DOI: 10.1590/1413-81232021266.02672021

Health in sight: an analysis of Primary Health Care in riverside and rural Amazon areas

Rodrigo Tobias de Sousa Lima (https://orcid.org/0000-0002-4098-5276) [1]
Tiótrefis Gomes Fernandes (https://orcid.org/0000-0002-8563-9529) [2]
Paulo Jorge Alves Martins Júnior (https://orcid.org/0000-0002-2688-6124) [3]
Cleudecir Siqueira Portela (https://orcid.org/0000-0002-1616-0055) [4]
James Dean Oliveira dos Santos Junior (https://orcid.org/0000-0002-0627-6126) [5]
Júlio Cesar Schweickardt (https://orcid.org/0000-0002-8349-3482) [1]

Abstract *The National Primary Care Policy has provided a significant change in terms of health actions in the riverside territory, establishing health teams and equipment. The Riverside and Fluvial Family Health teams for the Legal Amazon and Pantanal areas have been innovative regarding the integral care of the forest populations. This study aims to analyze primary health care in the rural and riverside context in the Amazon territory, based on the production of individual and collective actions by health teams, as well as their performance through services offered in the municipalities. The study is cross-sectional, with a descriptive-analytical design and quantitative approach, and analyzes the coverage of primary health care actions of family health strategy teams in urban, rural and riverside areas of eight municipalities located in the state of Amazonas. The results showed that there was an increase in primary care coverage in almost all analyzed municipalities, indicating that techno-assistance models such as the riverside and fluvial teams resulted in the inclusion of a population that is scattered over large areas of the territory of municipalities. A health policy that promotes equity results in changes and alterations in the ways of life and health status of the Amazonian populations.*
Key words *Primary Health Care, Rural Health Services, Patient Care Team, Amazonas*

[1] Instituto Leônidas e Maria Deane (ILMD/Fiocruz Amazônia), Laboratório de História, Políticas Públicas e Saúde na Amazônia (LAHPSA). R. Terezina 476, Adrianópolis. 69065-001 Manaus AM Brasil. tobiasrodrigo@gmail.com
[2] Faculdade de Educação Física e Fisioterapia, Universidade Federal do Amazonas (UFAM). Manaus AM Brasil.
[3] Graduação em Psicologia, UFAM. Manaus AM Brasil.
[4] Departamento de Atenção Básica e Ações Estratégicas, Secretaria de Estado de Saúde do Amazonas. Manaus AM Brasil.
[5] Departamento de Estatística, UFAM. Manaus AM Brasil.

Introduction

Primary Care, also called Primary Health Care[1–3], is the focal point of the Brazilian Unified Health System (SUS, *Sistema Único de Saúde*). The National Primary Care Policy (PNAB, *Política Nacional de Atenção Básica*) seeks social protection, universal care and, above all, the production of responses to health needs and access to its services in an equitable and comprehensive manner for the populations, including those in the Brazilian Amazon region[2,4].

The PNAB has provided a significant change in terms of Primary Care (PC) actions in the region, creating health teams and equipment adjusted and directed to the populations living in the Amazon region. Therefore, a new model of work and care appears through the Riverside and Fluvial Family Health Teams for the Legal Amazon and Pantanal areas. These new approaches have allowed the emergence of another techno-assistance model that dialogued with the territory and its populations[5]. The Basic Fluvial Health Unit (UBSF, *Unidade Básica de Saúde Fluvial*) and the Riverside Family Health Teams (eSFR, *Equipes de Saúde da Família Ribeirinha*)[3] have created access to a forest population that was historically marginalized regarding the care process.

In 2006, the first edition of the PNAB, through Ordinance N. 648 (of March 28, 2006) did not include Fluvial or Riverside Family Health Teams. Only with the publication of Ordinance N. 2,191 (of August 3, 2010) it became possible to establish different criteria for the implementation, funding and maintenance of these teams, which are expected to attend riverside populations living in the Legal Amazon and state of Mato Grosso do Sul. The second edition of the PNAB, through Ordinance N. 2,488 (of October 21, 2011)[1], brought new criteria for team planning and the third PNAB, through Ordinance N. 2,436 (of September 21, 2017)[3], included a review of the guidelines for primary care organization.

The present study deals with the territory of the state of Amazonas, as it has an extensive hydrographic network of more than 6 thousand kilometers of navigable rivers with different types (clear and dark waters) and biomes[6], great ethnic-cultural diversity, low population density and with the largest number of fluvial and riverside family health teams of the states in the northern region[7]. These factors interfere with the management of health services, especially regarding the access to primary care by *quilombola*, riverside and indigenous populations. Due to the living conditions and the ways the territory is envisioned, it is noteworthy that the fluvial transportation system in rural and riverside areas is limited by long distances, river channels and the water regime. Thus, the care schedule must also consider this territoriality, which is also influenced by economic, cultural aspects and mediated by river seasonality. The Amazonian territory can be analyzed based on the category of the 'fluid territory'[8,9] which is related to the types of public health policies to be developed in the Amazon region.

In view of the above, the understanding of the development and implementation of specific public policies for the Amazon territory helps us to analyze the access to health services by the population considering the principle of equity in SUS. Carrying out approaches that produce the visibility of primary care in rural and riverside areas in the Amazon region, especially the work of health teams, contribute to strengthen this model. The urban Basic Family Health Units (BFHU) such as the Fluvial and Riverside BHUs have guaranteed access to health services for populations in remote and difficult-to-access areas. Therefore, the present study aimed to analyze primary care in rural and riverside areas in the Amazon territory, based on the production of individual and collective actions by health teams, as well as their performance through services offered in municipalities in the state of Amazonas.

Method

Amazonas is the largest state of the federation, being intersected by an extensive hydrographic network, consisting of rivers, lakes, creeks and streams. The state has also preserved its forests through environmental and socioeconomic policies through parks, reservations, extractive reservations, and indigenous lands, with the exception of the southern region of the state where agribusiness has been expanding since the 1970s. The demographic density is low, around 2.23 inhabitants/km², with part of the population living in communities located on the river banks, i.e., the riverside populations[6]. A factor that impacts on health services are the great distances between the communities and the municipality's head office, as the vast majority of health actions and services end up concentrated in the municipalities' head offices.

The present study addressed the primary care reality of eight municipalities, namely: Bar-

reirinha, Borba, Careiro da Várzea, Humaitá, Nhamundá, Novo Aripuanã, Tefé and Urucurituba (Figure 1). The inclusion criteria were the municipalities that had: (a) at least one rural, riverside and urban family health strategy team; (b) at least one basic fluvial basic health unit in operation during 2019; (c) production of individual assistance and home visits sent monthly to the Ministry of Health (MH). The capital of the state of Amazonas, Manaus, was excluded from the study because it is a city that comprises more than half of the state's population, with a high urban concentration and a low connection with the rural area, representing a specific case of analysis in studies on health policy analysis in the Amazon region. Moreover, eligible municipalities that did not report their production through official information systems by more than one competence were excluded.

A cross-sectional study was carried out, with a descriptive-analytical design and quantitative approach, which analyzed the coverage of primary care actions by family health strategy teams in both urban and rural, as well as riverside areas in municipalities located in the state of Amazonas.

The data used are available on the Ministry of Health website and come from the Health Information System for Primary Care (SISAB, *Sistema de Informação em Saúde para a Atenção Básica*), by accessing information on production, as part of the e-SUS PC strategy, being for the study: Simplified Data Collection (SDC) or Citizen's Electronic Record (CEP). These records were generated according to the work of Primary Care professionals – Family Health Strategy teams – who are submitted to a validation process, considering: if there is duplication of data and cleaning of excess data; the date when the data were sent; and upon confirmation of the information, which verifies whether the number of the establishment in the National Register of Health Establishments (CNES, *Cadastro Nacional de Estabelecimentos em Saúde*), the number of the National Team Identifier (INE, *Identificador Nacional de Equipes*), the number of the National Health Card (CNS, *Cartão Nacional de Saúde*) and the professional's Brazilian Code of Occupations (CBO, *Código Brasileiro de Ocupações*) are valid, checking the data available on the database of the CNES System regarding the production competence and whether there is a single link between them[10].

Also at SISAB, data were collected on the production of collective activities and individual

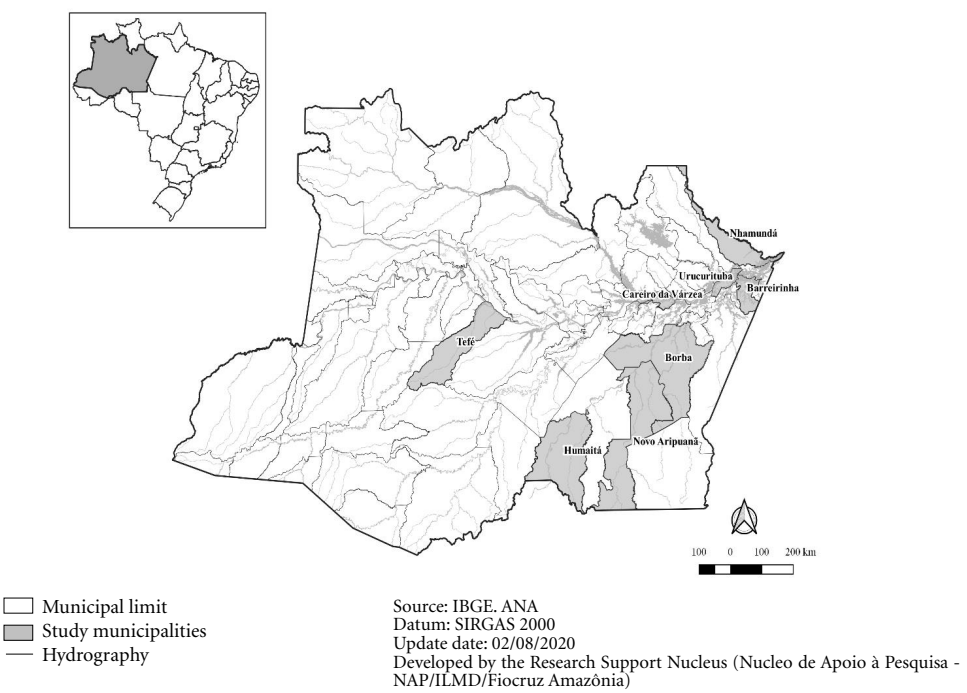

Figure 1. Map of the analyzed municipalities of the state of Amazonas.

outpatient production and home visits, according to the type of team (INE of the family health team; rural health team; riverside health team) linked to the Family Health Unit, Fluvial Family Health Unit and its respective CNES; the type of professional (physician, nurse, community health agent), based on the analysis of information available in the MH and the Brazilian Institute of Geography and Statistics (IBGE, *Instituto Brasileiro de Geografia e Estatística*) databases[11].

To assess the production of services, the variables of interest included individual care and collective actions, which are the set of actions of the team members (INE) by competence, linked to a health care establishment (CNES) throughout the year 2019. Reasons for providing care and collective actions were also calculated for comparison purposes, and the denominator that corresponded to the population registered at SISAB was used, according to the type of team.

To assess the primary care performance, averages of the indicators of the Previne Brasil Program[12] were calculated by type of family health team, for the year 2019: a) the proportion of pregnant women with at least 6 (six) prenatal consultations, with the first occurring up to the 20th week of gestation; b) proportion of pregnant women submitted to tests for syphilis and HIV; c) proportion of pregnant women who received oral care; d) coverage of cytopathological examination; e) proportion of hypertensive individuals whose Blood Pressure (BP) was measured every 6 months; f) proportion of diabetic individuals with a request for glycated hemoglobin test. Data were not available for the item "coverage of inactivated poliomyelitis and pentavalent vaccines".

The municipalities were classified according to the typology determined by IBGE. Characteristics such as demographic density, location in relation to the main urban centers and population size are the fundamental criteria of the proposed methodology to classify urban and rural areas in Brazil. Based on the crossing of these variables, the municipalities in the study were classified into five types: urban, adjacent intermediate, remote intermediate, adjacent rural and remote rural[13]. For the analysis purposes, the municipalities that had rural characteristics were grouped into a single class.

Excel spreadsheets were used to assemble the database and, subsequently, the free software "R", version 3.1.2 was used for the actual analysis. The statistical analysis was based on the calculation of the means of the quantitative variables and 95% confidence intervals (95%CI) and the level of significance was set at 5%. The trend graph was constructed, considering the average coverage rates of primary care in the municipalities in the study for every three years, during a 12-year period. The research complied with the guidelines for research involving human beings, being approved by the Research Ethics Committee.

Results

Of the 8 municipalities that constitute the sample, two are considered urban by IBGE, the only ones with an estimated population of more than 50,000 inhabitants in the year 2019 and with smaller proportions of rural population in 2010, and, consequently, a higher number of urban family health teams (FHTs). The municipality of Careiro da Várzea was the one with the highest number of riverside FHTs[8], given that its population mostly consists of rural area residents. Overall, the FHTs of rural areas (fluvial and riverside) of these municipalities were responsible for registering and monitoring approximately 60,000 people in 2019. And if one considers the rural population registered in 2010 as a base, the rural population representation of the service coverage can be observed in each municipality, with emphasis on the almost totality of coverage in Tefé (Table 1).

Figure 2 shows that most municipalities have increased their PC coverage during the 12 analyzed years, especially in the last three. A reduction was observed in Borba, which went from 100% PC coverage in 2008-2010 to 77% in the last three years, with a decrease in each period, and in Novo Aripuanã, which, despite the increase in coverage in the first 9 years, showed a sharp drop in 2017-2019, reaching 64%. The municipality of Urucurituba maintained 100% coverage from 2008 to 2019.

Table 2 shows the monthly production by type of team in each type of municipality. Overall, it was observed that the average total number of individual and collective actions were similar between types of team, and that there are more individual actions in municipalities with urban characteristics, when compared to rural ones, a less marked difference when considering the registered population for each type of team (ratio). Considering the total number of the municipalities, the fluvial FHTs showed a lower capacity of production of individual actions between medical and nursing professionals and CHAs in relation to the other types of FHTs, when considering

Table 1. Characterization of municipalities in the state of Amazonas, 2019.

Municipality	IBGE Typology	Demographic density (inhab/km²)	Estimated Population (2019)	Rural Population (% 2010)	Estimated Rural Population (2019)*	Urban FHTs	Fluvial FHTs	Riverside population FHTs	Registered Population RURAL FHTs	% estimated rural* population covered by PC
Barreirinha	Rural	4.76	32,041	55%	17,623	6	1	4	11,207	63.6
Borba	Rural	0.79	41,161	59%	24,285	8	1	2	5,811	23.9
Careiro da Várzea	Adjacent Rural	9.09	30,225	96%	29,016	1	1	8	10,720	36.9
Humaitá	Urban	1.34	55,080	32%	17,626	13	1	2	7,219	41.0
Nhamundá	Rural	1.30	21,173	62%	13,127	4	1	3	6,701	51.0
Novo Aripuanã	Intermediate Remote	0.52	25,644	35%	8,975	7	1	1	906	10.1
Tefé	Urban	2.59	59,849	19%	11,371	15	1	4	11,193	98.4
Urucurituba	Rural	6.14	23,065	42%	9,687	6	1	3	6,319	65.2
Total		3.32	288,238	50%	131,710	60	8	27	60,076	48.8

* Estimate using the 2010 proportion of rural population (Brazilian Institute of Geography and Statistics, IBGE) as reference. FHTs: Family Health Teams; PC: Primary Care.
Source: IBGE and SISAB.

the registered population. Nursing technicians or aids generated a higher average of individual actions between riverside FHTs than between urban FHTs, regardless of the type of municipality, and than fluvial FHTs for urban municipalities. Table 2 also highlights the low number of collective actions, especially among medical professionals, who did not register this type of action in fluvial FHTs.

Regarding the performance of the PC teams (Table 3), overall, despite the higher averages of the Previne indicators in urban FHTs, there are no significant differences in relation to the other types of FHTs. On the other hand, differences were observed for the proportion of 6 prenatal consultations, when compared to fluvial FHT, and for the proportion of diabetics with a glycated hemoglobin test, compared to the other types of FHTs. However, it is worth noting that the low number of rural teams results in great variability regarding the average, which makes it difficult to demonstrate statistically significant differences.

Discussion

The present study leads to the discussion about the evaluation of public policies in the Amazon region, especially regarding the improved access of riverside populations to PC.

The riverside and fluvial teams did not necessarily mean an increase in the primary care coverage in the municipalities, as they already had high coverage rates with other team models, based on the criteria adopted by the Ministry of Health. However, the possibility of differentiating the team types and diversifying work processes, as well as increasing the monthly cost, brought the coverage close to the needs of the riverside population regarding the integrality and continuity of care. The results of the study show that the riverside and fluvial teams, declared by the municipalities, are still insufficient for the effective coverage of this territory. Therefore, the discussion on primary care coverage in the Amazon region is the subject of discussion by managers and researchers, mainly regarding the change in the calculation and the rules for funding the teams[7,14]. The increase in coverage is only possible with tripartite funding[15], which allows expanding the number of teams and diversifying the types, according to the reality of each territory. However, the current PNAB[3] generated a decrease in the number of teams[14], as was the case in a municipality of Santarém, state of Pará[16].

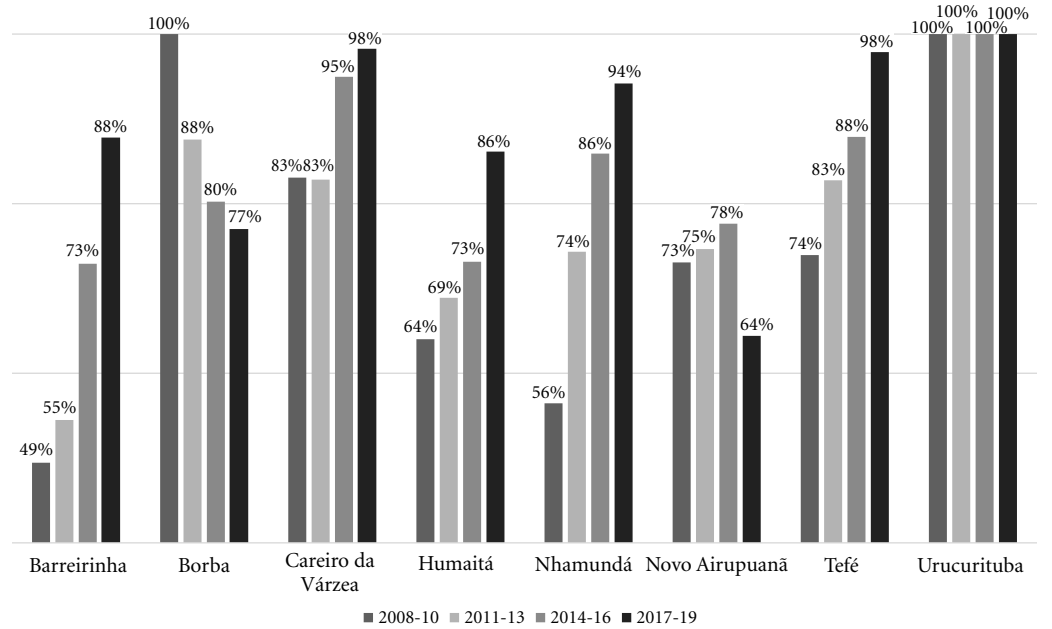

Figure 2. Evolution of the Primary Care coverage in the sample municipalities in periods of three years from 2008 to 2019.

Source: SISAB.

The category of 'fluid (or liquid) territory' has been used to highlight the characteristics of the Amazon territory in relation to health policies[8,9]. The Amazon territory is deeply marked by the water regime and the hydrological cycle, hence the need to incorporate in the analysis the dimension of this 'fluid territory' that interferes and dialogues with the population's way of life. Thus, the idea of a mobile service, to the detriment of a fixed service, or of a fixed service that becomes a flow, according to the categories by Milton Santos[17], represents a major change in the ways of acting on that place. The water paths and the people's ways shape the work processes and health services[8,16]. Thus, the fluid territory becomes an analyzer for looking and interpreting public policies, presenting us with information about riverside populations and their way of life that subsidize public policies. To know the territory, the place and the people is one of the prerequisites for any action and planning in health, which allows demonstrating the expansion of PC coverage in these areas, as an expression of the strengthening of the viable, sustainable and adequate public policy.

The results on the teams' production lead us to the discussion about the work processes in this type of territory, as it is still the subject of discussion by managers who are in the process of implementing/accrediting the fluvial and riverside health policy. The difficulty is to come up with the type of employment contract for the teams that need to remain aboard the boats for a continuous and long time[5,9,16]. The employment contracts were inspired in the indigenous health modality that uses the format of a 20-day work period, followed by 10 days off-duty[18]. This format results in the turnover of health professionals, losing one of the characteristics of PC, which is the creation of a bond between the professional and the user[19].

The results showed that there is not much difference between the work of the riverside teams with those with urban characteristics, with the exception of nursing technicians and aids who excel in production. The riverside and fluvial teams have a more collaborative and interprofessional work process[5,16], due to their coexistence and intensity of the relationships. Working in rural areas results in a relative isola-

Ciência & Saúde Coletiva, 26(6):2053-2064, 2021

Table 2. FHT actions and productions in the selected municipalities. according to the area of operation. Amazonas. 2019.

	Urban Municipalities[a]					
	Urban FHT		Fluvial FHT		Riverside FHT	
	Mean	Ratio (95%CI)	Mean	Ratio (95%CI)	Mean	Ratio (95%CI)
Individual Actions						
CHAs	2243.1	0.777 (0.608 - 0.945)	1718.4	0.389 (0.199 - 0.58)	2160.6	2.221 (1.538 - 2.903)
N. TECH/AID	495.8	0.172 (0.138 - 0.205)	1606.8	0.364 (0.062 - 0.666)	1032.0	1.061 (0.513 - 1.608)
N	135.3	0.047 (0.041 - 0.052)	163.4	0.037 (0.025 - 0.049)	146.0	0.15 (0.097 - 0.203)
MED	318.4	0.11 (0.098 - 0.123)	202.9	0.046 (0.018 - 0.074)	136.2	0.14 (0.097 - 0.183)
Collective Actions						
CHAs	11.9	0.005 (0.003 - 0.007)	17.3	0.011 (-)	3.2	0.001 (0.001 - 0.002)
N. TECH/AID	6.0	0.001 (0.001 - 0.002)	26.0	0.016 (-)	11.2	0.004 (0.000 - 0.008)
N	11.0	0.004 (0.003 - 0.005)	6.8	0.004 (-)	8.3	0.009 (0.003 - 0.014)
MED	1.7	0.001 (0.001 - 0.001)	-	-	5.6	0.006 (0.000 - 0.012)
	Rural Municipalities[b]					
	Urban FHT		Fluvial FHT		Riverside FHT	
	Mean	Ratio (95%CI)	Mean	Ratio (95%CI)	Mean	Ratio (95%CI)
Individual Actions						
CHAs	855.0	0.647 (0.507 - 0.786)	835.0	0.227 (0.106 - 0.349)	869.2	0.464 (0.332 - 0.595)
N. TECH/AID	179.6	0.052 (0.038 - 0.065)	296.9	0.081 (0.000 - 0.177)	473.6	0.253 (0.17 - 0.336)
N	93.0	0.07 (0.056 - 0.084)	115.5	0.031 (0.013 - 0.05)	111.0	0.059 (0.042 - 0.077)
MED	182.5	0.053 (0.043 - 0.062)	151.3	0.041 (0.028 - 0.054)	145.8	0.078 (0.063 - 0.092)
Collective Actions						
CHAs	6.6	0.005 (0.003 - 0.007)	10.2	0.003 (-)	4.3	0.002 (0.001 - 0.004)
N. TECH/AID	3.6	0.002 (0.001 - 0.002)	2.8	0.001 (0.000 - 0.002)	1.7	0.003 (0.002 - 0.004)
N	7.4	0.002 (0.002 - 0.003)	9.0	0.002 (0.000 - 0.006)	6.7	0.004 (0.002 - 0.005)
MED	2.3	0.001 (0.001 - 0.002)	-	-	3.0	0.001 (0.001 - 0.002)
	Total Municipalities					
	Urban FHT		Fluvial FHT		Riverside FHT	
	Mean	Ratio (95%CI)	Mean	Ratio (95%CI)	Mean	Ratio (95%CI)
Individual Actions						
CHAs	1587.6	1.201 (0.963 - 1.438)	1087.4	0.296 (0.165 - 0.427)	1180.9	0.63 (0.462 - 0.798)
N. TECH/AID	375.8	0.109 (0.087 - 0.13)	733.5	0.20 (0.015 - 0.385)	633.1	0.338 (0.228 - 0.448)
N	115.7	0.087 (0.078 - 0.097)	129.2	0.035 (0.022 - 0.049)	120.2	0.064 (0.049 - 0.079)
MED	265.0	0.077 (0.068 - 0.085)	166.8	0.045 (0.032 - 0.059)	143.1	0.076 (0.064 - 0.088)
Collective Actions						
CHAs	9.9	0.007 (0.005 - 0.01)	13.7	0.004 (0.002 - 0.006)	3.9	0.002 (0.001 - 0.003)
N. TECH/AID	5.1	0.002 (0.001 - 0.003)	10.5	0.004 (0.000 - 0.01)	7.1	0.011 (0.000 - 0.022)
N	9.3	0.003 (0.002 - 0.003)	8.5	0.002 (0.000 - 0.005)	7.2	0.004 (0.003 - 0.005)
MED	2.0	0.001 (0.001 - 0.001)		(-)	3.9	0.002 (0.001 - 0.003)

[a,b]Classification according to the IBGE typology, being grouped in the category "rural municipalities" those that were not urban. Urban municipalities: Tefé and Humaitá. Rural municipalities: Barreirinha, Borba, Careiro da Várzea, Nhamundá, Novo Aripuanã, Urucurituba. Note 1: CHAs: community health agents. N TECH / AID: nursing technicians or aids. N: Nurses. MED: Medical Doctors. FHTs: family health teams. Note 2: Ratio: Given by the average of actions divided by the average of the population registered in the FHTs. 95% CI: 95% confidence interval.

Source: SISAB.

tion from the team, but this can contribute to the interdisciplinary work[20]. Thus, the participation of all professionals in care increases the scope of health practices, where the participation of all professionals in care increases the scope of health practices.

The work process in the riverside and fluvial teams constitutes another dynamic due to

Table 3. FHT profile in the selected municipalities, according to Previne Indicators and area of operation, Amazonas, 2019.

	Urban Municipalities[a]					
	Urban FHT		**Fluvial FHT**		**Riverside FHT**	
	Mean	**Ratio (95%CI)**	**Mean**	**Ratio (95%CI)**	**Mean**	**Ratio (95%CI)**
PREVINE Indicator (%)						
Prenatal (6 consultations)	50.9	(43.8 - 58.0)	18.5	(0 - 37.6)	19.3	(0 - 66.1)
Prenatal (Syphilis and HIV)	61.8	(51.4 - 72.2)	26.5	(7.4 - 45.6)	38.3	(0 - 110.2)
Pregnant Women Oral Health	52.0	(44.6 - 59.4)	29.0	(0 - 79.8)	27.0	(0 - 87.2)
Cytopathological Coverage	25.1	(19.7 - 30.5)	24.0	(0 - 87.5)	9.7	(3.4 - 15.9)
Hypertension (measured BP)	16.9	(14.5 - 19.3)	11.5	(0 - 94.1)	5.0	(0 - 17.9)
Diabetes (Glycated Hemoglobin)	13.8	(10.3 - 17.2)	6.0	(0 - 31.4)	1.3	(0 - 2.8)
	Rural Municipalities[b]					
	Urban FHT		**Fluvial FHT**		**Riverside FHT**	
	Mean	**Ratio (95%CI)**	**Mean**	**Ratio (95%CI)**	**Mean**	**Ratio (95%CI)**
PREVINE Indicator (%)						
Prenatal (6 consultations)	46.4	(36.7 - 56.0)	25.0	(0 - 75.8)	33.0	(0 - 109.2)
Prenatal (Syphilis and HIV)	64.3	(52.3 - 76.4)	49.0	(0 - 125.2)	45.0	(0 - 400.8)
Pregnant Women Oral Health	50.5	(39.5 - 61.5)	72.0	(46.6 - 97.4)	17.5	(11.2 - 23.9)
Cytopathological Coverage	32.8	(24.2 - 41.3)	25.5	(0 - 57.3)	23.5	(17.2 - 29.9)
Hypertension (measured BP)	11.8	(4.8 - 18.7)	2.5	(0 - 8.9)	6.5	(0 - 76.4)
Diabetes (Glycated Hemoglobin)	11.2	(3.2 - 19.2)	-	-	3.5	(0 - 9.9)
	Total Municipalities					
	Urban FHT		**Fluvial FHT**		**Riverside FHT**	
	Mean	**Ratio (95%CI)**	**Mean**	**Ratio (95%CI)**	**Mean**	**Ratio (95%CI)**
PREVINE Indicator (%)						
Prenatal (6 consultations)	49.1	(43.6 - 54.6)	21.8	(13.6 - 29.9)	24.8	(5.1 - 44.5)
Prenatal (Syphilis and HIV)	62.8	(55.2 - 70.4)	37.8	(15.6 - 59.9)	41.0	(5.4 - 76.6)
Pregnant Women Oral Health	51.4	(45.5 - 57.4)	50.5	(10.6 - 90.4)	23.2	(1.0 - 45.5)
Cytopathological Coverage	28.1	(23.5 - 32.7)	23.8	(17.2 - 30.3)	16.0	(4.8 - 27.2)
Hypertension (measured BP)	14.9	(11.9 - 17.9)	7.0	(0 - 18.8)	5.6	(0 - 12.3)
Diabetes (Glycated Hemoglobin)	12.8	(9.2 - 16.3)	3.5	(0 - 8.8)	2.2	(0.6 - 3.8)

[a,b]Urban municipalities: Tefé and Humaitá. Rural municipalities: Barreirinha, Borba, Careiro da Várzea, Nhamundá, Novo Aripuanã, Urucurituba. Note 1: We used the highest result of the 'Previne indicator' among the four-month periods of 2019 and the first of 2020. Note 2: When the lower limit of the 95% Confidence Interval (95% CI) was a negative value, we used the zero "0" in the table.

Source: SISAB.

the existence of an expanded team, with a pilot, commander, cook and boat helper, who participate in the care scenario, such as the removal of patients[5]. However, their production is not accounted for in health information systems, as their actions constitute support and logistic activities, but there are situations in which health professionals need to know about boat engine mechanics, know the paths and channels in rivers[18,21]. In the case of road access areas, the driver is also part of the teamwork[22].

Nursing professionals have a prominent role in the health teams[16], as they are responsible for the logistics of food, supplies, fuel, preparing the work schedule, in addition to being responsible for health care. It means that in the Amazon region, the health work process, whether in indigenous health or in fluvial/riverside health, is expanded, requiring the professionals to have some competences, abilities and attitudes that are not evaluated, or "measured", by production metrics. The work of rural health teams needs to be more problem-solving, due to the lower frequency of consultations, long distances to be covered and the dispersion of the population[22]. This indicates the need to better understand the actions of PC

in the context of the Amazon region, as well as the need to evaluate health policies directed at the lifestyles and health status of rural populations[23,24].

Another component of working in the riverside areas is the team's travel time, which needs to be incorporated into the work time, because in the Amazon, time is the measure for the flows in the territory[25,26]. In the case of the fluvial BHU, the home and the work get mixed-up, as workers rest and live in the workplace, and while they sleep, they are moving to another community. In some riverside teams with urban characteristics, such as the one in the municipality of Tefé, they need to travel daily to their work area, which can represent hours on a speedboat, and the need to load all the supplies used for the day's activities. In this case, it is observed that the organization of the work process follows the specificities of the territory[20].

The function of the Community Health Agents (CHAs), as residents of the community where they operate, constitutes in the articulation between the adjoined population and the riverside and fluvial teams[16,27,28], especially in the intervals between the BFHU's current presence and the next, which can take one to two months, depending on the period of year[5] and the flooding of the rivers. A study carried out in a *quilombola* and riverside community in the region of the Lower Amazon River, showed that the CHAs carry out a type of assistance that is beyond what is recommended by the Ministry of Health, as they articulate other knowledges and practices that are part of the community's memory and history[29]. Thus, the analysis of this professional's production can conceal the practices and knowledge that remain in the shadow of official records.

The Family Health strategy, since its creation in 1994, has shown to be the main universal strategy for PC, using the principle of equity to provide special care to specific populations[15,30]. The expansion of the FHTs was accompanied by other teams, such as the "Street Consultation" (*Consultório na Rua*), Extended Family Health Center (NASF-PC), the Riverside Family Health teams (RFHTs) and the Fluvial Family Health teams (FFHTs)[7,15], as well as with other Programs, such as the "More Doctors Program" (*Programa Mais Médicos*), resulting in a 63.7% coverage of the population[2]. Therefore, the teams analyzed in this study have an important impact on the quality of life of the rural Amazon populations, but there is a limitation in the sizing of care when using indicators and data available in the information systems; thus, it is necessary to carry out qualitative studies, using participatory methodologies with the teams and the community[31].

Studies have shown that "the greater the coverage, the lower the number of hospitalizations for causes that are sensitive to primary care"[2,3]. The presence of the team in the riverside and rural territories means carrying out programmatic actions that contribute to preventive care and quality of life of the population, something that is unprecedented in the history of the Amazon region, marked by political campaign actions, which limit the integrality of care [5,8,9,16]. And here it is worth noting that, more than the simple presence of the teams in this territory, it seems there is a similar quality regarding most actions between the types of teams, especially when little access to medical technology is required, as the performance was similar between rural and urban teams in relation to the Previne indicators for prenatal care (syphilis and HIV), oral health of pregnant women, coverage of cytopathological examination and BP monitoring of hypertensive patients.

It is understandable the greater performance by urban FHTs to reach the minimum of six prenatal consultations when compared to the fluvial teams, due to the fact that the latter has an itinerant characteristic and, therefore, less capacity for longitudinal care. Likewise, a higher average of glycated hemoglobin tests by urban teams was already expected in relation to fluvial and riverside teams, since there is greater difficulty in accessing laboratories in the rural area of these municipalities. Pereira and Pacheco[32], studying the More Doctors Program in health care in a predominantly rural municipality in the state of Pará, suggested that the program resulted in increased access to PC services in these areas. However, it revealed the continuity of recurring problems that are external to the implementation of PC teams in the territory, such as: lack of access to medications and tests, limitations related to the return of patients referred to other services and flaws in the health care network, which directly impairs the search for problem-solving and integrality of care.

Studies from the National Program for Improving Access and Quality in Primary Care (PMAQ, *Programa Nacional de Melhoria do Acesso e da Qualidade da Atenção Básica*) show a certain similarity with our findings. In 2014, the assessment of PC teams in the municipality of Montes Claros, state of Minas Gerais by the health professionals, found no significant differ-

ence between urban and rural teams regarding the dimensions of permanent education, work process and comprehensive health care, in general; however, the characteristics of rurality in this municipality are quite different from those found among the riverside population in the Amazon region[24]. Thus, more specifically in the northern region of Brazil, Garnelo et al.[33], evaluating the access and coverage of primary care in rural and urban populations using data from the second cycle of the PMAQ, identified that, overall, users of rural origin have more access difficulties due to the unit opening hours and the waiting time for home visits. Visits in areas of difficult access require complex logistics, from the type of transportation, fuel, environmental control and the changes caused by the hydrological cycle.

Compared to users from urban areas, rural ones were more satisfied with the PC service, and in the state of Amazonas, in particular, they reported that the opening hours meet their needs, and when they need a consultation, they are usually well attended, perceiving some type of action to solve their problems, in addition to receiving more visits by CHAs. Regarding the level of satisfaction, the authors of the study show that this perception may have been influenced by the availability of health actions, compared to the assistance void prior to the implementation of the FHS model, even in the face of barriers observed by actors outside the communities, such as the professionals[33]. Thus, even in Amazonas, there were not many differences regarding the quality of care and services provided between urban and rural PC teams, according to the teams' viewpoint, corroborating what was indicated by the analyzed Previne results.

The present study has a limitation when evaluating health promotion actions, because they are not easily identified in the team's collective production, which directs their actions to the health education component and which, in most cases, are translated into actions such as lectures on disease prevention that comprise the calendar of campaigns and others that are specific to the Amazon region. Thus, it is necessary to extend the studies that analyze both the processes of permanent health education and ways to promote health in the fluid territories of the Amazon region. Finally, aiming at a higher quality of comparison, such analyses should be carried out in future studies, when there will be a higher number of riverside FHTs implemented in the region.

It is also known that the production in health services may suffer the effect from different periods of the year or different locations. Therefore, it was decided to work with the average of production throughout the period, aiming to reduce the influence of months with extremes of notifications, and by grouping municipalities with similar characteristics of urbanization and ruralization in the Amazon region; an attempt was made to raise some hypotheses on the effect of the locality on the issue. Another aspect to be considered is the classification of municipalities made by IBGE, used by the MH, to characterize what is urban and what is rural, and their variations: the municipality of Tefé, for instance, is categorized as "urban", but has a significant rural and riverside population, with almost 200 communities scattered over a large territory, which requires a considerable investment for care of these families. The municipality has one FFHT and 4 RFHTs, of a total of 19 teams[34].

Final considerations

This study indicates an increase in primary health care coverage in most of the assessed municipalities, especially in the last three years, and that the initiatives to create FHTs in rural areas, fluvial or riverside units, have optimized the access of a large part of this population to health services, although they remain insufficient for the entire population. It also shows there was a differentiation in outpatient production between the teams, according to the type of territory, indicating possible adaptations in work processes between rural units, with a higher appreciation of the roles of nursing technicians or aids and community health agents (CHAs).

Of the 61 municipalities in the interior of the state, only 8 had concurrent fluvial and riverside health teams. The low adherence of the municipalities to a policy that extends the access of the riverside populations, meaning more resources for the funding of these teams, with the hiring of professionals and logistical support, is something that still needs to be investigated and explained. The expansion of this type of policy is one way to produce social justice for the riverside populations[20,34].

The evaluation and monitoring of health management models in the Amazon region needs to be considered based on the following dimensions: types of team, population, territory, flow and fixed services, water cycle, logistical issues. The PC values the dynamics and knowledge of the territories and the population, because the

Ciência & Saúde Coletiva, 26(6):2053-2064, 2021

closer it is to the reality, the more efficient and effective it will be when providing health care. Thus, the care management models in operation in the Amazon region need to be expanded, supported and encouraged based on educational processes that prioritize health care access policies for the water and forest populations.

The discussion regarding access needs to be expanded beyond the offer of equipment and teams in a given territory[35], as it is necessary to think about participatory strategies that involve cultural, environmental, ethnic and territorial issues. The health work in riverside areas poses important challenges for the production of access and equity, and the geographical argument cannot be used to justify the lack of investments and management difficulties, as it is possible to create and implement techno-assistance models that can reach people's households, either by the rivers, roads or other trails that generate the encounter with care.

The policy of access to PC, aimed at riverside populations, does not have as obstacles the specificities of the territory and its culture, but they constitute challenges for attaining the integral and equitable health of the populations living in the different territories of the Amazon region. The Covid-19 pandemic showed that PC is the main coping strategy, as it operates in people's living territories. Thus, riverside populations, indigenous people, *quilombolas* and the peoples of the forest matter and are entitled to special attention and care.

Collaborations

RTS Lima, TG Fernandes, JC Schweickardt, CS Portela and PJA Martins Júnior participated in the study design, review and final writing of the manuscript. JDO Santos Junior participated in the statistical analysis of the data.

References

1. Brasil. Portaria nº 2.488, de 21 de outubro de 2011. Política Nacional de Atenção Básica. *Diário Oficial da União* 2011; 21 out.
2. Cecilio LCO, Reis AAC. Apontamentos sobre os desafios (ainda) atuais da atenção básica à saúde. *Cad Saude Publica* 2018; 34(8):1-14.
3. Brasil. Portaria nº 2.436, de 21 de setembro de 2017. Política Nacional de Atenção Básica. *Diário Oficial da União* 2017; 21 set.
4. Paim J, Travassos C, Almeida C, Bahia L, Macinko J. The Brazilian health system: history, advances, and challenges. *Lancet* 2011; 377(9779):1778-1797.
5. Lima RTS, Simões AL, Heufemann NE, Alves VP. Saúde sobre as águas: o caso da Unidade Básica de Saúde Fluvial. In: *Intensidade na Atenção Básica: prospecção de experiências informes e pesquisa-formação*. Porto Alegre: Rede Unida; 2016. p. 271-293.
6. Rios-Villamizar EA, Piedade MTF, Junk W. Tipologias de águas em áreas úmidas da Bacia Amazônica: uma revisão enfatizando a classificação dos rios e igarapés. In: Ferreira SJF, Silva ML, Pascoaloto D. *Amazônia das águas: qualidade ecologia e educação ambiental*. Manaus: Valer, Fapeam; 2016.
7. Almeida ER, Brandão CC, Matielo E, Santana MA, Ugarte OA, Costa TS. Atenção Básica à Saúde: avanços e desafios no contexto amazônico. In: Schweickardt JC, Kadri MR El, Lima RTS, organizadores. *Atenção Básica na Região Amazônica: saberes e práticas para o fortalecimento do SUS*. Porto Alegre; 2019. p. 15-50.
8. Schweickardt JC, Lima RTSL, Simões AL, Freitas CM, Marques VP. Território na Atenção Básica: abordagem da Amazônia equidistante. In: *In-formes da Atenção Básica: aprendizados de intensidade por círculos em rede*. Porto Alegre: Rede Unida; 2016. p. 101-131.
9. Kadri RM, Santos BS, Lima RTS, Schweickardt JC, Martins FM. Unidade Básica de Saúde Fluvial: um novo modelo da Atenção Básica para a Amazônia, Brasil. *Interface (Botucatu)* 2019; 23:e180613.
10. Brasil. Ministério da Saúde (MS). Secretaria de Atenção Básica. *Sistema de Informação em Saúde para a Atenção Básica-SISAB: Nota técnica - Relatório de Envio: produção enviada* [Internet]. Brasília: MS; 2019. Disponível em: http://189.28.128.100/dab/docs/portaldab/notas_tecnicas/nt_envio_producao_012016.pdf
11. Instituto Brasileiro de Geografia e Estatística (IBGE). *Atlas do censo demográfico 2010*. Rio de Janeiro: IBGE; 2013.
12. Brasil. Ministério da Saúde (MS). Secretaria de Atenção Básica. Portaria nº 2.979, de 12 de novembro de 2019. Institui o Programa Previne Brasil, que estabelece novo modelo de financiamento de custeio da Atenção Primária à Saúde no âmbito do Sistema Único de Saúde, por meio da alteração da Portaria de Consolidação nº 6/GM/MS, de 28 de setembro de 2017. *Diário Oficial da União* 2019; 13 nov.

13. Instituto Brasileiro de Geografia e Estatística (IBGE). *Classificação e caracterização dos espaços rurais e urbanos do Brasil: uma primeira aproximação*. Rio de Janeiro: IBGE; 2017.
14. Pinto H. Análise da mudança da política nacional de atenção básica. *Saude Redes* 2018; 4(2):191-217.
15. Sousa MF, Hamann EM. Programa Saúde da Família no Brasil: uma agenda incompleta? *Cien Saude Colet* 2009; 14(Supl. 1):1325-1335.
16. Figueira MC, Marques D, Vilela MF, Pereira JA, Bazílio J, Silva EM. Fluvial family health: work process of teams in riverside communities of the Brazilian Amazon. *Rural Remote Health* 2020; 20(3):5522.
17. Santos M. *Técnica, Espaço, Tempo: Globalização e meio técnico-científico informacional*. São Paulo: Hucitec; 1978.
18. Schweickardt JC, Ferla AA, Lima RTS, Amorim JSC. O Programa Mais Médicos na saúde indígena: o caso do Alto Solimões, Amazonas, Brasil. *Rev Panam Salud Publica* 2020; 44:e24.
19. Starfield B. *Atenção primária: equilíbrio entre necessidades de saúde, serviços e tecnologia*. Brasília: ONU, MS; 2002.
20. Savassi LCM, Almeida MM, Floss M, Lima MC. *Saúde no caminho da roça*. Rio de Janeiro: Fiocruz; 2019.
21. Schweickardt JC, Fela AA, Silva JMBF, Lima RTS, Andrade TR, Caldas JN, Ahmadpour B. O Programa Mais Médicos e seus encontros com o cuidado indígena no DSEI Alto Rio Solimões: anotações do campo de pesquisa. In: Schweickardt JC, Silva JMBF, Ahmadpour B. *Saúde indígena: práticas e saberes por um diálogo intercultural*. Porto Alegre: Editora Rede Unida; 2020.
22. Lima MC, Teixeira ACA, Barros E, Savassi LCM, Almeida MM, Segura MC, Anderson MIP. O fazer rural. In: Savassi LCM, Almeida MM, Floss M, Lima MC. *Saúde no caminho da roça*. Rio de Janeiro: Fiocruz; 2019.
23. Coimbra CEA. Saúde Rural no Brasil: tema antigo mais que atual. *Rev Saude Publica* 2018; 52(Supl. 1):2s.
24. Moreira KS, Vieira MA, Costa SM. Qualidade da Atenção Básica: avaliação das Equipes de Saúde da Família. *Saude Debate* 2016; 40(111):117-127.
25. Ferla AA, Trepte RF, Schweickardt JC, Lima RTS, Martino A. Os (des)encontros da pesquisa no tempo-espaço amazônico: um ensaio sobre produção de conhecimento como abertura à aprendizagem. *Rev Saude Redes* 2016; 3:241-261.
26. Kadri MR, Freitas CM. Um SUS para Amazônia: contribuições do pensamento de Boaventura de Sousa Santos. *Cien Saude Colet* 2019 (no prelo). Disponível em: http://www.cienciaesaudecoletiva.com.br/artigos/um-sus-para-amazonia-contribuicoes-do-pensamento-de-boaventura-de-sousa-santos/17453?id=17453.
27. Pereira FR, Schweickardt JC, Lima RTS, Schweickardt KHSC. O banzeiro no território líquido da Amazônia: a micropolítica do trabalho de uma equipe de saúde ribeirinha. In: Schweickardt JC, Kadri MR, Lima RTS, organizadores. *Atenção Básica na região Amazônica: saberes e práticas para o fortalecimento do SUS*. Porto Alegre: Rede Unida; 2019. p. 92-111.
28. Santos BS. *Micropolítica da gestão do trabalho e do cuidado na UBS fluvial de Borba-AM* [dissertação]. Manaus: Programa de Pós-Graduação em Condição de vida e Situações de Saúde na Amazônia, Fiocruz Amazônia; 2018.
29. Silva JMBF, Schweickardt JC, Ferla AA, Heufemann NEC. Saúde numa comunidade quilombola da Amazônia. In: Schweickardt JC, Kadri MR, Lima RTS, organizadores. *Atenção Básica na região Amazônica: saberes e práticas para o fortalecimento do SUS*. Porto Alegre: Rede Unida; 2019. p. 112-125.
30. Viana AL, Dal Poz MR. A reforma do Sistema de Saúde no Brasil e o Programa de Saúde da Família. *Physis* 1998; 8(2):11-48.
31. Giatti L. O caráter adaptativo da pesquisa participativa: rompendo com a monocultura de saberes. In: Toledo RF, Rosa TEC, Keinert TM, Cortizo CT, organizadores. *Pesquisa Participativa em Saúde: vertentes e veredas*. São Paulo: Instituto de Saúde; 2018.
32. Pereira LL, Pacheco L. O desafio do Programa Mais Médicos para o provimento e a garantia da atenção integral à saúde em áreas rurais na região amazônica, Brasil. *Interface (Botucatu)* 2017; 21(Supl. 1):1181-1192.
33. Garnelo L, Lima JG, Rocha ESC, Herkrath FJ. Acesso e cobertura da Atenção Primária à Saúde para populações rurais e urbanas na região norte do Brasil. *Saude Debate* 2018; 42(1):81-99.
34. Azevedo ES, Schweickardt JC, Martins FM, Lima NPT, Moreira MA. Saúde ribeirinha em Tefé: aprendizados da atenção básica em um território em movimento. In: Moreira MA, Figueiró R, Ferla AA, Schweickardt JC. *Educação permanente em saúde em Tefé-AM: qualificação do trabalho no balanço do banzeiro*. Porto Alegre: Rede Unida; 2019.
35. Sousa ABL, Monteiro IOP, Bousquat A. Atenção Primária à Saúde em áreas rurais Amazônicas: análise a partir do planejamento do distrito de saúde rural de Manaus. In: Schweickardt JC, Kadri MR, Lima RTS, organizadores. *Atenção Básica na região Amazônica: saberes e práticas para o fortalecimento do SUS*. Porto Alegre: Rede Unida, 2019. p. 71-91.

Article submitted 21/10/2020
Approved 02/02/2021
Final version submitted 04/02/2021

Chief editors: Maria Cecília de Souza Minayo, Romeu Gomes, Antônio Augusto Moura da Silva