English

Telehealth as support for primary health care in remote regions of Brazil: an integrative literature review

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Abstract

Objective: To analyze the use of telehealth in primary health care in remote regions of Brazil, highlighting its benefits, challenges, and contributions to health in these areas. **Methods:** This is an integrative literature review. The search was performed in the PubMed, BVS, CAPES Journal Portal, and Google Scholar databases, using filters for language (Portuguese, English, and Spanish), open access, and a publication period between 2015 and 2025. Studies were selected using Rayyan® software, through the review of titles, abstracts, and full-text articles, following inclusion criteria focused on the use of telehealth in PHC in remote regions of Brazil. **Results:** A total of 743 studies were identified, of which 8 met the eligibility criteria and comprised the final sample. The included articles address different telehealth strategies applied to PHC in remote regions of Brazil, with an emphasis on initiatives targeting vulnerable populations. The studies highlight benefits such as expanded access, technical feasibility, user satisfaction, and strengthened care networks, although challenges related to infrastructure, connectivity, and professional training persist. **Conclusions:** Telehealth is a strategic tool for expanding access and improving the quality of care in Primary Health Care in remote regions of Brazil. Theoretically, it contributes to understanding the potential and limitations of digital health in the context of health equity. In practice, it highlights the importance of investments in infrastructure, professional training, and integrated public policies to strengthen the SUS and reduce territorial inequalities in health care.

Key-words: Telemedicine; Primary Health Care; Effective Access to Health Services; Remote Areas; Brazil.

Resumen

La telesalud como apoyo a la atención primaria de salud en regiones remotas de Brasil: una revisión integradora de la literatura

Objetivo: Analizar el uso de la telesalud en la atención primaria de salud en regiones remotas de Brasil, destacando sus beneficios, retos y contribuciones a la salud en esas zonas. **Métodos:** Se trata de una revisión integrativa de la literatura. La búsqueda se llevó a cabo en las bases de datos PubMed, BVS, Portal de Periódicos CAPES y Google Scholar, con filtros de idioma (portugués, inglés y español), acceso abierto y periodo de publicación entre 2015 y 2025. Los estudios se seleccionaron en el software Rayyan®, mediante la lectura de títulos, resúmenes y textos completos, siguiendo criterios de inclusión centrados en el uso de la telesalud en la APS en regiones remotas de Brasil. **Resultados:** Se encontraron 743 estudios, de los cuales 8 cumplieron los criterios de elegibilidad y conformaron la muestra final. Los artículos incluidos abordan diferentes estrategias de telesalud aplicadas a la APS en regiones remotas de Brasil, con especial atención a las acciones dirigidas a poblaciones vulnerables. Los estudios evidencian beneficios como la ampliación del acceso, la viabilidad técnica, la satisfacción de los usuarios y el fortalecimiento de las redes de atención, aunque persisten retos relacionados con la infraestructura, la conectividad y la capacitación profesional. **Conclusiones:** La telesalud es una herramienta estratégica para ampliar el acceso y mejorar la calidad de la atención primaria en regiones remotas de Brasil. Teóricamente, contribuye a la comprensión de las potencialidades y limitaciones de la salud digital en el contexto de la equidad en salud. En la práctica, destaca la importancia de las inversiones en infraestructura, formación profesional y políticas públicas integradas para fortalecer el SUS y reducir las desigualdades territoriales en la atención sanitaria.

Palabras clave: Telemedicina; Atención Primaria de Salud; Acceso Efectivo a los Servicios de Salud; Zonas Remotas; Brasil.

Resumo

Telessaúde como apoio à atenção primária à saúde em regiões remotas no brasil: revisão integrativa da literatura

Objetivo: Analisar o uso da telessaúde na APS em regiões remotas do Brasil, destacando seus benefícios, desafios e contribuições para a saúde nessas áreas. **Métodos:** Trata-se de uma revisão integrativa da literatura. A busca foi realizada nas bases PubMed, BVS, Portal de Periódicos CAPES e Google Scholar, com filtros de idioma (português, inglês e espanhol), acesso aberto e período de publicação entre 2015 e 2025. Os estudos foram selecionados no software Rayyan®, por meio da leitura de títulos, resumos e textos completos, seguindo critérios de inclusão voltados ao uso da telessaúde na APS em regiões remotas do Brasil. **Resultados:** Foram encontrados 743 estudos, dos quais 8 atenderam aos critérios de elegibilidade e compuseram a amostra final. Os artigos incluídos abordam diferentes estratégias de telessaúde aplicadas à APS em regiões remotas do Brasil, com destaque para ações voltadas a populações vulneráveis. Os estudos evidenciam benefícios como ampliação do acesso, viabilidade técnica, satisfação dos usuários e fortalecimento das redes de cuidado, embora persistam desafios relacionados à infraestrutura, conectividade e capacitação profissional. **Conclusões:** A telessaúde é uma ferramenta estratégica para ampliar o acesso e qualificar o cuidado na Atenção Primária em regiões remotas do Brasil. Teoricamente, contribui para a compreensão das potencialidades e limitações da saúde digital no contexto da equidade em saúde. Na prática, destaca a importância de investimentos em infraestrutura, formação profissional e políticas públicas integradas para fortalecer o SUS e reduzir desigualdades territoriais no cuidado em saúde.

Palabras-chave: Telemedicina; Atenção Primária à Saúde; Acesso Efetivo aos Serviços de Saúde; Zonas Remotas; Brasil

INTRODUCTION

Telehealth is the provision of health services mediated by information and communication technologies (ICTs) to overcome geographic barriers, expand access, support clinical decision-making, and optimize the use of distributed resources, ensuring high-quality care across several specialties. The origins of telehealth are inextricably linked to the origins of telemedicine, which was initially focused specifically on medical activities[1]. Although both terms share the same underlying principle of using technology to deliver care remotely, telehealth broadens this concept to encompass other health-related fields, including health promotion and protection, health education, and public and community health[1, 2].

Telehealth has provided medical and care services remotely, facilitating access to diagnostics, consultations, patient monitoring, and health education. These technologies encompass tools such as teleconsultations, telediagnostics, telemonitoring, and professional training, enabling greater efficiency in care delivery, particularly in remote regions or areas facing resource shortages. Telehealth promotes the democratization of healthcare, reduces costs, and enhances the quality of care, becoming increasingly integrated into health systems [3].

Telehealth has gained prominence in Brazil as a strategy to reduce inequalities in access to healthcare, particularly in remote regions where Primary Health Care (PHC) faces challenges such as a shortage of professionals and precarious infrastructure[3]. The Telehealth Brazil Networks Program (Programa Telessaúde Brasil Redes), launched in 2007 and expanded in 2011, marked a milestone in the integration of digital technologies into PHC, with a focus on underserved regions [4]. The “Telehealth Manual for Basic Care/Primary Health Care,” developed by the Ministry of Health in partnership with the Federal University of Rio Grande do Sul (UFRGS), highlights telehealth as a fundamental strategy for strengthening PHC in Brazil, as well as the Unified Health System (SUS)[5].

During the COVID-19 pandemic, Ministry of Health Ordinance number 467/2020 accelerated the adoption of telemedicine, highlighting its potential to overcome geographic barriers during health emergencies[6]. However, recent studies indicate that the sustainability of these initiatives depends on continuous investment in connectivity and professional training[7]. The COVID-19 pandemic significantly accelerated the adoption and consolidation of telehealth in Brazil, transforming it into an essential tool for the healthcare system. Before the pandemic, telehealth was already growing but faced regulatory and infrastructure challenges. During the health crisis, its use was widely encouraged to reduce the movement of people within healthcare facilities, prevent transmission, and ensure remote care for patients with other health conditions [8]. Although it is a transformative tool for Primary Health Care (PHC), capable of enhancing the problem-solving capacity of care teams, professional expertise, and equity in access to healthcare, its full consolidation still relies on investments in infrastructure, permanent regulatory frameworks, and ongoing digital education.

In the Brazilian context, the North region faces several public health challenges, particularly regarding infectious diseases[9,10]. For example, malaria is caused by parasites of the genus Plasmodium spp. Researchers in Manaus (AM) conducted a study using a multicomponent

telehealth strategy implemented in the region, aiming to increase adherence to Plasmodium vivax malaria treatment and strengthen pharmacovigilance regarding the use of primaquine, a medication that can cause hemolytic anemia in individuals with glucose-6-phosphate dehydrogenase (G6PD) deficiency. In this study, the researchers used educational materials containing information on treatment and warning signs; an mHealth system that sent SMS reminders to encourage patients to continue their treatment; and telephone interviews conducted after treatment, integrated into an online platform linked to the National Malaria Surveillance System (SIVEP-Malária) [11].

In the Northern region of Brazil, there is a program established by the Ministry of Health known as Telemal+ for malaria. It is a teleconsultation channel staffed by a multidisciplinary team of specialists in malaria, other acute febrile illnesses, and HIV/AIDS/STIs/viral hepatitis within the Brazilian Amazon. The program also provides training, courses, and professional development opportunities for professionals at all levels of expertise. This teleconsultation service is a virtual support mechanism designed exclusively for healthcare professionals and enables specialists to offer guidance and assistance to other professionals regarding the diagnosis, treatment, and management of patients with malaria and other acute febrile illnesses. This technical guidance aims to improve the quality of healthcare delivery in hard-to-reach regions, while also helping to lower costs related to treatments obtained far from the patient's home. This is especially pertinent in the context of the Brazilian Amazon[12].

In the Northern region, the management of snakebite incidents in Indigenous communities, as described by Murta et al. (2023), illustrates challenges that telehealth seeks to mitigate: the need to decentralize specialized care and to overcome logistical and connectivity bottlenecks. In Brazil, telehealth within Primary Health Care is a strategic tool for reducing inequalities in remote areas, such as the Amazon and the Northeast, and has gained significant relevance in the post-pandemic era. Gaps persist regarding infrastructure, capacity building, and the integration of technology with local knowledge[13].

The guiding question that steered this study was: "What are the benefits, challenges, and contributions of using telehealth within the scope of Primary Health Care (PHC) in remote and hard-to-reach regions of Brazil toward strengthening health care in these territories?" This study aims to gather and analyze data regarding the use of telehealth within the scope of Primary Health Care (PHC) in remote and hard-to-reach locations in Brazil, identifying its benefits, challenges, and contributions toward strengthening health care in these territories.

METHODOLGY

2.1 Study type, search platforms, and search strategy

This study is an integrative literature review. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram was used to guide and document the stages of identification, screening, eligibility, and inclusion of the selected studies[14]. The identified studies were imported into the free software Rayyan® to remove duplicates and apply the eligibility criteria. Titles and abstracts were screened, followed by a full-text review of the pre-selected studies. For the search process, the platforms used were: PubMed, the Virtual Health Library (VHL), the CAPES Journals Portal, and Google Scholar; the search strategies described in Table 1 were adopted.

Table 1. Search strategies used for article selection

Search Platform	Adopted Strategy
PubMed[1], Virtual Health Library (VHL)[2] nad Journals Portal CAPES[3]	*(telehealth OR telemedicine)* *AND ("primary health care" OR "primary care")* *AND (Brazil)*

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	AND (remote OR rural OR underserved) *AND (challenges OR barriers OR implementation OR services OR tools OR technologies OR benefits OR impact OR outcomes OR effectiveness OR improvements)*
Scholar Google[4]	*("telehealth" OR "telemedicine") AND ("primary health care")* *AND Brazil* *AND (remote OR rural)* *AND (challenges OR barriers OR implementation OR benefits OR outcomes)*

1 The following filters will also be applied in PubMed: Free full text", "Publication date: 10 years"
2 Additional filters will be applied in the Virtual Health Library (VHL): "Full Text", "Languages: English, Portuguese, and Spanish", "Publication Year Range: Last 10 Years"
3 On the CAPES Journals Portal, the following additional filters will be applied: "Open Access," "Peer-reviewed," "Year of creation: 2015–2025," "National production," and "Languages: English, Spanish, and Portuguese."
4 On Google Scholar, the following additional filters will be applied: "Specific range: 2015–2025," "Search pages in Portuguese," and "Review articles."

2.2 Inclusion and Exclusion Criteria

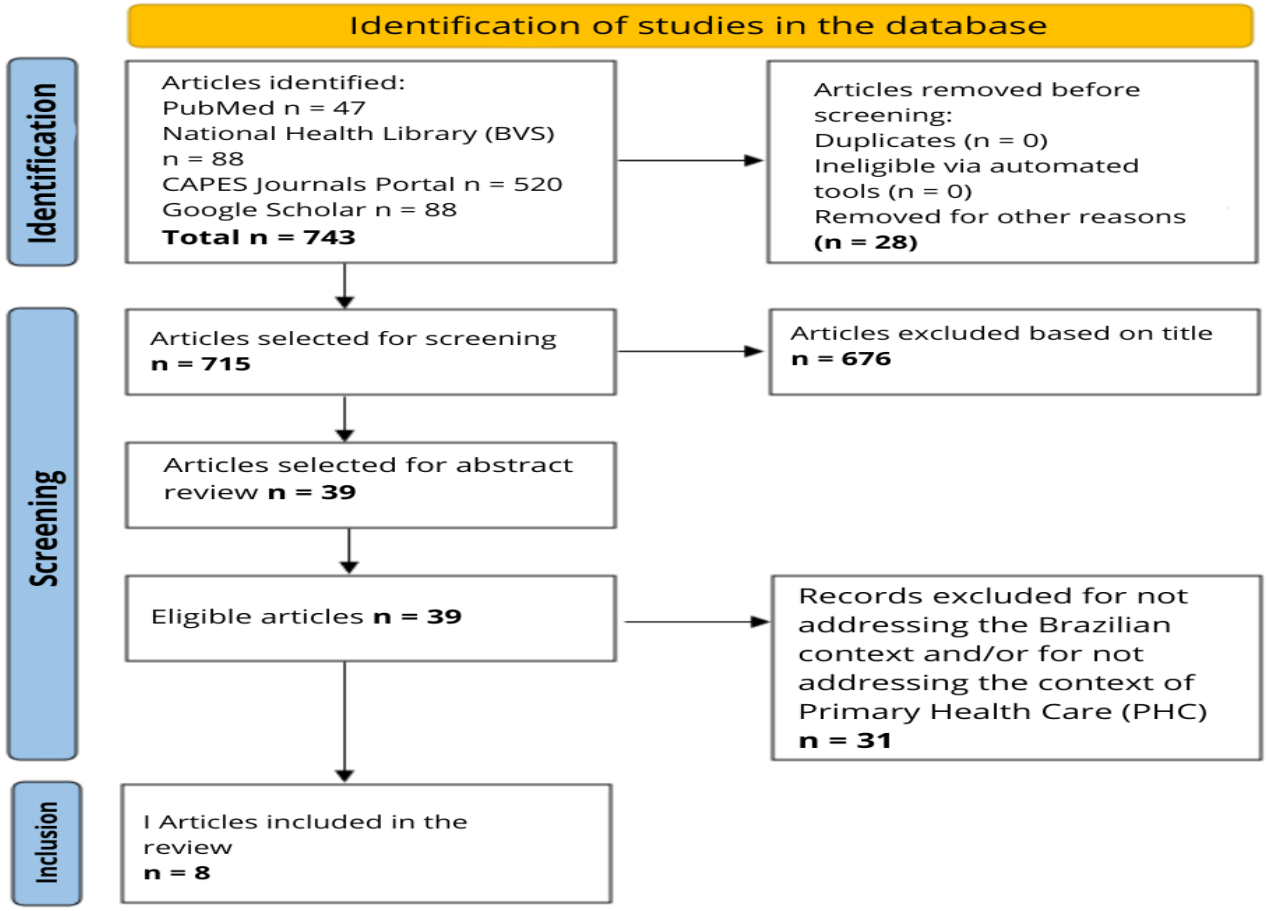
The selection included open-access primary studies from Brazil (2015–2025) focusing on telehealth in Primary Health Care (PHC) in remote or rural regions. Review articles, gray literature, and studies conducted outside Brazil or at other levels of care were excluded. The search, concluded on June 19, 2025, showed data extracted and synthesized by the author, year, title, journal, study design, objective, and conclusions.

RESULTS

3.1 Selection and characteristics of the articles included in the review

In total, 8 articles were included in the final analysis, drawn from an initial search that identified 743 articles across the search platforms (Figure 1). The primary data are presented in Table 2. To facilitate visualization, the studies were mapped out (Figure 2) and organized into a timeline based on their year of publication (Figure 3)

Figure 1. PRISMA flowchart



Source:Created by the authors, 2026

Table 2. Main Characteristics of the Selected Studies.

Author	Title	Journal	Main Objective	Conclusions
Rodrigues et al., 2025	*Revolutionizing pediatric neurology care: telemedicine advancements and regulatory impact in the Northeast of Brazil*	*Arquivos de Neuro-Psiquiatria* ANP ARQUIVOS DE NEURO-PSIQUIATRIA NEUROLOGY AND NEUROSCIENCE	To document the experiences of pediatric neurologists utilizing teleconsultations within the scope of the TeleNordeste program, a specialized medical care initiative in Northeast Brazil.	They highlight the effectiveness of teleconsultations in improving access to pediatric neurology in underserved regions, reducing the need for in-person care and generating cost savings for the public health system.
Batista-da-Silva et al., 2023	*Effectiveness of a multicomponent intervention to face the COVID-19 pandemic in Rio de Janeiro's favelas: difference-in-differences analysis*	*BMJ Global Health* BMJ Global Health	To analyze the impact of a multicomponent intervention combining mobile surveillance and telehealth on COVID-19 case detection and mortality rates in a large vulnerable community (Complexo da Maré) in Rio de Janeiro,	Investing in community-based interventions can reduce deaths and improve pandemic control in poor populations in low- and middle-income countries.

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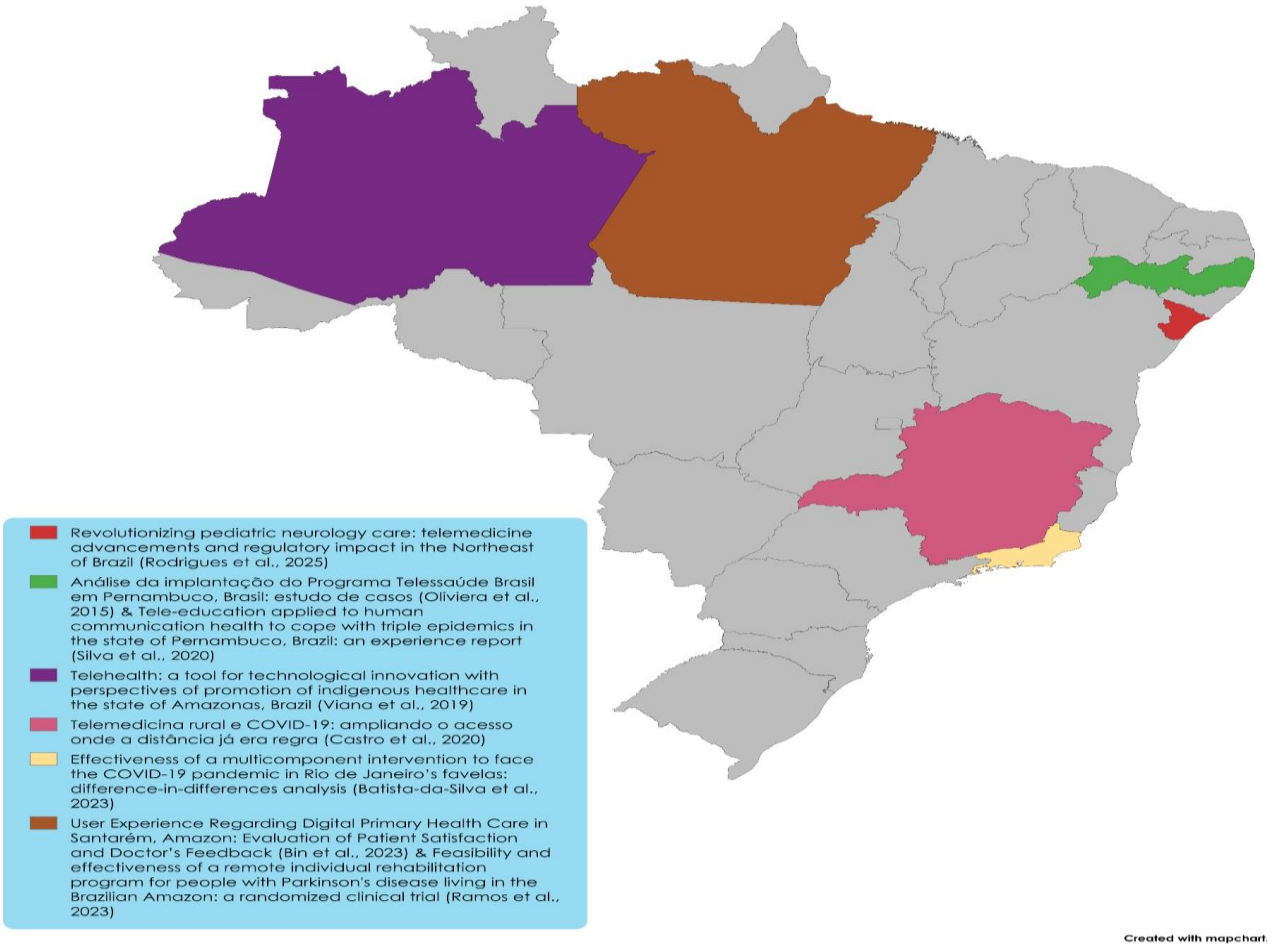
			Brazil.	
Bin et al., 2023	*User Experience Regarding Digital Primary Health Care in Santarém, Amazon: Evaluation of Patient Satisfaction and Doctor's Feedback*	*JMIR Formative Research*	To evaluate patient and physician feedback regarding the use of telemedicine in outpatient care in Paysandú, a riverside district in the Amazon.	Teleconsultations proved viable for providing medical care from more developed regions to communities remote from urban centers. In addition to technical feasibility, there was high acceptance and satisfaction among patients.
Ramos et al., 2023	*Feasibility and effectiveness of a remote individual rehabilitation program for people with Parkinson's disease living in the Brazilian Amazon: a randomized clinical trial*	*Frontiers in Neurology*	To evaluate the feasibility and effectiveness of a telerehabilitation program for people with Parkinson's disease living in an underrepresented community in the Brazilian Amazon.	The telerehabilitation program demonstrated high patient adherence and minimal adverse effects.
Castro et al., 2020	*Telemedicina rural e COVID-19: ampliando o acesso onde a distância já era regra*	*Revista Brasileira de Medicina de Família e Comunidade (RBMFC)*	To report the experience of a Family Health team in introducing a telemedicine service in a rural setting of the SUS.	The use of WhatsApp for telemedicine during the COVID-19 pandemic proved viable and strategic in rural areas, reducing inequities in access to healthcare. However, limitations such as a lack of devices, connectivity, or digital literacy still excluded vulnerable populations.
Silva et al., 2020	*Tele-education applied to human communication health to cope with triple epidemics in the state of Pernambuco, Brazil: an experience report*	*Revista CEFAC*	To evaluate the implementation of tele-education sessions for health professionals working in primary care in Pernambuco.	The tele-education service was widely approved and recognized as an accessible and effective approach for the continuing education of health professionals in primary care.
Viana et al., 2019	*Telehealth: a tool for technological innovation with perspectives of promotion of indigenous healthcare in the state of Amazonas, Brazil*	*JISTEM - Journal of Information Systems and Technology Management*	To present the telehealth system implemented in indigenous villages in the state of Amazonas, Brazil.	The telehealth system, despite the challenges (such as internet quality), presents itself as an effective alternative for reducing the effects of isolation in remote areas, although it still requires improvements in technological infrastructure.
Oliviera et al., 2015	*Análise da implantação do Programa Telessaúde Brasil em Pernambuco, Brasil: estudo de*	*Cadernos de Saúde Pública*	To evaluate, in six municipalities in Pernambuco, the degree of implementation of the Network of Telehealth Centers (RedeNutes), which is part of the	Telehealth demonstrates the potential to enhance comprehensive healthcare in the state, particularly through teleconsultations and telediagnosis. However, challenges regarding

	casos		Telehealth Brazil Program and carries out initiatives for the Family Health Strategy, through tele-assistance and tele-education services.	adherence to telecare have been observed, necessitating strategies for professional engagement and technological adaptation to enhance its effectiveness.

Source:Authored by the authors

Figure 2. Geographical distribution of studies in Brazil.



Source:Author, 2025. Developed on MapChart.

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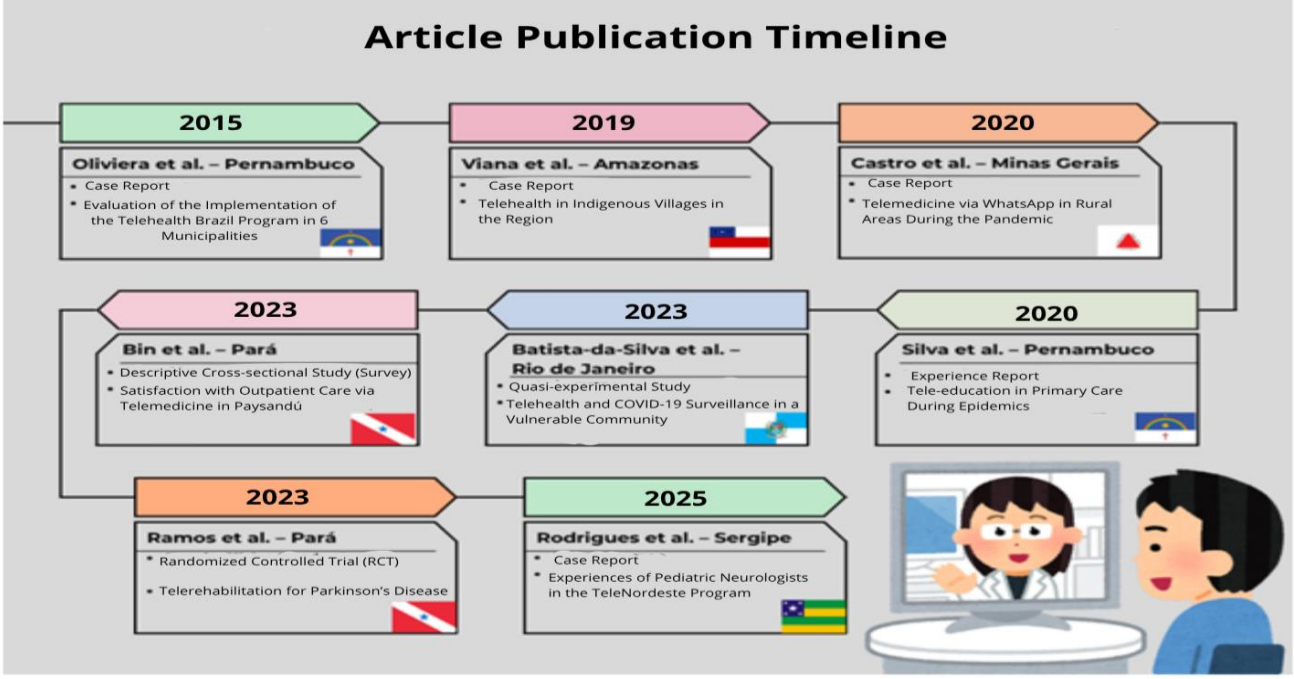
Figure 3. Timeline of Studies by State (2015–2025).



Source:Created by the authos, 2026. Made in Canva.

3.2 Thematic Axes of the Articles

The studies included in this literature review can be categorized into three main thematic axes. It highlights the uses, challenges, and potential of telehealth in vulnerable contexts in Brazil: Telemedicine in riverine and indigenous populations; Telemedicine during the COVID-19 pandemic; and Tele-education and professional training.

3.2.1 Telemedicine in riverside and indigenous populations

Telehealth has proven to be an effective tool for expanding access to healthcare in remote regions, such as riverside communities and indigenous villages. Studies such Lima et al. (2023) and Viana et al. (2019) have demonstrated its application in primary care and in specialties such as pediatric neurology (Rodrigues et al., 2025) and rehabilitation for Parkinson's disease (Ramos et al., 2023) [15, 16, 17]. Despite the benefits, such as cost reduction and increased healthcare coverage, structural challenges persist, including unstable internet connectivity, the lack of devices, and the need for continuous training of local professionals. These barriers limit the full implementation of digital solutions, particularly in areas such as the Amazon, where geographic isolation is an aggravating factor.

3.2.2 Telemedicine during the COVID-19 pandemic

A pandemia acelerou a adoção de serviços de teleconsultas, sobretudo em territórios com populações vulneráveis. Castro et al. (2020) relataram o uso inovador do WhatsApp para atendimentos em zonas rurais [18], enquanto Batista-da-Silva et al. (2023) demonstraram que intervenções combinando telessaúde e vigilância comunitária reduziram mortes por COVID-19 em favelas do Rio de Janeiro [19]. No entanto, a exclusão digital emergiu como um obstáculo crítico, com relatos de pacientes sem acesso estável à internet, no estudo de Castro et al., 2020. The pandemic accelerated the adoption of teleconsultation services, particularly in territories with vulnerable populations. Castro et al. (2020) reported the innovative use of WhatsApp for patient care in rural areas [18], while Batista-da-Silva et al. (2023) showed that interventions combining telehealth and community surveillance reduced COVID-19 deaths in the favelas of Rio de Janeiro[19]. Digital exclusion has emerged as a significant obstacle, with reports from the study by Castro et al. (2020) indicating that patients lack stable internet access.

3.2.3 Tele-education and Professional Training

The professional development of professionals through tele-education has shown to strengthen primary care, as indicated by studies by Oliveira et al. (2015) and Silva et al. (2020) [21,22]. In Pernambuco, tele-education sessions were highly rated by professionals within the Family Health Strategy, showing their potential for continuing education. However, low adherence to tele-assistance in certain contexts suggests a need for more effective engagement strategies, such as practical training and ongoing technical support [21].

DISCUSSION

The right to health, constitutionally guaranteed to all Brazilian citizens, is the foundation for the implementation of public policies, such as telehealth, that aim to expand the reach of services [23]:

> "Health is a right of all and a duty of the State, guaranteed through social and economic policies aimed at reducing the risk of disease and other health impairments, and at universal and equal access to actions and services for its promotion, protection, and recovery."
> (Brazil, 1988, p. 211).

Despite this legal backing, universal access still faces significant challenges in remote regions of Brazil, areas characterized by difficulties in transportation, a shortage of professionals, and limited infrastructure. Populations inhabiting rural areas, riverside communities, indigenous territories, and urban peripheries constitute one of the groups most impacted by these inequalities, experiencing daily both the absence of effective primary care and a lack of access to specialized services.

In this context, telehealth emerges as a strategic tool for reducing inequities by enabling remote care, diagnostic support, continuing education for professionals, and coordination among different levels of care. The Telehealth Brazil Networks Program (Programa Telessaúde Brasil Redes), established by Ministry of Health Ordinance number 2,546/2011, aims to support the consolidation of Health Care Networks, anchored by Primary Care, as well as to improve the quality of care across all levels of complexity through information and communication technologies, particularly to reduce disparities in access in remote regions and to promote continuing education for professionals.

Telehealth enables overcoming geographic and socioeconomic barriers, ensuring that care reaches the most vulnerable populations while upholding the principle of equity, which guides the allocation of greater resources where the need is greatest. Thus, the role of telehealth is reinforced as a public policy aligned with the constitutional mission of the SUS, contributing significantly to the democratization of healthcare. The articles included in this work present several successful examples that have been implemented in various regions of Brazil.

A study conducted by Rodrigues et al. (2025) demonstrated positive results regarding the implementation of telehealth, specifically through the TeleNordeste initiative, in the field of pediatric neurology [16]. In this study, all patients scheduled for pediatric neurology consultations via Basic Health Units (UBS-Unidades Básicas de Saúde) were included. Follow-up care for most of the patients seen was successfully maintained in a remote format; only 1.4% of patients required an in-person intervention. The virtual consultations were conducted by primary care professionals and pediatric neurologists. Only units with a stable internet connection capable of supporting real-time teleconsultations were eligible to participate, highlighting the need for infrastructure investment to ensure the proper implementation of such initiatives across the entire Brazilian territory.

The study by Batista-da-Silva et al. (2023) used a multi-component community intervention that, among various strategies, included mobile surveillance and telemedicine, specifically within the context of the COVID-19 pandemic [19]. The researchers worked with a vulnerable community located in the Complexo da Maré, in Rio de Janeiro. The study's intervention mitigated the impact of inequalities in healthcare access by promoting effective local actions. The results of this initiative underscore the urgent need to invest in public health strategies that acknowledge the specific characteristics of vulnerable territories. An integrated approach, combining technology, health surveillance, and community engagement, must become a permanent fixture of public policies aimed at the most marginalized populations. Investing in these territories is not merely a matter of efficiency, but, above all, a matter of social justice.

The article published by Bin et al. (2023) evaluated the experience of a telemedicine project that connected the city of São Paulo to Paysandú, a riverside district in the Amazon where accessing the nearest medical care requires hours of travel [24].

The study's data underscore the immense potential of telemedicine to reduce health inequalities, particularly in remote and underserved

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regions. However, they also highlight a crucial point: investment in technological infrastructure is indispensable for ensuring the quality of these connections and, consequently, the continuity of care. Projects such as this should not be viewed merely as emergency solutions, but rather as an integral part of a permanent national policy for health inclusion. Delivering medical care to the banks of the Amazon's great rivers is, above all, a way to reaffirm the right to health and dignity for these populations.

The randomized controlled trial conducted by Ramos et al. (2023) evaluated the feasibility and efficacy of a telerehabilitation program for individuals with Parkinson's disease in an underrepresented community in the Brazilian Amazon[17]. This study demonstrated another telehealth application: patient rehabilitation in historically underserved regions. Diseases know no geographic barriers, but access to healthcare does. This inequality exposes vulnerable populations to preventable risks, underscoring the importance of investing in technologies that deliver care to places where it currently does not reach.

The study by Castro et al. (2020), published during the year of the COVID-19 pandemic's greatest impact in Brazil and worldwide, aimed to report on the experience of implementing telemedicine via WhatsApp at the UBS located in a rural area [18].

The authors demonstrated that this was a viable strategy during the SARS-CoV-2 pandemic, emphasizing that in rural settings, vulnerabilities are historically more pronounced. However, they raise a new question, illustrating how this population is neglected yet again: not all residents were able to access the platform. This calls for reflection on how this population can be effectively reached, ensuring they receive the comprehensive support to which they are entitled.

The study by Silva et al. (2020) examined the implementation process of tele-education sessions aimed at professionals in PHC and Family Health Support Centers (NASF-Núcleos de Apoio à Saúde da Família) in Pernambuco, within the context of the triple epidemic (Dengue, Zika, and Chikungunya)[22]. The researchers' findings indicated a high level of acceptance, with 100% of participants deeming the topics relevant and important for their professional development. This type of initiative highlights the transformative role of tele-education as a tool for strengthening continuing education in health.

The study by Viana et al. (2019) was conducted in indigenous villages in the Amazon [15]. The authors highlight the limited number of health professionals in these municipalities, and that travel is often possible only by river. The main challenges encountered by the researchers include: a lack of understanding regarding cultural diversity; inadequate infrastructure; difficulties in transporting equipment; power outages; and high staff turnover, due to the difficult access to these regions.

Finally, the work by Oliveira et al. (2015) shows several significant cases regarding the state of Pernambuco. Since 2003, the Federal University of Pernambuco (UFPE) has established the Telehealth Center (NutesUFPE). This center is part of the Telehealth Brazil Program and develops initiatives for the Family Health Strategy through tele-assistance and tele-education services [21]. This study evaluated the degree of implementation of these strategies in several municipalities within the state. The authors demonstrated that, for the objectives to be fully achieved, there remains a need for expanded coverage, increased investment, greater uptake of the services offered, and improved connectivity.

CONCLUSION

Telehealth is a vital strategy for reducing inequalities and strengthening Primary Health Care (PHC) within the SUS, particularly in remote areas. This integrative review demonstrates that digital health expands access in isolated regions, benefiting vulnerable populations such as riverside dwellers, Indigenous peoples, and rural communities. The results confirm technical feasibility, high user satisfaction, and the strengthening of care networks and professional integration.

The sample of eight studies reflects the scarce body of literature on telehealth in these Brazilian regions, which limits the generalizability of the findings. However, this limitation underscores the urgent need for research and policies to address these gaps. The reviewed articles also highlight challenges such as precarious network infrastructure and the need for enhanced professional training.

This review reaffirms telehealth as strategic for equity, particularly in remote areas. It is vital to integrate digital health into the SUS with a focus on reducing inequalities, requiring investments in infrastructure, capacity building, and research involving traditional populations. The study consolidates evidence and guides practical actions to strengthen the SUS and ensure universal access, regardless of location.

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