



Between floods and ebbs: the use of watercrafts in the production of care and healthcare access in the liquid territory of an Amazonian municipality, Brazil

Entre cheias e vazantes: uso das embarcações na produção do cuidado e acesso à saúde no território líquido em um município amazônico, Brasil


Josiane de Souza Medeiros^a

 <https://orcid.org/0000-0002-7426-440X>
E-mail: psimedeirosio@gmail.com

Júlio César Schweickardt^b

 <https://orcid.org/0000-0002-8349-3482>
E-mail: julio.ilmd@gmail.com

Fabiana Mânica Martins^c

 <https://orcid.org/0000-0002-4440-2680>
E-mail: fabianamanica@ufam.edu.br

^aUniversidade Federal do Amazonas. Departamento de Assistência Estudantil. Manaus, AM, Brazil.

^bFundação Oswaldo Cruz. Instituto Leônidas e Maria Deane. Laboratório de História, Políticas Públicas e Saúde na Amazônia. Manaus, AM, Brazil.

^cUniversidade Federal do Amazonas. Faculdade de Medicina. Manaus, AM, Brazil.

Abstract

This qualitative study aimed to analyze watercrafts as a dimension of access to healthcare in the liquid territory of a municipality in the state of Amazonas. The data were produced using the cartographic method, which involved interviews, participant observation, and photographic images taken with healthcare providers from the municipality during trips from 2019 to 2020. The analyzed boats included *rabeta* canoes, small speedboats, large boats/recreational boats, *ajatos*/express boats, and the boat of the Basic Fluvial Health Unit (*Unidade Básica de Saúde Fluvial*). To analyze the material, the concept of a visibility plan was used, which shows the use of watercrafts in accessing and providing healthcare according to water cycles. We found that the use of these boats for healthcare access varies depending on the social, economic, cultural, and health conditions of riverine communities and the characteristics of the watercrafts, such as shape, size, motor power, and cargo capacity. Additionally, the use of these crafts is directly linked to the dynamics of the water cycles, which determine the type of boat, the route to be taken, and travel time.

Keywords: Riverine healthcare; Access to healthcare; Watercrafts; Territory; Amazon.

Correspondence

Josiane de Souza Medeiros
Av. Rodrigo Otávio, 6.200, Campus Universitário Senador Arthur Virgílio Filho — Coroado I, Centro Administrativo. Manaus, AM, Brazil. CEP 69077-000.

Resumo

Estudo qualitativo que teve como objetivo analisar as embarcações como dimensão do acesso à saúde no território líquido de um município do estado do Amazonas. Os dados foram produzidos a partir do método cartográfico, que envolveu entrevistas, observações participantes e imagens fotográficas realizadas com os trabalhadores de saúde do município, no decorrer de viagens que aconteceram em 2019 e 2020. As embarcações analisadas foram as canoas rabetas, lanchas de pequeno porte, barcos de grande porte/recreio, lanchas ajatos/expresso e embarcação da Unidade Básica de Saúde Fluvial. Para análise do material, empregamos o conceito de plano de visibilidade, a fim de fazer emergir o uso das embarcações no acesso e no cuidado à saúde; uso das embarcações de acordo com os ciclos das águas. Evidenciou-se que o uso dessas embarcações no acesso à saúde se dá de modo diversificado, relacionado às condições sociais, econômicas, culturais e de saúde dos ribeirinhos, bem como às características próprias das embarcações, como o formato e tamanho, a potência do motor e capacidade de carga. Além disso, o uso dessas embarcações está diretamente atrelado ao dinamismo dos ciclos das águas, que ditam o tipo de embarcação, o percurso a ser feito e o tempo de viagem.

Palavras-chave: Saúde ribeirinha; Acesso à saúde; Embarcações; Território; Amazônia.

Introduction

It is recurrent to look at the Amazon as the structural place of great distances, characterized by the lack of services, lack of assistance, lack of access, lack of public policies (Martins et al., 2022). These absences and shortcomings are justified because, in this territory, waters tend to be seen as barriers and everything is “far, far away.” Trying to fold the hegemonic thinking about research in the Amazon, in this article we want to look at the presences and powers that emerge from the multiplicities of researching health in the “Amazons.” To do this, we have chosen two categories to weave some discussions that help us think, discuss, and teach us about access to health with the riverside populations of the Amazon: liquid territory and watercraft.

As a category of analysis in public health, territory is the central idea guiding health care for a given population (Silva; Moebus; Ferreira, 2016). In the case of this study, the territory we are talking about is the Amazon, more specifically the liquid territory. The liquid territory category is under construction and has been discussed since 2016 by the Laboratory of History, Public Policies, and Health in the Amazon (LAHPSA/Fiocruz Amazônia). The concept for liquid territory emerged as a local epistemology when thinking about presences, powers, and rivers as a path of access, connection, encounters, a source of food and life, while trying to escape the colonialist way of approaching the Amazon (Martins et al., 2022; Schweickardt et al., 2016). This perspective implies a way of researching that is open to the unusual, to events, that articulate with the specificities of the Amazon and its people’s ways of life.

In the Amazonian territory, liquid refers to the physical, the movement, the energy produced by the waters of the rivers, *igarapés*, *igarapós*¹, and lakes that make up the life scenario of the Amazon’s riverside dwellers. This liquid is represented by the *banzeiro*², *remansos*³, *rebojos*⁴, and the water cycle

1 An area of the Amazon rainforest that remains flooded even when the rivers are dry.

2 *Banzeiro* is an Amazonian term to describe the movement of river water caused by boats and the natural movement of the water, what in other regions are called waves.

3 A stretch of river in which the water becomes calm after a period of intense agitation, usually caused by the current. The *remanso* can be located behind rocks or on the banks.

4 It’s a kind of whirlpool that forms in the waters, due to reliefs that exist at the bottom of the river. When the current meets these reliefs, they form real funnels of water, causing *remanso* on the surface of the rivers. There is a strong cosmology surrounding the *rebojos*

(Schweickardt et al., 2016). In this way, the analytical category of liquid territory needs to be understood as something concrete, which is part of the daily lives of riverine populations, including their health processes (Lima et al., 2016).

In this sense, understanding the dynamics of the waters is indispensable for any research in the Amazon, given that it is a central element in the lives of river dwellers. Thus, the flood is one of the phases of the water cycle, referring to the period when the waters are rising, filling up. Depending on the river, this phase takes place between January and May, corresponding to the period of intense rainfall in the region. The flood phase corresponds to the months of June and July—in this last month, the rivers will reach their maximum level, causing a large part of the floodplains to be submerged. The ebb corresponds to the period when the waters recede, i.e., begin to descend and eventually dry up during the months of August and September. The dry season is when the river reaches its maximum peak of drought, usually between October and November (Pereira, 2007).

Lima et al. (2016) point out that the category of liquid territory does not only involve physical and geographical aspects but is related to the flows of people who live their lives influenced by the dynamism of the water cycle, the relationships between people, public policies, and the organization of care practices. In this sense, Ferla et al. (2019) point out that the Amazon territory is alive and pulsating and is connected by a liquid surface.

A variety of watercraft circulate this liquid territory, transporting everything from basic supplies, such as food, to large vehicles, given that the connections between towns and communities are rivers and not roads (Medeiros, 2020). Because of this, watercrafts in the Amazon have been the focus of research. Most of these studies focus on geography, highlighting the importance of these vessels for the region's transport sector, territorial integration, their construction techniques and, above all, their importance for economic development

between the cities of the Amazon (Queiroz, 2019; Soares; Vidal Filho, 2020).

However, with the implementation of the *Unidades Básicas de Saúde Fluvial* (UBSF - Basic Fluvial Health Unit) in 2012, as part of the *Política Nacional de Atenção Básica* (PNAB - National Primary Care Policy), research on this new care strategy has emerged in the health field, especially highlighting the work processes of the *Estratégia de Saúde da Família Fluvial* (ESFF - Fluvial Family Health Strategy) and the expansion of access to health care for rural, water, and forest populations, including riverside communities in the Amazon, the focus of this study (El Kadri et al., 2019; Figueira et al., 2020; Lima et al., 2016). This expansion was provided by the work of the ESFF, as they traveled in boats that carries the UBSF.

The aim of this article is to analyze watercraft as a dimension of access to health in the liquid territory of a municipality in the state of Amazonas. Thus, the investigation was guided by the following questions: How do these watercrafts appear in the daily production of health care in this liquid territory? What social, economic, and cultural aspects are involved in the use of these crafts? What is the importance and how does the use of these craft affect the health of riverside dwellers according to the water cycles? We invite readers to dive with us into this tangle of rivers, waters, and craft that cross the production of health care in this liquid territory.

Methodological procedures

With a qualitative approach, this study adopted intervention research, which involves the participation of those who are somehow involved in the act of research (Passos; Barros, 2009). Based on this, we followed the clues of the cartographic method to trace the reality and subjective encounters (Cavagnoli; Maheirie, 2020) present in the daily lives of riverside health workers who have watercraft as a dimension of access to health in the liquid territory of Tefé/AM.

because they are very dangerous for navigation, swallowing almost everything that falls into their funnel.

The choice for intervention research and cartography is based on the idea that the researcher's work is not prescriptive but is constructed in a process (Passos; Barros, 2009). In this sense, the study is anchored in the following assumptions: the recognition that there is no neutrality in research, on the contrary, the researcher acts as an in-world researcher, mixing, entangling and affecting themselves with the research process (Gomes; Merhy, 2014); that every research process opens up questions rather than closing them; that different forms of knowledge are valid and do not overlap with each other; that research is not intended to reveal or verify truths, but to produce knowledge mediated by exchange and dialog, which takes place in the encounters between the actors involved (Barros; Cecílio, 2019).

The setting for the study was the municipality of Tefé, in the state of Amazonas. It was selected for convenience and because it is the reference for five other municipalities in the *Regiões de saúde do Médio Rio Solimões* (RSMRS - Mid-Solimões River Health Region). Also, because there was a cooperation agreement between the municipality of Tefé and LAHPSA, as well as because of the history of research in the municipality, in addition to being the field of the larger project, of which this article is the fruit.

The municipality of Tefé is located on the shores of Lake Tefé and has the city of Tefé as its administrative headquarters. In terms of distance from Manaus, the capital of Amazonas, it is 523 km away in a straight line and 633 km by river, with no land connection to any other municipality. It has a territorial extension of 23,692.223 km², with a population of 73,669 inhabitants, 11,418 of whom live in riverine communities (IBGE, 2022).

Regarding healthcare, the municipality is central and decisive for management and care in the RSMRS. In addition to the health services and devices installed in the city of Tefé, at the time of the research there was a whole investment and mobilization to guarantee health care for the populations in Tefé's riverside territories.

At the time of the research, the municipality of Tefé had seven Basic Health Units (UBS), two Health Posts, with 14 Family Health Strategies

with Oral Health (ESFSB), three Expanded Family Health Centers (NASF) and a Prison Health Care Team, a Tefé Regional Hospital (HRT), a Polyclinic, a Clinical Analysis Laboratory, a Central Pharmacy, a Psychosocial Care Center, a Rehabilitation Center, Mobile Emergency Care, a Municipal Regulatory Complex responsible for organizing the flow of urgent and emergency cases, if the user needs to be transferred to another point in the Health Care Network, as well as the Telehealth service (Moreira et al., 2019).

The municipality is not connected by roads, and access is predominantly by river, with an extensive hydrographic network. As such, Tefé's riverine health was organized by riverine health area, which generally has its localities and communities distributed according to the channels of rivers and lakes. In all, the liquid riverside territory had five health areas, called areas 10, 11, 14, 19 and 21.

These five areas have two UBS, one UBSF, one Health Post and 17 Support Units (UA), with 21 small boats. These health facilities are linked to five ESFSBs, four of which are ESFRs and one ESFF, and one NASF to serve 11,418 registered people (Moreira et al., 2019).

On the basis of the territory presented, health workers from the ESFR and ESFF, such as doctors, nurses, nursing and oral health technicians, social workers, psychologists, and Community Health Agents (ACS) participated in this study, as well as managers (secretary, coordinator, director) and unit managers. The participants were over 18 years old, of both sexes and had been working in riverside areas for at least a year. Thus, LAHPSA researchers and health service workers collectively built a way of mapping health experiences from the watercraft.

In the cartographic process, various instruments and tools were used, such as semi-structured interviews, informal conversations, photographic records, participant observations and a cartographic diary to produce the information collected. With regard to the interviews, we used two of their questions, which related precisely to health transportation, namely: what kind of transportation do users in the riverside area use to access urgent and emergency services? What is the municipality's structure for providing health transportation to

riverside communities? The cartography took place during the researcher's in-world flows, during the actual monitoring of the health professionals' work process, and during meetings with the riverine communities in the liquid territory of Tefé.

The fieldwork took the form of four trips during the following dates and periods of the water cycle: the first trip took place between June 4 and 6, when the rivers reach their maximum peak (flood); the second trip took place between September 16 and October 1, when the rivers are at their lowest levels (drought); the third trip took place between November 27 and December 5, when the rivers are beginning to rise (flood). These three trips took place in 2019 and the fourth was from March 2 to 8, 2020, when the rivers continue to rise (flood).

As for organizing and analyzing the data, first of all, the audios of the interviews were transcribed, so as to facilitate the emergence of visibility plans about the watercraft and the production of health care. As for the photographs, they were organized into folders by type of watercraft, making up an image bank with 543 photographs. The criteria used to choose the photographic images for this article were the frequency with which a certain type of watercraft appeared in the health workers' interviews, in observations when monitoring the teams' work process and the frequency with which they appeared in the image bank. Based on this, we selected five photographic images of the watercraft that were most present in the liquid territory of Tefé: *rabetas* canoes (canoes with an outboard motor), small speedboats, large boats/recreational boats, *ajatos*/express speedboats and the UBSF boat.

After organizing the materials, and based on the guiding questions of the research, a careful and attentive reading was made of the transcripts of the interviews, diaries, and participant observations, in order to identify scenes in which the five models of vessels mentioned above emerged. The scenes that emerged from reading these materials resulted in visibility plans. With these plans, we want to produce visibility for experiences, situations, and elements of everyday work, which often go unnoticed, made invisible or not valued, including by the team itself (Barros; Cecílio, 2019).

This study is linked to a broader research project under the SUS Research Program (PPSUS), funded by the *Fundação de Amparo Pesquisa do Estado de Amazonas* (FAPEAM - Amazonas State Research Foundation). This research was duly submitted to the Research Ethics Committee and was approved.

Results and discussion: the visibility plans of watercraft in access to health

Two visibility plans of watercraft as a dimension of access to health emerged: the use of craft in everyday health care; the use of craft in health according to the water cycles. In this sense, the results were presented in the form of visibility plans for the *rabetas* canoes, small speedboats, large boats/recreational boats, *ajato*/express speedboats and the UBSF boat and their uses in everyday health care and in relation to the water cycle, presented in this section in a way that is interwoven with the discussion.

The use of watercraft in everyday healthcare: from *rabetas* canoes to the UBSF

Through its different health policies for the riverside populations of the Amazon, the SUS ends up being the only one able to offer healthcare to these people (Reis et al., 2020). In this sense, especially through the PNAB, the SUS has sought health equity for these populations, who have historically had limited or even absent healthcare (Pessoa; Almeida; Carneiro, 2018).

Due to the specificities of the Amazon, such as long travel distances, population dispersion and the water cycle, the logic of health services has still been a challenge for the SUS, especially health transportation (Casanova et al., 2017). It is at this point that other elements of the territory and the populations that inhabit it are indispensable for healthcare. In the case of this article, we are focusing on watercraft, both those provided by institutional health services, such as SOS boats or *ambulanchas*, and those offered by other means, such as private boats owned by workers, users, and riverside communities.

The first watercraft we highlight is the “traditional” *rabeta* canoe. In the photograph in Figure 1, we can see that it is a small boat. It is made of wood and has a keel (a kind of rudder) at the back to help with steering. They may or may not have decks, a kind of flooring that makes the boat more comfortable. The tail is the boat’s engine and can vary in power, the most common being a 5HP engine. Its name is due to the long shaft and a small propeller at the end, which moves around like a tail.

Figure 1. Rabeta canoe moored in one of Tefé’s riverside communities



Source: LAHPSA archive, 2020.

Regarding the visibility plan of the use of *rabetas* in everyday healthcare, they appear in the liquid territory of Tefé in different ways, mainly in the practices of health workers, especially the ACS, and by service users themselves.

In the ACS work process, *rabetas* are used to travel between riverside communities during their home visits. Although this type of boat is the least powerful, we have consistently seen it used by the ACS in urgent and emergency situations. This practice takes place either to transfer the user to a community with a more powerful boat, or to

transport the midwife or prayer worker to the user, or to transfer the user directly to the HRT, which is located in the municipality’s headquarters. In these situations, the user is accommodated on the canoe’s deck, as it provides the greatest stability and comfort.

The ACS also use the *rabeta* to come to the city of Tefé at least once a month to carry out activities related to their work, such as planning, delivering documents, receiving materials, participating in Permanent Health Education (PHE) courses and meetings, and also to receive their salaries.

From the users’ perspective, the *rabetas* are also used in the search for health care. However, we noticed that users use them to travel shorter distances, such as leaving their locality to go to the community where the UBSF is located, a situation we can observe with the family that arrived in the boat in Figure 1.

This visibility plan for the use of *rabetas* draws attention to the role of ACSs in this liquid territory. According to the Ministry of Health and various studies, ACSs have been considered a fundamental agent for enabling and organizing healthcare in primary care throughout the expansion of the SUS (Barros; Cecílio, 2019; Guimarães et al., 2020). In the case of the health reality in the Amazon, this agent and worker gains even more importance, given that in all the communities that took part in this study, the ACS is the only healthcare provider who was born and lives in the community, with extensive knowledge of the territory in which they work.

A second watercraft that emerged from Tefé’s liquid territory was the small speedboat shown in Figure 2. This one is made of aluminum, making it light and easy to glide over the water. Although the photographic record shows a covered boat with a steering system at the front, we can see from our immersion in the liquid territory of Tefé that there is a diversity in the physical characteristics of these boats.

Thus, they may or may not have a cover, walls, steering at the front or on the engine handlebar itself, as well as different sizes. We should also note that the engine shaft, unlike the *rabetas*, is vertical to the water, a specificity that becomes decisive for the use of this boat in relation to the water cycle, as we

will see later. In terms of power, the engine of these speedboats can be low or medium-powered, with up to 175HP, which can be up to 20 times more powerful than *rabetas*, making it a fast boat (Queiroz, 2019).

Figure 2. Health workers using the small speedboat



Source: LAHPSA archive, 2020.

The speedboat we see in Figure 2 is exactly the model that was implemented by the Tefé Municipal Health Department (SEMSA) in the UA, which are strategic communities that have a nursing technician on call and a speedboat with a 40HP engine for urgent and emergency situations.

In addition to the speedboats used by the Support Units and which need to be available in the communities, SEMSA has other small speedboats that vary in size and power. In terms of the visibility of these speedboats in relation to their use in everyday health care, because they are fast and powerful, they can transport everything from the basic supplies that the teams need when they are in the communities, to quickly transporting a river dweller who has suffered an accident due to a falling tree, venomous animals or a pregnant woman with childbirth complications.

The small speedboats of the “flying” type, which are common in riverside communities and, after the *rabeta* canoe, are the ones most used by ACSs in their work process and by users, and they are so named because they are small, light and seem to fly over the water. When the UBSF boat goes out on trips, it takes a small speedboat as support, which is often used by the crew and the team. As the UBSF is a large craft, someone from the crew needs to go ahead with the

small boat, checking the paths to signal to the UBSF commander whether or not it can pass.

Figure 3 shows the Ajato/express speedboats as a third type of watercraft that is also used in some way for health access. Queiroz (2019), when researching the Ajatos (or *expressos*, as they are known locally), says that these are large speedboats, built in aluminum, with a structure to receive powerful machines, with engines above 400HP, allowing trips to be made in a short period of time, compared to recreational boats, mainly intercity and interstate trips.

Figure 3. Ajato/express speedboats sailing on the Solimões River, bound for Tefé



Source: LAHPSA archive, 2019.

The visibility plan for the use of *Ajatos* in relation to healthcare emerges more intensely when the search for care takes place in Manaus. As these boats make intermunicipal journeys, due to their speed, they are used to remove riverside dwellers in urgent and emergency situations, because after the air ambulance, the *Ajatos* are the fastest means of making the Tefé-Manaus journey, taking approximately 13 hours.

At the back of the boat is a kind of sofa-bed, which usually accommodates users who are being taken to Manaus for medical treatment, as it is more comfortable and because it is the part of the boat that sways the least in the waves. However, traveling by *Ajato* is one of the most expensive modes of transport, as well as not being very accessible to riverside dwellers, since at the time of the research the Tefé-Manaus stretch cost R\$ 300. As a result, SEMSA had an agreement with the *Ajatos* to pay for tickets for users in these situations.

In the photograph in Figure 4, we can see several watercrafts; in the center of the image, we highlight the large boat, also called a recreational boat by riverside dwellers. These large-sized boats are built with a combination of materials such as wood, iron, steel, fiberglass, and aluminum. They can have several floors, the first of which houses the administrative part of the boat, the galley, and the hold, where the various cargoes are stored. The upper decks are used for passenger accommodation. Between crew and passengers, this type of boat carries around 600 people.

Figure 4. Recreational boat moored in the port of Tefé when the rivers are drying up



Source: LAHPSA archive, 2019.

The use of these watercraft as a visibility plan for healthcare is particularly important for two reasons. The first concerns the fact that they transport practically everything, including healthcare materials and supplies. Secondly, because it is the main means of passenger transportation between Tefé and Manaus, directly affecting its use in Out-of-Home Health Care (TSFD).

From the first perspective of use, the importance of recreational boats stands out, as they transport all kinds of products and goods to Tefé. In their weekly comings and goings between Manaus and Tefé, they transport goods to supply the shops in Tefé, taking fish, fruit, vegetables, and flour produced by the riverside dwellers to supply the markets in Manaus. They transport medicines produced in large laboratories, but they

also take plant leaves, bark of sticks, roots, and medicine bottles produced by riverside dwellers. This type of boat brings hospital equipment to Tefé for different purposes, such as microscopes, ultrasound machines, mammography units, blood collection slides, etc. They even transport air to help those admitted to the HRT breathe, via huge oxygen cylinders. In this way, virtually all of Tefé's health services are supplied by what arrives via recreational boats, from the most sophisticated products bought on the internet to the most basic ones, such as oxygen for people to breathe.

The second use relates to the fact that recreational boats do not just transport goods and supplies for healthcare, they also carry different passengers, such as those who are going to visit family members, go shopping and receive health care in the capital. This means that, because they are more affordable, recreational boats are the watercraft that river dwellers use the most to go in search of healthcare outside Tefé.

In this sense, SEMSA's management has an agreement with recreational boats to provide tickets for users who have had their TSFD released, especially for elective healthcare. Because they take longer to travel on the Tefé-Manaus stretch than the Ajatos, recreational boats are not very viable for urgent and emergency removals and are used more for elective care.

Finally, Figure 5 shows the boat that houses the UBSF as another dimension of access to healthcare in the liquid territory of Tefé. It is a large vessel, built of iron and has two floors. In addition to the common areas of a traditional, fixed UBS such as a waiting room, procedure room, vaccination room, doctors', dentists' and nurses' offices, laboratory, pharmacy, room for cleaning materials, laundry and toilets, the UBSF provides the team and crew with a control room, cabins, toilets, pantry, kitchen and cafeteria, given that the ESFF can be on board for up to 20 days.

This vessel appears in the daily routine of health care for the riverside dwellers from the trips that the ESFR and ESFF make using the UBSF as a base to move around the rivers and lakes of Tefé, covering the closest communities to those considered more distant. In research on access to healthcare with

the UBSF, such as those by El Kadri et al. (2019); Lima et al. (2016); Figueira (2020), we saw that, historically, riverside dwellers had to travel from their communities in search of care, usually to the municipal headquarters. With the implementation of the UBSF, we have the opposite movement: health services moving to these populations.

Figure 5. UBSF boat moored in the port of a riverside community in Tefé



Source: LAHPSA archive, 2020.

Thus, since health services are provided by the UBSF closest to the riverside residents has reduced the need for them to travel to the municipality's headquarters exclusively in search of healthcare. In this liquid territory, healthcare is transported to the riverside dweller, providing assistance and expanding access to health in the bends, folds, and banks of the rivers (El Kadri et al., 2019; Martins et al., 2022).

Although this article has only analyzed five models of watercraft, our immersion in the liquid territory of Tefé has made us aware of their diversity. The frequency and intensity with which these craft were captured by the lenses of our cameras, in our observations and in the narratives of the health workers, reveal how indispensable they are in the production of healthcare in a territory where the paths are made by water.

These watercrafts also appear in a variety of ways in the daily lives of riverside communities. There are those communities that have SOS speedboats with 40HP engines installed in the

UA by SEMSA, precisely for the purpose of using them for emergencies. In other communities there are no 40HP boats, but the ACS has their own small boat, which can vary between 15 and 50HP. Many of these communities have *rabetas* canoes as their main means of accessing healthcare. The diverse characteristics of these watercrafts, such as shape and size, engine power, cargo capacity, and material used, make a big difference when it comes to urgencies and emergencies in the Amazon. This diversity of watercrafts in relation to their use to access healthcare also appeared in the research by Anjos and Albuquerque (2019) when they analyzed access to healthcare in the municipalities of Iranduba, Manaquiri, and Careiro da Várzea, even though they are closer to Manaus than Tefé, which is located in another health region and river channel.

Medeiros (2020) points out that another aspect to consider when producing health with the liquid territory of Tefé is the fact that the use of these watercrafts is strongly related to the social, economic, and cultural dimensions of the ways of life of the riverside communities. Thus, anyone who sees a *rabetas* canoe moored in a community's port and is not familiar with the Amazon's liquid territory may have the mistaken understanding that canoe sailing is synonymous with backwardness, that these people are not integrated into "globalization, modernity." However, the plans give visibility to the *rabetas* canoes which go in the opposite direction to this thinking.

The plans give visibility, in the sense that owning a *rabetas* canoe becomes more accessible to river dwellers. This is due to the fact that it is made by the river dwellers themselves, involving traditional knowledge that has been passed down from father to son, the materials used are easily available in the forest, maintenance, the purchase of the *rabetas* and the consumption of gasoline for this type of boat are less expensive than for speedboats and boats. In addition, the *rabetas* canoe is easier to handle. In this sense, the strong presence of *rabetas* canoes is not a sign of backwardness, but of a type of use that is geared towards the concrete needs of these populations, including health needs.

Use of watercrafts according to water cycles: care between droughts and ebbs

The daily use of watercraft in access to healthcare, which we saw in the previous section, is directly linked to the water cycle in the liquid territory of Tefé, which is why a visibility plan has emerged that tells about healthcare that takes place between floods and ebbs, in a dialog with the water cycle presented in the introduction to this article.

With regard to the visibility plan for the use of *rabetas* canoes according to the water cycles, it emerged that this vessel is used both during the flood and the drought to access health services. However, they play a more prominent role during the drought due to various factors. During this period, rivers become shallow, holes⁵ and *igarapés* (small, narrow waterways) no longer allow passage and, due to the physical characteristics of *rabetas*, as shown in Figure 1, they become the easiest watercraft to navigate in these conditions, presenting less risk of running aground, colliding with sandbanks and making it easier to drag the boat over mud, if necessary. Thus, if an urgency/emergency situation arises during the dry season, *rabetas* are usually the boats used to transport the river dwellers.

The use of small speedboats in relation to the water cycles highlights the ease with which they can be used during the flood and the greater difficulties during the drought. Access to health services and care practices is made easier during the flood because during this period the holes and streams are full, deep, and wide, acting as shortcuts, giving access to rivers and lakes, shortening travel times, especially in the event of an emergency. Driving small boats in this scenario is easier, due to the specific characteristics of this type of craft. In the dry season, however, speedboats present difficulties, as the engine shaft is vertically in the water, easily colliding with the bottom of rivers and lakes, and speedboats are often unable to move during the dry season.

With regard to the use of the *Ajatos/Express* speedboats according to the water cycles, the visibility plan showed few changes in relation to access to health during the flood and drought periods. This is because the *Ajatos* navigate almost their entire route along the Solimões River, which does not dry up sufficiently to prevent travel. Thus, the *Ajatos* make journeys all year round, suffering little interference from water cycles, for example, making journeys longer during the dry season.

Recreational boats are even more important because their trips are not suspended at any time of the year due to water cycles. However, travel times can vary greatly due to the size of the boat, the power of the engine, the cargo and the current of the rivers. During the dry season, journeys take longer because the driver has to dodge the sandbanks that form at this time and the current gets stronger, reducing the boat's speed. The trip from Manaus to Tefé takes approximately 40 hours during the dry season.

Regarding the UBSF, you can see in Figure 5 that it is easily moored in the port of one of the riverside communities, given that this trip took place in March, when the rivers are at their fullest. Thus, the UBSF vessel makes its journeys according to the dynamism of the water cycle. As it is a large vessel, it is only able to leave for trips between January and September, when the rivers have a navigable water level. In the other months, which correspond to the dry season, it is unable to travel and has to stay anchored in a deeper part of Lake Tefé in front of the city, serving as a base for other ESFRs.

Although the description of the watercrafts in this article has been done in order of size, this does not reflect an order of importance, given that the use of the craft follows the dynamics of the water cycles. In this liquid territory, a canoe is no more or less important than a UBSF, and vice versa. This becomes clear when the workers say that when the rivers are dry, the UBSF, due to its physical size, cannot reach the communities and the main form of access is via canoes or small speedboats; when the rivers are

⁵ Labyrinths of channels that communicate, branch off, connect, and cross each other in a river tangle, which can link one lake to another lake, one borehole to another borehole, or a tributary.

full, the UBSF is moored at the community's port, reducing the use of the canoe in the user's journey.

Thus, in this scenario where health practices are daily crossed by the dynamics of water cycles, watercraft have a different use. Small speedboats, for example, because they are made of galvanized aluminum, have characteristics that make it easier to travel through gaps, *igarapós* and *igarapés* during floods, as well as being faster than canoes. The recreational boats, due to their characteristics, move more slowly during the dry season, and can take almost three days to travel on the Tefé-Manaus stretch, which is why they transport the main supplies used in the health services. In addition, these are the boats that users generally use when they need elective health care in Manaus. The *Ajatos*, since they are extremely fast, are more commonly used for removal and urgent and emergency care from Tefé to Manaus. During the flood, the UBSF can travel for up to 20 days, expanding access to the riverside population, since it offers the same services as a traditional UBS with the added benefit that users do not have to travel to the municipality's headquarters; however, during the dry season it does not go on trips. *Rabetas*, on the other hand, play a more prominent role in the drought, because depending on the water level and the characteristics of the river, they often become the only craft that can navigate (Medeiros, 2020).

In this sense, it can be seen that the use of these watercraft articulates with the specificities and singularities of the liquid territory; during a major drought, for example, a big, fast boat is useless if it cannot navigate. Thus, understanding these watercrafts as a dimension of access to health is to think of health policies and practices that are closer to the reality of riverside populations.

Although not the focus of this article, the health-environment relationship is unquestionable; one issue that the use of these craft points to concerns the changes and variations in water cycles caused by climate change. Brandão (2019) and Kraft (2023) point out that, since the 2000s, more intense and prolonged floods have been occurring more frequently in the Amazon, mainly affecting municipalities on floodplains. In 2023, the state of

Amazonas experienced one of its biggest and longest droughts, with areas where not even canoes could get through.

In this sense, changes in the water cycle are added to other environmental problems caused by climate change and the loss of biodiversity, putting pressure and imposing new and different local demands on the SUS (Couto, 2020), for example, thinking about and implementing new strategies for health transportation, taking into account that, during extreme drought, the health services we have today, such as ESFR and UBSF, cannot reach the riverside populations.

With this study, we have seen the importance of watercrafts in access to health care. Given the impossibility of these crafts circulating due to extreme droughts, how will health care be provided to these peoples? This is a question for managers to discuss and implement this demand in health policies as soon as possible.

Considerations: Some lessons

When we look back at the objective of this article, which was to analyze watercrafts as a dimension of access to health in the liquid territory of a municipality in the state of Amazonas, in this case Tefé, we make these considerations based on some of the lessons that the visibility plans have made possible for us in the ways of doing health research with the Amazons.

One of these lessons was shown in the visibility plans, which brought to light the role of watercraft as more than just a means of transportation in the Amazon region, insofar as they proved to be essential for the production of healthcare from the perspective of both users and health workers and managers.

Another lesson is related to the different ways of looking at these watercrafts, looks aimed at understanding how they function as elements in access to health and what meaning they take on in a territory marked by the dynamism of the waters. Thus, the discussion of the text in the results section was based on the visibility plans related to the use of watercrafts in everyday health care and the use of crafts according to the water cycles.

The lessons have also been learned in the sense that these crafts linked to health care and access do not follow the logic of what is established in official health policies. The different crafts are not seen on a scale of importance, their use does not follow an established model or protocol, on the contrary, their use is differentiated and follows the logic of the water cycles, the ease or otherwise of getting gasoline, the power of the craft.

A better understanding of the use of these watercrafts in accessing riverside healthcare can help managers expand strategies, such as those that already exist, for making speedboats available in strategic communities. In addition, they can develop other strategies, for example, adapting *rabetas* for urgent and emergency removal situations, given that during the dry season, access is almost exclusively by means of this craft. Thus, these canoes could have stretchers, first aid kits, and lighting equipment both for safety and to facilitate navigability, considering the specificities of the territories.

References

- ANJOS, L. C. C.; ALBUQUERQUE, A. R. C. O acesso geográfico à saúde no triângulo fluvial do setor central da Amazônia. *Confins*, São Paulo, n. 43, p. 1-18, 2019. DOI: 10.4000/confins.25386
- BARROS L. S.; CECÍLIO L. C. O. Entre a 'grande política' e os autogovernos dos Agentes Comunitários de Saúde: desafios da micropolítica da atenção básica. *Saúde em Debate*. Rio de Janeiro, v. 43, n. especial 6, p. 10-21, 2019. DOI: 10.1590/0103-11042019S601
- BRANDÃO, L. C. *Vidas ribeirinhas e mudanças climáticas na Amazônia: ativando híbridos, friccionando conhecimentos e tecendo redes no contexto do Antropoceno*. 2019. 173 f. Dissertação (Mestrado em Sociologia) - Universidade Federal do Rio Grande do Sul, Porto Alegre, 2019.
- CASANOVA, A. O. et al. implementação de redes de atenção e os desafios da governança regional em saúde na Amazônia Legal: uma análise do Projeto QualiSUS-Rede. *Ciência & Saúde Coletiva*, São Paulo, v. 22, n. 4, p. 1209-1224, 2017. DOI: 10.1590/1413-81232017224.26562016
- CAVAGNOLI, M.; MAHEIRIE, K. A cartografia como estratégia metodológica à produção de dispositivos de intervenção na Psicologia Social. *Fractal: Revista de Psicologia*, Niterói, v. 32, n. 1, p. 64-71, 2020. DOI: 10.22409/1984-0292/v32i1/5680
- COUTO, R. C. S. Saúde e ambiente na Amazônia brasileira. *Novos Cadernos NAEA*, Belém, v. 23, n. 3, p. 167-178, 2020. DOI: 10.5801/ncn.v23i3.7280
- EL KADRI, M. R. et al. Unidade Básica de Saúde Fluvial: um novo modelo da Atenção Básica para a Amazônia, Brasil. *Interface*, Botucatu, v. 23, 2019. DOI: 10.1590/Interface.180613
- FERLA, A. A. et al. Encontros da Saúde e da Educação na Amazônia: inovações que brotam da diversidade e da complexidade de um território líquido. In: FERLA, A. A.; SCHWEICKARDT, K. H, S, C.; GAI, D. N. (org.). *Atenção básica e formação profissional em saúde: inovações na Amazônia*. Porto Alegre: Rede Unida, 2019. p. 8-20.
- FIGUEIRA, M. C. S. et al. Processo de trabalho das equipes saúde da família fluviais na ótica dos gestores da Atenção Primária. *Revista da Escola de Enfermagem da USP*, São Paulo, v. 54, p. 1-8, 2020. DOI: 10.1590/S1980-220X2018027303574
- GOMES, M. P. C.; MERHY, E. E. Apresentação. In: GOMES, M. P. C.; MERHY, E. E. (org.). *Pesquisadores in-mundo: um estudo da produção de acesso e barreira em saúde mental*. Porto Alegre: Rede Unida, 2014. p. 7-23.
- GUIMARÃES, A. F. et al. Acesso a serviços de saúde por ribeirinhos de um município no interior do estado do Amazonas, Brasil. *Revista Pan-Amazônica de Saúde*, Ananindeua, v. 11, 2020. DOI: 10.5123/s2176-6223202000178
- IBGE - INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA. *Tefé. Cidades: População - 2022*. Rio de Janeiro, 2023. Available from: <https://cidades.ibge.gov.br/brasil/am/tefe/panorama>. Access on: May 13, 2024.
- KRAFT, F. G. *Rio que transborda e terra que enraíza: o impacto de uma cheia e o deslocamento de comunidades ribeirinhas do Baixo Rio Madeira/RO*. 2023. 136 f. Dissertação (Mestrado em Psicologia) - Universidade de São Paulo, Ribeirão Preto, 2023.

- LIMA, R. T. S. et al. Saúde sobre as águas: o caso da UBS de Saúde Fluvial. In: CECCIM, R. B. et al. (org.). *Intensidades na Atenção Básica*: prospecção de experiências informes e pesquisa-formação. Porto Alegre: Rede Unida, 2016. p. 269-294. v. 2.
- MARTINS, F. M. et al. Produção de existências em ato na Amazônia: “território líquido” que se mostra à pesquisa como travessia de fronteiras. *Interface*, Botucatu, v. 26, p. 1-14, 2022. DOI: 10.1590/interface.210361
- MEDEIROS, J. S. *Caminhos da população ribeirinha*: produção de redes vivas no acesso aos serviços de urgência e emergência em um município do Estado do Amazonas. 2020. 235 f. Dissertação (Mestrado em Condições de Vida e Situações de Saúde na Amazônia) – Instituto Leônidas e Maria Deane, Fundação Oswaldo Cruz, Manaus, 2020.
- MOREIRA, M. A. et al. A saúde em processo no coração do Rio Solimões: Município de Tefé. In: MOREIRA, M. A.; FIGUEIRÓ, R. K. S.; FERLA, A. A. (org.). *Educação permanente em saúde em Tefé/AM*: qualificação do trabalho no balanço do banheiro. Porto Alegre: Rede Unida, 2019. p. 32-42.
- PASSOS, E.; BARROS, R. B. A cartografia como método de pesquisa-intervenção. In: PASSOS, E.; KASTRUP, V.; ESCÓSSIA, L (org.). *Pistas do método da cartografia*: pesquisa-intervenção e produção de subjetividade. Porto Alegre: Sulina, 2009. p. 17-31.
- PEREIRA, H. S. A dinâmica da paisagem socioambiental das várzeas do rio Solimões Amazonas. In: FRAXE, T. J. P.; PEREIRA, H. S.; WITKOSKI, A. C. (org.). *Comunidades ribeirinhas amazônicas*: modos de vida e uso dos recursos naturais. Manaus: EDUA, 2007. p. 11-32.
- PESSOA, V. M.; ALMEIDA, M. M.; CARNEIRO, F. F. Como garantir o direito à saúde para as populações do campo, da floresta e das águas no Brasil? *Saúde em Debate*, Rio de Janeiro, v. 42, n. spe 1, p. 302-314, 2018. DOI: 10.1590/0103-11042018S120
- QUEIROZ, K. O. As lanchas “ajato” no Solimões: modernização pretérita e integração territorial. *Novos Cadernos NAEA*, Belém, v. 22, n. 1, p. 89-109, 2019.
- REIS, M. H. S. et al. O impacto do advento de uma Unidade Básica de Saúde Fluvial na assistência aos povos ribeirinhos do Amazonas. *Revista Eletrônica Acervo Saúde*, [s. l.], v. sup. 53, n. 53, p. 1-6, 2020. DOI: 10.25248/reas.e3631.2020
- SILVA, K. L.; MOEBUS, R. L. N.; FERREIRA, V. L. Sobre e sob o território: entre a delimitação e a desterritorialização na produção do cuidado. In: MERHY, E. E. et al. (org.). *Avaliação compartilhada do cuidado em saúde*: surpreendendo o instituído nas redes. Rio de Janeiro: Hexis, 2016. p. 91-95. v. 1.
- SCHWEICKARDT, J. C. et al. Território na Atenção Básica: uma abordagem da Amazônia equidistante. In: CECCIM, R. B. (org.). *In-formes da Atenção Básica*: aprendizados de intensidade por círculos em rede. Porto Alegre: Rede Unida, 2016. p. 101-132. v. 1.
- SOARES, F. J. A.; VIDAL FILHO, W. B. Caracterização dinâmica de embarcações regionais do Amazonas. *UNOPAR Científica Ciências Exatas e Tecnológicas*, Londrina, v. 13, n. 1, p. 13-19, 2014.

Contribution of the authors

Data collection process: Josiane Medeiros and Fabiana Martins. Development or design of methodology: Josiane Medeiros and Fabiana Martins. Conception, design, and writing of the article: Josiane Medeiros. Acquisition of financial support for the project that gave rise to this publication: Júlio Schweickardt. All the authors have reviewed and approved this version for publication.

Received: 05/21/24

Resubmitted: 07/25/24

Approved: 08/05/2024