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REVIEW

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Colonial shadows – a systematic review of the Xavante health transformation

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Abstract

Background From a biocultural perspective, health is a multifaceted concept shaped not only by biomedical factors but also by social, cultural, political, and economic forces. In Indigenous contexts, health is particularly vulnerable, as it is profoundly influenced by external socioeconomic and cultural changes, often introduced or imposed by the broader society. The Xavante Indigenous community, located in the Central-Western region of Brazil, is one of the most extensively studied Indigenous groups in the country in terms of health. Despite a rich body of literature addressing various aspects of their health, there has been a notable absence of comprehensive studies that trace the historical evolution of their health status through bibliographic analysis. This article seeks to fill this gap by providing an in-depth examination of the historical transformation of the Xavante health, positioning this issue within the broader discourse of Indigenous health as a public health concern, while applying a decolonial perspective.

Methods A systematic bibliographic analysis was conducted to trace the historical trajectory of health among the Xavante people from Mato Grosso, Brazil.

Results A total of 109 academic publications meeting the inclusion criteria were identified. The analysis revealed sustained scholarly interest in the health of the Xavante community, particularly since their first sustained contact with the urbanized society. A comparative examination of the earliest and most recent, comprehensive studies on this topic highlighted a marked decline in the health status of the Xavante people over time.

Conclusions Despite periodic shifts in the administrative frameworks governing Indigenous healthcare in Brazil, including reductions in mortality rates and increased utilization of hospital services, the overall health status of the Xavante has significantly deteriorated. This article critically analyzes this trend through a decolonial lens, highlighting the limitations and shortcomings of existing health policies and interventions. It argues that the prevailing colonial approach to healthcare, compounded by the denial of culturally appropriate services, represents a clear violation of human rights. Furthermore, the article underscores the substantial impact of social determinants—such as historical trauma, cultural disruption, and systemic inequality—on the health outcomes of this community.

Keywords Indigenous health, Xavante, Colonial trauma, Academic research, Decolonial approach, Brazil

Background

With their number reaching over 250, indigenous groups represent barely 0.8% of the Brazilian population [51]. Like the majority of other indigenous groups around the world, they have suffered extensively from the expansion of Western societies in their native territories. Epidemies, forced labor, violence and social marginalization are the most common consequences of

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this process, and they have led to drastic demographic reductions and, in some cases, even the extinction of these societies [19].

Xavante are the native inhabitants of the Central-West regions of Brazil. Like many other indigenous groups around the world, the Xavante have also been highly affected by contact initially with Portuguese colonizers and later with urbanized Brazilians. Their last and eventually permanent contact with urbanized societies dates back to the 1940s [19]. The Xavante response to uninvited intrusion was often violent resistance but also more peaceful withdrawal toward the West [76]. The military regime in Brazil (1964–1985) was characterized by highly imperative goals that resulted in even more violent and discriminatory actions toward the indigenous segment of the population. Land takeovers and direct violations of human rights were commonplace [98]. The government policy focused on "pacifying" the native inhabitants of Central Brazil to expand agricultural and pastoral production and to "turn" the indigenous groups into "productive elements of the society" ([41], p. 48). Contact with nonindigenous groups and the enormous reduction in their territories resulted in a series of transformations and very negatively impacted the lifestyle, subsistence and health of the Xavante [45, 67].

In July 2023, I have participated in an academic project at the São Marcos, MT, Brazil that belongs to the formally recognized Xavante Indigenous Land (TI- *Terra Indígena*). During a month fieldwork I had the opportunity to meet several representatives of the Community and observe the life, relationships and customs of this village. I had also the privilege to talk to some of them, especially the elders. They often nostalgically spoke about the difficulty to carry out their traditional subsistence activities due to the important reduction of their territory, the changes in diet and lifestyle resulting from the contact with urbanized society, and the health issues they were experiencing. Although this was not the scope of the research project we were carrying out in São Marcos at that time, as a biological anthropologist, I got motivated to investigate the health trajectory of the Xavante. Not being able to conduct thorough ethnographic and biomedical research, I decided to investigate the health trajectory of the Xavante basing my research on available academic sources. In this context, the aim of this paper is twofold. On the one hand, I will present a record of published academic research on the health of the Xavante, which I will use to provide a temporal overview of the health status of this group. Despite the fact that the health of the Xavante will be examined through the lens of academics who have studied this group over time, on the other hand, I will critically analyze the issue of Indigenous health from a decolonial perspective to demonstrate the limitations and ineffectiveness of current approaches, as well as the bioculturality of health.

Organization of indigenous health care in Brazil

The Indian Protection Service (SPI) was created in Brazil in 1910 with the intention of protecting and assisting Indigenous populations in the process of "assimilation" and "integration" with national society [104]. However, it was not SPI that took the first steps toward protecting Indigenous health [19]. Historically, the Catholic Church in Brazil has had a strong influence on Brazilians' political, social and cultural life [93]. Before the establishment of SPI, Catholic missions played a significant role in providing healthcare for the population, especially in rural and underserved areas, including Indigenous communities [10, 65]. Later, these missions often acted as the primary healthcare providers, blending state-supported medical practices with Church-provided assistance. The creation, in 1972, of the Missionary Indigenous Council (CIMI—*Conselho Indigenista Missionário*), attached to the Brazilian National Bishop Council (CNBB), coordinated these efforts and focused on health, education, and legal assistance for Indigenous peoples [79].

However, it was not until 1956 that actual measures to address the health issues of the Indigenous populations were put into practice by the authorities. Noel Nutel's ideas resulted in the creation of Aerial Sanitary Unit Service (SUSA—*Serviço de Unidade Sanitária Aérea*) that would focus on providing direct health service to the communities and collecting information about their health conditions, together with an innovative strategy, that persisted even when the SUSA was dissolved in 1968, to isolate and treat areas infected by tuberculosis [95]. Following accusations of corruption and other serious crimes, SPI was dissolved, and its responsibilities were transferred to the National Foundation for Indigenous Peoples (FUNAI—*Fundação Nacional dos Povos Indígenas*) in 1967 [95]. Within this agency, a health division was created with the aim of planning and providing health services to Indigenous populations across the country. In 1973, Law 6001 (of December 19) established the Indian Statute, which defined Brazil's Indigenous legislation and placed the original populations under the tutelage of FUNAI [104]. FUNAI organized its work with Indigenous health in the form of Mobile Health Teams (EVS—*Equipes Volantes da Saúde*), but logistical difficulties, as well as insufficient funding and poor working conditions for employees, made health care for Indigenous peoples relatively disorganized and ineffective—a situation that did not improve over time [19].

In the 1980s, the Brazilian health system underwent a series of transformations that resulted in the creation, in 1990, of the Unified Health System (SUS—*Sistema Único*

de Saúde), which was designed to provide universal, egalitarian, complete and decentralized health care financed by the state throughout the Brazilian territory, including Indigenous lands [15]. With Law No. 9836 (September 23, 1999), responsibility for Indigenous health was transferred from FUNAI to the Ministry of Health, which was supposed to adapt "culturally appropriate" medical care through SUS, and especially through the Indigenous Health Care Subsystem (SasiSUS—*Subsistema de Atenção à Saúde Indígena SUS*), created for this purpose [19]. In 2002, the National Health Care Policy for Indigenous Peoples (PNASPI—*Política Nacional de Atenção à Saúde dos Povos Indígenas*) was implemented, which promotes the prevention and recovery of Indigenous health, providing a network of comprehensive healthcare services in Indigenous lands [7, 78]. SasiSUS has implemented its work in the form of Special Indigenous Health Districts (DSEI—*Distrito Sanitário Especial Indígena*), of which there are currently 34 that are strategically divided across the national territory based on the geographic occupation of Indigenous communities. In the Xavante district, the DSEI is located in Barra do Garças, Mato Grosso [73]. The creation of SASI and DSEI, as well as an integrated policy, constitute an important administrative advance in the protection of Indigenous health. However, the implementation of this system still faces significant challenges and difficulties that result in continuous risk to the health and lives of Indigenous communities [88].

Analyzing the historical trajectory of the measures taken by authorities in relation to Indigenous health care, a picture of constant changes emerges (I presume, with the intention of improvement). However, the quality of the services provided and, therefore, the health care and health of these groups, unfortunately, do not seem to improve [19].

The Xavante and the health care system

Various sources provide quite a pessimistic outlook on the health care system that the Xavante community is provided with. The majority of these texts are produced by researchers and academics; therefore, they reflect the perspective of the "outsiders" who due to long-term ethnographic research often have a profound knowledge on the reality they describe. Nevertheless, there are also voices who present these issues through the views and lived experience of the Xavante themselves. Independently of the source, there is a coherence in the narratives that indicate serious deficiencies.

Coimbra Jr et al. [19] report a lack of staff, the location of health care centres with very basic infrastructure in urbanized centres and not within the communities, or limitations in the services provided. The authors also point out the heterogeneity of the actors involved in the health response and the consequent lack of effectiveness, coordination of actions and centralized planning. Lack of a culturally appropriate approach and intercultural preparation of the actors involved, especially foreigners, makes the discrimination of the Xavante in municipal health units, both private and public, very evident [28]. They also noted the lack of knowledge of the living conditions, cultural aspects and medical needs of the Xavante by the municipal authorities, incompetence and lack of training of the health technicians who work in DSEI and in the communities or insufficient investment among other issues that hinder the improvement of this situation [19, 28].

Leite et al. [57] describe precarious sanitary conditions in São José village (*TI Sangradouro-Volta Grande*) that lead to soil, food and water contamination, and consequently high incidence of infectious and parasitic diseases that otherwise are preventable. And although the authors consider the infrastructure of the health base in São José to be adequate, they point out the significant shortage of professionals that attend this locality, with a medical doctor being available only once per week. At the same time, Gugelmin [45] emphasizes the discontinuity of health assistance related to frequent administrative changes in Indigenous healthcare, that affect the overall health status of the Xavante.

Apart from academics, the government itself acknowledges the difficult socioeconomic situation of the Xavante that directly affects their health status. In a report published in 2024 the *Secretaria de Saúde Indígena* of the *Ministério da Saúde* clearly states that the Xavante lack access to basic resources like clean water and health services, what is directly linked to various health issues like the avoidable proliferation of infectious diseases. Furthermore, poverty and limited economic opportunities detrimentally affect their quality of life, making it harder for the Xavante to obtain sufficient healthcare and proper nutrition [8]. Data obtained from the DSEI Xavante in 2020 indicate that 91,5% of Xavante villages did not have an Indigenous Basic Health Unit (UBSI- *Unidade Básica de Saúde Indígena*) [60].

Instituto Socioambiental (ISA), a non-governamental organization that works with Indigenous communities to "to develop solutions that protect their territories, strengthen their culture and traditional knowledge, raise their political profile and develop sustainable economies" [48] indicates that the access to health care constitutes a serious problem for the Xavante. Despite the existence of DSEIs, the healthcare in the communities is highly deficient, if not non-existent. Similarly, like Coimbra et al., [19], ISA points out the lack of adequate preparation of the health teams, the location of the centres in the cities and not in the villages, lack of preventive programmes,

discrimination from the health care providers due to the lack of intercultural training, all of which discourages the Xavante from seeking westernized medical help, even in really serious cases [49].

The Xavante are aware of the gap in the quality of health care between them and urban populations and are actively working to improve this situation [19]. In an interview for *Agencia Brasil*, *cacique* (the leader of the Community) Damião Paridzané expresses his concerns regarding the lack of healthcare assistance and organization, lack of medicines and adequate equipment of the health centres. He also questions the distribution of resources designated for Indigenous health care: "*As a chief, I have already demanded a lot. Where did the resources that the government transfers to the Ministry of Health go? (…) It is not the government that we should blame. The blame lies with those who work within it. The government transfers resources to people who are not Indigenous and to Indigenous people as well, but those who take care of the indigenous people's health only blame the lack of resources. This is a lie. We know that.*" [11], own translation).

During my month fieldwork in the Sao Marcos Community, our research team visited the abandoned Salesian Mission that once served as a medical centre, where expired medicines were laying on the floor of the decaying building. Not once I have witnessed a presence of a medical team. At the same time, during this month, three people died, including one child.

Health of the Xavante – academic perspective

The health of Indigenous populations is a topic of considerable academic interest from an epidemiological, public health, political, social and cultural point of view, among others. In the case of the Xavante, multiple studies have analyzed various aspects of the health of the Xavante population, both as a focus group and as one of the groups analyzed in broader studies.

Bibliographic review

The initial bibliographic search in the PubMed repository revealed 34 articles that contained the keywords "Xavante" and "health" or "Xavante" and "saúde" and 114 others that responded to the word "Xavante". The analysis of the abstracts allowed the initial classification of the records found and the removal of possible duplicates. When the summary was not sufficiently informative, the full texts of the articles were consulted. For the subsequent analysis, only those publications that met the following criteria were selected: 1) studies that analyzed some aspect of the Xavante health; 2) studies focused directly on the Xavante population or comparative studies with other groups; 3) studies of anthropological/medical/biological parameters, meta-analyses or ethnographic studies directly related to health; and 4) studies published in academic journals, academic books or monographs, including doctoral or master's theses. Publications that 1) were related to the cultivation of blackberries (*C. xavante*) and their nutritional properties or to the genetic diversity of *Astyanax xavante*; 2) studies that referred only to other direct studies of the Xavante population without including this group in the analysis; 3) studies that analyzed historical, religious or social aspects of Xavante without a direct relation to health; 4) studies that analyzed other groups in the region (e.g., Bororo) and mentioned only Xavante for reference; and 5) comments on other studies/articles were discarded. Among the 148 records identified, 59 were excluded because they did not meet the inclusion criteria. Considering that not all publications are always indexed in PubMed, an additional manual search in Google Scholar and SciELO was performed using the same keywords. Twenty additional publications not present in the PubMed results were also found.

In total, 109 academic records met the inclusion criteria. All of these findings are summarized in Table 1 and demonstrate a relatively continuous academic interest in the topic of the health of the Xavante population. The first article found is from 1964, and the most recent are from 2024, which forms a time frame of 60 years for this research. There are two peaks with the highest number of publications: 1967 (8) and 2001 (8). The first is probably related to the beginning of the Xavante trajectory in contact with urbanized populations and the great scientific interest, especially anthropological, in describing and understanding groups that until then remained quite isolated, and which could shed a light on the evolutionary history of our species [27]. The second peak in 2001 may be related to the general development of Brazilian science that occurred in the late 1990s, an increase in both national and international collaboration, more investment in research and the beginning of constant growth in scientific production [63]. The observable changes in the academic production related to the health of the Xavante also shows confluence with the process of re-democratization in Brazil after two decades of Military Dictatorship (1964–1985) when Indigenous health policies began to be considered and implemented in the national health system [79], what increased and facilitated the research. Santos et al. [87] argue that a key approach to raising awareness of Indigenous issues involved generating data on the demographics and health conditions of Indigenous populations and academic actively engaged in social movements that called for the protection of Indigenous territories and provision of adequate health care for the communities [26, 83].

Table 1 List of articles analyzed during the bibliographic research

	Author(s)	Year	Exclusively Xavante	Studied aspect
1	Neel & Salzano	1964	YES	Genetics
2	Neel et al	1964	YES	General health, anthropometry, genetics
3	Gershowitz et al	1967	YES	Blood groups
4	Neel & Salzano	1967	YES	General
5	Niswander	1967	YES	Oral health
6	Niswander et al	1967	YES	Anthropometry
7	Salzano et al	1967	YES	Demographic data and genetic structure
8	Shreffler & Steinberg	1967	YES	Serum protein groups
9	Tashian et al	1967	YES	Genetics, blood, urine
10	Weinstein et al	1967	YES	Physical state
11	Neel	1968	YES	Blood, urine and feces
12	Neel	1968	YES	Immunological state
13	Neel & Ward	1972	NO	Genetic structure
14	Salzano & Neel	1976	NO	ophthalmology
15	Salzano et al	1977	NO	Genetic variation
16	Gershowitz & Neel	1978	NO	Genetics—Immunological variability
17	Neves et al	1985	NO	Anthropometry PCA
18	Alvarez et al	1991	YES	Dermatosis
19	Coimbra Jr. et al	1992	YES	Chagas disease
20	Durr et al	1992	NO	Genetic variability
21	Vieira Filho	1992	YES	toxic nodular goiter associated with follicular carcinoma
22	Carneiro & Jardim	1993	YES	Blood pressure
23	Cerna et al	1993	YES	Genetics—susceptibility to Pemphigus foliaceus
24	Flowers	1994	YES	Demography
25	Friedman et al	1995	YES	Pemphigus foliaceus
26	Heidrich et al	1995	NO	Genetic variability
27	Santos et al	1995	YES	Intestinal parasitology
28	Coimbra Jr. et al	1996	NO	Hepatitis B
29	Ward et al	1996	NO	Genetics—Mitochondrial DNA Polymorphisms
30	Gomes et al	1997	NO	Cardiosurgery
31	Moraes et al	1997	NO	Genetics—susceptibility to Pemphigus foliaceus
32	Salzano et al	1997	YES	Genetics
33	Vieira Filho et al	1997	YES	Polyneuropathy
34	Arantes	1998	YES	Oral health
35	Leite	1998	YES	Nutritional state
36	Bogdawa et al	2000	NO	Genetic variability
37	Kvitko et al	2000	NO	Genetic variability
38	Mattevi et al	2000	NO	Genetics – obesity
39	Mattevi et al	2000	NO	Genetic variability
40	Arantes et al	2001	YES	Oral health
41	Coimbra Jr. et al	2001	YES	Blood pressure
42	Gaspar et al	2001	NO	Genetic variability
43	Gugelim	2001	YES	Nutritional anthropometry and human ecology
44	Gugelmin and Santos	2001	YES	Obesity and nutritional profile
45	Gugelmin et al	2001	YES	Growth patterns
46	Souza and Santos	2001	YES	Demographic profile
47	Vieira Filho et al	2001	YES	Autoimmune diabetes
48	Andrade et al	2002	NO	Genetics – lipoprotein lipase
49	Coimbra Jr.et al.;	2002	YES	General health

Table 1 (continued)

	Author(s)	Year	Exclusively Xavante	Studied aspect
50	Coimbra Jr. et al	2002	YES	General health
51	Gaspar et al	2002	NO	Genetics – susceptibility to cancer
52	Arantes	2005	NO	Oral health
53	Coimbra Jr. et al	2005	NO	Epidemiology and health
54	Leite et al	2005	YES	General health
55	Gugelmin and Santos	2006	YES	Nutritional state
56	Leite et al	2006	YES	Growth and nutrition
57	Martins et al	2006	YES	Heck's disease
58	Silva et al	2006	YES	Genetics – breast cancer
59	Lunardi et al	2007	YES	Hospital morbidity
60	Souza	2008	YES	Demographics and health
61	Arantes et al	2009	YES	Oral health
62	Orellana et al	2009	NO	Child growth
63	Santos et al	2009	NO	Genetic variation
64	Welch et al	2009	YES	Obesity
65	Arantes et al	2010	YES	Oral health
66	Arantes et al	2010	NO	Oral health
67	Basta et al	2010	YES	Tuberculosis
68	Linardi et al	2010	NO	Parasitology (*Tunga penetrans*)
69	Souza et al	2010	YES	General health, demography
70	Zembrzuski et al	2010	YES	Genetics – tuberculosis
71	Souza et al	2011	YES	Demographics and general health
72	Welch and Coimbra Jr	2011	YES	Tuberculosis
73	Ferreira et al	2012	YES	Child growth and nutrition
74	Friedrich et al	2012	NO	Genetics, lactase persistence
75	Hunemeier et al	2012	NO	Genetics/evolution
76	Kuhn et al	2012	YES	Genetic variation
77	Santos et al	2012	YES	General health
78	Silva et al	2012	YES	Genetics – breast cancer
79	Arantes and Frazão	2013	NO	Oral health
80	Alves Filho et al	2014	NO	Oral health
81	Fabbro et al	2014	YES	Diabetes mellitus II
82	Franco et al	2014	YES	Diabetes
83	Kuhn et al	2014	YES	Body fat
84	Fagundes	2015	YES	Vulnerability and health
85	Soares et al	2015	YES	Metabolic syndrome
86	Ferreira et al	2016	YES	Child growth
87	Lindenau et al	2016	NO	Genetics – innate immunity
88	Ferreira et al	2017	YES	Anemia
89	Arantes et al	2018	YES	Oral health
90	Lima et al	2018	YES	Diabetic retinopathy
91	Soares et al	2018	YES	Cardiovascular risk
92	Lima et al	2020	YES	Health and environment
93	Malerbi et al	2020	YES	Ophthalmology (Diabetic retinopathy)
94	Malerbi et al	2020	YES	Ophthalmology (Retinopathy and Asteroid Hyalosis)
95	Souza et al	2020	NO	Suicide
96	Welch et al	2020	YES	Growth and general health, nutrition
97	Abrahão et al	2021	YES	Diabetes
98	Fellows et al	2021	NO	COVID-19

Table 1 (continued)

	Author(s)	Year	Exclusively Xavante	Studied aspect
99	Plens et al	2021	NO	Epidemiology and health
100	Welch	2021	YES	General well-being
101	Demambro et al	2022	YES	COVID-19
102	Leite et al	2022	YES	Genetics—Obesity
103	Oliveira et al	2022	YES	Demographics and health
104	Rosa-Jiménez et al	2022	NO	Anemia
105	Welch and Coimbra Jr	2022	YES	Nutritional security
106	Guerra and Passos	2023	YES	Food genocide
107	Welch	2023	YES	General wellbeing
108	Zhou et al	2023	YES	Genetics—Breast cancer
109	Caetano et al	2024	YES	Obstetrics – introduction of ultrasound equipment in pregnancy care

The bibliographic references of the analyzed publications are detailed in Supplement 1.

The topics covered by researchers are very diverse, ranging from more general aspects (e.g., anthropometry, general health, nutritional or physical status, or growth patterns) to very specific questions focused on morbidity, pathogens or genetic analysis of singular sequences.

One of the very interesting aspects observed during research and related to the health of the Xavante is the practically total absence of breast cancer in this group [14]. To date, there are no definitive explanations for this phenomenon. Castro et al. [13] sustain that early pregnancy, multiple births and breastfeeding as possible preventive factors present in the Xavante communities, along with the lack of presence of risk factors, such as the use of hormones. Lima et al. [58] reported a similar situation (total absence of breast cancer) in a Terena Indigenous group in the state of Mato Grosso do Sul (Brazil). These observations are even more interesting because, in other Indigenous groups, this disease occurs relatively frequently, although less frequently than it does in urbanized populations [71]. Silva et al. [90] analyzed genetic susceptibility to this disease and reported a greater frequency of the variant allele of the MnSOD polymorphism in the Xavante population than in Portuguese cancer patients and a Portuguese control group,however, the authors did not determine the role of this variant in resistance to breast cancer [90]. Zhou et al. [105] also analyzed the genomic architecture of the Xavante in comparison with that of the general population and reported a low genetic risk of breast cancer, which was related to the genomic characteristics of this group. However, no concrete mechanisms or definitive answers have yet been presented, so this phenomenon remains unexplained.

A detailed analysis of scientific production in relation to the health of the Xavante also revealed an almost total absence of research focused on the mental health of this group. I found only one article that addressed this topic in the context of Indigenous suicide [29]. The authors conducted a bibliographic meta-analysis and found only 9 publications that addressed this topic. Only one of them clearly mentioned the Xavante as a focus group, along with the others analyzed [23]. However, the group analyzed was the Ofaié-Xavante of Mato Grosso do Sul,it is therefore pertinent to say that there is a significant gap in research focused on the mental health of the Xavante of Mato Grosso. The scarcity of academic research related to Indigenous mental health in general is noteworthy [6]. The authors indicate a lack of this type of approach, and the few existing studies "lack epistemological reflection to substantiate the complexity of this intercultural dialog that discusses knowledge arising from originally so distinct references" ([6], pp: 403). Figure 1.

Health of the Xavante in 1964

The first complete and extensive anthropological account of the biology and health of the Xavante was published by Neel and collaborators in 1964. Prior to this report, there were only scant references to the Xavante in the literature of Central Brazil e.g., [38]. For this reason, I consider the study by Neel et al. [74] as a temporal reference for future considerations. The report provides a very broad view of the health of the Xavante in São Domingos village in the 1960s.

Considering the common biological origin and the similarities in habitat, diet, culture, customs and activities among the other Xavante communities in the region, their results can be considered demonstrative of the general spectrum of the health of this group. However, as several authors emphasize, the different historical trajectories of each community, especially in relation to contact with urbanized populations, result in a certain degree of

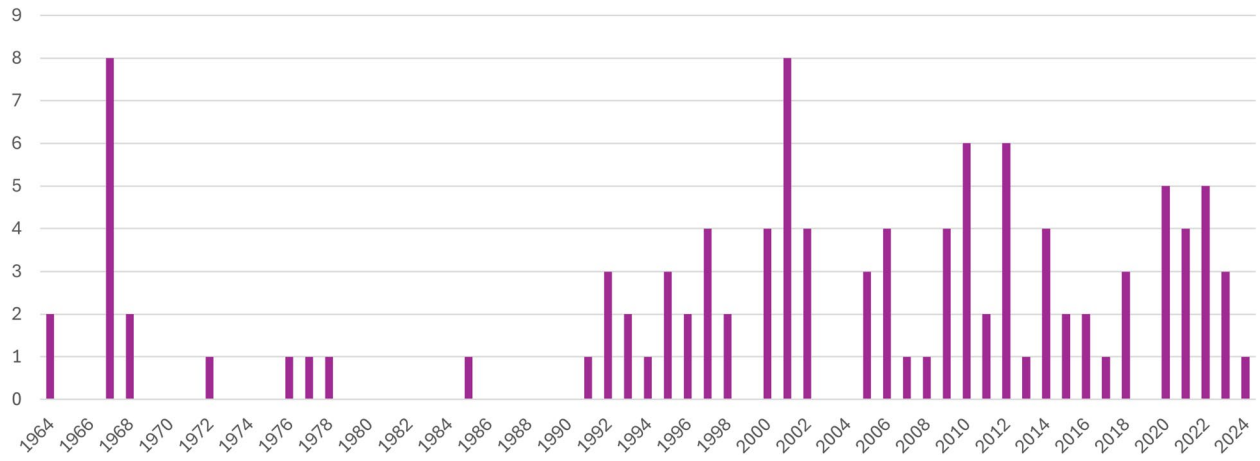

Fig. 1 Number of publications identified per year in the analyzed period (1964–2024)

demographic and epidemiological heterogeneity among them [57, 86], which should be considered according to the particular objectives of each study. In this case, since this work aims to construct a general and historical overview of the health of the Xavante as a whole, without a special focus on particular communities, a generalization will be constructed with the correction that it may not be representative of each specific scenario.

In addition to multiple anthropological aspects, Neel and collaborators (1964) examined in detail the main health indicators of 78 individuals (eyes, oral cavity, cardiovascular system, pulmonary system, abdomen), blood morphology and biochemistry (plasma cholesterol, plasma proteins, hemoglobin, blood smears) and some pathogenic antibodies (treponema infections, malaria and filariasis, whooping cough, *Salmonella*, poliomyelitis, measles and influenza).

To summarize this extensive work, the authors of this study, carried out in 1964, consider the Xavante a relatively healthy population with a high level of physical fitness and immunological resistance. They emphasize the generalized vitality and exuberant health of the Xavante men. Moreover, they noted that women, despite generally having good nutritional and health conditions when young, age faster and show more signs of declining health than men do. The high prevalence of diseases among women can be explained by greater physical demand, as well as the general lifestyle of women, which results in more pronounced exposure to pathogenic factors. The very high level of immunization against *Salmonella* is, in turn, explained by a very low level of hygiene that results in frequent infections and the possibility of transferring antibodies through breast milk. The existence of antibodies against measles or whooping cough, diseases considered nonendemic to indigenous populations, is explained by researchers on the basis of the possibility of important epidemics introduced by contact with urbanized populations in the relatively recent past before the research period. It has also been reported that the life expectancy of the Xavante in that period was relatively low, with few individuals over 40 years of age being found, both men and women. Considering the excellent health status, especially in men, researchers relate this fact to the higher probability of violent death in this group and consequently the relatively low probability of natural death at a more advanced age [74].

Current state of health of Xavante

The most recent publication that addresses the topic of the Xavante health in a relatively holistic manner is that of Welch et al. (2020). The authors present the first results of longitudinal research on the health of the Xavante. The data were collected between 2009 and 2012, and although they are not as complete as those of [74], they allow us to construct a contrast, almost 50 years after the first reports.

The authors noted a high prevalence of child malnutrition manifested by the high rate of stunting in children (22% in children under 5 years old, 16% in children under 10 years old, 11% in male adolescents and 6% in female adolescents), much more frequently than in non-indigenous children, despite them being born with adequate weight. Low weight in relation to height, which is also indicative of malnutrition, was the most common condition in children up to 10 years of age and was almost nonexistent in adults. On the other hand, adults have extremely high incidences of overweight and obesity, ~ 50% and ~ 23%, respectively. According to the authors of this study, overweight and obesity are more common in the Xavante community than in

non-Indigenous groups, with an average for the total Indigenous population. Additionally, the risk of metabolic complications, which reaches up to 82% in Xavante women, is directly related to excess weight in adults. Leite et al. [57] presented 1997 data from TI Sangradouro-Volta Grande, where anemia was diagnosed in up to 48% of men, 63% of women and 96% of children under two years of age. Moreover, Welch et al. (2020) reported a relatively low frequency of anemia, high blood pressure and diabetes in the TIs Pimentel Barbosa and Etênhiritipá compared with the national non-Indigenous population,however, it is possible to observe an increase in the occurrence of these morbidities in recent years [18, 86], data that these authors directly relate to the social, economic and behavioral changes caused by interactions with urbanized populations. These differences between Indigenous lands are representative of the distinct historical trajectories of the Xavante communities, which results in heterogeneity in the health profile of this group as a whole [57] and further proves the biocultural character of health. Arantes et al. [2] also reported a significant decline in the oral health of Xavante, with a high prevalence of cavities related, above all, to important dietary transitions.

As the authors themselves comment, the preliminary results of this research demonstrate a complex nutritional health scenario for the Xavante, which includes a double burden of malnutrition, initially manifested by childhood dwarfism, reaching a high prevalence of obesity in adults, increasing the risk of metabolic complications (Welch et al., 2020).

Despite the evident decline in the overall mortality rate and infant mortality, mainly related to the implementation of SasiSUS in 1999, these aspects remain very high compared with urbanized populations [19]. These data are indicative of two factors. First, it points to large health disparities between these two groups, but at the same time, it indicates that, despite important limitations, the Indigenous health system has provided the Xavante with greater access to health services, which improves their demographics [86]. Nevertheless, Lunardi et al. [62] reported that, despite improved access to health care, the main reasons for hospitalization of the Xavante children are diarrhea and acute respiratory diseases, which is also indicative of significant health disparities between Indigenous and urbanized populations.

Despite the Xavante having received more health care in the last two decades [19, 86], and there has been an increase in the use of hospital services by them since 1999 [62], a comparison of the most recent results with the first reports presented by Neel et al. in 1964 allows us to conclude that the nutritional and general health status of the Xavante has undergone a significant decline related mainly to the process of contact with urbanized populations, transformation of culture, diet, and economic and social systems [19, 86].

Considering the diversity of topics covered by researchers in relation to the health of the Xavante (Table 1), it is safe to conclude that the health of this group is widely examined. According to Coimbra et al. [21], the Xavante are among the most intensively studied Indigenous groups in Brazil from a health perspective. Although scientific publications addressing the health of this group were limited for several reasons during the first three decades after permanent contact, from the 1990s onward, academic attention began to be relatively constant, with only a few years without any contributions. This demonstrates a continuous scientific interest, which, on the other hand, does not necessarily impact public policies to directly improve the health (care) of this population. In this sense, academic attention seems to be disconnected from its potential application, which could contribute to a real influence on this issue through political or administrative recommendations, as well as social–scientific pressure to improve this situation.

The health of the Xavante — a decolonial lens of a public health problem

Indigenous populations represent a highly marginalized yet extremely relevant segment of our society. Historically oppressed, neglected, and disempowered continue to suffer from cultural suppression; deprivation of socioeconomic rights; systemic marginalization; and extreme social, health and infrastructural inequalities in relation to national populations. Below, I demonstrate, on the example of the Xavante, that the existing health care systems operate as one of the mechanisms of domination and oppression. Within this context, the health of Indigenous populations manifests as a public health problem that should be urgently addressed.

The Xavante are clear when addressing their health needs and inequalities. They are aware of the existing policies, which, as they claim themselves [28], look good only on paper, and are dissatisfied and nonconformed with the quality of service they receive. *Cacique* Damião, as mentioned before, criticizes the distribution of financial resources that are not used to improve the Xavante health care system. Xavante leaders understand the connection between the socio-cultural and economic changes their community is experiencing and the deterioration in their health condition. *Cacique* Tsuptó Buprewên Wa'iri Xavante tells De Lavor [28], who conducted interviews with several Xavante representatives, that changes in traditional diet are related to the previously unknown to them diseases like diabetes and hypertension: "*When mothers ate traditional food, no one had*

to go to the health centre to get saline or medication and there were no cases of high blood pressure and diabetes. We had no knowledge of these diseases" (own translation). He finds it challenging to convince new generations to go back to traditional diet. Vice-*cacique* Roberto emphasizes the importance of traditional Xavante semi-nomadic lifestyle that has been abandoned by territory limitations due to agro-pastoral invasive activities. Mr. Sereburã, an elder from Pimentel Barbosa village emphasizes the historical connection of the Xavante with nature and nomadic lifestyle that was guaranteeing their health: "*Indigenous people who stay too long in a village get sick*" (own translation). In this sense it becomes clear how the limitation of traditional Indigenous territories became an important factor affecting their health by directly affecting their lifestyle and diet. At the same time, the Xavante are critical in their assessment of the organization of Indigenous health care. They emphasize lack of adequate preparation of technical and medical staff in Indigenous health. As *cacique* Paulo Supretaprã puts it, they are "*incompetent for indigenous health*" (own translation) and similarly like *cacique* Damião he calls attention to distribution of financial resources and the lack of fulfilment of promises made by authorities: "*Where is the money to build the health centre and the dormitory for the multidisciplinary team?*" (own translation). Lack of adequate preparation of health professionals, excessive use of medicines and infrastructural deficiencies are among the most urgent health care issues mentioned by vice-*caciqe* of Etenhiritipa village—Caime Waiassé. The Xavante also describe prejudice they are encountered with at health centres, where they are often separated from other patients in "*a dirty, unsuitable place, without sheets*" (own translation) tells cacique Tsuptó. All quotations come from interviews conducted by De Lavor [28].

To understand the complexity of the issue of Indigenous health, it is essential to consider the historical aspects of these groups as determining and highly relevant factors. Mitchel et al. [70] proposed the concept of "colonial trauma", which they defined as a "complex, continuous, collective, cumulative and compound interaction of impacts related to the imposition of colonial practices and policies that impact the social, physical and mental health of Indigenous groups individually, collectively and across generations" [70], as a theoretical framework for understanding the exacerbating disparities between the physical and mental health of Indigenous and urban populations. There are countless academic reports that indicate an enormous gap between the health outcomes of Indigenous and urbanized populations that prevail regardless of the origin, history or culture of the original groups [30, 52, 53, 64, 97] (Waldram et al., 2006). In the case of Xavante, these disparities are also evident and indicated by both researchers [19, 86] and the Xavante themselves [28], Santos et al., [86].

In the current Indigenous context, it is highly relevant to address the concept of coloniality, in which, according to [80, 81], the violence and the subjugation of the Other based on factors such as biological affiliation, gender or class are justified by a power structure enrooted in a hierarchical and dualistic social classification. Within such a colonial framework, Indigenous communities are Othered, perceived as inferior, underdeveloped and primitive, in contrast to the superior, white, civilized and developed representatives of the Global North, who consider themselves as Superior Selves. Such a dualistic structure operates as a tool which justifies different forms of violence, invisibilisation and deligitimatisation of the indigenous communities, their way of being, living and thinking which challenge the presumed scientificity, neutrality and universality of a valid knowledge defined by the Global North [69].

According to the concept proposed by Mitchel et al. [70], the continuity of different types of trauma suffered by Indigenous communities by colonizers throughout history has resulted in a collective posttraumatic stress response, which is reflected in the prevalence of chronic diseases, poverty, high suicide rates, among other health disparities and social inequalities [84]. In this context, the oppression suffered by entire communities from systemic and persistent colonizing intrusion is responsible for health disparities at the interpopulation level [44, 59].

Colonialism, subsequent coloniality [69, 80, 81] and internal colonialism [13], as a traumagenic factors perpetuates in entire Indigenous communities like an immortal virus causing direct and negative effects on the health and well-being of these groups. Recognizing this factor as pathogenic is critical to understanding the complexity of Indigenous groups' health. The historical and political context of (neo) colonial trauma needs to be addressed by both researchers and policy makers to improve indigenous health. The essential factor in this process is the active participation of Indigenous communities in understanding and applying the perspective and particular needs of these groups, which can contribute to the restoration and reconstruction of Indigenous identities [70].

Unlike external colonialism, which involves the domination of foreign power over a territory, the concept of internal colonialism, similarly like coloniality assumes that, in states of imperialist origin, the dominant classes of society maintain and exercise colonial relations with minority groups, including Indigenous populations [13]. Coloniality and internal colonialism in the context of the Xavante people of Brazil refer to the systemic marginalization and exploitation that this group faces within its

own country. For the Xavante, this process was characterized by the loss of land, cultural suppression and deprivation of socioeconomic rights, all under the auspices of the Brazilian State and its institutions. The Brazilian state's push for economic development in the Amazon and *Cerrado* regions often came at the expense of Indigenous lands, with little regard for the rights or traditional way of life of the Xavante. The construction of roads, hydroelectric dams, and agribusiness ventures led to significant deforestation and environmental degradation, further undermining the Xavante's subsistence practices and connection to their ancestral lands. In this context, the healthcare system provided by the State has also been an instrument of internal colonialism. Access to medical assistance for the Xavante has historically been limited and substandard [19, 85]. When available, these services often reflect the values and norms of the dominant society, with little respect for traditional Xavante knowledge. This has led to a loss of Indigenous knowledge and created dependence on external systems that do not fully meet the needs of the Xavante community.

From a biocultural perspective, health is an aspect of human life influenced and affected not only by purely biomedical factors but also by social, cultural, political and economic factors [56]. Kunitz [54] argues that health and disease are not separate from the context in which they occur. On the contrary, according to this author, there is a strong correlation between health, disease and colonial policies,political institutions; and culture and patterns of Indigenous social organization [86].

In addition to the negative consequences of prolonged (neo) colonial influences, the current socioeconomic context also implies rapid ecological and social changes, which affect the biological and social ecosystems of human populations in general [36]. In the Indigenous context, health is particularly vulnerable and highly influenced by socioeconomic and cultural changes, which are often imposed or at least introduced by national society [31, 37, 40, 55].

According to the concept of "colonial trauma" [70], since the first contact with urbanized populations, Indigenous communities have suffered significant inequalities at multiple levels compared with urbanized populations [4, 5, 22, 25, 42, 72]. Infrastructural inequalities have direct and negative relationships with health [1]. Examples include, among many others, highly limited access to drinking water, precariousness or even lack of sanitation infrastructure and solid waste management in Indigenous populations [22]. These aspects are crucial factors in preventing infectious diseases [34], and their lack or precariousness implies a high risk of prevalence of these morbidities [32, 35, 99], especially due to soil contamination by rotavirus, enterobacteria and intestinal parasites [57]. Coimbra et al. [22] reported poor sanitary conditions as the determining factor and direct cause of the high incidence of infectious and parasitic diseases among the Xavante, which mainly cause diarrhea, the most common cause of hospitalization among Indigenous children [57, 62].

The transformation of economic systems through the adoption of agriculture, commodity production, and paid work in cities directly impacts the nutritional patterns and diets of Indigenous populations [19, 33, 34, 61, 102]. Government measures, as well as the transformation of traditional culture through contact with urban populations, are determining factors that influenced the transition in the subsistence of the Xavante population [94]. In the 1970s, FUNAI implemented an economic project with the aim of transforming the Xavante into rice producers [19]. Owing to their historical nomadism and subsistence, which is based mainly on hunting and gathering [19], large-scale rice cultivation has not been successful. However, this experience transformed Xavante's eating habits and left them dependent on rice monoculture [57, 86]. In addition, the acquisition of industrialized products in urban stores thanks to the money received through paid work in cities or even from government aid, introduced a high number of processed foods into the Xavante diet and the subsequent reduction in dietary diversity [94]. The clear transformation and westernization of the diet in recent decades constitute a determining factor that directly affects the health status of this group (as well as most Indigenous communities today) [86]. The increase in ultra-processed products, high in calories, high in carbohydrates, refined sugar and salt in the diet, the abandonment of traditional dishes and ways of preparing food, as well as a more sedentary lifestyle, results in an increase in the prevalence of chronic metabolic diseases, cardiovascular diseases and high levels of obesity, which are beginning to form part of the health status of the Xavante communities [19, 85]. Already in 1997, Vieira Filho et al. reported that dietary monotony can cause nutritional polyneuropathy in several Xavante communities [100]. The ecological conditions and degradation of the natural habitat of Indigenous communities imply a transformation of traditional subsistence activities, both in the form of dietary changes and in the transition from hunting and gathering activities to a more sedentary life and paid work, with hunting and gathering being either impossible owing to the destruction of natural ecosystems, proximity to farms, limited territories or dangerous due to contamination of the same by, for example, artisanal mining [28]. The differences, especially ecological ones, between communities result in different levels of involvement in paid work and consequent

differences in health status related to this factor between villages [57].

New sources of income, such as access to paid work or different forms of government financial aid, have improved the socioeconomic conditions and purchasing power of the Xavante families but at the same time, have changed their eating habits [28]. However, Santos et al. [85] noted an interesting relationship between money and health. In Global North countries, poverty is generally associated with the prevalence of obesity [9, 47], however, in the case of the Xavante, the highest percentage of overweight or obese individuals is among families with the best socioeconomic status [85]. In this context, the Xavante themselves realize the negative impact of money, which affects cultural continuity and compromises the traditional values of their communities [85]. The authors point out that awareness is emerging among the Xavante regarding the negative effects of overweight on health, which are often not considered by traditional Xavante medicine. In addition, there is a desire to reconsider nutritional practices to reduce the prevalence of obesity. However, the Xavante are aware of the difficulties in motivating and sustaining dietary changes, which requires solutions that are in line with current lifestyles and values [85].

The abuse of alcohol and other drugs also constitutes a high-risk factor for Indigenous health, including the Xavante. Currently, alcohol consumption is much more common in Indigenous groups than in the rest of the national population [21, 92]. Contact with urbanized populations is considered the main cause of the recent emergence of social, chronic, and noncommunicable diseases, including alcoholism, among Indigenous communities [39]. In addition to affecting the daily lives of communities through increased violence or inability to work due to drunkenness and its consequences, alcoholism is classified as one of the main causes of mortality in these groups, both due to the increase in related diseases such as hypertension, diabetes, depression, and external factors, such as accidents, run-overs, violence, homicides, suicides, and rapes [21, 91]. Guimarães and Grubits [46] reported a positive correlation between the degree of contact with urbanized populations and the prevalence of alcoholism in Indigenous communities. The authors indicate that the economic and social system of Indigenous populations was intensely and negatively affected by paid work, national development projects or extractivism. According to Quiles [82], alcohol is a tool of domination by urbanized societies over Indigenous populations [46]. The economic, social and cultural changes related to the colonization process are factors that imply individual and collective trauma among Indigenous communities, leading to an imbalance in the individual and social well-being of entire communities. Alcoholism appears to be a manifestation of this imbalance [24].

In the Xavante context, the impact of socioeconomic changes on the health of this group during recent decades is evident. Godoy et al. [43] clearly indicated that health status, nutritional status, food security and social dynamics are highly impacted by changes in Indigenous economies driven by contact and interaction with urbanized populations. Starting with the direct violence caused initially by European colonizers and continued by Brazilian farmers and ranchers often violently appropriating the lands occupied by Indigenous groups, the expulsion or voluntary abandonment of original territories, the lack of understanding of Indigenous culture and biology by the authorities at the beginning of these groups' contact with national society, the intention of forced assimilation of Indigenous communities into the national economy, the attempt to implement an ethnocentric vision in a project of supposed "civilization" and "progress", the racist notion of inferiority of Indigenous populations, and the intention of a form of well-intentioned government aid through the introduction of the basic food basket, which contains mainly carbohydrates, refined sugar and highly processed products, are factors that have a high negative impact on the health of the Xavante population. All of them fall within the concept of coloniality bringing direct evidence for the need to decolonize Indigenous health care.

To address the Xavante health transformation we also need to look at the historical aspect and the specific socio-political context of the country in the twentieth century. The last permanent contact of the Xavante with urbanized society occurred in the 1940' [19]. It was during the Republican period in Brazil (1889 – 1930), when the SPI was already established (1910) and the Union began to take responsibility and become directly involved in Indigenous healthcare [50]. The main objective of the SPI was the acculturation of Indigenous peoples and their integration with the national society at the cost of their own cultural identity [68]. During this time, spanning nearly three decades, the Xavante maintained relatively favorable health, as noted by Neel et al. 1964. Nonetheless, they began to exhibit signs of recent epidemics attributable to increased interactions with the national society. FUNAI, substituted the SPI in 1967, during a political conjuncture characterized by increasing authoritarianism of the Military Government, established in the country after the State coup in 1964, and the responsive intensive social mobilization [89]. While addressing the unequal relation between the State and its Indigenous citizens, FUNAI continued to perceive them as passive subjects that need "protection" and tutelage, as they were supposedly unable to practice social life to

a full extent [68]. During the Military Dictatorship, Indigenous people were considered obstacles to the expansionist policy of the government, as well as the economic, social and political development [68]. The 1978 proposal of "Emancipation Decree" by the Ministry of Interior was perceived by the Indigenous community as a significant threat to their unique status as a distinct social group [83]. This perception catalysed the consolidation of Indigenous movements and the establishment of numerous non-governmental organizations advocating for Indigenous rights [79]. Within this framework, scholarly inquiry into the health status and demography of Indigenous populations emerged as a critical and intentional effort to amplify the visibility of Indigenous demands [79]. Notably, scientific documentation of epidemics and human rights abuses associated with development projects in the Amazon was leveraged to urge governmental intervention in safeguarding Indigenous territories and ensuring healthcare provision for these communities [26, 83]. Previously mentioned CIMI, apart from developing Indigenous health actions, also acted as a strong advocate for Indigenous rights, their political participation and organization, provided a critical nexus for interaction and exchange of ideas between Indigenous and non-Indigenous actors. It was also pivotal in denouncing the insufficiency of the healthcare provided by FUNAI [79]. Despite of many wrongdoings, in this context, the impact of the Catholic Church on the development of Indigenous rights and health care is essential. Military regimen (1964–985) sparked strong resistance movements from the general society, academia and health professionals that eventually led to the reorganization and democratization of Brazilian healthcare and the creation of the Indigenous Health Subsystem (SasiSUS) in 1999 [17, 77]. Indigenous representatives actively participated in this process bringing to the debate the importance of land protection and demarcation as critical conditions that would ensure their right to health, as for these groups rights to land and health are intrinsically connected [79]. In this context, the First National Conference on Indigenous Health Protection (CNPSI—*Conferência Nacional de Proteção à Saúde do Índio*), convened in 1986 in Brasília, identified the assurance of full citizenship and the realization of all constitutional rights of Indigenous citizens as fundamental determinants of health [16]. The Constitution of 1988, for the firs time acknowledged the special status of Indigenous peoples and granted them the right to difference and self-determination, marking a departure from the previously dominant assimilationist tradition. It also guaranteed the exclusive use of their traditionally occupied territories, defined in accordance with their usages, customs, and traditions [50]. The re-democratization period was marked by the formulation of strategies aimed at addressing the needs of Indigenous communities, integrating territoriality and healthcare. This objective was realized through the establishment of the DSEIs (Special Indigenous Health Districts) [79]. It was also imperative for Indigenous communities that their healthcare be administered at the federal level, due to the inherent conflict of interest concerning land rights present at the municipal level [79]. This necessity was addressed through the establishment of SasiSUS, which is administered by the Brazilian Ministry of Health.

Notwithstanding such critical socio-political advancements of Indigenous healthcare, it is worth asking the question why it is not working? Why Indigenous population continues to struggle to obtain adequate and sufficient healthcare? Why is their health deteriorating, as illustrated by the Xavante case? Where is the problem?

Health of the Xavante – future perspectives

Despite multiple initiatives of both an administrative and social nature to improve the health of the Xavante, as well as active academic research in this area, the general panorama of this context remains quite pessimistic. The main reason for this situation appears to be the lack of a holistic approach to Indigenous health. The measures taken by political decision-makers were often specific—they addressed one or several aspects (e.g., administration, regional division, etc.) without considering other key factors that have a major impact on Indigenous health (e.g., culture, traditions, etc.). The administrative measures were often provisional, temporary, timid and conservative (Coimbra Jr., 2014). The constant changes in the administrative organization of Indigenous health in recent decades indicate, on the one hand, either the ineffectiveness of the proposed systems or an approach that remains embedded in coloniality, which practical application continues completely disconnected from Indigenous reality, despite, in theory, responding to their main requests. A system that is based rather on political arrangements and benefits, without considering the Xavante population's culture, traditions and everyday needs. Indigenous Community addresses the frequent changes in the administrative organization of Indigenous healthcare and questions the necessity of creation of new structures, as it was in 2014 when the Ministry of Health announced the proposal of creation of National Institute of Indigenous Health (INSI—*Instituto Nacional de Saúde Indígena*) that would substitute the SESAI [66]. Cacique Damião form TI Maraiwatsédé says: "*Why make changes every year? It doesn't get better. When FUNAI took care of the health of the Indians, it improved a lot. The population increased and even the oldest old people lived. Today, the elderly population is decreasing due to lack of treatment. And now they want to transfer the health of*

the Indians to an institute." ([11], own translation), referring to the proposal. The Indigenous Community alleges that such a decision was taken top-down without proper consultations and in some communities even with forced approval, what reinforces the historical colonial practices in relation to Indigenous citizens [66]. This situation clearly illustrates the historical detachment of policy making from listening to the voices and needs of Indigenous people. As Sônia Guajajara, leader of the Articulation of Indigenous Peoples of Brazil (APIB—*Articulação dos Povos Indígenas do Brasil*) and the current Minister of Indigenous People stated: "*INSI may even be created, but it will be against the will of the indigenous movement*" ([66], own translation). The Xavante also point out the ineffectiveness of the proposed projects, which remain good only on "paper" [28]. The physiobiological adaptation to an Indigenous nutritional pattern, which has a major impact on the health of the Xavante, is also not considered when certain projects are implemented (e.g., basic food basket). All of this constitutes a highly colonial vision or approach that directly destroys the traditional way of life and health of the Xavante.

Despite administrative progress and continuous changes in the organization of health care for the Xavante and other Indigenous groups, their current state of health leaves much to be desired. Indigenous groups are clearly treated as second- or third-class citizens. The coloniality present in the Brazilian society, especially regarding its classist and racist dimensions, becomes evident when the health of Indigenous groups is analyzed. Despite having their rights theoretically protected by the 1973 Indian Statute and the 1988 Constitution, in practice, they do not have full independence of self-government and self-determination, since living within the borders of an imposed State territory, they are subject to the rules and laws of that State. However, at the same time, Indigenous groups clearly do not receive the same quality of rights and services as other segments of Brazilian society, with the correction that the level and quality of services are classist throughout the Brazilian territory and depend on the wealth of each segment [3, 96].

The analysis revealed that the relatively healthy Xavante population, at the beginning of its contact with urbanized societies, has become highly affected population, with a higher prevalence of chronic and noninfectious diseases of civilization – higher than in urbanized societies. This clearly demonstrates that despite efforts to improve the well-being of Indigenous groups, and the fact that they receive significantly more health care than before 1999 [19], their health status is actually worsening. This finding indicates that not only is the health system responsible for the well-being of individuals and communities but also a combination of factors that impact individual and collective health. As such, this analysis clearly confirms the biocultural character of health and well-being and implies that isolated efforts are not sufficient to address and resolve existing problems. Holistic, inter- and multidisciplinary approaches with active community participation, which cover all aspects that influence health and well-being, including colonial trauma, are essential for improving health status. Decolonizing the Xavante health care should imply the consideration of the current socioeconomic context and, most importantly, the needs, culture and traditions of Xavante, in order to give them voice and agency in the construction of an adequate and satisfactory system that would respond to the needs of the Community.

Colonial, top-down solutions result in the worsening of the well-being and health of Indigenous populations. Both political and academic efforts should focus on a decolonial approach to Indigenous health, working not for but with communities, listening to Indigenous voices, and considering and respecting their needs, habits and culture. Santos et al. [85] propose an approach that recognizes the local history of the community where research focused on the health of this group is conducted, since universal proposals will never be the appropriate response in the face of such biological, anthropological, historical, cultural, cosmological, social or political diversity of these groups. At this point, the question arises as to whether it is still possible to reverse this situation now that the communities are already so dependent on both industrialized products and urbanized habits and, according to the Xavante themselves, it is difficult to convince young people, to abandon these new things and return to a more traditional life [28]. Are there any measures that can help improve this impasse?

Supplementary Information

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Supplementary Material 1.

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KG planned the research and designed the work; collected, analyzed and interpreted the data; and drafted and reviewed the manuscript.

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