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REVIEW ARTICLE

Primary health care in the Amazon and its potential impact on health inequities: a scoping review

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ABSTRACT:

Introduction: Health studies of the Amazon often focus on diseases and infections prevalent in the region, and few studies address health organizations and services. In this sense, this study fills a gap by reviewing the studies aimed at primary healthcare (PHC) implementation in the nine Amazonian countries. This review addresses a need to explore the forms in which PHC is implemented in the Amazon areas outside the urban centers and its potential to reduce health inequities. This study contributes to improvements in the practices of managers and health professionals and research on the topic.

Methods: Scoping review methodology was applied to peer-reviewed articles. The databases searched were PubMed, Scopus, Lilacs, Embase and Web of Science. Selected studies included peer-reviewed publications, published between January 2000 and November 2019, that focused on PHC or one of its components in the Amazon, and were published in English, Spanish and Portuguese. The study used Arksey and O'Malley's scoping review guidelines, supported by Levac, and included five steps: (i) identification phase, where search queries were applied to the databases followed by the removal of duplicates; (ii) screening phase, where titles and abstracts of articles were screened to exclude irrelevant articles; (iii) eligibility phase, where the full texts of articles were read to assess their relevancy to this study; (iv) data extraction, using a spreadsheet designed to capture relevant information required in this review, using an iterative process; (v) summarizing and classification of each article according to content. The second and third phases were conducted independently by two reviewers. If a disagreement arose between the reviewers, a third reviewer was consulted to help decide whether to include or exclude a study.

Results: This review included 25 studies. Of these, 11 presented promising results regarding PHC functioning in the Amazon region, and 14 presented challenges and difficulties in its functioning. Some PHC strategies implemented in the Amazon showed the potential to reduce inequities, mostly when they involved actions that increased access to PHC in the region when they developed a culturally adapted role and engaged community members in the decision-making and in the collaborative construction of health services. Actions that exposed challenges and difficulties were related to ill-prepared healthcare professionals, inadequate service approach and the inability to adapt to cultural issues.

Conclusion: The findings reveal information about PHC implementations that have had promising results in the Amazon region and, at the same time, show the challenges and difficulties of the PHC actions. The findings also highlight and synthesize knowledge about the potential that PHC strategies have to affect existing inequities in the Amazon region and gaps in the studies that have been undertaken, or at least published, including a lack of studies of PHC implementation and examination of strategies aimed at health determinants.

Keywords:

Amazon region, health equity, health services research, primary health care, public health, rural health services.

FULL ARTICLE:

Introduction

Most of the Amazon region population living outside urban areas and big cities is subject to precarious living and health conditions. These circumstances result from how these people have been exploited over time, which generally demonstrate a disregard for their interests[1]. Investments have been made in the Amazon region to expand large-scale livestock, soy production and extractive activities, such as logging, mining, oil and gas exploration and construction of hydroelectric plants, but, in general, these actions operate in an exploratory logic that, in addition to being harmful to the environment, violate local communities' rights[2].

The areas of environmental degradation 'coincide' with social degradation areas, which further exposes people to vulnerable situations and, consequently, health risks[3]. The literature cites access to potable water, lack of basic sanitation, infectious diseases, exposure to toxic products, and high nutrition-related disease rates as common problems in this region[4-8].

These conditions are aggravated by the Amazon being marginalized by domestic policies of Amazonian countries, which exclude the region from national plans and dynamics[9]. This situation contrasts with the importance of the Amazon on the global stage because it accounts for 56% of the world's rainforest and 20% of its freshwater flow.

The Amazon is in South America, covering an area of 6 million km^2 in nine countries. Its coverage is distributed in those countries as follows: Brazil (58.4%), Peru (12.8%), Bolivia (7.7%), Colombia (7.1%), Venezuela (6.1%), Guyana (3.1%), Suriname (2.5%), French Guiana (1.4%), and Ecuador (1%)[10]. It is characterized as a biome predominantly composed of forest located in the Amazon River's hydrographic basin. Despite that, the Amazon is not homogeneous but consists of different areas that result from the interaction of its physical aspects with the population diversity that inhabited this region at different times in history[11].

The literature shows how parts of the region gained importance because of the natural resources to be explored[12]. This resulted in the occupation of the territory, which has contributed to the formation of large urban centers and places where a greater financial and political capital is concentrated in relation to most of the region, which consists of a mosaic of farms, villages, isolated houses and small towns spread over a vast territory, often accessible only by river, and that can be considered remote because of the difficult access. As a rule, these places are inhabited by Indigenous peoples. These peoples include a wide variety of groups, who, depending on where and how they live, are known as 'villagers', '*mestizos*', 'river people' or '*caboclas*'[13].

The historical development of this region and the transformations that it has undergone, also marked by inequalities in the distribution of power, prestige, and resources, has contributed to the presence of health inequities in the region, which can be observed in the lack of resources and public policies, including health policies, in areas outside the urban centers or that are not being economically explored. This reality has contributed to the limited access to health services, especially high-complexity services, that are usually offered in larger cities[14,15].

In most South American countries, primary health care (PHC) has been strongly influenced by selective PHC models. In those countries, the vertical health programs focusing on specific diseases and not on the global needs of users were common between the 1980s and 1990s[16]. One result of this process in health policy was to increase privatized services and adopt a market-oriented approach with minimal economic interventions targeted at specific groups[17]. These policies have led to a general lack of support for a more comprehensive PHC model and have increased social inequities[18]. It was common for the poorest and rural populations to be harmed in this model[19].

However, in the first decade of the 21st century, several countries in South America experienced processes of renewal of PHC that have sought once again to adopt a comprehensive PHC approach that is closer to the Alma-Ata[2] concept. Countries such as Bolivia, Brazil, Ecuador, Peru, and Venezuela began to adopt new PHC models that have common features: a family approach, comprehensive care, and a community approach with multidisciplinary teams in specific territories with specific populations.

A study focusing on PHC in South American countries has reported effective results in the performance of PHC related to improving health conditions, but challenges and problems in its implementation process were also pointed out[20]. Giovanella et al highlight the challenges of reaching remote and disadvantaged areas in South America[18].

In the Amazon, some studies have reported disorganized distribution of healthcare services and the lack of PHC services[14,21], and findings showed that those most excluded from services in Amazon are mainly vulnerable and socioeconomically disadvantaged populations[22].

The absence and difficulties of PHC performance in the Amazon causes concern because studies have found improvements in health indicators associated with the implementation of PHC[23]. Furthermore, in rural and remote areas, care recommended by PHC has been considered strategic to meet the needs of these territories[24]. Its relevance in these locations is emphasized, given its importance for reducing morbidity and mortality[25]. PHC is also considered ideal when caring for traditional populations in rural and remote areas[26].

Given the relevance of PHC in the Amazon and the difficulties of health policies to prove effective when facing this context[27], the aim of this review was to map the studies in the literature that have addressed these issues, identify the ways in which PHC is implemented, analyze its potential to reduce health inequities in locations outside urban areas in the Amazon, and identify gaps that can guide future research and help plan service improvements in this region.

Methods

Because of the complexity of the issue and that it has not been reviewed previously to any extent, this study adopted a scoping review methodology. By using the protocol proposed by Arksey and O'Malley[28], the main concepts of the area of study were mapped, and existing gaps in evidence were identified. The understanding gained from the mapped studies was then synthesized in accordance with the method described by Levac et al[29].

In view of the study objectives, this review proposed the following question: 'How does PHC function and what are its strategies in the Amazon and their respective potential to reduce inequities?'. In this study, the concept of PHC followed the approach defended by Vuori[30], which presents at least four ways of understanding PHC: as a set of activities, as a level of care, as a strategy of organization for the service system, and as a principle that should guide all the actions developed in a health system. The search keywords were identified, considering these statements.

The search keywords (Table 1) were identified through consultations between the researchers and a health science librarian and a scan of the titles and subject headings from the results of the preliminary search. All the studies in the databases were limited to the languages spoken by the team members (English, Portuguese and Spanish) and a publication date between January 2000 and November 2019.

For this review, especially as it focuses on a specific ecosystem in which the territorial characteristics are not limited to commonly held ideas about rural life, the decision was made not to use the term 'rural' as a search criterion, but instead use the term 'Amazon', opting to include the studies about PHC in the Amazon provided they were not limited to the urban areas in this region.

The databases searched were PubMed, Scopus, Lilacs, Embase and Web of Science between June 2019 and November 2019. The bibliographic information for each search result was imported into Covidence (http://www.covidence.org). Subsequently, duplicate articles were removed and the abstracts were reviewed.

The titles and information on the abstracts in these records were reviewed independently by two researchers; studies that did not meet the inclusion criteria or any of the established exclusion criteria were excluded (Table 2). Only studies published in peer-reviewed journals were included. Where there was disagreement about eligibility, one of the authors who had not participated in the first phase of the review gave their opinion, and then the other authors reread the item, and the final decision on inclusion was made in a group meeting. Studies were not excluded on quality grounds but purposely included to map available evidence as consistent with the scoping review methodology.

After that, three authors read the complete articles and reviewed them independently. During this process, the reference lists of included studies were also evaluated, resulting in the selection of no additional studies. The authors created a spreadsheet model with predefined codes that was shared among reviewers for data extraction. During data charting, some codes were adjusted, and other codes were added to the spreadsheet. That resulted in the following information being collected for each article: author, year of study, objective, country, method, how rural is described, PHC strategy/actions, positive impacts, and negative impacts. Then, each article was summarized and classified according to content.

This process enabled visualization of the scope and discussion among the team, resolving any disagreements about content allocation. Following this, content analysis was performed in accordance with the theoretical reference used.

Table 1: Keywords for electronic database search 2020

Database	Search string
PubMed	((general practitioner*[Title/Abstract] OR primary medical care[Title/Abstract] OR primary health services[Title/Abstract] OR family health[Title/Abstract] OR family medicine[Title/Abstract] OR community medicine[Title/Abstract] OR family doctor[Title/Abstract] OR family physician[Title/Abstract] OR medical home[Title/Abstract] OR atención integral de salud[Title/Abstract] OR medicina familiar[Title/Abstract] OR atención medica primaria[Title/Abstract] OR equipo basico de salud[Title/Abstract] OR medico comunitário[Title/Abstract] OR medico da família[Title/Abstract] OR unidade básica de saúde[Title/Abstract])) AND Amazon*[Title/Abstract]
Scopus	TITLE-ABS-KEY ((“general practitioner*” OR “primary medical care” OR “primary health service*” OR “family health” OR “family medicine” OR “community medicine” OR “family doctor*” OR “family physician*” OR “medical home” OR “atención integral de salud” OR “medicina familiar” OR “atención medica primaria” OR “equipo basico de salud” OR “medico* comunitário*” OR “medico da família” OR “unidade básica de saúde”) AND amazon*)
Lilacs	(“primary health care” OR “primary care” OR “primary health” OR “atenção básica” OR “atenção primária” OR “atencion primaria” OR “saúde da família” OR “salud familiar” OR “atendimento básico” OR “atendimento primário” OR “servicios básicos de salud” OR “basic health services”) AND amazon*
Scielo/Web of Science	TS=((“primary health care” OR “primary care” OR “primary health” OR “atenção básica” OR “atenção primária” OR “atencion primaria” OR “saúde da família” OR “salud familiar” OR “atendimento básico” OR “atendimento primário” OR “servicios básicos de salud” OR “basic health services”) AND amazon*)
Scielo.org	(“primary health care” OR “primary care” OR “primary health” OR “atenção básica” OR “atenção primária” OR “atencion primaria” OR “saúde da família” OR “salud familiar” OR “atendimento básico” OR “atendimento primário” OR “servicios básicos de salud” OR “basic health services”) AND amazon*
Embase	(‘primary health care’:ab,ti OR ‘primary care’:ab,ti OR ‘primary health’:ab,ti OR ‘atenção básica’:ab,ti OR ‘atenção primária’:ab,ti OR ‘atencion primaria’:ab,ti OR ‘saúde da família’:ab,ti OR ‘salud familiar’:ab,ti OR ‘atendimento básico’:ab,ti OR ‘atendimento primário’:ab,ti OR ‘servicios básicos de salud’:ab,ti OR ‘basic health services’:ab,ti) AND amazon*:ab,ti

Table 2: Inclusion/exclusion criteria for scoping review papers

Inclusion criteria	Exclusion criteria
1. Papers published in English, Portuguese or Spanish 2. Studies focusing on primary health care or one of its components in the Amazon 3. Peer-reviewed journals only	1. Studies that address informal health care 2. Studies that address medium- and high-complexity services, emergency services, emergency and hospital care 3. Studies that address clinical intervention or screening or that are restricted to the analysis of any prevalent disease 4. Studies outside the Amazon 5. Studies restricted to urban areas

Ethics approval

Because this work was a literature review and relied on secondary materials, it did not require ethical review.

Results

The database search returned 817 results. Following the removal of duplicate articles, 378 unique records remained for possible inclusion in the review. Those papers abstracts were then read, leaving 81 studies for the researchers to read in their entirety and independently, after which 25 studies were included (Fig1). Table 3 shows the main characteristics of each included study.

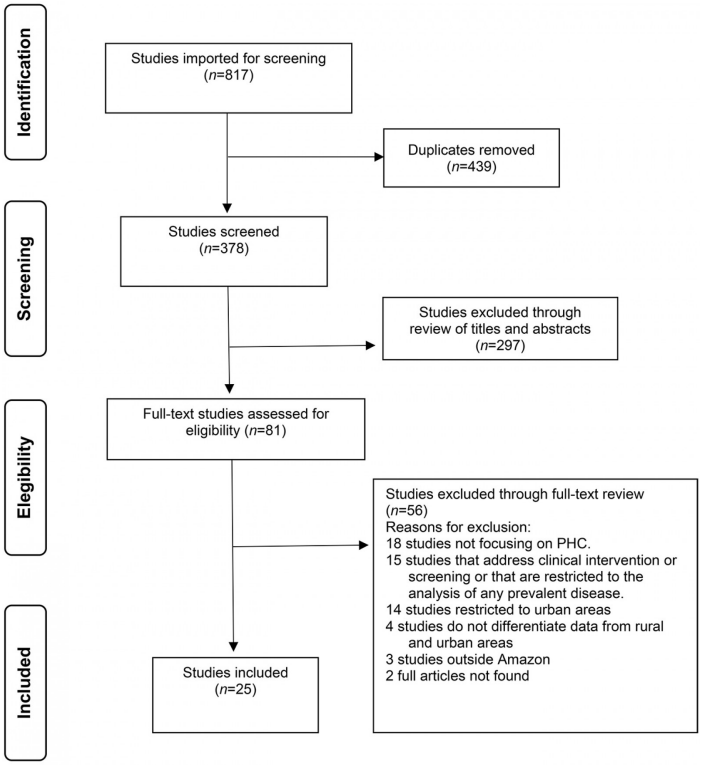

Figure 1: Flow diagram for the scoping review process.

Table 3: Data extraction sheet[31-55]

Author, date	Aim	Country	Methods/activities	How rural and remote Amazon is described	Primary healthcare strategy/performance	Positive impacts	Negative impacts
Sousa et al 2015 [ref. 32]	To identify how the application of Amazonian culture occurs in educational practices developed with the elderly in a health unit	Brazil	Descriptive qualitative study	Rural-riverine communities	Nurses developed educational practices for the elderly	They strengthened the bond with the elderly in the community and provided an exchange of knowledge between professionals and the community	
Paixão et al 2009 [ref. 33]	To evaluate a course designed to improve early diagnosis/ suspicion of leprosy	Brazil	Evaluation using a questionnaire	Northern region of Brazil	An educational model for health professionals provides knowledge through interactive technologies in a territory that involves long distances in Amazon	Improvements in diagnostic skills	
Moretti-Pires et al 2010 [ref. 34]	To investigate the perspective of nurses and family health practitioners on alcohol abuse	Brazil	Observational, descriptive, and qualitative study	A municipality with 390 km in a straight line from Manaus and 440 km along the river, with geographical access exclusively by water and airways	Family Health Strategy implemented		The doctors' discourse starts from a biomedical posture centered on disease and cure. They do not work in the promotion and intercultural perspectives
Faria et al 2010 [ref. 35]	To apprehend the perception of healthcare professionals about the development of the Family Health Strategy in the interior of Amazon	Brazil	Phenomenological method	A small municipality in the state of Amazonas in Brazil	Family Health Strategy implemented		Professionals are unclear about service priorities and objectives. Health care is restricted to the curative and immediate aspects of the population's health needs. The services present difficulty in retaining health professionals and management the bureaucratization
Moretti-Pires et al 2010 [ref. 36]	To investigate the understanding of family health doctors of the region of Middle Solimões (Amazon) on several aspects of alcohol abuse	Brazil	Observational, descriptive and qualitative study	Municipality of Coari, geographically isolated area	Family health doctor approach is centered on people and is based on the social determinants of the disease		The doctors present no skills to work with alcohol problems and do not follow Ministry of Health policy
Moretti-Pires and Campos, 2010 [ref. 37]	To investigate the perceptions of physicians, nurses, and dentists concerning the functioning of multidisciplinary family health teams	Brazil	Qualitative study using a semi-structured questionnaire	Municipality of Coari	Family Health Strategy works in a multidisciplinary team		The multidisciplinary work takes place only in theory and not in the logic that governs the work process
Moretti-Pires, 2009 [ref. 38]	To investigate whether medical training in the State of Amazonas, Brazil is consistent with the guidelines for working under the Family Health Strategy	Brazil	Qualitative empirical study using a focus group and semi-structured interviews	Municipalities in Amazonia. Difficulty in geographic access and problems in an urban and commercial structure	Changes made in undergraduate medical courses proposed by health policies in Brazil		The doctors' focus is still based on the biomedical concept, inadequate to the service, by several aspects, including the fragmented attention in specialties. The doctor has difficulty articulating himself in an interdisciplinary team
Souza, 2015 [ref. 39]	To present some notes about the academic supervision process on Indigenous areas, under the *Programa Mais Médico para o Brasil*	Brazil	Experience report	Indigenous areas. Difficulties in reaching, marked by ethnic-cultural diversity, lower health indicators and poor health	Academic supervision in Indigenous areas		The supervisors are far away and are not familiar with the reality faced by the doctors

Katsurayama et al 2016 [ref. 40]	To analyze the relationship between work and subjectivity in the Family Health Strategy within the state of Amazonas	Brazil	Qualitative study using interviews focus groups and participant observation	Municipalities situated in Amazon	Family Health Strategy implemented		Power relations based on authoritarianism that results in a lack of equity in the team and no spaces where workers can be heard by their managers and supervisors
Pioner, 2012 [ref. 41]	To investigate the existence of precarious work and moral harassment among workers of Family Health Strategy in the municipality of Manacapuru (Amazonas)	Brazil	Qualitative–quantitative study using self-answered questionnaire	A municipality in the metropolitan region of Manaus, state of Amazonas	Family Health Strategy implemented		Excessive pressure for productivity. Conditions of work that endanger the health of workers. Presence of permanent tension between (implicit and explicit) requirements of the process of work
Garnelo et al 2018 [ref. 42]	To investigate and discuss access to and coverage of primary health care offered to rural and urban populations	Brazil	Cross-sectional study	Vast geographical distances	Family Health Strategy implemented		The distribution of services is unequal. It is not respecting the geographical and social conditions of the people, and the difficulty of transportation aggravates access to health services
Heufemann et al 2013 [ref. 43]	To evaluate the context and degree of implementation of the Tuberculosis Control Program	Brazil	Logical model, a judgement matrix, documentary research, observation and interview	A municipality located in the Amazon forest	Implementation of the Tuberculosis Control Program in primary healthcare services		Tuberculosis Control Program actions are restricted to the urban area of the municipality, with no planning, goals or strategies directed to the rural area
Garnelo et al 2001 [ref. 44]	To describe the process of planning and execution of preventive actions in STD/AIDS in primary health care	Brazil	Descriptive study	A place where Indigenous groups live	Implementation of the actions in Indigenous communities addressed to HIV/AIDS using participatory methodologies, which includes Indigenous leaders, Indigenous community health worker and trained professionals	Approach avoided possible negative reactions in the community to the program	
Kitajima and Moreira, 2012 [ref. 45]	To discuss the organizational health in the municipality of Borba (Amazonas), from 2005 to date, mainly the primary health care, work processes, advances and challenges in a small town in the Amazon region in front of development of public health policies	Brazil	Descriptive study	An extensive territorial area with a vast river and a stream network influencing the seasonality of community access	Strategies to retain professionals, reducing working hours and giving professionals the possibility of taking a leave of absence to participate in courses and training. Team of specialists that supports professionals	Improved quality of care and use of financial resources	
Pereira and Pacheco, 2017 [ref. 46]	To assess how the More Doctors Program has been implemented in rural areas and contributions made by physicians to ensure comprehensive health care	Brazil	Qualitative study using interviews	Rural city in state of Pará	Implementation of a program to hire doctors to work in vulnerable rural and remote regions	Increased number of medical appointments and demand for services; decreased turnover of professionals and inequities in health	

Kadri et al 2019 [ref. 47]	To describe the process of planning and execution of activities of floating health unit and care management differentiated in this new healthcare model	Brazil	Descriptive study using interviews and observation	It highlights the fluidity of the place by calling it 'liquid territory' since its characteristics are not fixed but change seasonally	A fluvial unit that works with primary health care	Included people previously excluded from health services, increasing coverage	
Scopel et al 2015 [ref. 48]	To contribute to understanding role of Indigenous health agents in expansion of hegemonic medical model in a context of medical pluralism	Brazil	Ethnography	Indigenous community	Indigenous health workers that occupy a central position in the community and act in the external negotiations	Opened the possibility for empowerment of Indigenous health workers in a complex network formed by Munduruku in interaction with state power	
Kawasaki et al 2015 [ref. 49]	To evaluate impact of community health worker training on recognition and satisfaction regarding performance of community health worker among members of community in Amazonas	Brazil	Baseline and endline surveys; qualitative analysis was conducted to evaluate acceptability, feasibility, and sustainability of community health worker refresher training	Rural communities and remote areas	Face-to-face community health worker training, including demonstrations and role-playing based on community health worker manual published by Ministry of Health conducted by a non-profit organization, during two years	Community was satisfied with the training, and community health worker became more confident in role and improved performance	
Neto et al 2016 [ref. 50]	To identify state of the dialogue between traditional and scientific medicine based on practices of a health unit	Brazil	Ethnography	Rural-riverine communities	Practices of a health unit in Indigenous territory		Health professionals do not consider traditional knowledge in their performance
Moretti-Pires et al 2011 [ref. 51]	To investigate perspective of nurses and family health practitioners on alcohol abuse	Brazil	Qualitative study using focus group	A municipality with 390 km in a straight line from Manaus and 440 km along the river, with geographical access exclusively by water and airways	Family health strategy implemented		Professionals presented low connections with community and had little experience working in Amazon region. Doctors' discourse starts from a biomedical posture, centered on disease and cure, distancing itself from perspective of intersectoral action and health promotion and prevention
Vacas et al 2003 [ref. 52]	To describe environmental, social and health programs provided by Agip Oil Ecuador	Ecuador	Descriptive qualitative study	Biological diversity, relatively untouched by logging and agriculture	A non-governmental program built medical posts at 11 community locations. Supported basic healthcare training and certification program provided by the Ministry of Public Health for 17 community members	Reduced morbidity and mortality rate in region. Increased medical attention and productivity. Helped community become more self-sufficient	
Fuentes et al 2010 [ref. 53]	To analyze case studies of health services in the Amazon	Ecuador	Case studies	Remote and inaccessible	Health posts in Indigenous communities where a nursing assistant and a microscopist work and receive support from a medical coordinator. Only some health posts have nurses		Lack of cultural competence from staff; difficulties in retaining workforce

Díaz and Sanchez, 2011 [ref. 54]	Describes use of medications by simplified medical assistants/non-professional community workers for primary health care in rural clinics types I and II	Venezuela	A descriptive, non-experimental, field and cross-sectional study	Hard-to-reach areas and Indigenous territory	Prescription of drugs by simplified medical assistants and non-professional community workers for primary health care in rural clinics		Prescription of medicines does not follow WHO recommendations for primary healthcare attention. Professionals use a list of medications that are in disagreement with national standards
Eersel et al 2018 [ref. 55]	To evaluate impact of unique health program of Medical Mission on health status of Amazonian Amerindians	Suriname	Retrospective and descriptive study	'Hinterlands', located in remote south and south-west of country	Health assistants receive formal three-year training program provided by a non-governmental primary healthcare organization. Physicians and nurses conduct regular supervisory and support to health assistants by short-wave radio or mobile telephone	Program achieved its goal of providing free, accessible and effective medical services to Indigenous people from Suriname while considering their specific cultural perceptions	
Martínez et al 2004 [ref. 56]	To measure reliability of technology and effect the system had on staff access to medical training and information	Peru	Evaluation using baseline survey and a second survey	Area is large (twice the size of Belgium) and lacks roads. Has poor telecommunication infrastructure	Voice and email communication via VHF radio as a strategy to improve communication between personnel of rural health posts in remote areas and other professionals	Staff at health posts were nearly unanimous (97%) in saying they felt more self-confident in performing their work because they could consult their referral physician when needed	

Study locations

Of the articles included, the majority originated in Brazil[31-50], followed by Ecuador[51,52], Venezuela[53], Suriname[54], and Peru[55]. As well as registering the country where the PHC services took place, this review prioritized how the authors referred to the study location. This characterization was important because of the different landscapes and population groups of the Amazon. Most authors referred to the study location as 'small municipalities' (*n*=9). Other terms used by authors to designate the place were 'Indigenous areas' (*n*=7), 'rural/remote' (*n*=3), and the 'region of the country' where the study took place (*n*=2); while other authors used characteristics to describe the place as a '*várzea* region' (floodplain) (*n*=2). One of the studies that also referred to riverbank areas gave more emphasis to the aspects of the population groups that inhabited the place, referring to it as a 'fishing community' (*n*=1) and one of the studies referred to the place as 'interior' (*n*=1).

Implementation of actions and strategies adopted by primary health care

Of the 25 studies, 11 of them[31,32,43-48,51,54,55] revealed promising results regarding PHC implementation and strategies. On the other hand, 14 studies presented results that highlight difficulties and challenges to be overcome[33-42,49,50,52,53].

Impacts on access

Based on the PHC actions implemented and their respective results in the studies (Table 3), six studies suggest that the implemented actions successfully broadened access. These actions include:

- use of technology to support and supervise community health workers (CHWs) and nursing technicians[51,54,55] that helped provide services in isolated areas that do not have other health professionals
- measures taken by policies and management to organize and adapt the services and retain medical professionals in remote areas[44,45,51] that increased the number of medical attention and the demand for care
- performance of a new health unit model that operates aboard a boat[46], which included people previously excluded from health services and increased the number of people with health assistance.

However, in two studies, the PHC actions and results indicate a possible increased difficulty in access to services. One of them[41] analyzed the access and coverage in urban, rural and remote areas. This study revealed services concentrated in urban areas, and their design did not consider the vast distances, population dispersion, and financial expenditure imposed on users. Another study[42], which focused on the context and degree of implementation of the Tuberculosis Control Program in PHC services, found that the actions were restricted to the municipality's urban area and revealed no planning, goals, or strategies to the rural area, despite presenting disease cases.

Impacts on quality

Twelve studies pointed out implemented actions and results that showed flaws in the quality of services. These findings appeared in studies that investigated PHC services. Four studies focused on actions and strategies related to the approach used by the services [33,36,37,50] and presented the work with individual care, focused on the disease and did not consider the reality of families and the sociocultural context. Three studies were dedicated to the performance of professionals considering their previous academic education and training[34,35,53] and found professionals poorly prepared to work in the PHC services and contradictions between what is expected and what is done by professionals in the services. Four studies described the service management[34,38-40] and found problems in supervising, monitoring actions and managing professionals' relationships. Two studies investigated whether the

services were working with a cultural approach[49,52] and found that the health professionals did not consider the traditional knowledge in their performance.

Nine studies presented results that suggest positive impacts on the quality of services. Five of them referred to training or other strategies used to prepare the professionals[32,44,48,51,54], which resulted in qualified professionals to work. One of the studies dedicated to monitoring the activities and support to the professionals[44] showed how these actions can contribute to improving the quality of care and the use of financial resources. Four studies were addressed to investigated the adoption of culturally appropriate approaches by services[31,43,47,54] and found facilitated ties with the community. One of the studies focused on the approach of implementing an STD/AIDS program in an Indigenous community and described the use of participatory methodology[43] that avoiding a possible resistance to the program.

Impacts on community empowerment

Engaging community members in the construction of and decision-making for PHC actions appeared in one study[47] that showed the participation of Indigenous health agents in both local health groups and regional health groups.

Discussion

The findings of this review revealed that few studies have focused on PHC in the Amazon. However, another problem was identified: the unequal distribution of these studies. As this review shows, most studies were conducted in Brazil, and few studies were conducted in other Amazonian countries. No studies were found in Bolivia, Colombia, Guyana, or French Guiana. Despite the difficulty of research in countries with low income, it is in these countries that research in PHC is the most necessary[56]. Notably, the diversity of terms used by authors of the studies to refer to the location reveals that there is no single way of referring to places in the Amazon outside the urban centers.

The studies found in the review, in general, focused on the functioning of free-of-charge public health units, projects and actions in rural areas of the Amazon. The actions and strategies addressed by the studies were part of the list of daily activities in these units. Some studies described projects developed in these units by policies especially established for rural or Amazonian areas. It is noteworthy that some actions and strategies were carried out by various actors, including non-profit organizations, foundations and programs developed by universities.

Most studies were conducted in healthcare units that are part of the Brazilian program Family Health Strategy. The Family Health Strategy was implemented in Brazil in 2006 and is the main primary care initiative in the country. These healthcare units follow the same healthcare model all over the country, with no differences between urban and rural areas, serving as a gateway to the entire health system. The teams of health professionals (general practitioner, one nurse, one or two nursing technicians and four to six community agents) are placed in strategic geographical locations[57].

In countries other than Brazil, the health units portrayed have a specific operation model in rural areas, grouped into health posts and health units. Health posts are typically located in isolated areas and composed of CHWs or nurse practitioners, who are usually assisted by doctors from health units. Health units are located in a provincial or district capital and are made up of doctors and nurses. A common feature of the health posts is that they are located over scattered areas and serve a smaller number of people[18].

The actions and strategies of PHC, as well as the results, reveal that most of the PHC implementations face difficulties and challenges. Nevertheless, some studies reported promising results and suggested that the strategies of PHC were effective in the Amazon region.

It is important to recognize the actions that have contributed to a better performance of PHC, as well as the strategies and actions that still present problems, both for the relevance that the PHC has in improving people's health conditions[58] and for its role concerning health inequalities, since it is considered the most effective model in reducing health differences in society and in promoting equity[59]. To achieve this result, the PHC must meet the following requirements: the PHC team should be highly accessible, and focus on high-quality and networked operations with other sectors to increase social cohesion and empowerment[60].

Previous studies have shown that improvement in access, in Latin American countries, results in better health conditions. For example, a study conducted in rural areas of Bolivia reported that mortality rates were four times lower in areas assisted by PHC than in areas that did not receive assistance[61]. Confirming those studies, the results of this review also showed positive impacts on rural Amazonian areas due to an improvement in access. Also, this review showed that the total number of PHC actions in the Amazon that had a positive impact on access was higher than those that had a negative impact.

Among these results, one of the studies demonstrated the importance of using radio and cell phones, making it possible for more educated professionals to support CHWs and nursing practitioners in isolated locations where they must work alone. It also slightly reduced the feelings of professional isolation of part of rural healthcare personnel. One of the studies suggested that health units using this strategy reduced the morbidity and mortality rate in a remote community in the Amazon region. That is particularly relevant in Amazonian countries where rural health units are composed of only CHWs or nursing practitioners, and communication is difficult because of their isolation. In this regard, there is a recognized impact of the presence of these workers on communities in disadvantageous conditions in Latin America[62], where they are considered a link between rural community members and other providers of health services[63].

However, some actions have demonstrated the potential to negatively affect access. These were related to how services are geographically arranged and how they are provided in rural areas, which in some cases accentuate differences between places, potentially increasing inequities. For example, one study presented the imbalance in the distribution of services between urban and rural areas in the Amazon, and another showed problems in retaining the workforce. These are everyday situations in rural Amazon and demand action from managers to overcome these differences. One example is the imbalance in the number of doctors available in urban and rural areas in the Brazilian Amazon, which needs policies and management measures to be overcome[64].

Although the number of studies with negative results regarding access was lower than the positive, the number of actions with negative results regarding quality was higher. The findings of this review demonstrate that the quality of services remains a challenge for PHC in the Amazon. Findings in this area reveal problems related to the cultural adaptation of services, inadequate approaches, poor preparation of the workforce and problems in service management. Among the negative impacts on the quality of the services, the most recurrent results are related to the use of a biomedical approach by health professionals and problems in the management of services.

Despite the effort to adopt a comprehensive healthcare approach by health policies in the South American countries, this review shows the use of a biomedical approach rather than a 'whole-patient oriented' one[65]. This can be explained by the strong market-oriented influence in these countries[66]. However, Starfield[67] states that a health system focused on subspecialization threatens equity goals because subspecialty care is too expensive, and countries cannot afford the cost of distributing this type of service to everyone.

Another issue that was most often related to negative impacts on the quality of PHC services was limitations in manager performance. Management performance plays a key role in conducting PHC services in rural areas. Studies that showed these results presented difficulties for managers in carrying out inspections, monitoring the results of services, supporting professionals and implementing services[68].

Some of the actions described in the studies demonstrated improved service quality. These studies were often related to the education and training of professionals, the most frequently cited being CHW training. The studies suggest that when CHWs are trained, they become important allies for the quality of services in Amazonian areas. These results have also been found in prior studies, which highlights the importance of these professionals in rural and remote areas[69]. However, problems in the preparation of CHWs to work in PHC showed they could put the populations they serve at risk; for example, by distributing medicines without proper guidance. This review also indicates that the higher-level professionals had a deficit in their training, according to their actions and the results of the studies, evidencing contradictions between what is recommended and the work execution in Amazon.

The culturally appropriate approach was considered the most important characteristic of the PHC services in the study with Indigenous people[26], but some studies in the review still presented negative results in this regard. Not paying attention to or not adapting the services to cultural differences tends to unbalance the power between the population and health professionals in rural areas. According to Malatzky[70], the power relations that unroll in rural and remote settings must be carefully considered because of the prevalent understanding of the fragilities of such settings, with healthcare actions often reproducing and reinforcing that type of relation.

Despite health policies in Latin America adopting strategies that have shown good results by engaging people to control and participate in the development of health services[71], only one study described the engagement of people as a strategy used by the PHC services in Amazon. The lack of studies with similar orientation is a challenge for the PHC services in these areas, since community engagement has been recognized as one way to offer quality and sustainable PHC actions in remote areas[72].

Also of note in the findings is the gap in PHC actions that involved external partnerships in their implementation, which is understood to be essential for a less fragmented PHC that responds better to the inequities. This review also identified in PHC actions a lack of strategies aimed at modifying health determinants, which in this region primarily involve social and environmental issues. It is also of note that this review did not find evidence of any PHC strategies that demonstrated, prior to the service implementation, a concern with the impacts on inequities, a strategy that Freeman et al[73] identified as significant when implementing PHC services.

Strengths and limitations

This scoping review is the first attempt to comprehensively synthesize and describe the published literature on PHC in the Amazon. A second strength is that the review included studies in Portuguese, Spanish, and English, which broadened the scope of the research to provide significant coverage of the available literature.

One of the limitations of this review is that it focuses only on peer-reviewed articles and probably did not include valuable documents from the grey literature. Also, since none of the included studies reported the effectiveness of their interventions or measured the impact on inequities, the analyses were based on the results presented by the authors about the general aspects of the PHC in the Amazon and interpretations about what has been exposed by the literature about this topic to reach the conclusions presented here.

Conclusion

As an initial study exploring the existing literature about PHC in the Amazon, this review has produced useful findings. It has exposed forms of PHC implementation that appear to have promising results, indicating the paths to be followed by public health policies, health managers and professionals in the Amazon region.

The results highlight the benefits of actions that expanded access to PHC given their ability to adapt to the singularities of the place, such as the policies for the provision of professionals in remote areas, the strategies used by managers to retain professionals in the Amazon and the health unit model adapted to the river. These results reinforce the need to recognize, given the heterogeneity of this region, that one-size-fits-all policies are insufficient and specific solutions are required that respect the singularities of the place.

Investment in training and the use of technologies by CHWs have shown promise in the region. However, there are still uncertainties and insufficient knowledge about the ideal performance of this professional group. The Indigenous health agents are workers specific to the Amazon region. As found in the review, they can mediate traditional and biomedical knowledge, providing a less unequal power relationship between professionals and Indigenous people. However, both the CHWs and the Indigenous health agents need to be recognized by public policies. Research that addresses their performance can help outline the possible roles they can play according to the needs and singularities of each place.

The difficulties and challenges reveal that, despite the efforts of some Latin American countries to adopt comprehensive approaches in the training of professionals in academic courses, it is still necessary to strengthen public policies in this direction and prepare professionals to work in Amazonian areas. It must include training in approaches that promote the openness of these professionals to provide care that is culturally appropriate, comprehensive, holistic and accessible. Further to this, qualified managers are required to support and supervise the professionals.

The review exposed gaps in the research that has been undertaken or at least published, including a lack of studies of strategies aimed at health determinants. There was also a lack of evidence of work involving community engagement and partnerships developed with other actors in the community. In this sense, there is an urgent demand for research and policies to prioritize these themes since they are fundamental strategies in the face of the threats to the health of people living in the Amazon.

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