# Telehealth actions and services in Mato Grosso


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## Abstract

**Objective**: To report on the implementation of the Digital Health Program in Mato Grosso, addressing its historical overview and telehealth offerings, and presenting the advances and challenges in this process. **Method**: This is a qualitative, experience-report study, with documentary analysis of the implementation trajectory of the Mato Grosso Digital Health Program. **Results**: Telehealth and Digital Health Center develops telehealth actions and services, including teleconsultation, teleinterconsultation, telediagnosis, teleeducation, training, and monitoring, focusing on the intersection of technology, information, health, and services aimed at strengthening the Healthcare Network. **Discussion:** The state of Mato Grosso faces challenges in the distribution of specialized services and access to diagnostic and therapeutic support. Therefore, Telehealth contributes to the strengthening, promotion, coordination of care, and consolidation of the Healthcare Network. **Conclusion**: The Center has also contributed to the management and coordination of the Digital Health Strategy Policy. Its implementation has been gradual through partnerships between the state, universities, professionals, managers, and the federation at different stages, combining efforts to build a community-based Unified Health System.


**Key-words:** Healthcare. Health Management. Health Plan Implementation. Telehealth. Digital Health.


## Resumen

Acciones y servicios de Telesalud en Mato Grosso

**Objetivo**: Informar sobre la implementación del Programa de Salud Digital en Mato Grosso, abordando su panorama histórico y la oferta de telesalud, y presentando los avances y desafíos de este proceso**. Método**: Estudio cualitativo, de tipo experiencial, con análisis documental de la implementación del Programa de Salud Digital de Mato Grosso. **Resultados**: El Centro de Telesalud y Salud Digital desarrolla acciones y servicios de telesalud, incluyendo teleconsulta, telediagnóstico, teleeducación, capacitación y monitoreo, con enfoque en la intersección de tecnología, información, salud y servicios para fortalecer la Red de Salud. **Discusión**: El estado de Mato Grosso enfrenta desafíos en la distribución de servicios especializados y el acceso al apoyo diagnóstico y terapéutico. Por lo tanto, la telesalud contribuye al fortalecimiento, la promoción, la coordinación de la atención y la consolidación de la Red de Salud. **Conclusión:** El Centro también ha contribuido a la gestión y coordinación de la Política de Estrategia de Salud Digital. Su implementación se ha llevado a cabo de forma gradual mediante alianzas entre el estado, universidades, profesionales, gestores y la federación en diferentes etapas, aunando esfuerzos para construir un Sistema Único de Salud comunitario.


**Palabras clave:** Atención sanitaria. Gestión sanitaria. Implementación de planes de salud. Telesalud. Salud digital.


## Resumo

Ações e serviços de Telessaúde em Mato Grosso

**Objetivo**: Relatar a experiência de implantação e implementação do Programa Saúde Digital no território mato-grossense, abordando seu panorama histórico e as ofertas de Telessaúde, apresentando os avanços e desafios neste processo. **Método**: Trata-se de um estudo de natureza qualitativa, do tipo relato de experiência, com análise documental sobre a trajetória de implantação e implementação do Programa de Saúde Digital Mato Grosso. **Resultados**: O Núcleo de Telessaúde e Saúde Digital desenvolve ações e serviços de telessaúde de teleconsultoria, teleinterconsulta, telediagnóstico, tele-educação, capacitação e monitoramento das ações, com escopo na intersecção entre tecnologia, informação, saúde e serviços que objetivam fortalecer a Rede de Atenção à Saúde. **Discussão**: O Estado de Mato Grosso enfrenta problemas na distribuição de serviços especializados e de acesso a apoio diagnóstico e terapêutico, desta forma a Telessaúde corrobora para o fortalecimento, promoção, coordenação do cuidado e a consolidação da Rede de Atenção à Saúde. **Conclusão**: O Núcleo tem contribuído também com a gestão e coordenação da Política de Estratégia em Saúde Digital, sua implantação e implementação aconteceram de forma gradativa mediante parcerias do estado com as universidades, profissionais, gestores e federação em diferentes momentos, somando esforços para uma construção comunitária do Sistema Único de Saúde.


**Palavras-chave:** Atenção à Saúde. Gestão em Saúde. Implementação de Plano de Saúde. Telessaúde. Saúde Digital.

## INTRODUCTION

The state of Mato Grosso has a vast territorial area of 903,208.36 km², with a population density of 4.05 inhabitants/km² and an urbanized area of 1,244.20 km², with long geographic distances between cities. The territory has 142 municipalities, each with different health needs[1]. In addition to urban areas, the state has *quilombola* communities and indigenous peoples, including 45 indigenous ethnic groups[1], each with its own specificities.

In this context, it is important to acknowledge the growing role of Information and Communication Technologies (ICT) in developing tools within the health sector, aimed at facilitating access to care in remote areas that face gaps in service delivery. The implementation of Digital Health and Telehealth initiatives in the state began in 2013[2]. Digital Health encompasses the convergence of technology, information, and health, integrating software, hardware, and services as part of the digital transformation process. This includes the recording of electronic health data and the utilization of telehealth, among other components[3].

Telehealth initiatives use digital technologies to offer telehealth services as a complement to in-person healthcare, facilitating access to specialist doctors, reducing waiting times, and expediting diagnoses and treatments. The following telehealth care modalities in the state standout: teleconsultations, telediagnosis, teleinterconsultations, and teleeducation, in which teleconsultation was the pioneering telehealth initiative in Mato Grosso[4].

In 2014, the implementation, coordination, operationalization, and monitoring of the *Programa Telessaúde Brasil* – Mato Grosso State Center was established, aiming to strengthen and qualify Primary Health Care (PHC)[4]. However, the implementation of Telehealth services becomes a challenge, given the inequalities and diverse realities in the Unified Health System (SUS), which involve connectivity, infrastructure, digital literacy, and resistance to the use of digital technologies in health.

In 2024, the Ministry of Health (MS) launched the SUS Digital Program to facilitate digital transformation within the SUS, aiming to enhance public access to its services and actions, and to ensure comprehensive and effective health care[5]. In alignment with these ministerial initiatives, the State of Mato Grosso (MT) has been progressing toward the implementation and ongoing development of telehealth services.

Currently, the Mato Grosso Telehealth and Digital Health Center (NTSD/MT-*Núcleo de Telessaúde e Saúde Digital de Mato Grosso*) is linked to the Health Care Superintendence of the State Department of Health, and is responsible for coordinating policy in the region. Therefore, scientific production in the form of experience reports on the logic of health care as a state policy focused on digital health becomes an important tool for sharing experiences and guiding future actions.

Thus, the objective of this work is to report the experience of implementing the Digital Health Program in the Mato Grosso state, addressing its historical panorama and Telehealth offerings, presenting the advances and challenges in this process.

## METHODOLOGY

This is a qualitative study, of the experience report type, with documentary analysis on the implementation trajectory of the MT Digital Health Program.

The qualitative approach is characterized by the meanings, values, beliefs, and attitudes of the participants, as well as the context in which they live, their social conditions, and processes that cannot be reduced to the mere operationalization of variables[6]. Consequently, this methodological approach aligns with the objectives of the current work. Through the experience report, which emphasizes the observation of reality, there is no requirement to test hypotheses; instead, it establishes connections between real-world findings and relevant theoretical frameworks.

To this end, data collection and documentary analysis were used, which refers to a broad examination of several documents that have not yet been used for analysis in any work, in the following sources[7]: documentary information (reports, articles, ordinances) and records in files (organizational, tables, monitoring data, surveys) regarding the offerings of the MT Digital Health Program and its implementation and deployment trajectory that began in 2013.

## RESULTS

### Theoretical framework

The initial attempt to implement Telehealth in Mato Grosso began in 2009; however, due to operational difficulties, the proposal was not consolidated at that time. They were implemented in 2013, regulated by Ordinance number 053/2013/GBSES and revoked by Ordinance number 102/2014/GBSES, which established the implementation, coordination, operation, and monitoring of the *Programa Telessaúde Brasil* - Mato Grosso State Center, to support the Family Health Strategy (ESF-

*Estratégia Saúde da Família*) linked to the Primary Care Coordination[4].

Through a partnership with the Federal University of Mato Grosso (UFMT) and the Júlio Muller University Hospital (HUJM), the Mato Grosso State Health Department (SES/MT-*Secretaria de Estado de Saúde de Mato Grosso*) integrated the Telehealth Scientific Technical Center into the University Telemedicine Network (RUTE-*Rede Universitária de Telemedicina*) in 2015, offering teleconsultation, telediagnosis, and tele-education services to all municipalities in the state with its own Mato Grosso team[8].

In 2022, teleconsultation services in Mato Grosso were temporarily suspended due to the discontinuation of the National Telehealth Platform, managed by the Federal University of Rio Grande do Sul (UFRGS)[9]. The following year, Telehealth services were resumed and are now available via the contracted Telehealth Platform, acquired by the State of Mato Grosso, and which is currently maintained.

In 2023, with 10 years of telehealth services under way, the state adopted the Digital Health Strategy Policy and established the MT Digital Health Program. This expanded telehealth services to all levels of healthcare, implemented through the MT Telehealth and Digital Health Center (NTSD/MT).

The center is responsible for coordinating Telehealth initiatives and contributing to the development of guidelines and policies related to Digital Health. It provides services and actions such as teleconsultation, teleinterconsultation, telediagnosis, tele-education, training, and monitoring. These efforts lie at the intersection of technology, information, health, and services, all aimed at strengthening the Health Care Network (RAS).

## Services offered

### Telehealth

Telehealth services are provided through the Telehealth Platform, acquired by the Government of the State of Mato Grosso in 2022. Within the platform, NTSD/MT offers teleconsultation and teleinterconsultation in the following specialties: Allergology and Immunology, Anesthesiology, Cardiology, Pediatric Oncology, Clinical Oncology, Surgical Oncology, Vascular Surgery, Dental Surgery/Stomatology, Endocrinology, Pediatric Endocrinology, Endoscopy, Geriatrics, Gynecology, Hematology and Hemotherapy, Pediatric Hematology, Infectology, Infectious Diseases-Pediatrics, Neurosurgery, Oncology, Orthopedics and Traumatology, Pediatrics, Pulmonology, Radiotherapy, Pediatric Rheumatology, medical clinic, according to Ordinance number 0416/2024/GBSES[10]. "In the period from December 2023 to November 2024, 1298 teleconsultations and 1201 teleinterconsultations were carried out, with Otorhinolaryngology and General Practice being the most used," respectively[8].

Among the actions developed by NTSD/MT, 112 of the state's 142 municipalities joined the program[9]. Telehealth in Indigenous and *Quilombola* communities and in the territory's prison system are highlighted. According to the 2022 Demographic Census by the Brazilian Institute of Geography and Statistics (IBGE)[1], the state has the seventh-largest Indigenous population in Brazil, with 58,232 Indigenous people, as well as 11,729 *Quilombolas* and 45 prison units.

Considering the diversity of ethnic groups and quilombos, associated with the specific health needs of each population, the state, in partnership with the Union and the municipalities involved, enabled in 2024 to train teams from the Special Indigenous Health Districts (DSEIs-*Distritos Sanitários Especiais Indígenas*) of Araguaia, Xingu, and Xavante to use the Digital Health platform[11]. This is a promising start to the expansion and implementation of Digital Health services for indigenous and *quilombola* populations, aiming to improve the quality of access to health services.

### Health in Prison

In teleconsultation, care is shared between health professionals through the Digital Health platform, with the patient present, for diagnostic or therapeutic assistance, facilitating interprofessional work[3].

Regarding the state's telehealth service offerings, since August 2023, the Health in Prison MT project has been using teleconsultation in prison units. Currently, five prison units (Tangará da Serra Provisional Detention Center, Cáceres Women's Public Prison, Major PM Zuzi Alves da Silva Penitentiary, Cáceres Men's Prison, and Ana Maria do Couto May Women's Penitentiary) are supported through teleconsultation, as illustrated in Figure 1.


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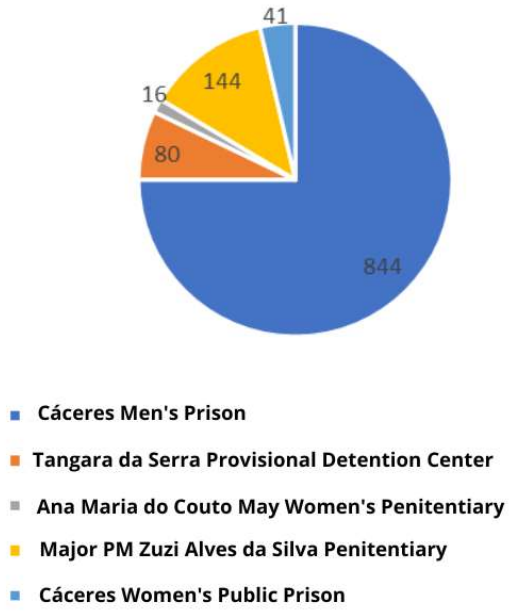
Figure 1 – Teleconsultations in Mato Grosso Prisons (August 2023–November 2024)



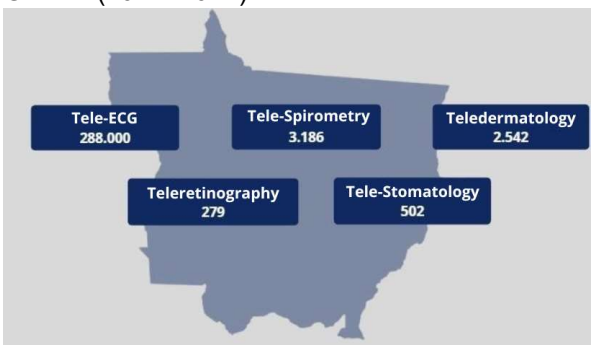

**Source**: Report from the Telehealth and Digital Health Center/MT.

Since its implementation and deployment, 1,125 teleconsultations have been carried out in medical clinics[9]. This work has contributed to reducing the healthcare gap in these units, as it has enabled faster and more humane access to medical services for people deprived of liberty.

## Telediagnosis

Telediagnosis is a service that uses information and communication technology to support remote diagnoses. This service is provided in partnership with federal universities and specialists from various fields. They prepare evidence-based diagnostic reports and make them available to healthcare professionals and the public through the national telediagnosis platform[12]. Currently, telediagnosis services are offered in tele-electrocardiogram (Tele-ECG), stomatology, teledermatology, telespirometry, and teleretinography, as illustrated in Figure 2. According to data collected by the platform, the Digital Health Program of Mato Grosso offered 294,509 telediagnoses between 2014 and 2024 in Mato Grosso[13].

Figure 2 – Overview of telediagnosis in Mato Grosso (2014–2024)




**Source:** Telediagnosis report from the MT Telehealth and Digital Health Center.

According to Figure 2, Tele-ECG is the most widely used telediagnosis method in the state. Launched in 2014, it is a pioneering tool, currently operating in 94 municipalities, with 273 permanent locations equipped with active electrocardiogram devices and over 288,000 telereports issued[9]. Its widespread use is tied to the existing infrastructure in municipalities, most of which already have electrocardiogram devices, but still lack specialized cardiologists to produce the reports. Thus, Tele-ECG is a complementary tool available to municipalities in patnership with the Federal University of Minas Gerais (UFMG). Subsequently, “teledermatology services began to be offered in October 2018,” with 2,545 telereports prepared to date[9].

Telespirometry is a telediagnostic service that provides reports on tests measuring lung vital capacity, which is crucial for diagnosing various respiratory conditions, including asthma and chronic obstructive pulmonary disease[8]. These reports are generated by pulmonologists from the Federal University of Minas Gerais (UFMG), with both remote and in-person training offered to technicians for conducting the tests. The service was available in municipalities starting in 2022 but was discontinued in November 2024 due to the conclusion of the project execution period established between the university and the Ministry of Health, as the agreement was not renewed. During this timeframe, a total of 3,186 telespirometry reports were completed[8].

Through the Tele-EstomatoMT application, a tool developed by the Federal University of Paraíba (UFPB) in partnership with the Ministry of Health and granted to the State Coordination of Oral Health/Telehealth and Digital Health of the State of Mato Grosso, dental health professionals have been able to send images detailing the clinical characteristics of lesions, whether suspected of being cancerous or not, since February 2023. This information is analyzed by a stomatologist from the NTSD/MT, who issues reports with the diagnostic hypothesis and treatment guidelines[9]. By December 2024, 47

municipalities in Mato Grosso had signed up for this offer, and 502 reports had already been produced.

In May 2024, teleretinography was integrated into the services provided by NTSD/MT. After capturing precise and detailed images of the retina, these images are assessed by a biomedical professional from NTSD/MT, who compiles a preliminary report and forwards it to specialists at the Federal University of Goiás (UFGO) for further evaluation. This service is accessible to the state's Basic Health Units (UBSs) and Indigenous Health Districts (DSEIs), resulting in a total of 279 reports generated by December 2024.

### Training of health professionals, tele-education, and monitoring of services

As one of the Program's initiatives, ongoing training and education in Digital Health, the NTSD/MT provides ongoing training for municipal professionals on the use and management of platforms and data logging. To this end, in-person training sessions are held weekly on Tuesdays and Wednesdays at the NTSD/MT physical facility, and remote training sessions via Google Meet on Mondays and Thursdays. According to a survey by the NTSD/MT, 71 in-person and 11 remote training sessions have been conducted for different teams to date[9]. Content on digital health topics is also available through the Tele-Educa Mato Grosso YouTube channel.

Furthermore, daily monitoring of the services offered is carried out to support municipalities, organize flows, and evaluate the frequency of use, aiming at efficiency and optimization of processes within the Telehealth and telediagnosis platforms.

## DISCUSSION

Despite the progress and accomplishments achieved thus far, the implementation of the MT Digital Health Program services still faces significant challenges. The implementation process is continually evolving, with the NTSD/MT playing a central role in the coordination and execution of Digital Health and telehealth policies within the region.

Among the advancements observed, the NTSD/MT has enabled the state to actively provide a significant array of services to both the population and healthcare professionals. These accomplishments have led to enhanced access to specialized medical services via Telehealth, facilitated knowledge exchange between specialists and general practitioners, streamlined services, improved resolution rates, decreased regional disparities, and shortened waiting lists for specialized care and examinations. Therefore, it is important to emphasize the many positive factors and reasons that support the integration of Telehealth solutions into the SUS[14].

Moreover, the transfer of patients between municipalities in pursuit of specialized care has been significantly reduced, leading to both savings and increased efficiency. In 2023 and 2024, digital services have already resulted in approximately R$23 million in savings for the state's public finances, primarily through reductions in patient transportation costs[13]. Additionally, beyond conserving public resources, the Telehealth service empowers individuals deprived of liberty to access their rights to health and citizenship.

According to Brunozi[8], the state of Mato Grosso faces distribution and access issues regarding specialized care. “Many municipalities lack facilities offering diagnostic and therapeutic support, with approximately 20% of these services concentrated in the capital[8],” and tertiary care is centralized in the metropolitan region. Given this reality, Telehealth contributes to reducing testing costs, strengthening, promoting, and coordinating care, and consolidating the RAS (Health Network) by decentralizing its scope of action to remote regions with limited professional and hard-to-use technologies.

To this end, as Primary Health Care (PHC) is a fundamental and organizing component of the RAS, “Telehealth must strengthen the horizontality of the territories that make up the RAS in an inclusive way, not in a way that affirms the hegemony of the specialty, but to corroborate that Primary Health Care fulfills its role[8].”

As a means of enhancing health initiatives in Primary Healthcare (PHC), the training of professionals and the monitoring of their activities led to improved utilization of platforms and equipment, such as electrocardiograms and fundus cameras. Furthermore, promoting the integration of Telehealth into daily practices resulted in a notable increase in service usage. In this context, training, an essential component of the SUS Continuing Education Strategy (EPS), “[...] represents a reality across various levels of care aimed at enhancing professional knowledge, thereby improving the quality of care for individuals receiving services[15].”

However, according to Oliveira et al[16]., PHC, the primary focus of training for the Digital Health strategy faces daily organizational challenges such as high employee turnover. Consequently, this impacts NTSD/MT services, requiring frequent training for professionals and impacting the continuity of care. Furthermore, there are challenges related to the digital literacy of health professionals, as well as resistance to the use of health technologies, which hinders the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formation of teams to provide services on the digital platform.

Silva et al[17]. suggest that this resistance may be associated with a lack of or insufficient academic training in computer science and other technologies, particularly among professionals from the analog generation, adapted to a traditional culture of in-person care. It is worth noting that the use of digital technologies in healthcare and their new guises is something new in everyday healthcare for many professionals, managers, and users. Therefore, the implementation of new strategies, especially those that bring new functionalities, goes through a process of resistance before gaining acceptance among professionals.

In this context, continuing education tools are significant strategies for developing and improving professionals' knowledge of healthcare technologies. Therefore, it is crucial to consider the needs of healthcare professionals when developing and improving telehealth, and ongoing support from the NTSD/MT is essential.

Regarding challenges, the lack and/or instability of connectivity, connectivity inequities across regions, a shortage of IT professionals in the RAS (Regional Health Network), low-speed internet, incipient infrastructure in PHC, and the need to purchase equipment are obstacles faced in the coordination and operation of the Digital Health and Telehealth strategy in Mato Grosso. Furthermore, “Equitable access to digital health services remains a challenge, especially for populations in rural, marginalized, or technology-poor areas[18],” a scenario that is part of the reality in the state of Mato Grosso, which has seen a significant increase in the rural population in municipalities whose economic base is agribusiness.

Currently, it is observed that Mato Grosso's Telehealth system lacks a multidisciplinary team and relies on centralized medical care, which only partially addresses patients' needs. Therefore, it is crucial to provide multidisciplinary care to users in order to ensure comprehensive healthcare.

## CONCLUSION

The Telehealth offerings coordinated by NTSD/MT in the Mato Grosso territory increase the resolution capacity of the RAS, especially the APS, reducing the pent-up demands for specialties and exams, as well as reducing costs and human resources.

The Center has played a significant role in the management and coordination of the Digital Health Strategy Policy, which is executed under the framework of the MT Digital Health Program. The implementation and deployment of this strategy have progressed gradually through collaborations among the state, universities, professionals, administrators, and the federation at various stages, uniting efforts to foster a community-based SUS.

The MT Digital Health Program services are spread across various health regions, providing numerous benefits as outlined in this report. However, despite the advantages of telehealth and telediagnosis, these services face challenges related to maintenance. These challenges include staffing difficulties, a lack of multidisciplinary collaboration, emerging primary healthcare (PHC) infrastructure, disparities in connectivity, and political issues about the Center's partnerships, such as the recent discontinuation of telespirometry. To effectively address the infrastructure needs of PHC, it is essential to enhance internet access, upgrade computer equipment, and invest in testing tools.

Based on this experience report, we observed significant progress and numerous challenges that permeate the development and implementation of NTSD/MT services. Aware of these challenges, the Center plans to implement multidisciplinary healthcare services through the establishment of a Digital Multidisciplinary Outpatient Clinic, seeking to strengthen and value the physical, social, and psychological dimensions of individuals in the health-disease process. Therefore, Telehealth represents an important opportunity for transforming public health in the state of Mato Grosso.

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