

# Access and coverage of Primary Health Care for rural and urban populations in the northern region of Brazil

## *Acesso e cobertura da Atenção Primária à Saúde para populações rurais e urbanas na região norte do Brasil*

Luiza Garnelo<sup>1</sup>, Juliana Gagno Lima<sup>2</sup>, Esron Soares Carvalho Rocha<sup>3</sup>, Fernando José Herkrath<sup>4</sup>

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**ABSTRACT** Access inequities to the Unified Health System compromise the assurance of primary health care for rural populations and other groups in situations of vulnerability. A cross-sectional study that evaluated users' access and coverage of Family Health Teams (FHT) from the seven states of the Northern region of Brazil and that joined the external evaluation of the second cycle of the National Program for Access and Quality Improvement in Primary Care (PMAQ-AB). The PMAQ-AB data were related to demographic, socioeconomic and health indicators, using the Spearman correlation coefficient. For the region as a whole, the assistance coverage of teams based in rural, urban and urban areas that declared covering rural populations was 83.3%. Coverages between 90-100% were found for Acre, Amapá, Roraima and Tocantins. Lower percentages were found in Pará (50.5%) and Amazonas (60.5%). The coverage extension hides geographical access barriers related to the concentration of Family Health Strategy teams in urban areas, a situation that involves 451 (25.3%) units and 494 (22.9%) teams in charge of serving rural populations, but which act in urban area, adding barriers to the arrival of users to the units. Difficulties in welcoming spontaneous demand, appointment scheduling and availability of transportation for care were also reported.

**KEYWORDS** Health services accessibility. Rural population. Primary Health Care.

**RESUMO** *Iniquidades de acesso ao Sistema Único de Saúde comprometem a garantia de cuidados primários de saúde para populações rurais e para outros grupos em situação de vulnerabilidade. Estudo transversal que avaliou acesso de usuários e cobertura assistencial de Equipes de Saúde da Família (EqSF) dos sete estados da região norte do Brasil e que aderiram à avaliação externa do segundo ciclo Programa Nacional de Melhoria do Acesso e da Qualidade da Atenção Básica (PMAQ-AB). Os dados do PMAQ-AB foram relacionados a indicadores demográficos, socioeconômicos e de saúde, por meio do coeficiente de correlação de Spearman. Para o conjunto da região, a cobertura assistencial de equipes sediadas em área rural, urbana e urbana que declararam atender a populações rurais foi de 83,3%. Coberturas entre 90-100% foram encontradas para o Acre, o Amapá, Roraima e o Tocantins. Menores percentuais foram encontrados no Pará (50,5%) e no Amazonas (60,5%). A extensão de cobertura encobre barreiras de acesso geográfico ligadas à concentração de equipes da Estratégia Saúde da Família nos espaços urbanos, situação que se estende a 451 (25,3%) unidades e a 494 (22,9%) equipes encarregadas do atendimento*

<sup>1</sup>Fundação Oswaldo Cruz (Fiocruz), Instituto Leônidas e Maria Deane (ILMD) - Manaus (AM), Brasil.  
Orcid: <https://orcid.org/0000-0003-0263-7286>  
[luiza.garnelo@fiocruz.br](mailto:luiza.garnelo@fiocruz.br)

<sup>2</sup>Universidade Federal do Oeste do Pará (Ufopa) - Santarém (PA), Brasil.  
Fundação Oswaldo Cruz (Fiocruz), Escola Nacional de Saúde Pública Sergio Arouca (Ensp) - Rio de Janeiro (RJ), Brasil.  
Orcid: <https://orcid.org/0000-0002-5576-0002>  
[julianagagno@yahoo.com.br](mailto:julianagagno@yahoo.com.br)

<sup>3</sup>Universidade Federal do Amazonas (Ufam), Escola de Enfermagem - Manaus (AM), Brasil.  
Orcid: <https://orcid.org/0000-0002-1011-6053>  
[willy.rocha@hotmail.com](mailto:willy.rocha@hotmail.com)

<sup>4</sup>Fundação Oswaldo Cruz (Fiocruz), Instituto Leônidas e Maria Deane (ILMD) - Manaus (AM), Brasil.  
Orcid: <https://orcid.org/0000-0003-4439-0189>  
[fernandoherkrath@gmail.com](mailto:fernandoherkrath@gmail.com)



*de populações rurais, mas que atuam em espaço urbano, adicionando barreiras à chegada dos usuários às unidades. Dificuldades no acolhimento à demanda espontânea, agendamento de consulta e disponibilidade de transporte para o atendimento também foram reportadas.*

**PALAVRAS-CHAVE** Acesso aos serviços de saúde. População rural. Atenção Primária à Saúde.

## Introduction

The guarantee of access to health care integrates the principle of universality of the Unified Health System (SUS) that has not yet been implemented for a significant part of Brazilians, in particular, the population in a situation of vulnerability and residing in rural areas. The persistence of strong regional inequalities in living conditions and the provision of health services, associated with the high concentration of professionals and health actions in urban areas, penalizes the residents of the Northern and Northeast regions more intensely<sup>1-3</sup>.

The rural population represents almost 16% of the Brazilian population<sup>4</sup>; has a strong dependence on public health services and a weak link to supplementary health plans<sup>5</sup>. It also faces inequities of geographical access, insufficiency of health professionals and precariousness of the physical network of health units<sup>6</sup>. These factors limit the regular supply of Primary Health Care (PHC) in the rural environment<sup>7</sup> and the search for the reference network that has been preferentially installed in urban areas.

The Northern region concentrates the worst rates of utilization of health services in the Country<sup>7,8</sup>, facing a low availability of doctors (1/1000 inhabitants), which is 7 times lower than that found in

the capitals of the South of the Country (7.1/1000). Among the federated units in the North, Amazonas had the lowest percentage of doctors working in the countryside (6.9%) in 2013. The same state had 2.0 doctors/1000 inhabitants in the capital in the same year, against 0.2/1000 in the countryside (capital/countryside ratio of 10), a smaller value only than Pará, with a capital/countryside ratio of 11.32.

Analysis of health regions in the legal Amazon<sup>8-11</sup> show a low Human Development Index (HDI) in 46% of them and indicate that the health policies of the federal government for the region suffer from low institutionality, discontinuity and limited sensitivity to regional specificities. The transfer of federal resources is lower than the national average and there is restricted management capacity at the municipal level<sup>11</sup>. It is a set of factors that implies insufficient supply of PHC network and difficulty in fixing health workers, in addition to optimizing the concentration of services of medium and high complexity in capitals<sup>11</sup>.

The limitations of the organization and provision of health services are associated with low income, population dispersion and the great geographic distances typical of the Amazon. Together, these elements result in barriers to access and use of health services, which particularly penalize rural populations<sup>11</sup>.

Access studies<sup>12-15</sup> to health services and actions show the marked polysemy of the term, which requires a clear definition of the conceptual choice adopted in each study. Unglert<sup>16</sup> prioritizes the notion of access/geographical accessibility when valuing the time and the difficulty/easiness of the displacement to be made to cover the distance that separates the health service from the residence of the user in a given territory. The same author acknowledges two other dimensions in the study of access: a technical dimension, which is directly related to the characteristics of the organization of services and procedures/care offered there, and an economic dimension, aimed at the characterization of costs involved in the displacement in search and in obtaining diagnostic and therapeutic means.

Giovanella and Fleury<sup>17</sup> recognize five dimensions that integrate the concept of access, such as availability, the relationship between the type and quantity of services offered in face of the needs recognized by the population; financial capacity, relation between cost and offer of services made available; accessibility, relation between disposal and distance of the implanted services and the dwelling places of the users, resulting in the necessity of major or minor displacement; and acceptability, which can be translated as the recognition (or not) by the users of the pertinence of the actions offered, reflecting on the interest and accession to them. Acceptability is directly related to functional adequacy, a term that expresses adjustment strategies by the services offered and the users' efforts to accommodate what is available to them.

In the detailing made by the authors, it is of special interest the accessibility dimension, enriched for purposes of this study by the inflection given by Donabedian<sup>18</sup>, which distinguishes between geographical and socio-organizational accessibility,

the latter contemplating aspects such as waiting time, possibility of immediate care and ways of organizing the day-to-day functioning of health services.

Reception, an important attribute of PHC care, has assumed here the meaning pointed out by Franco, Bueno and Merhy<sup>19</sup> who understand it as a qualified and humanized listening of needs of the users, enhancing not only the therapeutic alliance, but also the increase of accessibility to health services.

It is necessary to distinguish the estimated coverage of primary care – often interpreted as equivalent to access – from the multiple dimensions contained in the term access. In this study, coverage was understood as the quantified possibility of obtaining care, and may not be effective for various reasons, such as the barriers encountered by individuals in seeking care. In this sense, it is understood that health care coverage differs from the concepts of access and use of health services<sup>20,21</sup>.

The objective of this study was to discuss the access and coverage of PHC offered to rural and urban populations living in the seven states of the northern region of Brazil, based on socioeconomic and health indicators and data from the external evaluation of the second cycle of National Program for Access and Quality Improvement in Primary Care (PMAQ-AB).

## Methods

The PMAQ-AB is a program of the Ministry of Health that aims to increase access and improve the quality of PHC by means of evaluation and periodic monitoring of its actions. The program is developed in four phases (accession/contractualization, development, external evaluation, and new cycle or recontractualization) and is already in its third evaluation cycle. The external evaluation is developed through six modules: I (observation of the infrastructure of the basic

health unit); II (interview with the professional about the work process of the Family Health Team – FHT who works in the unit); III (interview with the user at the Basic Health Unit – BHU about satisfaction and conditions of access and use of health services; for this module, four users are interviewed per team, selected for convenience among those present in the unit); IV (interview with the professional of the Family Health Support Nucleus); V (observation of the oral health infrastructure in the BHU) and VI (interview with the oral health professional)<sup>22</sup>. The data analyzed here come from the external evaluation instruments, from the 2nd cycle, carried out between 2013 and 2014, which included 29,808 FHT, of which 19,948 teams with oral health, in 5,211 municipalities of the Country<sup>23</sup>.

In this cross-sectional study, data from modules I (for identification of the number of establishments and teams covered by the PMAQ-AB), module II (variables II.12.1; II.12.6; II.12.9; II.12.12; II.12.13; II.12.13.1; II.12.13.2; II.12.18; II.13.1; II.14.8; II.31.3; II.31.5) and module III (variables III.5.1; III. 5.2; III.5.7; III.6.1; III.6.2; III.7.2; III.7.3; III.11.1; III.23.5)<sup>24</sup> were used, in order to analyze the data on 1,784 BHU, 2,157 teams (equivalent to 69.4% of those working in the Northern region) and 8,394 users (*table 2*).

The variables selected in module II were about items concerning the reception of spontaneous demand, scheduling of consultations at the BHU, health care and attendance to rural populations. From module III (interview with the user), items related to accessibility, appointment of consultations in the BHU, care and satisfaction with care were analyzed.

The analysis took into account the geographic location of the units and the responses of teams located on rural, urban areas and urban teams that provide assistance to rural populations. Teams and units registered as rural were included in the last group, but whose geographic coordinates prove that they are based in urban space and that in the

interviews applied to the professionals these confirmed to attend rural population (question 31.3 of module II).

For the identification of the location of health units in rural or urban areas, the geographical coordinates of each establishment were used in the PMAQ-AB database. These data were analyzed in the open source geographic information system QGIS, version 2.18, using the municipal territorial meshes provided by the Brazilian Institute of Geography and Statistics (IBGE)<sup>25</sup>. The coordinates of the establishments with missing data were obtained through the addresses available in the database and in the National Register of Health Facilities.

For the construction of the socioeconomic and health scenario of the municipalities of the Northern region, the health indicators made available by Datasus referring to the year 2013 were used, including coverage of FHT, percentage of hospitalizations due to PHC conditions, percentage of basic calendar vaccines of vaccination of children with adequate coverage in the municipality, number of inhabitants and proportion of residents in rural areas<sup>26</sup>. Data on human development and inequality in income distribution provided by the Atlas of Human Development in Brazil were also used<sup>27</sup>. The correlation of the team coverage with the other municipal indicators was evaluated using the Spearman correlation coefficient. The data were analyzed in the SPSS program, version 22.0.

The databases of public access of the PMAQ-AB cycle 2, made available on a website of the Ministry of Health<sup>23</sup> were used, in addition to the IBGE database<sup>25</sup>. The PMAQ-AB study was approved by the Research Ethics Committee in Human Beings of the Oswaldo Cruz Foundation's National School of Public Health (CEP/Ensp/Fiocruz), which can be identified by CAAE 02040212100005240 and approval opinion n° 117.396, having followed ethical principles of Resolution n° 466/1228.

## Results

The percentage of coverage estimated for the PHC teams in the municipalities of the Northern region is shown in *figure 1A*. Of the 450 municipalities, 34% (n=153) had a

population coverage of 100%. A negative correlation was found between the population of the municipalities and the coverage of the teams. The lower the population size, the higher the coverage percentage ( $r_s = -0.55, p < 0.001$ ).

Figure 1. A: percentage of coverage of the PHC teams by municipality, Northern region, Brazil, 2013. B: location of the teams evaluated in the second cycle of PMAQ-AB, Northern region, Brazil, 2013-2014

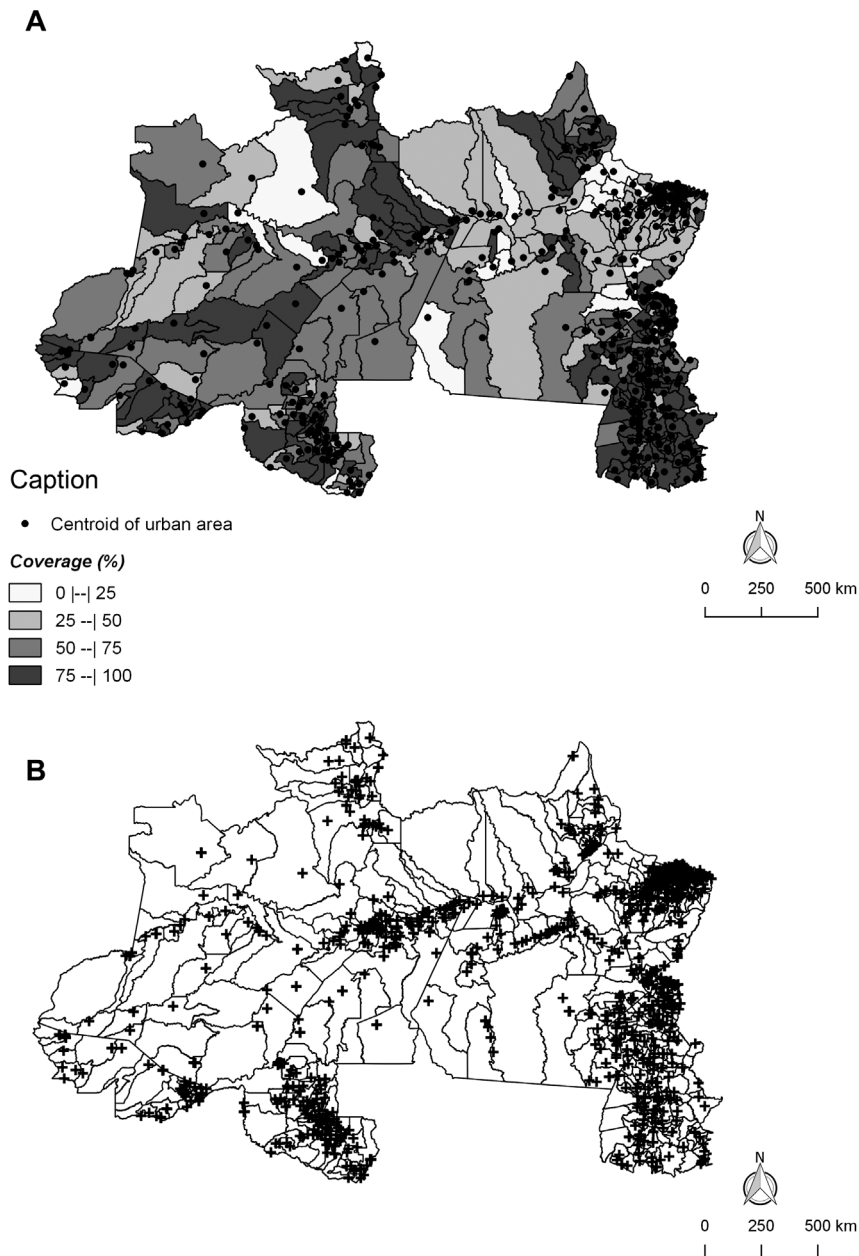


Figure 1 emphasizes, in its component A, the care gaps in large areas of the Northern region. Component B also shows the concentration of teams in certain spaces, such as the municipal headquarters that in the states of Amazonas and Acre tend to settle on the banks of the great rivers, leaving uncovered the population that lives far from the watercourses. In states such as Pará, Rondônia and Tocantins, where the road network is more expressive, there is a greater presence of Family Health Strategy (FHS) teams in cities distributed along the roads.

The municipal indicators evaluated in the study are described in *table 1*, which brings the proportion of rural population in the municipalities of the region, ranging from 0.2% to 95.8%

(median=0.44). The correlation between the percentage of coverage and the proportion of rural population in the municipalities was very weak ( $rs=0.11$ ,  $p=0.025$ ). In addition, although the municipalities with the highest coverage had a lower percentage of hospitalizations due to sensitive conditions of the PHC, the correlation was also weak ( $rs=-0.20$ ,  $p<0.001$ ). The same occurred for the percentage of vaccines with adequate coverage ( $rs=0.11$ ,  $p=0.025$ ). There was also a weak correlation between the coverage of the teams with the Gini index ( $rs=-0.22$ ,  $p<0.001$ ) and a moderate correlation with the Municipal Human Development Index (HDI-M) ( $rs=0.35$ ,  $p<0.001$ ), suggesting a better coverage in municipalities with better indicators.

Table 1. Measures of central tendency and dispersion (median and amplitude) of the indicators used for socioeconomic and health characterization of the municipalities of the Northern region

Federation Unity	% rural population	% coverage primary care	% hospitalizations due to conditions sensitive to primary care	% vaccines with adequate coverage	Index of Gini	HDI
AC	44,0 (8,2-86,7)	97,4 (19,8-100)	40,8 (15,9-55,5)	22,2 (11,1-77,8)	0,60 (0,54-0,78)	0,589 (0,469-0,727)
AM	47,0 (0,5-95,8)	60,5 (17,1-100)	41,6 (12,0-73,7)	44,4 (11,1-100)	0,61 (0,52-0,80)	0,564 (0,450-0,737)
AP	34,1 (2,1-58,9)	90,2 (58,7-100)	22,8 (11,9-62,1)	66,7 (11,1-100)	0,61 (0,55-0,69)	0,641 (0,576-0,733)
PA	52,1 (0,2-88,1)	50,5 (0-100)	40,8 (11,9-70,5)	55,6 (0-100)	0,56 (0,42-0,70)	0,583 (0,418-0,746)
RO	48,4 (5,2-83,1)	71,1 (0-100)	35,8 (15,6-55,5)	77,8 (11,1-100)	0,53 (0,43-0,67)	0,643 (0,584-0,736)
RR	56,7 (2,3-86,9)	100 (22,9-100)	28,5 (16,0-45,9)	22,2 (11,1-88,9)	0,66 (0,53-0,78)	0,624 (0,453-0,752)
TO	35,6 (2,3-78,4)	100 (0-100)	30,4 (10,3-53,6)	77,8 (0-100)	0,54 (0,42-0,74)	0,639 (0,500-0,788)
<b>Northern Region</b>	<b>44,2 (0,2-95,8)</b>	<b>83,3 (0-100)</b>	<b>36,1 (10,3-73,7)</b>	<b>55,6 (0-100)</b>	<b>0,56 (0,42-0,80)</b>	<b>0,609 (0,418-0,788)</b>

Source: Datasus<sup>26</sup>; Atlas of Human Development in Brazil<sup>27</sup>.

Of the 153 municipalities which presented 100% population coverage, one third (33.3%) had a larger rural population than the urban one (*table 1*). However, *figure 1B* showed that most of the teams evaluated in the second cycle of PMAQ-AB (82%) are based in urban

areas of the municipalities; In addition, 38.7% of the teams located in urban areas (22.9% of the total) stated that they provide assistance to rural populations, that is, they work in locations far from their areas of coverage.

Table 2. Quantitative of health units, teams and participating users in the 2nd cycle of the PMAQ-AB according to the rural, urban and urban which assists the rural population categories, Northern region, Brazil, 2013-2014

FU/ Region	Basic Health Units participating in the PMAQ-AB				Primary Health Teams participating in the PMAQ-AB				Users participating in the PMAQ-AB			
	Rural (R) n(%)	Urban (U) n(%)	Urban which assists Rural (UR) n(%)	Total n(%)	Rural (R) n(%)	Urban (U) n(%)	Urban which assists Rural (UR) n(%)	Total n(%)	Rural (R) n(%)	Urban (U) n(%)	Urban which assists Rural (UR) n(%)	Total n(%)
AC	17 (18,7)	51 (56,0)	23 (25,3)	91 (100)	17 (17,5)	55 (56,7)	25 (25,8)	97 (100)	213 (55,2)	68 (17,6)	105 (27,2)	386 (100)
AM	49 (12,3)	263 (65,8)	88 (22,0)	400 (100)	57 (12,2)	315 (67,3)	96 (20,5)	468 (100)	1281 (68,5)	224 (12,0)	365 (19,5)	1870 (100)
AP	14 (18,9)	46 (62,2)	14 (18,9)	74 (100)	14 (11,1)	96 (76,2)	16 (12,7)	126 (100)	403 (78,7)	60 (11,7)	49 (9,6)	512 (100)
PA	217 (31,6)	345 (50,2)	125 (18,2)	687 (100)	224 (28,9)	420 (54,1)	132 (17,0)	776 (100)	1683 (54,3)	888 (28,7)	528 (17,0)	3099 (100)
RO	38 (21,2)	81 (45,3)	60 (33,5)	179 (100)	41 (16,3)	142 (56,3)	69 (17,0)	252 (100)	580 (56,3)	168 (16,3)	283 (27,4)	1031 (100)
RR	13 (21,7)	31 (51,7)	16 (26,7)	60 (100)	13 (16,9)	46 (59,7)	18 (27,4)	77 (100)	172 (53,1)	60 (18,5)	92 (28,4)	324 (100)
TO	19 (6,5)	149 (50,7)	126 (42,9)	294 (100)	22 (6,1)	201 (55,7)	138 (38,2)	361 (100)	660 (56,4)	67 (5,7)	444 (37,9)	1171 (100)
<b>Northern Region</b>	<b>367 (20,6)</b>	<b>966 (54,1)</b>	<b>451 (25,3)</b>	<b>1784 (100)</b>	<b>388 (18,0)</b>	<b>1275 (59,1)</b>	<b>494 (22,9)</b>	<b>2157 (100)</b>	<b>4992 (59,5)</b>	<b>1536 (18,3)</b>	<b>1867 (22,2)</b>	<b>8394 (100)</b>

Source: PMAQ-AB<sup>23</sup>; IBGE<sup>25</sup>.

Table 2 reaffirms the previous observation that most of the BHU is located in urban areas (54.1%), in contrast to 367 (20.6%) based in rural areas. The same table shows 461 (25.3%) units registered as rural, but whose operating regime led to its inclusion in the urban category that serves the rural population. If all were based in rural areas, this population would have at their disposal 45.9% of the total BHU of the Northern region, which does not occur, since the interior has only 20.6% of them working in rural territories. In the case of Roraima, the sum of rural and urban BHU that inform assisting the rural population (n=29, 48.4%) is slightly lower than the percentage of urban BHU (51.7%). In Pará, this proportion is almost equivalent (341/345). Similar behavior is observed for the variable FHS teams.

Regarding users, most of the interviews (81.7% of the interviewees) were registered

in rural units. However, this information is inconclusive due to the aforementioned sample bias for the selection of users by PMAQ-AB. What the information contained in table 2 allows to infer is that the presence of users in rural BHU was high at the moment of data collection, since the number of rural users interviewed exceeded by 3.2 times the number of urban interviewees, number of teams and units is much higher in cities.

These results can either derive from the refusal of urban users to respond to the survey or from their low frequency in the units, making it difficult to obtain the interviews. The percentage of users interviewed in urban units serving the rural population was also higher than the percentage reached in purely urban units and teams (22.2% versus 18.3% in urban areas).

The available data do not allow undoubted

conclusions about such events. If on the one hand they can be attributed to a high displacement of residents in rural areas to the urban units scaled to assist them, on the other hand there is no way to prove (or disprove) that the service done there is directed exclusively to rural people, or it also encompasses the demand of urban residents in the vicinity of these BHU. The last hypothesis is reinforced by results that will be presented in *table 4*, in which 97% of the interviewees,

for the whole Northern region, report distance of up to 15 minutes between their home and the BHU. The great distances which are characteristics of Amazonia argue against the possibility that these respondents are, in fact, residents of rural areas.

The data of the external evaluation instrument obtained through the interview with the professionals of the teams are described in *table 3*.

Table 3. Access indicators according to the Family Health Strategy participating teams in the PMAQ-AB, Northern region, Brazil, 2013-2014

Indicators	AC				AM			
	R n(%)	U n(%)	UR n(%)	Total n(%)	R n(%)	U n(%)	UR n(%)	Total n(%)
<b>Reception to spontaneous demand</b>								
Team undertakes reception	16 (94)	53 (96)	25 (100)	94 (97)	47 (82)	265 (84)	83 (86)	395 (84)
Reservation of slots for spontaneous demand appointment	11 (65)	36 (65)	12 (48)	59 (61)	31 (54)	226 (72)	70 (73)	327 (70)
User leaves BHU with the appointment scheduled in situations where it is not the case to assist on the same day	7 (41)	39 (71)	18 (72)	64 (66)	49 (86)	284 (90)	81 (84)	414 (88)
Team was trained to evaluation and classification of risk and vulnerability of users <sup>1</sup>	7 (44)	30 (57)	14 (56)	51 (54)	23 (49)	124 (47)	52 (63)	199 (50)
<b>Appointment scheduling at BHU</b>								
On any day of the week, at any time	4 (24)	31 (56)	12 (48)	47 (48)	28 (49)	183 (58)	53 (55)	264 (56)
With scheduled time	5 (29)	14 (25)	10 (40)	29 (30)	14 (25)	97 (31)	23 (24)	134 (29)
Queue to get password	10 (59)	30 (55)	6 (24)	46 (47)	22 (39)	78 (25)	50 (52)	150 (32)
Agenda of the professionals organized for home visits	17 (100)	53 (96)	25 (100)	95 (98)	46 (81)	253 (80)	66 (69)	365 (78)
Articulation between the work of the health team with traditional caregivers such as midwives, healers, those who give medicines, shamans and prayers	2 (12)	5 (9)	5 (20)	12 (12)	18 (32)	34 (11)	19 (20)	71 (15)
Transportation available to enable assistance to rural population <sup>2</sup>	9 (60)	2 (33)	16 (64)	27 (59)	30 (63)	10 (31)	57 (59)	97 (55)
<b>Total</b>	<b>17</b>	<b>55</b>	<b>25</b>	<b>97</b>	<b>57</b>	<b>315</b>	<b>96</b>	<b>468</b>
Indicators	RO				RR			
	R n(%)	U n(%)	UR n(%)	Total n(%)	R n(%)	U n(%)	UR n(%)	Total n(%)
<b>Reception to spontaneous demand</b>								
Team undertakes reception	38 (93)	134 (94)	64 (93)	236 (94)	13 (100)	36 (78)	15 (83)	64 (83)
Reservation of slots for spontaneous demand appointment	17 (41)	111 (78)	43 (62)	171 (68)	10 (77)	27 (59)	11 (61)	48 (62)
User leaves BHU with the appointment scheduled in situations where it is not the case to assist on the same day	23 (56)	117 (82)	47 (68)	163 (65)	12 (92)	36 (78)	15 (83)	63 (82)
Team was trained to evaluation and classification of risk and vulnerability of users <sup>1</sup>	24 (58)	68 (48)	34 (49)	164 (65)	9 (69)	9 (25)	8 (53)	26 (41)



Table 3. (cont.)

<b>Appointment scheduling at BHU</b>								
On any day of the week, at any time	19 (46)	57 (40)	31 (45)	107 (42)	7 (54)	13 (28)	6 (33)	26 (34)
With scheduled time	12 (29)	21 (15)	9 (13)	42 (17)	2 (15)	7 (15)	0 (0)	9 (12)
Queue to get password	26 (63)	90 (63)	48 (69)	164 (65)	10 (77)	33 (72)	18 (100)	61 (79)
Agenda of the professionals organized for home visits	38 (93)	131 (92)	60 (87)	229 (91)	13 (100)	46 (100)	18 (100)	77 (100)
Articulation between the work of the health team with traditional caregivers such as midwives, healers, those who give medicines, shamans and prayers	3 (7)	5 (4)	3 (4)	11 (4)	1 (8)	2 (4)	1 (6)	4 (5)
Transportation available to enable assistance to rural population <sup>2</sup>	28 (88)	10 (67)	46 (67)	84 (72)	5 (71)	2 (100)	9 (50)	16 (27)
<b>Total</b>	<b>41</b>	<b>142</b>	<b>69</b>	<b>252</b>	<b>13</b>	<b>46</b>	<b>18</b>	<b>77</b>
Indicators	AP				PA			
	R n(%)	U n(%)	UR n(%)	Total n(%)	R n(%)	U n(%)	UR n(%)	Total n(%)
<b>Reception to spontaneous demand</b>								
Team undertakes reception	14 (100)	91 (95)	16 (100)	121 (96)	213 (95)	403 (96)	131 (99)	747 (96)
Reservation of slots for spontaneous demand appointment	8 (57)	80 (83)	14 (88)	102 (81)	179 (80)	335 (80)	110 (83)	624 (80)
User leaves BHU with the appointment scheduled in situations where it is not the case to assist on the same day	11 (79)	88 (92)	16 (100)	115 (91)	205 (92)	386 (92)	121 (92)	712 (92)
Team was trained to evaluation and classification of risk and vulnerability of users <sup>1</sup>	7 (50)	38 (40)	9 (56)	54 (43)	128 (57)	235 (56)	87 (66)	450 (58)
<b>Appointment scheduling at BHU</b>								
On any day of the week, at any time	6 (43)	9 (9)	5 (31)	20 (16)	113 (50)	214 (51)	76 (58)	403 (52)
With scheduled time	2 (14)	42 (44)	6 (38)	50 (40)	64 (29)	151 (36)	41 (31)	256 (33)
Queue to get password	8 (57)	35 (36)	8 (50)	51 (40)	74 (33)	129 (31)	36 (27)	239 (31)
Agenda of the professionals organized for home visits	14 (100)	93 (97)	14 (88)	121 (96)	204 (91)	394 (94)	123 (93)	721 (93)
Articulation between the work of the health team with traditional caregivers such as midwives, healers, those who give medicines, shamans and prayers	2 (14)	10 (10)	5 (31)	17 (13)	31 (14)	20 (5)	18 (14)	69 (9)
Transportation available to enable assistance to rural population <sup>2</sup>	7 (54)	9 (43)	8 (50)	24 (48)	95 (64)	7 (29)	76 (58)	178 (58)
<b>Total</b>	<b>14</b>	<b>96</b>	<b>16</b>	<b>126</b>	<b>224</b>	<b>420</b>	<b>132</b>	<b>776</b>
Indicators	TO				Região Norte			
	R n(%)	U n(%)	UR n(%)	Total n(%)	R n(%)	U n(%)	UR n(%)	Total n(%)
<b>Reception to spontaneous demand</b>								
Team undertakes reception	22 (100)	195 (97)	135 (98)	352 (98)	363 (94)	1177 (92)	469 (95)	2009 (93)
Reservation of slots for spontaneous demand appointment	19 (86)	182 (91)	114 (83)	315 (87)	275 (71)	997 (78)	374 (76)	1646 (76)
User leaves BHU with the appointment scheduled in situations where it is not the case to assist on the same day	19 (86)	180 (90)	113 (82)	312 (86)	326 (84)	1130 (89)	411 (83)	1867 (87)
Team was trained to evaluation and classification of risk and vulnerability of users <sup>1</sup>	16 (73)	133 (66)	76 (55)	225 (62)	214 (55)	637 (50)	280 (57)	1131 (52)

Table 3. (cont.)

Appointment scheduling at BHU								
On any day of the week, at any time	12 (55)	103 (51)	76 (55)	191 (53)	189 (49)	610 (48)	259 (52)	1058 (49)
With scheduled time	6 (27)	50 (25)	36 (26)	92 (25)	105 (27)	382 (30)	125 (25)	612 (28)
Queue to get password	6 (27)	86 (43)	66 (48)	158 (44)	156 (40)	481 (38)	232 (47)	869 (40)
Agenda of the professionals organized for home visits	22 (100)	197 (98)	131 (95)	350 (97)	354 (91)	1167 (92)	437 (88)	1958 (91)
Articulation between the work of the health team with traditional caregivers such as midwives, healers, those who give medicines, shamans and prayers	3 (14)	9 (4)	6 (4)	18 (5)	60 (15)	85 (7)	57 (12)	202 (9)
Transportation available to enable assistance to rural population <sup>2</sup>	17 (85)	8 (89)	113 (82)	138 (83)	191 (69)	48 (4)	325 (66)	564 (68)
<b>Total</b>	<b>22</b>	<b>201</b>	<b>138</b>	<b>361</b>	<b>388</b>	<b>1275</b>	<b>494</b>	<b>2157</b>

Source: PMAQ-AB<sup>23</sup>; IBGE<sup>25</sup>.

R= Rural BHU; U=Urban BHU; UR=Urban BHU which assists rural.

<sup>1</sup>FHT which undertakes reception to spontaneous demand in BHU: AC= 94; AM=395; RR=236; RO= 64; AP=121; PA=747; TO=352; RN=2009.

<sup>2</sup>FHT which performs actions with traditional/settled/rural population: AC= 46; AM= 176; RR=27; RO=101; AP=50; PA=305; TO=167; RN=827.

Table 3 shows an average value of 93% of the teams in the Northern region that reported carrying out reception to spontaneous demand; in the discrimination by the Federation Unity (FU), the lowest percentages were found in Amazonas (84%) and in Roraima (83%). The reserve of slots for spontaneous demand ranged from 61% (Acre) to 87% (Tocantins), indicating the need to improve performance in this item. Although 87% of the teams have reported that the user leaves BHU with a scheduled appointment in situations that do not require the same day care, the rural teams of Acre and Rondônia (here included urban ones that serve the rural population) reported a lower percentage of appointments in such cases.

Difficulties for scheduling on any day and time were identified for the Northern region as a whole (on average, only 49% of the teams can perform this type of scheduling). In this item, the lowest percentages occurred among the rural teams of Acre (24%) and Amapá (43%). The scheduled appointment frequency was low (28% for the region as a whole), regardless of whether the performance was rural or urban. On the other hand, the percentage of teams trained to

evaluate risk and vulnerability of users only exceeded 60% in the states of Roraima and Tocantins. In other states, the percentages remained at 50%, except in Roraima (41%) and Amapá (43%).

Entering the queue to obtain a password was more common for rural populations, and was more frequent in the assistance of urban teams that served rural populations (ranging from 24% in Acre to 100% in Roraima). The organization of the agenda for home visits was reported by about 90% of respondents. In Amazonas, Rondônia, Amapá and Tocantins, these percentages were lower for urban teams that declared to serve rural populations.

The adoption of complementary treatment alternatives through articulation with traditional caregivers was irrelevant, especially in urban areas (7% for the region as a whole). Approximately one third of the teams in the region that serve the rural populations stated that they did not have available transportation to enable their users to be assisted.

Table 4 describes the external evaluation data obtained through interviews with the users in the health units.

Table 4. Access indicators according to participating users in the PMAQ-AB, Northern region, Brazil, 2013-2014

Indicators	AC				AM			
	R n(%)	U n(%)	UR n(%)	Total n(%)	R n(%)	U n(%)	UR n(%)	Total n(%)
<b>Accessibility</b>								
Distance up to 15 minutes from home to the BHU	65 (96)	206 (97)	103 (98)	374 (97)	221 (99)	1252 (98)	347 (95)	1820 (97)
Arrival to BHU is easy or very easy	42 (62)	180 (85)	84 (80)	306 (79)	163 (73)	1017 (79)	272 (75)	1452 (78)
Hours of operation of the BHU meets the needs	53 (78)	191 (90)	93 (89)	337 (87)	169 (75)	1094 (85)	313 (86)	1576 (84)
<b>Appointment scheduling at BHU</b>								
User goes to BHU and schedules an appointment	12 (18)	66 (31)	21 (20)	99 (26)	124 (55)	747 (58)	180 (49)	1051 (56)
User goes to the BHU and has to get a password	17 (25)	80 (38)	25 (24)	122 (32)	48 (21)	209 (16)	72 (20)	329 (18)
User stays in the queue to get a password	11 (16)	58 (27)	41 (39)	110 (28)	32 (14)	286 (22)	129 (35)	447 (24)
Users schedules an appointment on any day of the week, at any time	12 (18)	66 (31)	38 (36)	116 (30)	95 (42)	483 (38)	145 (40)	723 (39)
<b>Attendance</b>								
When he/she goes to BHU without an appointment, he/she is well or very well received	34 (50)	71 (33)	39 (37)	144 (37)	112 (50)	483 (38)	155 (42)	750 (40)
At the time he/she was received at BHU, something was done to solve his/her problem.	38 (56)	73 (34)	40 (38)	151 (39)	113 (50)	502 (39)	159 (44)	774 (41)
Receives visit from the Community Health Worker (CHW)	60 (88)	165 (77)	88 (84)	313 (81)	193 (86)	1003 (78)	302 (83)	1498 (80)
Care received from the team is good or very good	52 (76)	174 (82)	89 (85)	315 (82)	157 (70)	1016 (79)	287 (79)	1460 (78)
<b>Total</b>	<b>68</b>	<b>213</b>	<b>105</b>	<b>386</b>	<b>224</b>	<b>1281</b>	<b>365</b>	<b>1870</b>
Indicators	RO				RR			
	R n(%)	U n(%)	UR n(%)	Total n(%)	R n(%)	U n(%)	UR n(%)	Total n(%)
<b>Accessibility</b>								
Distance up to 15 minutes from home to the BHU	163 (98)	580 (100)	281 (99)	1024 (99)	59 (98)	169 (98)	91 (99)	319 (98)
Arrival to BHU is easy or very easy	126 (75)	441 (76)	207 (73)	774 (75)	49 (82)	133 (77)	72 (78)	254 (78)
Hours of operation of the BHU meets the needs	137 (82)	512 (88)	232 (82)	881 (85)	34 (57)	110 (64)	73 (79)	231 (71)
<b>Appointment scheduling at BHU</b>								
User goes to BHU and schedules an appointment	43 (26)	210 (36)	122 (43)	375 (36)	20 (33)	94 (55)	31 (34)	145 (45)
User goes to the BHU and has to get a password	40 (24)	66 (11)	61 (22)	167 (16)	16 (27)	65 (38)	34 (37)	115 (35)
User stays in the queue to get a password	35 (21)	113 (19)	48 (17)	196 (19)	33 (55)	72 (42)	51 (55)	156 (48)
Users schedules an appointment on any day of the week, at any time	58 (35)	235 (41)	97 (34)	390 (38)	5 (8)	15 (9)	5 (5)	25 (8)
<b>Attendance</b>								
When he/she goes to BHU without an appointment, he/she is well or very well received	87 (52)	231 (40)	148 (52)	466 (45)	24 (40)	33 (19)	15 (16)	72 (22)
At the time he/she was received at BHU, something was done to solve his/her problem.	87 (52)	251 (43)	152 (54)	490 (48)	25 (42)	35 (20)	14 (15)	74 (23)
Receives visit from the Community Health Worker (CHW)	141 (84)	456 (79)	222 (78)	819 (79)	46 (77)	104 (60)	69 (75)	219 (68)
Care received from the team is good or very good	146 (87)	466 (80)	234 (83)	846 (82)	39 (65)	97 (56)	61 (66)	197 (61)
<b>Total</b>	<b>168</b>	<b>580</b>	<b>283</b>	<b>1031</b>	<b>60</b>	<b>172</b>	<b>92</b>	<b>324</b>

Table 4. (cont)

Indicators	AP				PA			
	R n(%)	U n(%)	UR n(%)	Total n(%)	R n(%)	U n(%)	UR n(%)	Total n(%)
<b>Accessibility</b>								
Distance up to 15 minutes from home to the BHU	60 (100)	397 (99)	49 (100)	506 (99)	879 (98)	1662(99)	514 (97)	3055 (99)
Arrival to BHU is easy or very easy	44 (73)	280 (69)	28 (57)	352 (69)	692 (78)	1377 (82)	386 (73)	2455 (79)
Hours of operation of the BHU meets the needs	50 (83)	330 (82)	39 (80)	419 (82)	723 (81)	1371 (81)	426 (81)	2520 (81)
<b>Appointment scheduling at BHU</b>								
User goes to BHU and schedules an appointment	29 (48)	208 (52)	26 (53)	263 (51)	491 (55)	985 (59)	288 (55)	1764 (57)
User goes to the BHU and has to get a password	10 (17)	76 (19)	8 (16)	94 (18)	262 (30)	442 (26)	138 (26)	842 (27)
User stays in the queue to get a password	16 (27)	127 (32)	22 (45)	165 (32)	138 (16)	389 (23)	108 (20)	635 (20)
Users schedules an appointment on any day of the week, at any time	7 (12)	34 (8)	6 (12)	47 (9)	374 (42)	596 (35)	205 (39)	1175 (38)
<b>Attendance</b>								
When he/she goes to BHU without an appointment, he/she is well or very well received	33 (55)	157 (39)	22 (45)	212 (41)	457 (51)	749 (45)	251 (48)	1457 (47)
At the time he/she was received at BHU, something was done to solve his/her problem.	34 (57)	158 (39)	22 (45)	214 (42)	494 (56)	794 (47)	260 (49)	1548 (50)
Receives visit from the Community Health Worker (CHW)	43 (72)	347 (86)	35 (71)	425 (83)	750 (84)	1339 (80)	413 (78)	2502 (81)
Care received from the team is good or very good	54 (90)	317 (79)	35 (71)	406 (79)	713 (80)	1232 (73)	412 (78)	2357 (76)
<b>Total</b>	<b>60</b>	<b>403</b>	<b>49</b>	<b>512</b>	<b>888</b>	<b>1683</b>	<b>528</b>	<b>3099</b>
Indicators	TO				Região Norte			
	R n(%)	U n(%)	UR n(%)	Total n(%)	R n(%)	U n(%)	UR n(%)	Total n(%)
<b>Accessibility</b>								
Distance up to 15 minutes from home to the BHU	64 (96)	653 (99)	434 (98)	1151 (98)	1512 (98)	4918 (99)	1819 (97)	8249 (98)
Arrival to BHU is easy or very easy	56 (84)	502 (76)	309 (70)	867 (74)	1172 (76)	3930 (79)	1358 (73)	6460 (77)
Hours of operation of the BHU meets the needs	55 (82)	548 (83)	378 (85)	981 (84)	1221 (79)	4156 (83)	1554 (83)	6931 (83)
<b>Appointment scheduling at BHU</b>								
User goes to BHU and schedules an appointment	41 (61)	393 (60)	233 (52)	667 (57)	760 (49)	2703 (54)	901 (48)	4364 (52)
User goes to the BHU and has to get a password	25 (37)	161 (24)	129 (29)	315 (27)	418 (27)	1099 (22)	467 (25)	1984 (24)
User stays in the queue to get a password	6 (9)	127 (19)	67 (15)	200 (17)	271 (18)	1172 (23)	466 (25)	1909 (23)
Users schedules an appointment on any day of the week, at any time	37 (55)	233 (35)	215 (48)	485 (41)	588 (38)	1662 (33)	711 (38)	2961 (35)
<b>Attendance</b>								
When he/she goes to BHU without an appointment, he/she is well or very well received	39 (58)	274 (42)	217 (49)	530 (45)	786 (51)	1998 (40)	847 (45)	3631 (43)
At the time he/she was received at BHU, something was done to solve his/her problem.	42 (63)	318 (48)	227 (51)	587 (50)	833 (54)	2131 (43)	874 (47)	3838 (46)
Receives visit from the Community Health Worker (CHW)	59 (88)	572 (87)	379 (85)	1010 (86)	1292 (84)	3986 (80)	1508 (81)	6786 (81)
Care received from the team is good or very good	46 (69)	436 (66)	313 (70)	795 (68)	1207 (79)	3738 (75)	1431 (77)	6376 (76)
<b>Total</b>	<b>67</b>	<b>660</b>	<b>444</b>	<b>1171</b>	<b>1536</b>	<b>4992</b>	<b>1867</b>	<b>8394</b>

Source: PMAQ AB<sup>23</sup>; IBGE<sup>25</sup>.

R= Rural BHU; U=Urban BHU; UR=BHU which assists rural.

The vast majority of respondents (over 97% in all FU and Northern region) reported taking less than 15 minutes to reach the health unit, suggesting, at first sight, easy access to services. However, the data are not conclusive regarding the profile of the interviewees – whether they are rural residents or residents of the city – in health units located in the urban area that mention to assist rural areas. Regarding the hours of operation of health facilities, 79% of the interviewees in rural BHU in the Northern region consider that such time meets their needs, although this did not occur in all the units of the federation evaluated.

Regarding the arrangement of appointments, it was observed that 25% of the users served by urban teams that attend rural populations reported facing queues to obtain arrangement of appointments, in contrast to 11% of users of rural units. This information contrasts with the statements of the professionals who report that 40% of the users assisted in rural units and 47% of the rural ones assisted in urban areas face queues (*table 3*).

In states such as Acre, Rondônia and Roraima, it was reported greater difficult to schedule a consultation on any day and time of the week for rural teams or to attend to these populations. The home visits by community agents were more reported by users of the services of teams that work in the rural area (84%). Users of teams that serve rural populations, especially those based in rural areas, reported a higher percentage (53%) of reception to spontaneous demand and higher satisfaction (79%) with the service received.

In general, a greater discrepancy between rural and urban was observed for the variables reserve of slots to meet spontaneous demand, whose percentages were lower among the rural teams (especially in the states of Acre, Amapá and Amazonas), as well as in the interaction with traditional caregivers. The limited percentage of teams that declare to have transportation (69% of the rural and 66% of the urban that serve

the rural population) is worthy of attention to serve its users. This is a relevant problem because those who work in the city will be forced to travel long distances in order to accompany their rural clientele.

## Discussion

The estimate of health care coverage is a relevant indicator in the evaluation of PHC and the performance of FHS teams in Brazil<sup>29,30</sup>. However, analysis that include rural populations in the Northern region should broaden their scope in order to apprehend the singularities of access to health services by such groups. The results show that municipalities with smaller population sizes have higher coverage, which does not translate, necessarily, into greater geographical or organizational accessibility, according to Donabedian<sup>18</sup>.

The spatial distribution of the establishments, based on the geographical coordinates that locate the FHS teams that joined the PMAQ-AB, shows a concentration of service provision at the headquarters of the municipalities, a figure that covers 38.7% of the teams that declared to serve rural populations, although based in urban areas. The data available in the PMAQ-AB database do not provide explanations on the reasons why the Municipal Health Secretariats decided to allocate professionals of the FHT in territories distant from the dwelling of their assigned population. However, the results presented demonstrate the harm generated by such an arrangement, which contradicts guidelines and routines recommended for PHC.

They are scarce the investigations about accessibility to the services of health in rural areas of the Amazonian legal. In a case study on access and use of dental services in the municipality of Amazonas<sup>31</sup>, two forms of access to oral health services by rural populations were verified: either users traveled by their own means, with the physical and

financial onus implied in this option, or waited for the passage of mobile units that provided care with irregular periodicity and with a reduced average time of permanence in each locality, precluding actions for prevention and health promotion of the individuals assisted in the rural area.

In a publication that discusses the results of the first cycle of PMAQ-AB in the state of Amazonas<sup>32</sup>, the authors pointed out insufficient extension of service coverage to rural populations. When present, it is developed on an itinerant basis, or through the designation of urban teams of the PHC to serve the inhabitants of the countryside. It is up to them to assume the physical and financial burden of moving to the city, which adds new barriers to access to the desired care. It is considered here, that even in cases where the percentages of coverage appear to be close to the desired in strictly numerical terms, in the case of the Northern region, it must be understood that the coverage percentage reached by the FHS does not take into account the long distances, the dispersion of population and the financial expenditure imposed on users. They should have care offered in their neighborhood, but they will have to look for them in distant places.

Assis and Jesus<sup>33</sup> correlate access with the availability of appointments and their schedules, but also with the possibility of entering services to meet unscheduled demands, but understood as priority by users. This approach fits in this study in the analysis of socio-organizational accessibility. Results presented for this item show little flexibility of the teams in welcoming the demands of users who face the great distances to reach the unit. Although most of the respondents has affirmed to accomplish the reception to the spontaneous demand, 40% of them reported that rural users enter the queue to schedule or obtain appointments and that they had few opportunities to get same-day care, or

to have extra or reserved places for spontaneous demand.

These findings are congruent with the publications<sup>34,35</sup> that identify rigidities in the actions of the teams that are anchored in the centrality of medical care, together with the lack of preparation to provide adequate reception. By prioritizing the accomplishment of pre-programmed procedures, operational routines prevail in the needs of the users and leave in secondary plan the production of bond and reception, generating dissatisfaction and queuing or abandonment of the search for care<sup>36</sup>. In this context, 40% or more teams that are not qualified to evaluate situations of clinical risk and vulnerability of users are worrying.

Users of rural origin face important access and non-attendance problems regarding the opening hours of the unit, the waiting time and the availability of home visits. Such complaint gains concrete contours when recalling that one-third of the health teams report not having transportation to carry out their activities, allowing the understanding of the restriction of the offer of home visits.

Satisfaction/dissatisfaction is usually mediated by how users are treated by teams. The appreciation of gentleness, listening and welcoming by professionals reveals the importance of cultivating the bond and adopting the light technologies<sup>37,38</sup>. On the other hand, the availability of health actions, even when compared to the care gap prior to the implementation of the FHS model, can induce users to demonstrate high levels of satisfaction, even in the presence of barriers to access the service and low regularity in the provision of care<sup>39</sup>.

Just as the literature recognizes the inequalities in health conditions and the use of services among the regions of the Country<sup>40</sup>, the present study also suggests the existence of inequities arising not only

from geographical differences, natural accidents and forms of occupation of the territory, but which are linked to broader levels of social determination, such as differences in purchasing power and the possession of means of transportation that help overcome barriers to access to health services.

When taken in the light of the main support theorists adopted in the article, the overall analysis of the results evidences the presence of important geographical accessibility limits – which Unglert<sup>16</sup> defines in terms of time and difficulty/ease of movement, and which, according to Giovanella and Fleury<sup>17</sup>, have a relation with the distance between health services and places of dwelling of the users –, thematic inherent to the condition of resident in rural area. However, instead of seeking to neutralize or compensate for them, the health system adds new barriers to organizational accessibility<sup>18</sup> by opting for the provision of health care in urban spaces for residents in rural areas.

Added to these are the other difficulties common to all users, both urban and rural, such as long waiting times, braving queues and low possibility of immediate care, which are also present in the reality studied. In this sense, reception<sup>19</sup>, understood as qualified listening with a view to increasing accessibility to services, is also impaired, since the data show high percentages of difficulty in marking appointments. These elements characterize a host more committed to the administrative logic than to the needs perceived by the users.

Like all research, this one also presents limitations, being pointed here aspects inherent to the evaluation design of the PMAQ-AB, whose selection of informants is based on the free accession, and not by random choice. Nevertheless, it should be considered that the study covered almost 70% of public primary care providers in the Northern region. The selection of the

users suffers from similar problems, since the interviewees were selected randomly, but among those present in the establishments. That is, in addition to not representing the universe of the population served by the teams, the results related to users express the perspective of those who have already accessed the service, obscuring the point of view of those who have failed to get there. However, the relevance of the data produced under the PMAQ-AB, whether for its coverage, for generating regular information in the three cycles already carried out, or for providing information on a relatively invisible population in the large household surveys that have been developed on the Country is not negligible.

## Final considerations

Notwithstanding the known fact that rural populations are sparsely distributed in the territory and face limitations in access to health services, the data demonstrate the difficulty of the FHS teams in mitigating the rigidity of their schedules in order to meet the spontaneous demand and to provide service or scheduling on the same day of attendance at the unit for those who come from far away. Doing so would require a re-ordering of PHC routines in order to achieve greater flexibility and sensitivity with the rural needs of the user.

Avoiding the pilgrimage in search of specialized services, as a general rule offered only in urban centers, would also require an increase in investment in physical network and personnel training, seeking to expand the resilient level of the PHC network in the Northern region. On the other hand, the lack of available and regular transportation in the rural areas of the legal Amazon is an important factor restricting access for users who move in search of care.

In general, the users positively evaluated

not only the travel time to the health unit but also the hours of operation of the establishments investigated. However, the characteristics of the study, when interviewing users who were already in the waiting room for service, allow to infer that the results obtained exclude the clientele that is potentially the least satisfied: that is, those who were not able to be present in the units, which should face even greater barriers to access. In addition, the responses of users in this item strongly contrast with the evaluations of professionals on the same topic.

Thus, the care gaps suggested by the spatial distribution of the teams studied appear to point to a coverage gap, despite

the percentages, merely numerical, of coverage contained in the official health system information. These do not attempt to pulverize the countryside population, which requires specific modes of organization of services, depending on the singularities of the Amazonian ways of living.

## Collaborators

All authors (Garnelo L, Lima JG, Rocha ESC, Herkrath FJ) were responsible for collecting, producing, analyzing the data and writing the article. ■



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