



## Evaluation of prenatal care in Primary Health Care in Brazil


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### Abstract

*Objectives:* to evaluate prenatal care in Primary Care by identifying the aspects that influence structural and operational adequacy.

*Methods:* evaluation research with analysis of 4,059 municipalities that joined the 2nd cycle of the Program for Improving Access and Quality in Primary Care in 2013-2014. The evaluative model composed of 19 indicators grouped in structural aspects and operational aspects dimensions was validated in a consensus conference. Data analysis was descriptive, with the issuance of value judgment.

*Results:* in structural aspects, 32.6% of the municipalities presented adequacy, whilst in operational ones, only 24.1%. In the general prenatal evaluation, less than a quarter (24.6%) of the municipalities was adequate, those with up to 10 thousand inhabitants had a higher percentage of adequacy (41.6%). The South region presented adequacy of 33.8%, considering all sizes.

*Conclusions:* most municipalities presented low adequacy in prenatal care, with better performance of structural aspects. Smaller municipalities presented better results in all analyzed items. Structural aspects and general evaluation of prenatal care are highlighted in the South region. Adequate attention to prenatal care needs to be comprehensive and equitable, with the strengthening of regional networks geared towards social inclusion.

**Key words** Health evaluation, Primary health care, Quality assurance, Health care



## Introduction

Prenatal care includes health education actions, risk identification, prevention and treatment of complications and diseases, requiring planning and structuring to guarantee access and continuity of care with effective comprehensiveness of care, in order to promote mother and child health.<sup>1,2</sup>

Low-risk prenatal care is configured as one of the main programmatic actions carried out in Primary Care (PC). The whole process of women's health care is influenced by the social, economic and cultural context of the environment in which pregnant women and concepts live. Structural and operational aspects must be guaranteed for continuous and quality monitoring, with humanized care to pregnancy. Prenatal care involves a warm relationship and the systematic follow-up of the pregnant woman contributes to the early detection of diseases and gestational risk, preparation for childbirth and establishment of a bond with motherhood.<sup>3</sup>

The inadequacy of prenatal care actions is associated with negative effects such as prematurity and low birth weight, in addition to increased risk of fetal and maternal death, hospitalizations in intensive care units, postpartum depression and anxiety, and successive pregnancies in a short time.<sup>4,5</sup>

In Brazil, there has been an increase in coverage of prenatal care in the last years in most of the country,<sup>6,7</sup> coinciding with the institutionalization of actions aimed at the comprehensiveness of care, proposed from different national programs in the period from 1984 to 2011. Despite this, the challenges persist with a high level of inadequacy of actions, endangering maternal and child health.<sup>6</sup>

High child mortality rates, with a higher concentration of deaths in the early neonatal components,<sup>2,8</sup> and the still high maternal mortality rate (58 maternal deaths out of 100 thousand live births), with expressive disparities in the country,<sup>9</sup> reinforce the existence of failures in the care provided.

The institutionalization of prenatal care evaluation is a fundamental strategy for the improvement of quality with consequent reduction of maternal and infant morbimortality,<sup>10</sup> since it reveals and produces subsidies for awareness and confrontation with failures, reviewing public policies and managerial and procedural adaptations, in order to respond more adequately and with immediate solution the needs of this population group. Studies that evaluated prenatal care with national coverage observed inadequacies in relation to the recommended<sup>6,10,11</sup> and had as a unit of analysis users<sup>11</sup> and PC<sup>6,10</sup> teams, and it was necessary to advance in the aspects

of municipal management responsibility.

Accordingly, the objective of this study was to evaluate prenatal care in PC by identifying the aspects that influence structural and operational adequacy, with a focus on management, having the Brazilian municipalities as a unit of analysis.

## Methods

Evaluative study, of quantitative based approach of the low risk prenatal care having as analysis units the Brazilian municipalities that participated in the external evaluation of the Program for Improving Access and Quality of Primary Care (PMAQ - AB), in 2013 - 2014.

The municipalities that have joined with at least 80% of the teams in the 2<sup>nd</sup> cycle of PMAQ - AB were included, and responded to modules I and II. The sample consisted of 4,059 municipalities, 19,849 Basic Health Units (BHU) and 24,626 participants in the Family Health Strategy (FHS).

The theoretical-logical model and the matrix of analysis and judgment are based on documental and bibliographic research pertinent to the theme. The main documents used were the ordinance that established the Stork Network (2011) and the Technical Standards and Manuals of the series of Notebooks of Primary Care n° 18, n° 26 and n° 32: HIV/Aids, hepatitis and other sexually transmitted diseases (2006), Sexual health and reproductive health (2010) and Attention to low risk prenatal care (2013), respectively.

The evaluative model was validated in Consensus Conference, in two stages: distance and face-to-face meeting. A group of eight experts from the field of women's health and/or public policy evaluation participated in the two phases. The model was emailed and the experts were invited to give their full, partial agreement or disagreement within 15 days. The researchers consolidated the answers and cases of discordance were the subject of debate in the face-to-face meeting. All suggestions were included from consensus.

The analysis and judgment matrix has two dimensions, six sub-dimensions, 19 indicators and 30 measures. The "structural aspects" dimension analyzes the conditions of infrastructure, human resources and standardization of care that give the conditions for the teams to carry out their activities. The "operational aspects" dimension analyzes the activities carried out by the teams, focusing on the organization of care, promotion and prevention and follow-up (Tables 1 and 2).

**Table 1**

Analysis and judgment matrix of structural aspects of the evaluation of prenatal care in Primary Care. Brazil, 2017.

Evaluative matrix	Measures	Judgment Parameters	
<b>Structural aspects</b>			
Infrastructure		≥ 90% = adequate (1.0)	
Adequacy of the physical space	% BHU with nursing office and waiting room	89 to 75% = minimally adequate (0.5) <75% = inadequate (0.0)	
Materials and equipment for prenatal care	% UBS that makes available a pregnant woman's booklet	≥ 90% = adequate; 89 to 75% = minimally adequate; <75% = inadequate	Both adequate= adequate (1.0) Both inadequate= inadequate (0.0) Other situations= minimally adequate (0.5)
	% BHU with availability of equipment and furniture for prenatal care	≥ 90% = adequate; 89 to 75% = minimally adequate; <75% = inadequate	
Inputs and medicines	% BHU with supply of important vaccines for the prenatal period	≥ 90% = adequate; 89 to 75% = minimally adequate; <75% = inadequate	Both adequate= adequate (1.0) Both inadequate= inadequate (0.0) Other situations= little adequate (0.5)
	% BHU with availability of essential medicines for the gestational period	≥ 90% = adequate; 89 to 75% = minimally adequate; <75% = inadequate	
<b>Human resources</b>			
Adequacy of staff	% FHS with complete minimum health staff *	Dichotomous analysis, according to population size. Parameter to "adequate" Up to 50 thousand inhab. = 100% >50 to 100 thousand inhab. = 90% >100 to 500 thousand inhab. = 85% > 500 thousand inhab. = 60%	Both adequate= adequate (1.0) Both inadequate= inadequate (0.0) Other situations= little adequate (0.5)
	% FHS with oral health*	Dichotomous analysis, according to population size. Parameter to "adequate" Up to 25 thousand inhab. = 100% >25 to 50 thousand inhab. = 90% >50 to 100 thousand inhab. = 85% >100 to 500 thousand inhab. = 75% >500 thousand inhab. = 60%	

continue

\* Parameters defined according to the tertile distribution for each population size stratum, \*\* Data collected on the site of the CNES, BHU= Basic Health Unit, FHS= Family Health Strategy.

**Table 1** **concluded**

Analysis and judgment matrix of structural aspects of the evaluation of prenatal care in Primary Care. Brazil, 2017.

Evaluative matrix	Measures	Judgment Parameters
Structural aspects		
Human resources		
Population coverage	% population with coverage of the FHS***	Dichotomous analysis, according to population size. Parameter to "adequate" (1.0) Up to 25 thousand inhab. = 100% >25 to 50 thousand inhab. = 85% >50 to 100 thousand inhab. = 65% >100 to 500 thousand inhab. = 55% >500 thousand inhab. = 40%
Specialized support	% FHS which receives support from experts	≥ 90% = adequate (1.0) 89 to 75% = minimally adequate (0.5) <75% = inadequate (0.0)
Standardization of care		
Normatization of care	% FHS which uses protocols for prenatal risk stratification	≥90% = adequate; 89 to 75% = minimally adequate; <75% = inadequate
	% FHS that has protocols with definition of guidelines to host the pregnant woman	≥90% = adequate; 89 to 75% = minimally adequate; <75% = inadequate
Updated information		
	% FHS that monthly feed the prenatal information system	≥90% = adequate; 89 to 75% = minimally adequate; <75% = inadequate
	% FHS with cytopathological collection record	≥90% = adequate; 89 to 75% = minimally adequate; <75% = inadequate

\* Parameters defined according to the tertile distribution for each population size stratum, \*\* Data collected on the site of the CNES, BHU= Basic Health Unit, FHS= Family Health Strategy.

**Table 2**

Analysis and judgment matrix of the operational aspects of the evaluation of prenatal care in Primary Care. Brazil, 2017.

Evaluative matrix	Measures	Judgment parameters
Operational aspects		
Organization of care		
Appropriation of territory	% FHS with registration of all pregnant women in the territory	≥90% = adequate (1.0) 89 to 75% = minimally adequate (0.5) <75% = inadequate (0.0)
Early capture	% FHS that perform an active search of pregnant women for prenatal care	≥ 90% = adequate (1.0) 89 to 75% = minimally adequate (0.5) <75% = inadequate (0.0)
Adequate access	% FHS that have extended working hours**	Dichotomous analysis, according to population size. Parameter for "Adequate" (1.0) Up to 10 thousand inhab. = 100% >10 thousand inhab. = 80%
Programming of care		
	% FHS that offer scheduled prenatal consultations	≥ 90% = adequate; 89 to 75% = minimally adequate; <75% = inadequate
	% FHS that have agenda scheduling according to gestational risk	≥ 90% = adequate; 89 to 75% = minimally adequate; <75% = inadequate
Promotion and prevention		
Early diagnosis		
	% FHS that request the rapid pregnancy test	≥ 90% = adequate; 89 to 75% = minimally adequate; <75% = inadequate
	% FHS that request the rapid HIV test	≥ 90% = adequate; 89 to 75% = minimally adequate; <75% = inadequate
	% FHS that request the rapid syphilis test	≥ 90% = adequate; 89 to 75% = minimally adequate; <75% = inadequate

continue

\*\*Parameters defined according to the quartile distribution for each population size stratum, \*\*\*Data collected on the website of Sinasc, BHU= Basic Health Unit, FHS = Family Health Strategy, HIV= Human Immunodeficiency Virus, LB= Live Births.

Table 2

concluded

Analysis and judgment matrix of the operational aspects of the evaluation of prenatal care in Primary Care. Brazil, 2017.

Evaluative matrix	Measures	Judgment parameters	
Operational aspects			
Promotion and prevention			
Immunization	% FHS that register the up to date vaccination of the pregnant woman	≥ 90% = adequate (1.0) 89 to 75% = minimally adequate (0.5) <75% = inadequate (0.0)	
Identification of diseases	% FHS that request prenatal exams	≥ 90% = adequate; 89 to 75% = minimally adequate; <75% = inadequate	Both adequate= adequate (1.0) Both inadequate= inadequate (0.0) Other situations = minimally adequate (0.5)
	% FHS that receive the examinations in a timely manner for necessary interventions	≥ 90% = adequate; 89 to 75% = minimally adequate; <75% = inadequate	
Health education	% FHS that offer educational and health promotion actions for pregnant women	≥ 90% = adequate (1.0) 89 to 75% = minimally adequate (0.5) <75% = inadequate (0.0)	
Follow-up			
Follow-up of the gestational cycle	Proportion of LB of mothers with seven or more prenatal visits***	≥ 90% = adequate (1.0) 89 to 75% = minimally adequate (0.5) <75% = inadequate (0.0)	
Reference and counter-reference	% FHS that maintains a register of higher risk pregnant women referred to other points of care	≥ 90% = adequate; 89 to 75% = minimally adequate; <75% = inadequate	Both adequate= adequate (1.0) Both inadequate= inadequate (0.0) Other situations = minimally adequate (0.5)
	% FHS that receive the counter-referral of maternity hospitals	≥ 90% = adequate; 89 to 75% = minimally adequate; <75% = inadequate	
Continuity of care	% FHS which conducted puerperium consultations up to 10 days after delivery	≥ 90% = adequado; 89 a 75% = pouco adequado; <75% = inadequado	

\*\*Parameters defined according to the quartile distribution for each population size stratum, \*\*\*Data collected on the website of Sinasc, BHU= Basic Health Unit, FHS= Family Health Strategy, HIV= Human Immunodeficiency Virus, LB= Live Births.

In addition to the PMAQ – AB database, the official sites of the Live Birth Information System (Sinasc), the National Registry of Health Establishments (CNES) and the Brazilian Institute of Geography and Statistics (IBGE) were used as sources of evidence.

The parameters for the issuing of value judgments that guided the descriptive analysis were defined based on literature review, documentary research and the fact that all actions chosen were well founded, based on scientific evidence and recommended in official documents for at least five years. (Tables 1 and 2).

In the analysis of the measures it was considered *adequate* when in the municipality at least 90% of the BHU or FHS teams performed the action (s); *inadequate* when less than 75% of the BHU or FHS teams performed the action (s); and *minimally adequate*, in the rest of the cases. There was an exception in four measures: for minimum adequate FHS team, FHS teams with oral health and population coverage, the parameters were defined by population size, by tertile distribution, and for extended hours of operation, they were also defined by population size, but by quartile distribution.

Data were analyzed using Microsoft Office Excel® and SPSS 22.0 software and presented in tabular form.

For indicators with more than one measure it was considered *adequate* when all measures were classified as adequate, *inadequate* when all measures were classified as inadequate and the other situations, as *minimally adequate*.

Initially, measures and indicators were analyzed and, in the aftermath, the conversion into scores 1.0 (*adequate*) 0.5 (a) and 0.0 (*inadequate*) was made. The analysis was guided by the sum of the scores, followed by the calculation of the percentage of points obtained compared to the maximum score expected in each of the components, as follows:  $(\Sigma \text{obtained} / \Sigma \text{expected}) \times 100$ . For the value judgment of dimensions, the cut-off points used were: *adequate* (100%-75% of the expected), *inadequate* (less than or equal to 50% of the expected) and the other cases were *minimally adequate*, received weight two, considering it with greater influence on the adequacy of attention.

The study was approved by the Human Research Ethics Committee of the Federal University of Santa Catarina (CEPSH/UFSC), Opinion n° 1.599.464.

CAAE n° 53671016.1.1001.0121.

## Results

The study analyzed 72.9% of the total number of Brazilian municipalities, predominantly with a population size of less than 25 thousand inhabitants (78.8%), with less than one quarter (24.6%) presenting an *adequate* prenatal care.

In Table 3, it is observed that the structural aspects dimension 39.1% of the municipalities was classified as *minimally adequate*. In the analysis of the infrastructure, the physical space presented more than half of the *adequate* municipalities (69.6%). Regarding human resources, a positive highlight was the specialized support with 86.4% of the municipalities offering specialist support to the PC teams and for the population coverage that showed adequacy in 53.3% of the municipalities. The standardization of care was the subdimension with the highest percentage of *inadequate* municipalities (62.0%), especially in the standardization of care indicator.

The classification in the dimension of operational aspects was minimally adequate in 49.1% of the municipalities. In the organization of the care, the appropriation of the territory (82.3%) and the early capture (56.9%) were indicators with the highest percentages of adequacy. While in the access indicator 63.9% of the municipalities were *inadequate*, that is, they do not have health units with an extended working period. In the analysis of promotion and prevention actions, a low percentage of municipalities (22.6%) presented adequacy in the early diagnosis of pregnancy, HIV and syphilis. In the follow-up subdimension, most municipalities (58.7%) were *inadequate*, especially in gestational follow-up (64.8%). In contrast, the continuity of care is within the expected level in 74.9% of the municipalities.

With regard to the population size and regional location (Tables 4 and 5), municipalities with up to 10,000 inhabitants achieved better results in structural aspects (50.8%), operational aspects (38.6%) and general prenatal evaluation (41.6%), compared to the others. Regarding location, the worst results were observed in the North region in all items analyzed. The Southeast region presented adequacy in operational aspects and the South region in structural aspects and the general prenatal evaluation.

**Table 3**

Classification of municipalities in the evaluation of prenatal care in Primary Care according to components, dimensions and subdimensions. Brazil, 2017.

Components	A		LA		I	
	n	%	n	%	n	%
Structural Aspects	1323	32.6	1587	39.1	1149	28.3
Infrastructure	1442	35.5	1130	27.8	1487	36.6
Adequacy of physical space	2825	69.6	485	11.9	749	18.5
Materials and equipment	1735	42.7	2040	50.3	284	7.0
Inputs and medicines	1116	27.5	1898	46.8	1045	25.7
Human Resources	1515	37.3	1063	26.2	1481	36.5
Staff Adequacy	1476	36.4	1542	38.0	1041	25.6
Population coverage	2164	53.3	-	-	1895	46.7
Specialized Support	3509	86.4	273	6.7	277	6.8
Standardization of care	1543	38.0	-	-	2516	62.0
Normatization of care	900	22.2	1557	38.4	1602	39.5
Updated information	1811	44.6	2030	50.0	218	5.4
Operational Aspects	977	24.1	1994	49.1	1088	26.8
Organization of care	1956	48.2	704	17.3	1399	34.5
Appropriation of territory	3340	82.3	321	7.9	398	9.8
Early Capture	2310	56.9	563	13.9	1186	29.2
Adequate access	1464	36.1	-	-	2595	63.9
Programming of care	2226	54.8	1515	37.3	318	7.8
Promotion and prevention	1985	48.9	823	20.3	1251	30.8
Early diagnosis	916	22.6	1668	41.1	1475	36.3
Immunization	3401	83.8	312	7.7	346	8.5
Identification of diseases	1670	41.1	1972	48.6	417	10.3
Health education	2451	60.4	561	13.8	1047	25.8
Follow-up	551	13.6	1125	27.7	2383	58.7
Gestational follow-up	185	4.6	1244	30.6	2630	64.8
Reference and counter-reference	1093	26.9	2737	67.4	229	5.6
Continuity of care	3041	74.9	462	11.4	556	13.7
General Evaluation of Prenatal Care	997	24.6	2153	53.0	909	22.4

A= Adequate, LA= Minimally adequate, I= Inadequate.



Table 4

Evaluation of structural, operational aspects and overall evaluation of prenatal care in Primary Care, according to population size. Brazil, 2017.

Population size (inhabitants)	A		LA		I		p
	n	%	n	%	n	%	
Structural aspects							<0.001*
Up to 10 thousand	990	50.8	692	35.5	267	13.7	
10 to 25 thousand	214	17.1	569	45.6	466	37.3	
25 to 50 thousand	64	13.6	176	37.5	229	48.8	
>50 thousand	55	14.0	150	38.3	187	47.7	
Operational aspects							<0.001*
Up to 10 thousand	752	38.6	854	43.8	343	17.6	
10 to 25 thousand	120	9.6	677	54.2	452	36.2	
25 to 50 thousand	51	10.9	247	52.7	171	36.5	
>50 thousand	54	13.8	216	55.1	122	31.1	
General evaluation of prenatal care							<0.001*
Up to 10 thousand	810	41.6	876	44.9	263	13.5	
10 to 25 thousand	106	8.5	760	60.8	383	30.7	
25 to 50 thousand	41	8.7	273	58.2	155	33.0	
>50 thousand	40	10.2	244	62.2	108	27.6	

\*Pearson's Chi-square test, A= Adequate, LA= Minimally adequate, I= Inadequate.

Table 5

Evaluation of structural, operational aspects and overall evaluation of prenatal care in Primary Care, according to regions. Brazil, 2017.

Regions	A		LA		I		p
	n	%	n	%	n	%	
Structural aspects							<0.001*
North	61	22.7	84	31.2	124	46.1	
Northeast	431	34.2	576	45.6	255	20.2	
Center-west	95	24.1	156	39.6	143	36.3	
Southeast	393	31.8	477	38.6	367	29.7	
South	343	38.2	294	32.8	260	29.0	
Operational aspects							<0.001*
North	33	12.3	133	49.4	103	38.3	
Northeast	143	11.3	707	56.0	412	32.6	
Center-west	87	22.1	202	51.3	105	26.6	
Southeast	420	34.0	535	43.2	282	22.8	
South	294	32.8	417	46.5	186	20.7	
General evaluation of prenatal care							<0.001*
North	39	14.5	133	49.4	97	36.1	
Northeast	180	14.3	773	61.3	309	24.5	
Center-west	89	22.6	201	51.0	104	26.4	
Southeast	386	31.2	619	50.0	232	18.8	
South	303	33.8	427	47.6	167	18.6	

\*Pearson's Chi-square test, A= Adequate, LA= Minimally adequate, I= Inadequate.

## Discussion

The analysis of this study reveals relevant data on prenatal care under the responsibility of Brazilian municipalities. Less than a quarter of the municipalities presented prenatal adequacy in PC, with worse conditions in the ones with larger population size and located in the North region.

Between the two dimensions analyzed, the structural aspects presented a greater number of municipalities classified as *adequate*. In the infrastructure analysis, financial incentives from the Ministry of Health offered to municipalities since 2011 for the reform, expansion and construction of BHU could have contributed to the result of adequacy of the physical space, with a view to improving working conditions, access and quality of PC.<sup>12</sup>

The high percentage of municipalities offering specialized support is another positive aspect in this dimension, since a care network must be activated in cases that exceed the competencies of the PC teams. In this network are the Family Health Support Center (NASF) and specialists who provide matrix support and care, fundamental to ensure qualified and resolute clinical action. However, as in other studies,<sup>11,13</sup> problems were identified in the adequacy of personnel and population coverage. These are extremely important factors in ensuring that the demands of the population are met without increased workload and with a satisfactory team-population relationship.<sup>14</sup>

In the subdimension of standardization of care, most municipalities were *inadequate*, differing from the findings of Luz *et al.*<sup>6</sup>. It is worth mentioning that the authors analyzed the availability of protocols, unlike the measure adopted in this study that included the information of its use. Municipal management needs to standardize care and encourage teams with respect to the use of clinical protocols for safe decision-making and quality in the care for pregnant women in all units and health services.

Operational aspects are fundamental for the comprehensive and equitable care of the mother / baby binomial. In the organization of care, teams must provide access and adherence to health services. Teams from the municipalities studied, mostly, have information of the territory, make early capture and offer scheduled appointments, according to the gestational risk. Such strategies are fundamental for continuous follow-up with a view to reducing risks and possible complications for the pregnant woman and the fetus.<sup>14,15</sup> However, access to the BHU was inadequate, with almost two-thirds

of the municipalities without an alternative schedule of care for the pregnant worker. Similar findings were reported by Silva MZN *et al.*<sup>15</sup> corroborating the observation that the non-expansion of the opening hours of the units makes it difficult for pregnant women to access the service, as well as it threatens their right to health.

Promotion and prevention actions ensure general health and well-being in the gestational period and include: early diagnosis, immunization, identification of diseases and health education. The findings on early diagnosis in this study deserve attention. Confirmation of pregnancy in the first months allows continuous follow-up, with more guidance and consultation, possibility of identification and appropriate treatment of diseases. Rapid tests of HIV and syphilis allow the immediate onset of follow-up as well as the prevention of vertical transmission of these diseases. The increase in the number of cases, especially syphilis in Brazil, reinforces the concern and demonstrates the importance of qualified prenatal care in PC.<sup>16</sup>

Women should be followed throughout the gestational and puerperal cycle, at different points in the network. The ideal number of consultations is a controversial topic, but it is a frequent indicator in studies evaluating prenatal care. Some countries consider four, six, ten and can reach 15 consultations, as in Finland.<sup>17</sup>

In 2016, the World Health Organization (WHO) expanded the number of consultations from four to eight, based on the scientific evidence that related the increase in the number of meetings with a lower probability of stillborn children.<sup>1</sup> In Brazil, the last recommendation, defined in 2011, is at least seven prenatal consultations, and was used in this analysis. The prevalence of accomplishment of seven or more prenatal visits has increased in the country over the years, from 43.7%, in 2000, to 61.1%, in 2010.<sup>18-21</sup> Despite advances, more than half of municipalities (64.8%) were inadequate in this indicator, considering the judgment parameter defined in this study.

Follow-up at different points in the network has been regular in most municipalities and its effects on the monitoring of high-income pregnant women and the return from maternity are a concerning issue. On the other hand, postpartum care continuity was *adequate* in most municipalities. Nearly three-quarters of the municipalities have at least 90% of the teams performing puerperal consultation until the 10<sup>th</sup> day following the birth, similar to what was found by other authors.<sup>22,23</sup> Concerning about the baby's health, calendar for vaccinations and early diagnosis tests, such as that of the foot, contribute to

the return of puerperae to the unit during this period, and may justify the high percentage of adequacy of this indicator. Measures to improve network integration must be implemented in order to increase safety and improve outcomes in the follow-up of pregnant women.

The municipalities with larger population size showed the worst results compared to smaller ones, corroborating studies at the national level. Larger municipalities have more difficulties in equating public policy actions, while smaller ones are able to meet the basic needs of the population more easily.<sup>24,25</sup> As well as that found by other researchers,<sup>4,11</sup> the North region was the one that presented the worst results, requiring a development model committed to the reduction of regional inequalities and integration between levels of health care, combined with economic and social policies geared towards social inclusion.

In this study, an evaluation of prenatal care in PC was conducted with data from the PMAQ, using Brazilian municipalities as the unit of analysis. Limitations such as the use of secondary data made it difficult the deepening of the analysis. On the other hand, the exploration of data collected with public resources, in a research that adopted a qualified methodological process, is desirable. In the PMAQ, data collection is done with prior sche-

duling, interviewees are aware of the content of questions and it also provides financial contribution to the municipalities that meet established goals. Therefore, it would be expected to find slightly better results, which allows us to affirm that, in fact, data presented here can represent the Brazilian reality.

The reduction of maternal and child mortality rates is a global goal and it has been demanding from the managers actions that ensure equitable public policies and the strengthening of regional networks of care focused on social inclusion for decades.<sup>26</sup>

Most of municipalities in the country presented a low adequacy in prenatal care, even though the performance was better in structural aspects. It is recommended periodic prenatal evaluations to follow up and adopt measures that will improve the quality of this care.

### Authors' Contribution

Cunha AC e Lacerda JT - preparation of the manuscript, search in databases, data collection and analysis, writing, conducting and review. Alcauza MTR and Natal S - writing and review of the manuscript. All authors have approved the final version of the manuscript.

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