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## Primary Health Care and the Management of Chronic Non-Communicable Diseases: Challenges and Strategies for Hypertension and Diabetes in the Amazon

*Primary Health Care and the Management of Noncommunicable Diseases: Challenges and Strategies for Hypertension and Diabetes in the Amazon*

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### Summary

Non-communicable chronic diseases (NCDs), especially systemic arterial hypertension and diabetes mellitus, constitute significant public health problems, demanding continuous strategies for care, monitoring, and prevention of complications. In the Amazonian context, particularly in riverside communities, the management of these conditions presents additional challenges related to territorial inequalities, geographical barriers, logistical limitations, and weaknesses in the organization of health services. Given this scenario, Primary Health Care (PHC) assumes a strategic role in coordinating care, providing longitudinal follow-up, and promoting equity. This study aimed to analyze, through a narrative review, the impact of chronic non-communicable diseases on health.

This study, based on a literature review, examines primary health care (PHC) strategies for managing systemic arterial hypertension and diabetes mellitus in riverside communities of the Amazon. The methodology consisted of a narrative review of scientific publications and normative documents, selected from electronic databases and official institutional sources in the health field. The results show a high prevalence of underdiagnosis, discontinuity of care, and a greater risk of complications associated with non-communicable diseases (NCDs) in these territories, as well as highlighting the relevance of strategies such as active case finding, territorialization, the work of Community Health Agents, health education, and supported self-care. It concludes that strengthening PHC, with actions adapted to the socio-territorial specificities of riverside communities, is fundamental to improving care for NCDs, reducing avoidable hospitalizations, and promoting greater equity in access and health outcomes.

**Keywords:** Primary Health Care; Non-Communicable Chronic Diseases; Hypertension; Diabetes Mellitus; Amazon.

### Abstract:

Noncommunicable Diseases (NCDs), especially Systemic Arterial Hypertension and Diabetes Mellitus, constitute significant public health problems, demanding continuous strategies for care, monitoring, and prevention of complications. In the Amazonian context, particularly in riverside communities, the management of these conditions presents additional challenges related to territorial inequalities, geographical barriers, logistical limitations, and fragilities in the organization of health services. Given this scenario, Primary Health Care (PHC) plays a strategic role in care coordination, longitudinal monitoring, and the promotion of equity. This study aimed to analyze, through a narrative literature review, PHC strategies focused on the management of systemic arterial hypertension and diabetes mellitus in riverside communities in the Amazon. The methodology consisted of a narrative review of scientific publications and normative documents, selected from electronic databases and official institutional health sources. The results show a high prevalence of underdiagnosis, discontinuity of care, and a higher risk of complications associated with NCDs in these territories, while also highlighting the relevance of strategies such as active case finding, territorialization, the role of Community Health Agents, health education, and supported self-care. It is concluded that strengthening PHC, with actions adapted to the socio-territorial specificities of riverside communities, is fundamental to qualify the care for NCDs, reduce avoidable hospitalizations, and promote greater equity in access and health outcomes.

**Keywords:** Primary Health Care; Noncommunicable Diseases; Arterial Hypertension; Diabetes Mellitus; Amazon.



## **1. Introduction**

Non-communicable chronic diseases (NCDs) currently constitute one of the main challenges for health systems globally, due to its high prevalence, course prolonged and with a significant impact on the morbidity and mortality of the population. Among these conditions, Systemic Arterial Hypertension and Diabetes Mellitus stand out, being responsible for a significant portion. burden of cardiovascular, renal, and metabolic diseases, in addition to requiring monitoring. continuous and comprehensive care actions over time (WHO, 2023).

In Brazil, tackling NCDs is strongly associated with strengthening the Primary Health Care (PHC), recognized as the preferred entry point to the Unified Health System. of Health (SUS) and as the level of care responsible for coordinating care, by longitudinality and through the coordination of actions for promotion, prevention and treatment (BRAZIL, 2017). When structured based on its essential attributes, primary health care (PHC) has the potential to reduce Preventing avoidable hospitalizations, improving clinical control, and promoting greater equity in access to services. health.

However, the implementation of this care model faces specific challenges in certain contexts. Territorial regions marked by social and geographical inequalities, as is the case in the Brazilian Amazon. Riverside communities, characterized by population dispersion and dependence on transportation. Due to riverine factors and structural limitations in health services, they experience significant obstacles in access. to services and continuity of care, which directly impacts early diagnosis, in clinical monitoring and proper management of NCDs (VIANA et al., 2018). In this context, It becomes essential to understand the epidemiological profile of these conditions and the main challenges. logistical challenges faced by these populations.

Given this scenario, strategies such as proactive outreach and strengthening the bond between For users and healthcare teams, health education and longitudinal care play a central role in overcoming territorial barriers and improving the quality of care for people with hypertension. Systemic Diabetes Mellitus. The analysis of these strategies proves especially relevant for the addressing the underdiagnosis of these conditions, a recurring problem in remote territories, as well as well as for understanding the relationship between discontinuity of care and the occurrence of hospitalizations. due to conditions sensitive to Primary Health Care.

Furthermore, the role of Community Health Agents and the adaptation of practices Assistance tailored to local sociocultural specificities is a fundamental element. for strengthening the bond, promoting supported self-care, and improving Therapeutic adherence in riverside communities.

Thus, critically analyzing these dimensions contributes to identifying potential and limitations of the practices developed at this level of care.



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In this sense, the present study proposes to analyze, through a narrative review of Literature, the strategies adopted by Primary Health Care in the management of Arterial Hypertension Systemic Diabetes Mellitus in riverside communities of the Amazon, considering the challenges logistical, organizational, and territorial aspects, as well as the impact of these actions on promoting equity. and in improving health outcomes.

## **2. Theoretical Framework / Results**

### **2.1 Riverside Populations: Identity and the Right to Health**

The foundation of this study requires a clear definition of the target audience from the perspective of the National Policy for Comprehensive Health of Rural, Forest and Water Populations (PNSIPCFA). According to this policy (Brazil, 2013), riverside populations are recognized as communities. whose ways of life are based on a close relationship with the cycles of rivers and forests.

The theoretical framework assumes that these populations are specific population groups that They demand health actions that respect their cultural identity and forms of organization. social. The policy establishes that equity in the SUS (Brazilian Public Health System) is only achieved when it is recognized that access Healthcare for those living "by the river" cannot be the same model designed for urban centers. urban areas. Therefore, the management of hypertension and diabetes must be adapted to the seasonality of the Amazon region. (periods of flooding and drought), which alters everything from diet to the physical ability to move to consultations.

### **2.2. Social Determination and the "Welfare Void"**

Delving deeper into the Social Determinants of Health (SDH), the study is based on the premise that... The chronicity of diseases in the Amazon is aggravated by structural determinants. The concept of "void" "Assistance" refers not only to a lack of doctors, but to the absence of a support network that Consider:

- Supply Chain Logistics: The challenge of maintaining the flow of essential medicines. (insulin, antihypertensives) due to river distances.
- Food Security: The nutritional transition experienced by communities that previously depended on From fishing and farming, they now consume ultra-processed products brought by "boats-  
"Regatões" (river traders), increasing the prevalence of NCDs (non-communicable diseases).
- Communication Barriers: The lack of connectivity that isolates the healthcare professional and the patient, hindering ongoing education and specialized support.



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Therefore, the management of NCDs within the Theoretical Framework is seen as a biopsychosocial challenge, where  
The effectiveness of drug treatment is inseparable from transportation, communication, and other conditions.  
Feeding the riverside territory.

### 3. Materials and Methods

This study is characterized as a narrative literature review, with  
a conceptual analysis approach, focused on scientific production and normative documents that  
They address the management of Chronic Non-Communicable Diseases within the scope of Primary Care.  
Health, with an emphasis on remote territorial contexts. The choice for a narrative review is based on...  
in their ability to describe, interpret, and critically discuss the state of knowledge of  
comprehensive form, allowing the integration of different theoretical and normative perspectives.

This approach allows for the systematization of key concepts, guidelines, and strategies.  
related to the longitudinal care of users with Systemic Arterial Hypertension and Diabetes  
Mellitus, especially in settings marked by social vulnerability and geographical barriers,  
like the riverside communities of the Amazon.

The bibliographic material was compiled with the aim of supporting the discussion.  
The theoretical and analytical framework is developed in the subsequent sections. The sources of information included databases of  
widely recognized electronic data in the health field, such as Latin American Literature and  
The Latin American Journal of Health Sciences (LILACS), the Medical Literature Analysis and Retrieval System  
Online (MEDLINE) and the Scientific Electronic Library Online (SciELO), in addition to documents  
normative and institutional.

Guidelines, manuals, and technical standards from the Brazilian Ministry of Health were consulted.  
documents from the National Primary Care Policy, as well as clinical protocols and guidelines.  
therapeutics developed by the Brazilian Diabetes Society and the Brazilian Society of  
Cardiology. The selection of materials considered thematic relevance and context.  
of Primary Health Care and its contribution to understanding care strategies for  
Chronic Non-Communicable Diseases in hard-to-reach Amazonian territories.

### 4. Results and Discussion

The analysis of the selected publications showed that the management of Chronic Diseases does not  
Transmissible diseases, especially systemic arterial hypertension and diabetes mellitus, in healthcare.  
Primary healthcare in riverside communities of the Amazon is marked by a set of challenges.  
structural, territorial and organizational factors, as well as relevant care strategies.



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developed by healthcare teams.

The studies analyzed indicate a high prevalence of underdiagnosis of these conditions. chronic diseases in riverside areas, associated with difficulty in regular access to health services, The limitations in the availability of preventive actions and the low coverage of longitudinal follow-up. geographical and logistical barriers, such as long distances, dependence on river transport and The seasonality of the rivers was a recurring finding, negatively impacting the continuity of the... Care and clinical management of patients with NCDs.

Regarding the organization of Primary Health Care, the results indicate Weaknesses related to staff shortages and turnover, and insufficient resources. Materials and the difficulty of maintaining regular follow-up schedules. Such limitations They contribute to irregular blood pressure and blood glucose monitoring, as well as to... Discontinuation of pharmacological treatment increases the risk of complications and hospitalizations. avoidable.

On the other hand, the literature analyzed highlights the active search and performance of the Agents. Community Health Workers as central strategies to expand access to diagnosis and treatment. Monitoring of NCDs in riverside communities. Studies show that actions Home visits, tracking of individuals at risk, and community monitoring promote... Early identification of cases strengthens the bond between users and healthcare teams.

The results also demonstrate that health education practices and initiatives aimed at Supported self-care has a positive impact on therapeutic adherence and understanding of... users regarding their health condition, especially when adapted to specific needs. Local sociocultural factors. Building lasting bonds between professionals and the community was identified as a factor that facilitates longitudinal care.

Additionally, studies indicate that the use of clinical guidelines and stratification Risk assessments contribute to the organization of care in primary health care, although their full application is limited. due to territorial and structural inequalities. Innovative strategies, such as telehealth and actions of Continuing education for teams emerges as an alternative to support the management of NCDs in remote regions, although they depend on adequate infrastructure and connectivity conditions.

Overall, the results show that, despite existing limitations, Attention Primary healthcare plays a fundamental role in the care of people with hypertension and Diabetes Mellitus in riverside communities of the Amazon, with territorial strategies being... Community and educational initiatives are key elements for expanding access to and improving the effectiveness of... Careful.



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#### **4.1 Chronic Non-Communicable Diseases and the Structuring Role of Primary Health Care in the Amazonian Context**

Non-communicable chronic diseases (NCDs), especially hypertension.

Systemic diabetes mellitus is a significant public health problem in Brazil.

Brazil, due to its high prevalence, impact on morbidity and mortality, and continuous demand for healthcare. In this scenario, Primary Health Care (PHC) occupies a strategic position, as to be responsible for coordinating care, providing longitudinal follow-up, and for implementation of actions to promote health and prevent illness, as recommended by National Primary Care Policy (BRAZIL, 2017).

In the Amazonian context, however, tackling NCDs presents additional challenges. related to regional inequalities, adverse socioeconomic conditions, and specificities territorial. Studies indicate that the effective implementation of essential primary health care attributes, such as accessibility, Longitudinality and integrality become more complex in remote regions, impacting negatively impacts the early diagnosis and clinical control of hypertension and diabetes (STARFIELD, 2002; VIANA et al., 2018).

In this way, primary health care assumes an even more relevant role in the Amazon, as it establishes itself as The main gateway to the healthcare system and a privileged space for continuous care. for people with NCDs, requiring organizational and care strategies adapted to their realities. local.

#### **4.2 Territorial and organizational barriers, active search and health surveillance in the care of NCDs in riverside communities**

Initially, access to health services in riverside communities of the Amazon.

It is shown to be strongly conditioned by territorial, logistical, and organizational barriers, such as large geographical distances, dependence on river transport, seasonality of rivers and conditions Adverse weather conditions. These conditions repeatedly hinder the regular movement of Users are being transported to health units, compromising continuity of care and follow-up. Systematic treatment of chronic non-communicable diseases, especially hypertension. systemic and diabetes mellitus (VIANA et al., 2018).

Furthermore, in addition to physical barriers, there are weaknesses related to the organization of services. health issues, including the shortage and high turnover of professionals, and the limited availability of material resources. and the irregularity in the supply of medicines. In this sense, the literature points out that such conditions They contribute directly to late diagnosis and inadequate clinical control of these diseases. increasing the risk of cardiovascular and metabolic complications, as well as the occurrence of



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avoidable hospitalizations (BRAZIL, 2013a; PAHO, 2022).

Given this scenario, proactive case finding is becoming a central strategy in Primary Care. Health services to address the underdiagnosis of NCDs in territories marked by Social vulnerability and difficulties in accessing services. Indeed, evidence indicates that A significant portion of the population lives with hypertension and diabetes mellitus without a diagnosis. prior, which delays the start of treatment and compromises health outcomes (BRAZIL, 2013a; WHO, 2023).

In this context, the role of Community Health Agents stands out, whose work... It enables the tracking of individuals at risk, home monitoring, and closer contact between health services and riverside communities. Furthermore, studies show that integration The systematic approach of actively seeking out the work processes of Family Health teams expands coverage. In providing care, it strengthens the bond with users and improves the quality of care for people with NCDs in remote territories (MENDES, 2011).

Associated with these strategies, health surveillance plays a fundamental role in to support the planning, organization, and evaluation of actions developed in Primary Care. to Health. Thus, the proper use of information systems and the systematic collection of data Epidemiological studies allow us to identify disease patterns, map areas of higher risk, and provide guidance. More timely and equitable interventions, contributing to the control of NCDs in the Amazon. (MALTA et al., 2021; BRASIL, 2022).

Finally, the recognition of territory as an analytical and operational category reveals itself. Essential for planning primary health care actions. From this perspective, territorialization enables... identifying the population's health needs, organizing team schedules, and... prioritization of strategies compatible with the socio-territorial specificities of the communities riverside communities, consistently contributing to the reduction of health inequities.

#### **4.3 Longitudinality of care, coordination of care and prevention of avoidable hospitalizations**

The longitudinality of care is an essential attribute of Primary Health Care and is particularly relevant in the management of Chronic Non-Communicable Diseases, which require Continuous monitoring and regular follow-up. The literature shows that discontinuation of Care in primary health care is associated with an increase in hospitalizations for care-sensitive conditions. Primary (CSAP), especially those related to complications of hypertension and diabetes. (BRAZIL, 2014).

In riverside communities, longitudinality is often compromised by Barriers to access and irregularities in healthcare services. Lack of follow-up.





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Systematic treatment favors clinical worsening, poor therapeutic adherence, and overburdening of services. of medium and high complexity. In this sense, strengthening the coordination of care by primary health care is crucial. It is fundamental to guarantee coordinated and effective care flows (STARFIELD, 2002; MENDES, 2011).

Organizing the teams' work process, with a clear definition of responsibilities, The use of clinical protocols and regular monitoring of users with NCDs proves to be strategic. for the prevention of avoidable hospitalizations and for the improvement of health outcomes in territories Amazonians.

#### **4.4 Linkage, health education and supported self-care in the management of NCDs in territories remote**

The bond between users and healthcare teams is recognized as a central element for the Therapeutic adherence and effectiveness of care for people with hypertension and diabetes. mellitus. In riverside territories, where physical access to services is limited, relationships of trust are crucial. Building relationships over time becomes even more relevant, fostering shared responsibility. through care (STARFIELD, 2002).

Health education, when developed in a continuous, dialogical, and culturally relevant way, Sensitive, it contributes to strengthening supported self-care and expanding autonomy. of users in the control of NCDs. Studies indicate that educational actions adapted to the modes of Riverside communities show greater effectiveness in promoting health and preventing complications. (BRAZIL, 2013b; PAHO, 2022).

Multiprofessional collaboration, especially with the involvement of Community Health Agents, enhances the impact of the actions. Educational initiatives strengthen the link between the community and health services, reaffirming the role of primary health care. as a privileged space for comprehensive and longitudinal care.

Establishing strong interpersonal bonds acts as a determining factor for... Overcoming geographical barriers in the Amazon. In scenarios where physical distance imposes prolonged intervals between appointments, the trust placed in the healthcare team functions as the main driver of continuous therapeutic adherence. Unlike the traditional biomedical model, the Care for NCDs in riverside territories depends on a "symbolic presence" of the team in The user's daily routine; when there is a link, guidance on controlling hypertension and diabetes. They remain effective even in the physical absence of the professional, consolidating shared responsibility. as a strategy for survival and autonomy.

The effectiveness of this model is enhanced by the work of Community Health Agents. (ACS), which carry out the cultural mediation necessary for scientific knowledge to become applicable to



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local reality. Health education, by abandoning its imposing character and adopting a stance

Dialogical, it allows supported self-care to make sense within the riverside way of life.

respecting traditional knowledge and regional seasonality. In this way, multidisciplinary action

It not only prevents acute complications of NCDs, but also reaffirms primary health care as a space for care.

integral, where the technology of social relations compensates for the limitations of the technological infrastructure.

and physics.

#### **4.5 Clinical guidelines, risk stratification and equity in care for riverside populations**

The adoption of clinical guidelines based on scientific evidence is fundamental for

To improve the management of hypertension and diabetes mellitus in Primary Health Care.

guidelines developed by the Brazilian Society of Cardiology and the Brazilian Society of Diabetes

They highlight the importance of cardiovascular and metabolic risk stratification as a tool for

to guide clinical monitoring and therapeutic intensification (Brazilian Society of

CARDIOLOGY, 2021; BRAZILIAN DIABETES SOCIETY, 2023).

However, the literature emphasizes that the application of these guidelines must consider the principle.

of equity, recognizing the social, cultural, and territorial inequalities that characterize the

riverine populations of the Amazon. Adapting clinical recommendations to the local reality is

essential to ensure effective care and prevent the widening of health inequities

(BRAZIL, 2021; WHO, 2023).

The use of cardiovascular and metabolic risk stratification, as recommended

According to Brazilian specialty societies, this represents progress in standardizing healthcare.

In primary health care, in the Amazonian context, this tool transcends simple clinical classification.

allowing teams to identify users with greater vulnerability early on.

By organizing the patient flow based on evidence, it's possible to optimize resources significantly.

resources are often scarce in remote areas, ensuring that the intensity of care is proportional to...

severity of each case of hypertension and diabetes.

However, applying these guidelines in the Amazon requires a cultural and territorial adaptation.

that takes into account the geographical and nutritional barriers of riverside communities. The rigidity of

Clinical protocols can become ineffective if there is no flexibility to deal with seasonality.

from rivers or with a diet based on local resources. Therefore, equity manifests itself in the adjustment of

recommendations tailored to the user's actual capabilities, preventing the technical guideline from becoming...

It is an instrument of exclusion because it is unattainable in the daily lives of these populations.

The effectiveness of managing NCDs in remote areas lies in the capacity of primary health care to...

To articulate technical stratification with community ties. Longitudinal care in the Amazon does not...



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It is limited to monitoring blood pressure or glucose indicators; it depends on the integration between the Scientific knowledge and educational practices sensitive to the territory. By aligning the guidelines of the Societies With knowledge of local specificities in Cardiology and Diabetes, primary health care strengthens its role. A strategy to reduce inequities, promoting care that is simultaneously clinically sound. rigorous and socially just.

#### **4.6 Innovation in care, telehealth and workforce qualification in Amazonian primary health care**

The incorporation of innovative strategies in healthcare has been highlighted as A promising alternative to reduce inequalities in access in remote territories. Within the scope of In primary health care (PHC), the use of low-tech technologies, combined with telehealth initiatives, can increase the effectiveness of the system. of care for people with NCDs, provided that infrastructure limitations are respected and local connectivity (MERHY; FEUERWERKER, 2016; BRAZIL, 2023).

The Ministry of Health emphasizes that telehealth can support clinical decision-making, ongoing education for staff and support for users in hard-to-reach areas, such as the Legal Amazon. However, these strategies should be understood as complementary. to the in-person and territorial actions of primary health care (BRAZIL, 2023).

At the same time, the qualification and retention of the health workforce constitute challenges. Structural elements for the effectiveness of primary health care in the Amazon. Continuing education programs and policies. Providing professionals is fundamental to strengthening the continuity of care and to ensure the sustainability of actions aimed at managing NCDs in riverside communities (GIOVANELLA et al., 2020; PAHO, 2023).

The integration between lightweight technologies and telehealth tools emerges as a mechanism. of essential equity for the Legal Amazon. By reducing geographical barriers, telehealth does not It not only expands access, but redefines the effectiveness of Primary Health Care (PHC), allowing that the management of Non-Communicable Chronic Diseases (NCDs) takes place within the user's territory, minimizing costly and risky travel.

However, the implementation of these innovations faces the "bottleneck" of limitations. Infrastructural. The effectiveness of digital health is directly proportional to the quality of connectivity. and the local electricity grid; without robust investments in technological infrastructure, the strategies Innovative companies risk deepening the digital divide instead of solving it, becoming... exclusive tools for better-equipped urban centers.

Telehealth should be rigorously understood as a hybrid support system, and not as... a substitute for physical presence. The complexity of care in riverside communities requires the "gaze". "sensitive" and the longitudinal link that only territorial teams possess. Technology acts as



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A complementary intelligence that enhances clinical decision-making, but also the sustainability of care.

It lies in maintaining human contact and understanding local cultural particularities.

Finally, technology alone does not guarantee the effectiveness of the system without valuing the workforce. of work. The retention of professionals in the Amazon region is the pillar that sustains the continuity of Caution. Therefore, provision policies must go hand in hand with continuing education. transforming telehealth into a retention tool as well, by offering technical support and to reduce the professional isolation of those working in remote areas.

## Final Considerations

This narrative review allowed for an analysis of Primary Health Care strategies. focused on the management of systemic arterial hypertension and diabetes mellitus in communities. riverside communities in the Amazon, highlighting the importance of care for Non-Communicable Chronic Diseases in this context. The context is marked by structural, territorial, and organizational challenges that compromise the access to and continuity of healthcare.

The findings in the literature demonstrate that geographical barriers, logistical limitations, and scarcity High staff turnover, as well as the fragility of the service infrastructure, contribute to this. for underdiagnosis, inadequate clinical management, and increased hospitalizations for conditions sensitive to Primary Health Care. These factors widen health inequalities and reinforce the The need for specific strategies for Amazonian territories.

On the other hand, the evidence analyzed indicates that primary health care has high potential for to mitigate these difficulties, especially when structured around strategies such as the search Active participation, strengthening the bond, health education, and supported self-care. The role of Community Health Agents, combined with the territorialization of actions and the cultural adaptation of Interventions prove fundamental for promoting continuity of care and for... improving therapeutic adherence in people with hypertension and diabetes.

Furthermore, the judicious use of clinical guidelines, coupled with the principle of equity, as well such as the incorporation of innovative strategies, such as telehealth and continuing education of Teams are key elements in improving the quality of care in regions. remote actions. However, such initiatives should be understood as complementary to the actions. In-person and community-based primary health care, respecting territorial specificities and local limitations.

It is concluded that strengthening Primary Health Care in the Amazon is indispensable. to address Chronic Non-Communicable Diseases, requiring continuous investments. in territorial planning, workforce qualification and organization of the care process.



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By recognizing the unique characteristics of riverside communities, Primary Health Care reaffirms its strategic role in reducing health inequities and consolidating the principles of the Unified Health System.

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