

# Strategies For Strengthening High Risk Pregnancy Care In Primary Healthcare Services

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## Research article

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# Abstract

## Background:

In the Brazilian Public healthcare system (The Unified Healthcare System - Sistema Único de Saúde), Primary Healthcare has expanded from implementing healthcare networks, an organization form of services with centrality to primary care services. Due to the extension and heterogeneity of Brazilian municipalities, several organization forms of primary care services existed. In the city of São Paulo they were organized by three modalities of Basic Health Units. Thus, this study aimed to evaluate the care continuity in high-risk pregnancy care in different models of the basic health units.

## Methods:

Data analysis defined performing prenatal care in primary care even after referral to the high-risk pregnancy service as the dependent variable. The independent variables were the sociodemographic and organizational aspects of health services. Logistic regression was used as the statistical technique.

## Results:

Care is provided in a similar way in all basic health unit models, without prioritizing pregnant women with greater vulnerabilities (under 15 years and over 35 years, with education less than 7 years). Regarding women of black or brown color, it was observed that they were more likely (OR 1.997) to have care continuity in family health units. Home visiting and knowing the community health agent proved to be tools for organizing health services which are capable of producing better care.

## Conclusion:

Primary healthcare services in Brazil for high-risk pregnancy care are organized without considering individual vulnerabilities. The home visits and the presence of the community health agent need to be strengthened in organizing the services, as they are able to modify the process of producing healthcare.

## 1. Background

Since the Alma-Ata Declaration, the pursuit of health for all has been the guarantee of universal access to quality healthcare and the importance of becoming a point of first contact in the healthcare network<sup>3</sup>.

In search for improved clinical quality, health results, efficiency in health spending, and in following other international examples, Brazil began to implement the organization of SUS according to the Health Care Network (RAS) model starting from 2010, which aims to ensure the provision of continuous and comprehensive care through coordination and protagonism of primary healthcare through polyarchic organizations of its five components (Primary Health Care (PHC), Specialized Care, Support Systems, Logistics Systems and Governance)<sup>1,2</sup>.

According to the organization model in the RAS, the PHC component (implemented since the 1990s) is highlighted, listed as the gateway to health services and care provider.

In Brazil, PHC expansion has been focusing on implementing Basic Health Units (UBS) with Family Health Teams (ESF), but it is still possible to find two other UBS models in several Brazilian cities, namely Traditional UBS and mixed UBS<sup>4, 5</sup>.

It is not possible to point out a consensus on which UBS model is the most suitable for SUS, although there is a higher prevalence of studies pointing out the ESF as a model which is capable of producing better results in general, especially in small municipalities (with 50% higher PHC attributes for EFS)<sup>6</sup>, with results showing improved prenatal adequacy rates in these UBS models, and in contrast to other studies showing no difference between PHC attributes for traditional units compared to ESF<sup>7,8</sup>.

The traditional UBS models are those which allow greater first contact access, mainly due to the extended operation characteristic adopted in some of these units and for presenting greater absorption capacity for spontaneous demands<sup>9</sup>. In child healthcare, mixed-type UBS are highlighted as providing better results for care coordination, comprehensive care and community orientation when compared to the two other models<sup>10</sup>.

Among the various expected attributes of PHC services, care continuity<sup>11, 12</sup> may vary according to the type of injury or characteristic of the population present in the territory, and there is a distinction between the type of users served and the procedures offered in each model. This work aims to answer the question: "How do sociodemographic characteristics and types of PHC services influence the care continuity between PHC and Specialized Care (SC) in the different types of UBS in the care of high-risk pregnancy?".

## 2. Methods

A cross-sectional evaluative study, being a clipping from the multicenter study entitled "Inquiry on the functioning of primary healthcare and access to specialized care in Brazilian metropolitan areas - AcesSUS", which had the municipality of São Paulo as its study site and aimed to evaluate the care continuity in high-risk pregnancy care in different basic health unit models.

### 2.1 Study Object

The selection of the study object was based on using the concept of tracing condition, pointed out as an effective strategy<sup>13</sup> to evaluate the quality of health services in facing complex system situations by choosing to investigate a health problem which presents prevalence with a clear/definite diagnosis, and for which the health disease process and its management have known patterns.

The tracing condition chosen was High Risk Pregnancy (HRP). This condition is present in 15% of all pregnancies<sup>14</sup>, which has several characteristics and risk factors clearly and objectively listed which predispose a pregnant woman to HRP, such as age under 15 years or over 35 years, unsafe marital status, low education, exposure to occupational risks, previous reproductive history of abortion, preterm delivery, gestational diabetes and pre-existing clinical conditions of hypertension, heart disease, and gynecopathy among others.

Given the existence of any of the characteristics or risk factors, it is recommended to evaluate the gestational risk stratification of these women and to confirm the risk. Based on this stratification, diagnostic resources and intervention procedures follow standardized recommendations through pre-defined protocols and guidelines. As it is a complex health condition, the health system is challenged to offer care in an articulated manner between different levels of complexity.

## 2.2 STUDY POPULATION

The study population consisted of pregnant women who were met in the waiting room of the specialized outpatient clinics (SC) of the city of São Paulo during the month of September 2016 and who were mandatorily referred by Primary Health Care (PHC).

## 2.3 SAMPLE SELECTION

The sampling process followed multiple stages. In the first step for population sizing, we considered the estimated number of medical consultations for high-risk pregnant women performed in each of the specialized care services, using the Integrated Care Management System (*SIGA*) of the municipality of São Paulo as the data source, from January to October 2015, totaling a monthly average of 623.2 calls.

In the second stage, we chose to estimate proportions to calculate the sample size, assuming a confidence level of 95% ( $z = 1.96$ ), and a general sampling error of 0.004. The sample model was defined to allow the analysis of the three types of *UBS* existing in the city of São Paulo (family, traditional and mixed health units) in order to disaggregate the data according to the three models (stratum), considering sampling error of 0.07 for each PHC model, totaling 600 pregnant women as the minimum expected sample, and predicting equal frequencies of 200 in each of the models.

Pregnant women in the city of São Paulo are linked to health units with various organizational characteristics. The traditional *UBS* are units which have teams of general practitioners, pediatricians, obstetric gynecologists, and nursing staff. The *ESF* units have teams composed of general practitioners, nursing staff and community health agents. The mixed type units have the two forms of health teams in their structure which act simultaneously and complement each other.

The third stage was based on the number of women to be included in the sample and the average number of women attended weekly in each service (stratum). The inclusion criterion was to have been

forwarded by the PHC through a municipal regulation system. A total data collection time of 27 days was estimated, comprising the 14 sample services. Considering the dynamics of the data collection stage, a sample weight ranging from 3.144286 to 5.50000 was assigned to each of the sample's specialized services.

## 2.4 INSTRUMENT AND DATA COLLECTION

The primary data collection was applied to users of the specialized level service, and was performed by applying a questionnaire composed of 49 semi-structured questions, elaborated and validated by experts (<https://www.fcm.unicamp.br/acessus/metodologia/inquerito-amostragem/questionarios/gestacao-de-alto-risco>). The questionnaire was about sociodemographic conditions, use of primary care services, specialized care and support systems (laboratory diagnosis and imaging).

Data collected from sociodemographic conditions were: age; years of study; self-declared skin color; which PHC service is responsible for referral and access to health insurance. For PHC services, the gestational period was surveyed when prenatal care began; if she was or remained in prenatal care (PN) in PHC; intervals between PN consultations; which professionals performed care; if the community health agent (CHA) of the territory was known and if at any time during the pregnancy had received home visit (HV).

Data collected from Specialized Care were: if they knew the reason for being in the at-risk prenatal service; time of pregnancy when she was referred; referral professional; days elapsed between referral and first consultation at SC; frequency of consultations and negotiation of the form of delivery with the medical professional.

Furthermore, the use and access to medicines during pregnancy and request and access to laboratory and imaging tests (ultrasound, cardiotocography or others) were investigated for the logistic and support systems. The survey was conducted by previously trained interviewers, and covered 14 SC services for high-risk pregnancy in the city of São Paulo from all health regions, out of a total of 16 services which are referrals to the municipal health system.

## 2.5 DATA ANALYSIS

Of the 49 survey questions, the dependent variable was extracted from the question "Mrs. (xxx), did you follow prenatal care at the station, center or health unit before coming to this service?", selecting the answer as the dependent variable "I am still doing prenatal care at the station, center or health unit", calling the continuity of care between PHC and SC services as a representation for the study.

The independent variables were subdivided from two perspectives; the first was about the sociodemographic characteristics of pregnant women, assuming that youths under 15 years old and

women over 35 years old are vulnerable to develop at-risk pregnancy, as well as those with less than seven years of formal education, and having black/brown skin.

The second set of independent variables was selected to identify the care characteristics of PHC services, using the following variables: “knows the CHA”, “received HV”, “Gestational Age which started the PN” and the elapsed time between “referral and first consultation at SC”.

Data were tabulated in an Excel spreadsheet and a preliminary description of variables was performed with support of the Stata version 14.0 program (StataCorp LP, CollegeStation, United States), while a logistic regression test was also applied in order to identify likelihood of association of continuity of care.

## **2.6 ETHICAL ASPECTS**

The study was approved by the Research Ethics Committee of the University of Campinas under opinion No. 1,777,800/2016. The informed consent form was read and signed by all women who agreed to participate in the study prior to the application of each questionnaire, according to Resolution 466/2012 of the National Health Council.

## **3. Results**

It is possible to identify prevalence and similar distribution among the three types of services from the results obtained from the total of 688 pregnant women interviewed for the sociodemographic variables, pregnant women aged 16 to 35 years old and schooling up to complete high school (61.22%), resembling the overall average (Table 1).

Table 1

Sociodemographic and care variables of PHC services, according to the different PHC models

Variables	ESF units (293)		Traditional units (241)		Mixed units (154)		Total (688)	
	N	%	N	%	N	%	N	%
Age (years)								
12 to 15	26	8,87	8	3,32	7	4,55	41	5,96
16 to 35	184	62,80	167	69,29	107	69,48	458	66,57
≥ 36	83	28,33	66	27,39	40	25,97	189	27,47
Years of study								
≤ 7	74	25,34	65	27,20	54	35,07	193	28,13
8 to 12	185	63,36	148	61,92	86	55,84	420	61,22
≥ 13	33	11,30	26	10,88	14	9,09	73	10,64
Skin color								
White	103	35,27	100	42,02	53	34,42	256	37,37
Black	54	18,49	40	16,81	27	17,53	121	17,66
Brown	134	45,89	92	38,66	71	46,10	298	43,50
Indigenous	1	0,34	6	2,52	3	1,96	10	1,46
Home visits								
Yes	211	72,01	15	6,22	73	47,40	299	43,46
No	82	27,99	226	93,78	81	52,60	389	56,54
Community Health Agents								
Yes	270	92,15	30	12,93	98	65,33	398	58,88
No	23	7,85	202	87,07	52	34,67	278	41,12
Prenatal Care Capture								
Early capture <sup>1</sup> ,	250	85,32	184	76,35	125	81,17	559	81,25
Late capture	43	14,68	57	23,65	29	18,83	129	18,75
Range for reference								
<sup>1</sup> before the 12th gestational week								

<b>Variables</b>	<b>ESF units (293)</b>		<b>Traditional units (241)</b>		<b>Mixed units (154)</b>		<b>Total (688)</b>	
≤ 30 days	266	91,10	215	89,58	139	92,05	620	90,12
> 30 days	26	8,90	25	10,42	12	7,95	63	9,88
Continuity of care in the PHC								
Yes	242	83,16	156	65,27	103	66,88	501	73,40
No	49	16,84	83	34,73	51	33,12	183	26,60
<sup>1</sup> before the 12th gestational week								

Regarding the color variable, there was a predominance of brown color followed by white in the ESF and mixed services, while the opposite situation occurred in traditional units where there was a predominance of white women followed by brown women.

In the analysis of the variables of the characteristics of the health services, the pregnant women linked to the ESF units reported having received home visits the most (72.01%), followed by mixed units (47.40%), and with a much lower percentage of the overall sample average (43.40%) occurring for the traditional type units (6.22%).

For the CHA representative, 92.15% (Table 1) of pregnant women linked to the ESF units reported knowing them, followed by mixed units (65.33) and traditional units (12.93). It is noteworthy that at the time of applying the survey, the HV was considered as existing independent from the professional who performed it, and it is identified that the proportion of HV is lower than the number of pregnant women who reported knowing their CHA in the data analysis. Therefore, the work of the CHA professional in the territory should be debated.

Early capture, which occurs before the 12th gestational week, was prevalent in all UBS models, with an emphasis on the ESF units (85.32%), followed by mixed units (81.17%), and the traditional units (76.35%) were below the general average.

The interval between the referral by the PHC and the first consultation of the SC in all unit types was less than 30 days, with emphasis on the mixed units (92.05%), followed by the ESF (91.10%) and the traditional units (89.58%).

There was less chance of continuity of care for pregnant women in the vulnerable age group between services in EFS UBS (OR 0.622 CI 0.32–1.18), which was opposite of the other UBS (Table 2). The years of study achieved by pregnant women reflected differently on the continuity of care in the UBS types; those in a state of vulnerability, having less than seven years, had lower chances of continuity of care in the mixed units (OR 0.661 CI 0.17- 2.47) and in the EFS (OR 0.766 CI 0.29-2.00), while in those linked to

traditional units, the low level of education increased the chance of effective continuity of care between PHC and SC.

Table 2

Analysis “continuity of care” and sociodemographic and health service characteristics according to the UBS models

Variáveis	ESF units (293)		Traditional units (241)		Mixed units (154)	
	OR <sup>1</sup>	IC <sup>2</sup>	OR <sup>1</sup>	IC <sup>2</sup>	OR <sup>1</sup>	IC <sup>2</sup>
Age (years)						
15 a 35	1		1		1	
< 15 to > 35	0,622	0,327-1,185	1,015	0,548-1,877	1,014	0,456-2,254
Years of study						
> 7	1		1		1	
≤ 7	0,766	0,293-2,003	1,225	0,548-1,877	0,661	0,177-2,472
Skin color						
White	1		1		1	
Non-white	1,997	1,044 - 3,817	0,811	0,451-1,458	1,256	0,586-2,691
Home visits						
Yes	1		1		1	
No	0,687	0,331-1,425	0,478	0,834-2,740	0,539	0,206-1,410
Community Health Agents						
Yes	1		1		1	
No	0,618	0,209-1,822	1,195	0,393-3,634	0,730	0,261-2,042
Prenatal Care Capture						
Early capture <sup>3</sup> ,	1		1		1	
Late capture	1,593	0,563-4,502	0,851	0,432-1,676	2,214	0,791-6,194
Range for reference						
≤ 30 days	1		1		1	

<sup>1</sup>Logistic regression test. Odds ratio.

<sup>2</sup> 95% confidence interval.

<sup>3</sup> Before the 12th gestational week

Variáveis	ESF units (293)		Traditional units (241)		Mixed units (154)	
	OR <sup>1</sup>	IC <sup>2</sup>	OR <sup>1</sup>	IC <sup>2</sup>	OR <sup>1</sup>	IC <sup>2</sup>
> 30 days	0,906	0,321-2,559	1,069	0,418-2,736	0,348	0,851-1,428
<sup>1</sup> Logistic regression test. Odds ratio.						
<sup>2</sup> 95% confidence interval.						
<sup>31</sup> Before the 12th gestational week						

Black or brown women compared to white women were more likely to have continuity of care between PHC and SC when linked to ESF (OR 1.977 CI 1.04–3.81) and mixed units(1.256 CI0.17-2.47).In the analysis of the characteristics of health services, the absence of home visits under the responsibility of PHC proved to be a variable which reduces the chances of continuity of care in all UBSmodels, with greater intensity for UBSESF, followed by mixed and traditional.

Women who reported not knowing the community health agent in their territory were less likely to carry out continuity of care, both for those linked to UBS EFS (OR 0.618 CI 0.20–1.82) or to mixed (OR 0.730 CI 0.26–2.04). The CHA professional is not predicted in the traditional type units, thus, the absence of this professional was not shown as a variable that decreases the chances of effective continuity of care.

Late prenatal intake increased the chances of continuity of care in mixed units (OR 2.214 CI 0.79–6.19) and ESF (OR 1.593 CI 0.56–4.50) and reduced it in traditional units (OR 0.851 CI 0.43–1.67), compared to pregnant women starting prenatal care by the 12th gestational week. The greater chance of continuity of care in mixed units and ESF in pregnant women captured late may be related to their performance based on territories with a limited and assigned population, which allows them to more actively develop actions in the territory, especially for the population most at risk and vulnerable, as in the case of HRP.

The time elapsed between the request for referral by the PHC and the consultation of the SC when more than 30 days reduces the chances of continuity of care, both in mixed units (OR 0.348 CI 0.85–1.42) and in ESF (OR 0.906 CI 0.32–2.55). There is almost no difference between the referral periods for traditional units.

## 4. Discussion

Among the three types of UBS, the EFS had the lowest chances of continuity of care after referral to SC for both the variables of age and education. Surveillance strategies and health education in the territories are essential, since there is a tendency of repetition of pregnancy in adolescents and chances of reduced years of schooling and less opportunity for access to income<sup>15,16,17</sup>. Another important action to be taken by the PHC services is family planning aimed at the adolescent public, considering that 23% of pregnancies were scored as planned, with a positive association (OR 1.92) of desire to become pregnant

in women with less than eight years of studying<sup>17</sup> and highlighting the increase in the number of pregnant women under 14 years of age<sup>15</sup>.

The results show that women of black and brown color are more likely to establish continuity of care between PHC and SC in ESF (OR 1.99) and mixed (OR 1.25) units. Non-white women in the United States were more likely to receive general health counseling on HIV testing, breastfeeding, and alcohol and tobacco use than white-skinned women<sup>18</sup>.

Although the results suggest that the ESF and mixed units have greater opportunity to perform care for pregnant women of black or brown color,<sup>19</sup> it is pointed out that these groups of pregnant women are unable to perform the recommended routine examinations, they have more commute during childbirth, have a reduced number of prenatal consultations<sup>20</sup> and overall have higher rates of inadequacy for prenatal care<sup>21,22</sup>. This situation reinforces the discussions presented that expanding access to prenatal care was not sufficient for inducing quality care<sup>23</sup>, and although EFS and mixed units are able to strengthen the continuity of care between services, they may not be able to effect care for pregnant women.

Regarding the set of sociodemographic characteristics of pregnant women (age, education and color), the EFS units were generally the ones which most reinforced the disparities in the continuity of care among vulnerable groups. Health actions in PHC services, especially here in the EFS units, need to be more careful in being guided considering the conditions of social vulnerability of the territories in order to reduce health inequities.

Among the characteristics related to health services, the absence of home visits (HV) was shown as a reducing factor of the chances of continuity of care. The HV provides the opportunity to expand the knowledge of users' life context<sup>24</sup>, and has the ability during the pregnancy and puerperal period to reduce the prevalence of low birth weight and increase the prevalence of exclusive breastfeeding in the first six months<sup>25</sup>.

The HV is shown as a successful action in maternal and child healthcare, but some challenges must be put in the agenda seeking improvement. The visits last less than 5 minutes<sup>26</sup>, a relatively short period to develop health promotion and disease prevention actions; also, the HVs focus on diseases or the health status of the user, with low focus on health education issues<sup>26</sup>.

The HV should be performed by all professionals who make up the PHC teams, but there is a leading role for the work of Community Health Agents. After reformulating the Brazilian National Primary Care Policy<sup>27</sup>, the CHA no longer constitutes a mandatory member of the teams, thus weakening a potent form of PHC care. Inclusion of CHAs in teams is essential for strengthening primary care.

The results point to the prevalence of early prenatal intake in the three types of UBS, however there is a greater chance of effective continuity of care in the EFS and mixed units when intake occurs late. Late

prenatal intake reduces the chances of risk identification and timely intervention of complications<sup>19,28</sup>, triggering alarm in health teams and moving various resources such as HV and CHA to maintain surveillance. This situation may be the explanatory hypothesis for the findings.

Sending PHC referrals to SC in a timely manner is a challenge for healthcare networks, when over 30 days proved to be a variable capable of reducing the chances of continuity of care in high-risk pregnancy. Strategies such as the use of clinical practice and regulation protocols widely known by health professionals, and strengthening strategies such as matrix support and the use of health technologies can reduce the demand and the long waiting time for specialized care<sup>29,30</sup>.

For the characteristics of the services, the ESF and mixed units presented similar results, but there are necessary advances in the three UBS modalities, such as strengthening the HV, maintenance and expansion of the CHA in the health teams, and improving the PHC resoluteness to reduce referrals and the time taken for effective service by the specialized services.

## Study Limitations

As a limitation of the study, the adopted statistical analytical model did not follow the consensus in the literature and the selection of independent variables for the logistic regression test were included in order to enable representing personal characteristics and services which may directly or indirectly influence continuity of care and not based on pre-test significance for each individual variable (chi-squared test). It is noteworthy that this strategy was adopted because it is an evaluative study of health services, and was not conducted from the epidemiological perspective.

The results, however representative of the sample, cannot be extended to other populations, since the statistical significance to assess relationships has not been confirmed, but they collaborate in order to highlight weaknesses in the healthcare in the studied sample.

## 5. Conclusion

The ESF and mixed units are located in the territories in order to reduce inequities in access to healthcare; a fact represented by the prevalence of black and brown women in high-risk pregnancy care. The traditional units are implemented in what are today the central regions in the city of São Paulo as they are older, and have less access to vulnerable populations both for the education and color variables.

For the set of sociodemographic variables (age, education and color), traditional-type units are more likely to maintain continuity of care in the low-educated population than the EFS for the black/brown population. Working the territory with all types of UBS units according to their vulnerabilities is essential, considering as many variables as possible in an attempt to reduce the selective offer of continuity of care.

Home visits and community health agents were effective in the set of service characteristic variables, increasing the chances of continuity of care. Such care tools should be strengthened in the different UBS models in order to enhance the performance of PHC services.

## **Declarations**

### **Ethics approval and consent to participate**

The study was approved by the Research Ethics Committee of the University of Campinas under opinion No. 1,777,800/2016. The informed consent form was read and signed by all women who agreed to participate in the study prior to the application of each questionnaire, according to Resolution 466/2012 of the National Health Council.

### **Availability of data and materials**

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

### **Competing interests**

The authors declare that they have no competing interests" in this section.

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### **Authors' contributions**

NA conducted the analyses of data, interpreted the data and drafted the manuscript. OYT contributed to the interpretation of data and critically revised the manuscript. All authors read and approved the final manuscript.

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### **Not applicable**

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