15.8%) | 978 [80] 8.1 (6.5-10.1%) | 2,482 [305] 12.3 (9.5-15.8%) | 2,557 [410] 16.0 (11.7-21.4%) | 260 [35] 13.5 (5.6-29.0%) | 300 [50] 16.8 (12.6-22.0%) | 0.083 |
| Pelvic surgery | 6,577 [886] 13.5 (11.3-15.9%) | 978 [83] 8.5 (6.8-10.5%) | 2,482 [300] 12.1 (9.5-15.3%) | 2,557 [411] 16.1 (11.7-21.8%) | 260 [38] 15 (6.3-30.4%) | 300 [52] 17.5 (13.7-22.1%) | 0.078 |
| Obstetric history | | | | | | | |
| Gesta | 6,577 [115] 1.7 (1.4-2.2%) | 978 [2] 0.2 (0.1-0.7%) | 2,482 [44] 1.8 (1.2-2.6%) | 2,557 [53] 2.1 (1.4-3.0%) | 260 [1] 0.6 (0.1-3.6%) | 300 [14] 4.7 (3.3-6.8%) | 0.000 |
| Abortion | 3,849 [25] 0.7 (0.3-1.6%) | 636 [0] 0% (-) (0.1-0.8%) | 1,384 [4] 0.3 (0.1-0.8%) | 1,512 [16] 1.1 (0.3-3.8%) | 149 [0] 0% (-) (0.6-9.8%) | 165 [4] 2.4 (0.6-9.8%) | 0.363 |
| Vaginal delivery | 3,849 [48] 1.2 (0.8-1.9%) | 636 [0] 0% (-) (0.7-3.4%) | 1,387 [21] 1.5 (1.0-2.3%) | 1,512 [22] 1.5 (1.0-2.3%) | 149 [2] 1.2 (0.3-5.6%) | 165 [2] 1.3 (0.4-4.6%) | 0.274 |
| Caesarean | 3,849 [66] 1.7 (1.1-2.6%) | 636 [1] 0.2 (0.0-1.2%) | 1,387 [23] 1.7 (0.8-3.6%) | 1,512 [31] 2.1 (1.1-3.9%) | 149 [2] 1.4 (0.5-3.5%) | 165 [7] 4.4 (1.5-12.5%) | 0.069 |
| Child born alive | 3,849 [272] 7.0 (5.9-8.4%) | 636 [25] 3.9 (2.3-6.4%) | 1,387 [100] 7.2 (5.1-10.2%) | 1,512 [122] 8.1 (6.4-10.2%) | 149 [12] 8 (4.3-14.2%) | 165 [12] 7.4 (4.1-13.0%) | 0.139 |
| Stillborn | 3,849 [382] 9.9 (8.2-11.9%) | 636 [38] 6.0 (4.4-8.2%) | 1,387 [120] 8.7 (6.2-12.1%) | 1,512 [160] 11 (8.3-13.6%) | 149 [14] 9.4 (5.6-15.3%) | 165 [48] 28.8 (13.1-51.9%) | 0.002 |
| Low birth weight | 3,849 [1,030] 26.8 (23.6-30.1%) | 636 [150] 23.5 (20.7-26.5%) | 1,387 [461] 33.2 (27.7-39.2%) | 1,512 [345] 22.8 (18.2-28.1%) | 149 [30] 19.9 (11.1-33.1%) | 165 [45] 27.5 (17.9-39.7%) | 0.007 |

p - p-value of the chi-square test. Values displayed as: Total cards [number of incomplete cards], Percentage of incomplete cards (95%CI for the percentage of incomplete cards).

Source: Authors.

pregnant woman's card, through Technical Note No. 703²⁹. The importance of using the MS card standardised model was not cited in this document. The low use of the MS card model in the private sector prevented the inclusion of these services in the present analysis.

The completeness rate varied according to the type of records. The block with higher completeness contains information on obstetric history, which ranged from "good" to "regular", even though there were "bad" scores for specific fields in some regions (e.g., poor filling for "low birth weight" in the Southeast region). Still, the scenario is much better than that observed in Vitória/ES where the completeness varied between "bad"

and "very bad", in the analysis of 1,006 cards of women attending public health care units or services commissioned by the SUS¹⁹. An explanation for this difference was the exclusion, in the present study, of the cards in which the variable "gesta" was filled as "zero" or "one". The completeness of the subsequent fields, numbers of deliveries, abortions and neonatal outcomes would not be an omission, since those fields were not applicable to a woman in her first pregnancy. In the study conducted in Vitória, this exclusion was not described, and may explain the worst score.

The relevance of filling these fields is noteworthy, given that history of previous pregnancies, the incidence of abortions, stillbirths and

Table 2. Evaluation of the incompleteness of filling data from the first consultation and the procedures performed, by macro-region, 2011-2012.

| | Brazil | North | Northeast | Southeast | South | Midwest | p |
|--------------------------------------|---------------------------------------|-----------------------------------|---------------------------------------|---------------------------------------|-----------------------------------|-----------------------------------|-------|
| Procedures performed in consultation | | | | | | | |
| Previous weight | 6,577 [2,009] 30.5 (27.7-33.5%) | 978 [228] 23.4 (18.4-29.1%) | 2,482 [835] 33.7 (29.0-38.7%) | 2,557 [803] 31.4 (26.6-36.7%) | 260 [63] 24.3 (15.9-35.3%) | 300 [79] 26.2 (21.8-31.0%) | 0.046 |
| Height | 6,577 [2,351] 35.8 (32.1-39.5%) | 978 [234] 24.0 (16.3-34.0%) | 2,482 [976] 39.3 (34.0-44.9%) | 2,557 [971] 38.0 (31.5-44.9%) | 260 [79] 30.7 (21.7-41.5%) | 300 [89] 29.7 (22.7-37.7%) | 0.024 |
| LMD | 6,577 [628] 9.6 (8.2-11.1%) | 978 [35] 3.5 (2.4-5.1%) | 2,482 [164] 6.6 (5.3-8.2%) | 2,557 [360] 14 (11.2-17.5%) | 260 [38] 14.4 (9.4-21.4%) | 300 [34] 11.2 (7.5-16.4%) | 0.000 |
| EDD | 6,577 [578] 8.8 (7.6-10.1%) | 978 [29] 3.0 (2.1-4.4%) | 2,482 [155] 6.3 (5.0-7.9%) | 2,557 [293] 11.4 (9.2-14.2%) | 260 [44] 17.1 (11.4-24.8%) | 300 [57] 18.7 (14.6-23.7%) | 0.000 |
| First consultation | | | | | | | |
| Date | 6,577 [166] 2.5 (1.8-3.5%) | 978 [5] 0.5 (0.3-1.0%) | 2,482 [84] 3.4 (1.9 - 6.1%) | 2,557 [46] 1.8 (1.2-2.7%) | 260 [8] 3.1 (1.3-7.3%) | 300 [22] 7.4 (4.3-12.3%) | 0.000 |
| Weight | 6,577 [3,701] 56.3 (53.8-58.7%) | 978 [544] 55.6 (49.4-61.6%) | 2,482 [1,260] 50.8 (47.2-54.3%) | 2,557 [1,607] 62.8 (58.6-66.8%) | 260 [110] 42.1 (30.6-54.6%) | 300 [183] 60.9 (54.1-67.3%) | 0.000 |
| Gestational age | 6,577 [505] 7.7 (6.4-9.2%) | 978 [41] 4.1 (2.2-7.5%) | 2,482 [177] 7.2 (5.5-9.2%) | 2,557 [195] 7.6 (5.3-10.7%) | 260 [42] 15.9 (9.4-25.5%) | 300 [52] 17.3 (10.9-26.3%) | 0.000 |

LDM - date of last menstruation; DPP - expected due date; p - p-value of the chi-square test. Values displayed as: Total cards [number of incomplete cards], Percentage of incomplete cards (95% CI for the percentage of incomplete cards).

Source: Authors.

premature infants are often related to premature births and “very low” birth weight of newborns³⁰. Another point to be highlighted is the relevance of data on parity, described in some studies as one of the determining factors for the adequacy of prenatal care. Multiparous women attend fewer consultations compared to their primiparous counterparts^{31,32}.

The section on personal history, as “diabetes mellitus”, “arterial hypertension” and “pelvic surgery”, essential for the classification of gestational risk^{3,5}, presented “regular” score nationwide and in the Southeast region. Similarly, two studies conducted in Brazilian capitals of the Southeast region described “regular” completeness. However, they did not quote the evaluated variables and only provided grouped results, unsuitable to compare the findings^{15,18}.

The joint analysis of the sections, which should be completed at the first prenatal consultation, is based on an adequate anamnesis and,

aims at a better evaluation of gestational risk centred on clinical and obstetric accounts. The scenario observed in the present study indicates the need for greater communication among care givers to ensure a better use of contacts between health professionals and pregnant women in the health unit^{3,5}. This may allow the identification of gestational risks by the professionals at an early stage and provide guidance for referrals, likely to be necessary throughout the pregnancy^{3,19,33}.

The data related to the current pregnancy presented the lowest level of completeness, varying according to the type of information. The field “date of consultation” presented the highest score but this information is independent of the interaction of the professional with the pregnant woman. The fields DLM, EDD and gestational age at the first visit showed great variation between regions, with greater incompleteness in the South, Southeast and Midwest regions. Also, in the South and Southeast regions, a higher num-

Table 3. Evaluation of the incompleteness of filling the results of tests on the pregnant woman's card, by macro-region, 2011-2012.

| | Brazil | North | Northeast | Southeast | South | Midwest | p |
|---------------------------|---------------------------------------|-----------------------------------|---------------------------------------|---------------------------------------|-----------------------------------|-----------------------------------|-------|
| Tests results | | | | | | | |
| Urine (EAS) | 6,577 [1,091] 16.6 (14.5-18.9%) | 978 [221] 22.6 (15.2-32.3%) | 2,482 [434] 17.5 (14.9-20.4%) | 2,557 [350] 13.7 (10.5-17.6%) | 260 [19] 7.3 (4.3-12.3%) | 300 [68] 22.6 (16.7-29.8%) | 0.017 |
| USG up to 20th week | 6,577 [1,068] 16.3 (13.8-19.1%) | 978 [347] 35.5 (24.2-48.7%) | 2,482 [419] 16.9 (14.0-20.2%) | 2,557 [221] 8.6 (6.4-11.5%) | 260 [26] 9.9 (6.5-14.8%) | 300 [58] 19 (12.6-27.6%) | 0.000 |
| 1st Fasting Blood Glucose | 6,577 [1,284] 19.5 (16.9-22.5%) | 978 [220] 22.5 (16.2-30.4%) | 2,482 [564] 22.7 (18.5-27.5%) | 2,557 [408] 15.9 (11.6-21.4%) | 260 [24] 9.3 (4.3-19.0%) | 300 [70] 23.3 (17.3-30.5%) | 0.045 |
| 1st Serology syphilis | 6,577 [945] 14.4 (12.6-16.4%) | 978 [230] 23.5 (17.4-31.0%) | 2,482 [417] 16.8 (13.8-20.3%) | 2,557 [220] 8.6 (6.6-11.2%) | 260 [12] 4.4 (2.3-8.3%) | 300 [66] 21.8 (15.7-29.6%) | 0.000 |
| 1st HIV Serology | 6,577 [1,695] 25.8 (22.8-28.9%) | 978 [315] 32.2 (22.8-43.3%) | 2,482 [855] 34.4 (29.5-39.7%) | 2,557 [416] 16.2 (12.2-21.3%) | 260 [35] 13.5 (9.6-18.6%) | 300 [76] 25.1 (22.8-28.9%) | 0.000 |
| 2nd Fasting Blood Glucose | 6,405 [4,201] 65.6 (62.8-68.3%) | 947 [652] 68.7 (63.8-73.3%) | 2,407 [1,747] 72.6 (68.3-76.5%) | 2,511 [1,468] 58.4 (53.3-63.4%) | 254 [122] 47.6 (39.8-55.4%) | 286 [215] 75.3 (68.0-81.4%) | 0.000 |
| 2nd Serology syphilis | 6,405 [4,006] 62.6 (59.6-65.4%) | 947 [658] 69.4 (63.5-74.7%) | 2,407 [1,660] 69 (64.1-73.4%) | 2,511 [1,367] 54.4 (49.5-59.2%) | 254 [116] 45.4 (35.9-55.3%) | 286 [208] 72.9 (64.1-80.2%) | 0.000 |
| 2nd HIV Serology | 6,405 [4,988] 80.0 (74.8-80.7%) | 947 [757] 84.9 (74.1-84.7%) | 2,405 [2,044] 72.3 (79.5-89.1%) | 2,511 [1,815] 60.6 (66.5-77.4%) | 254 [155] 76.2 (46.5-73.2%) | 286 [218] 77.9 (68.7-82.5%) | 0.000 |

USG - ultrasound; p - p-value of the chi-square test. Values displayed as: Total cards [number of incomplete cards], Percentage of incomplete cards (95%CI for the percentage of incomplete cards).

Source: Authors.

Table 4. Evaluation of prenatal care by Kotelchuck index, by macro-region, 2011-2012.

| | Inadequate | Partially adequate | Adequate | More than adequate | p-value |
|---------------------|----------------------------|----------------------------|----------------------------|--------------------------|---------|
| North n=973 | 314 32.2 (26.6-38.4%) | 236 24.2 (20.5-28.4%) | 345 35.5 (31.1-40.1%) | 79 8.0 (6.3-10.2%) | |
| Northeast n=2459 | 578 23.5 (20.4-26.9%) | 574 23.4 (20.9-26.1%) | 1,044 42.5 (39.0-46.0%) | 263 10.7 (8.4-13.5%) | |
| Southeast n=2554 | 375 14.7 (12.2-17.5%) | 478 18.7 (16.7-21.0%) | 1,136 44.5 (41.1-47.9%) | 566 22.1 (18.8-25.8%) | 0.000 |
| South n=259 | 42 16.1 (12.2-21.0%) | 46 17.8 (12.9-24.1%) | 125 48.0 (38.6-57.5%) | 47 18.0 (10.2-30.0%) | |
| Midwest n=300 | 72 24.0 (19.4-29.2%) | 62 20.8 (17.0-25.3%) | 125 41.8 (36.9-46.8%) | 41 13.5 (9.8-18.3%) | |
| Total | 1,380 21.1 (19.1-23.2%) | 1,397 21.3 (19.9-22.8%) | 2,775 42.4 (40.3-44.5%) | 993 15.2 (13.4-17.1%) | |

Source: Authors.

ber of US was observed before the 20th gestational week, reflecting greater use of this diagnostic method to determine gestational age in these regions. Early US is considered the gold standard

for estimating gestational age, which favours better planning for delivery, improves the early detection of multiple pregnancies, and clinically unsuspected foetal malformations^{3,12,14}.

Previous studies indicated that the non-completion of the US may represent the lack of the examination or its underreporting^{15,19}. However, another publication with data from the study “Birth in Brazil” revealed that almost all pregnant women reported having US in prenatal care⁸. Thus, these results suggest that either the examination occurred after the 20th gestational week or that it was performed before the 20th gestational week but was not recorded.

The completeness of the “height” field and “previous weight” had a “bad” score, even using the weight recorded in the first consultation, done until the 14th gestational week as a proxy for pre-gestational weight. A similar scenario of low completeness of these data, was observed in a study that evaluated 115 cards of pregnant women assisted in public health care units in Florianópolis²¹. In a study that described the completion of the “nutritional follow-up chart”, the evaluation was even worse as it portrayed all cards with no information on the charts. However, the same research revealed that, according to the maternal recall, the weight was verified during all consultations, indicating that the procedure was conducted, but with under recording of the field in the card³⁴.

Information on height and weight, anthropometric indicators, are essential to evaluate and predict gestational weight gain. The adequacy of gestational weight gain aims to prevent undesirable maternal and neonatal outcomes, such as gestational diabetes mellitus, arterial hypertension, macrosomia, perinatal death, LBW, among others³⁵. This need is reiterated by the orientation of the MS to record the nutritional status both in the medical files and in the pregnant woman’s card aiming at the prevention and control of diseases during pregnancy^{3,5}.

The results of first routine laboratory tests ranged from “regular” (glycemia, serology for syphilis and EAS) to “bad” (HIV serology). The MS guides to undertake serologies for syphilis and HIV twice during the prenatal period to identify infected pregnant women, aiming at treating women and adopt measures to avoid vertical transmission to the conceptus. Regarding HIV serology, comparable results were reported in some studies^{15,36}, with completeness less than 90%. It is noteworthy that the WHO³⁷ recommends testing in at least 95% of pregnant women as a process indicator for reducing vertical transmission. As for serology for syphilis, it is recommended to record the result and treatment of syphilis on the pregnant woman’s card³. It is

underscored that adequate treatment reduces subsequent harms, such as LBW, prematurity, congenital infections and perinatal deaths³⁸.

The completion of the first fasting glucose test obtained a “regular” score and the second, “very bad”. It is important to highlight that diabetes mellitus during pregnancy is associated with higher maternal and foetal morbidity and mortality, and the early detection and diagnose is important during the prenatal follow-up. Currently, women who are diagnosed with pre-gestational diabetes (GDM) present at the first prenatal consultation or in the first trimester gestational diagnostic criteria like those predetermined for the classification of pre-gestational diabetes, or women who were not diagnosed with pre-gestational diabetes mellitus, but who had fasting glycemia between 92 and 126 mg/Dl³⁹.

Women who had preterm birth were excluded from the analysis of the second routine of laboratory tests. Even so, the results were more worrisome when compared to the first routine. The level of completeness for blood glucose, HIV serology and syphilis were “very poor” in all regions of Brazil. Romero and Cunha’s score¹⁶ classify incompleteness above 50% as “very bad”. Regardless of the above-mentioned results, the South and Southeast regions presented better performance when compared to the other regions of the country.

The registration of the test results does not depend only on the request for the examination by the health professional and the subsequent registration of the result. It is also dependent on the actual completion of the examination by the pregnant woman and the timely return of the result, contingent on a well-established reference/counter-reference flow, which qualifies access and completeness in the SUS¹⁹.

The results of the present study, representing exclusively the analysis of the pregnant woman’s card, illustrate that despite the expansion of access to prenatal care, with coverage greater than 95% since the beginning of the 2000s, the quality of these prenatal care services and practices describe inadequacies, analogous to studies that used different data sources, such as interviews and medical records^{32,33}.

Previous studies also evaluated the adequacy of prenatal care through the pregnant woman’s card and showed that this important communication instrument is subject to incompleteness^{13,18}. The completeness of the card reveals a summary of the main data of the professional’s evaluation in their contact with the pregnant

woman in health services and favours the continuity of care¹³. Incompleteness brings distinct interpretations, which may be due to both the under-registration and/or no accomplishment of the recommended procedure. In addition it may weaken the compliance with SUS principles, including: “use of epidemiology to set priorities”, “right to information about one’s own health” and “equity”, the scope of the Guidelines for Coordination of Care and provide over time data contemplated in the National Primary Care Policy (PNAB)^{17,18}. Furthermore, not completing the card may generate uncertainties and/or risk to the patient, because it allows for the repetition or neglect of important procedures¹⁹. According to Barreto and Albuquerque¹⁷ “the pregnant woman’s card was underutilised as a professional inter-communication tool throughout delivery and postpartum care”(p.263).

In addition to these issues, incompleteness may also lead to inadequacy of data needed for the construction of essential indicators for evaluation and planning policies on maternal and child health. It is essential that health teams and managers make effective use of the card and value the “filling,” to enable the evaluation of prenatal care, enhance the decision-making process, allow to depict the reality of prenatal care among the target population and support subsequent action plans^{13,21,22}.

The evaluation of prenatal care, using the pregnant woman’s card, can be based on qualitative or quantitative criteria. The qualitative criteria deal with the evaluation of the fields describing the content of the assistance. The analysis of prenatal care based on the quantitative criteria portray the access to health and prenatal care, it has an assessment founded on gestational age at the beginning of prenatal care and the actual number of consultations¹⁷.

The quantitative evaluation showed 58% adequacy of care considering the recommendations of the number of consultations in PHPN. If the current recommendation of the Stork Network initiative (*Rede Cegonha*, implemented in 2011)⁴⁰ was adopted for the analysis, recommending the beginning of prenatal care until the twelfth gestational week and the accomplishment of more than seven consultations for a full-term pregnant woman, the adequacy of prenatal care would decrease to 42%. This recommendation, of a higher number of prenatal consultations, was also adopted by the World Health Organization⁴¹ in its most recent prenatal care protocol, where at least eight prenatal consultations are advocated for a pregnant woman at habitual risk.

For both, the PHPN criterion and the Stork Network, the quantitative evaluation was more favourable than the qualitative one, in accordance with the studies that analysed prenatal care incorporating indicators of the content of care as well as the number of consultations^{12,15,31}. Thus, beyond greater access to health services, when the criteria related to the content of care are evaluated, the need to improve the quality of prenatal care is revealed^{12,15}. It is extremely important that future studies evaluating prenatal care also assess its content.

The main limitation of the present study was the exclusion of private services, resulting from the decision to restrict the analysis to the card model recommended by the MS. The number of pregnant women assisted in these services who presented the MS card was so small that it made it impossible to include it in the analysis. This may be a subject of future studies. The decision to analyse only the cards with the MS model was necessary to standardise the variables comprised in this tool, following the recommendations of the PHPN and the Technical Manual^{5,27}. The card models created and used by the private services often do not include the same fields covered in the MS standard model.

The use of a single model of pregnant women’s card by all services, knowingly facilitates the establishment of a filling routine, the implementation of an appropriate reference/counter-reference system and comparative analysis of some variables, and the importance of data congruence to compare the findings³⁶. It is also worth mentioning that the card models used in Brazil, present different blueprints and the filling areas are not suitable for the appropriate registration, often causing scribbled records and, making data interpretation difficult²⁰.

A second limitation was the analysis was restricted to the variables collected for the study “Birth in Brazil”. This prevented the analysis of data of other recommended procedures in prenatal care, such as vaccinations and prescription of iron supplementation. We also did not evaluate the data on procedures adopted for complications diagnosed during pregnancy. It is recommended that future studies aimed at evaluating the completeness of the pregnant woman’s card delimit the variables based on technical procedures recommended by the MS, such as the minimum package advocated for prenatal care throughout Brazil. Standardisation enables the comparison between studies and interpretation of results^{6,7}.

Conclusion

Notwithstanding the advances achieved in the expansion of access to prenatal care in recent decades, this study confirms the need to improve prenatal care in Brazil, valuing both, the use of the pregnant woman's card recommended by the MS, and the completeness of this tool undertaken by professionals who implement prenatal care.

It is essential to contemplate the registration and compliance, particularly with established procedures, to reduce the inadequacies and inequities persisting in the care of pregnant women. Future studies should allow for the inclusion of private services, since the number of pregnant women assisted in these services and presented the MS card was so small that it made it impossible to include it in the analysis.

Collaborations

LR Mello participated in the design of the article, systematic literature review, data analysis, writing and final review of the manuscript. D Marano participated in the design of the article, systematic literature review, data analysis, writing and final review of the manuscript. MEL Moreira participated in the design of the article, data analysis, writing and final review of the manuscript. RMSM Domingues participated in the data analysis, writing and final review of the manuscript. ACC Costa participated in the data analysis, writing and final review of the manuscript. MAB Dias participated in the data analysis, writing and final review of the manuscript.

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Article submitted 10/03/2021

Approved 09/09/2021

Final version submitted 11/09/2021

Chief editors: Romeu Gomes, Antônio Augusto Moura da Silva