

Health of Indigenous Peoples in Brazil: Inequities and the Uneven Trajectory of Public Policies

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Summary

Victims of epidemics, slavery, genocide, and countless other episodes of violence during the colonial enterprise in Brazil, which continues decades into the 21st century in some regions, Indigenous peoples face health inequities resulting from a five-century history of social marginalization and vulnerability. Since the late 1990s, the health and well-being of Indigenous peoples in the country have benefited from progressive legislation that values sociocultural diversity within a public primary healthcare subsystem attending to Indigenous peoples living in federal Indigenous lands. However, these transcultural ideals remain elusive in practice. The Indigenous Healthcare Subsystem continues to suffer from numerous systemic problems, including low quality of local services, lack of health professional training for work in intercultural contexts, and unpreparedness for attending to health emergencies involving Indigenous peoples living in voluntary isolation. Being Indigenous in Brazil in the 2020s implies greater chances of higher infant mortality, lower life expectancy, suffering from undernutrition and anemia during childhood, living with a high burden of infectious and parasitic diseases, being exposed to a swift process of nutritional transition, and experiencing a surge in chronic violence. Community case studies have shown the importance of close patient follow-up over long periods of time, the heavy burden of disease due to nutrition transition since the mid-1980s, the relevance of international reference curves for evaluating Indigenous child undernutrition, and failures of primary healthcare provided to Indigenous populations. Improvements in national health information systems in Brazil beginning in the early 2000s have shown external causes, perinatal diseases, infectious and parasitic diseases, and respiratory diseases to be the leading causes of death among the country's Indigenous population.

Keywords: Indigenous peoples' health, health inequity, morbidity and mortality, Indigenous health policy, Indigenous demography, Brazil

Subjects: Global Health, Public Health Policy and Governance, Special Populations

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Introduction

Nationally representative health indicators became available for the Indigenous population in Brazil in the beginning of the 21st century. Most showed health inequities favoring the national benchmark population, although there were some exceptions, such as hypertension, which was lower in the Indigenous population (Anderson et al., 2016; Coimbra Jr. et al., 2013). The overall health profile of the Indigenous peoples in Brazil is herewith described, emphasizing its trajectory over time and its current status, as well as the national health policies and health information systems that inform, and sometimes obscure, understanding of health conditions among these peoples. Special emphasis is placed on the health inequities affecting Indigenous peoples relative to the general Brazilian population that became more visible due to greater production of national health data in the early 2000s (Coimbra Jr. & Santos, 2004). Among the main national health policies that affect the health and well-being of Indigenous peoples in Brazil are progressive laws that prioritize differentiated access to health services and recognize native sociocultural diversity, but the policies' goals remain elusive in practice. Although questions related to the health of Indigenous peoples in Brazil involve many local particularities, considering the country's vast contrasts between different cultural groups and their regional settings, themes are identified that seem to apply across the country and that find parallels in situations observed in other world regions (see Anderson et al., 2016; Paradies, 2018).

After a brief characterization of the Indigenous peoples in Brazil, focus is placed on three main aspects of Indigenous peoples' health in the country and the circumstances that allow one to speak about it empirically. First, overlapping profiles of morbidity and mortality involving infectious/parasitic and noncommunicable chronic diseases are discussed. Next, the emerging availability of nationally representative health data for Indigenous peoples in Brazil is addressed, keeping in mind the many limitations that such data present. Finally, challenges involved in public policies directed toward Indigenous peoples' health since 2000 are debated. In the remainder of this section, several key dimensions of these themes are previewed to situate the discussions that follow.

The current configuration of Indigenous peoples' health in Brazil reflects, to a large degree, adverse impacts of a five-century history of colonization in combination with 20th century events that have produced marked social marginalization and vulnerability (see, for instance, Davis, 1977; Hemming, 1987). Among the most important factors resulting from the deep history of oppression is territorial violence associated with the country's colonial origins and formulation over more than three centuries of Portuguese rule and its subsequent approach to internal colonialism over 200 years as an independent country, as well as ongoing and pervasive circumstances promoting structural racism, land invasions, environmental degradation, and, in many cases, dereliction or omission by the State. Access to traditional territories is essential to the physical, social, symbolic, and spiritual maintenance and reproduction of Indigenous peoples in Brazil. This complex history of diminished access to territorial resources, in combination with diverse disadvantageous and omissive public policies, contributed to considerable delays in Indigenous peoples' benefiting from the marked social advances achieved for the country's non-Indigenous population since the 1990s, particularly in the fields of education, housing, food

security, sanitation, and health.¹ For example, being Indigenous in the 2020s implies greater chances of higher infant mortality, lower life expectancy, suffering from undernutrition and anemia during childhood, living with a high burden of infectious and parasitic diseases, being exposed to a swift process of nutritional transition, and experiencing a surge in chronic violence (Cerqueira, 2021; Coimbra Jr. et al., 2013; Lima et al., 2020).

Although there are important parallels between health conditions and determinants among Indigenous peoples in Brazil and other world regions, several factors that are specific to the Brazilian case are important for understanding in detail the sociohistorical and political processes that came to frame the field of Indigenous peoples' health in the country. For example, toward the end of the 1990s, a national health policy and primary care services subsystem for Indigenous peoples residing in Indigenous lands was implemented within the purview of the Unified Health System, a nationalized healthcare system established by the 1988 democratic constitution (Paim et al., 2011). This important subsystem has been recognized in a global context as "one of the first experiences of public policy directed toward Indigenous peoples within a universal health system" (Pontes, 2021, p. 226). Although it helped bring about important improvements in some health indicators, such as child vaccination, child mortality, and access to hospital services, after nearly two decades, its impacts at the community level remain inadequate to address the full complexity of real health needs in the diverse sociocultural, environmental, geographic, and epidemiologic contexts that exist among the country's Indigenous peoples (Coimbra Jr. et al., 2013; Langdon & Garnelo, 2017; Mendes et al., 2018; Oliveira et al., 2021).

"Improved but still insufficient" describes not only Indigenous peoples' health services in Brazil, but also the information sources and systems that exist to inform health policy and planning (Coimbra Jr. & Santos, 2004; Coimbra Jr. et al., 2013; Santos et al., 2019). For Indigenous peoples or any other ethnic-racial minority, the availability of data is fundamental to identifying and addressing health inequities (Anderson et al., 2016). Analyses of Indigenous peoples' health in Brazil has benefited from the expansion of health information systems in the country and the existence of diverse academic research groups that specialize in health in this population segment. Despite these advantages, which place Brazil in a favorable situation with respect to the availability of data when compared to other countries in South America (see Montenegro & Stephens, 2006), the existing National Indigenous Health Information System, maintained and curated by the Indigenous Healthcare Subsystem, requires substantial improvement (Santos et al., 2019; Sousa et al., 2007). Lack of transparency, inconsistent data entry, poor systematization, absence of key information (like specific ethnic affiliation), coverage restricted to local districts,² and inaccessibility by researchers and the public contribute to the system's limited utility in comparison to Indigenous health information systems in some countries in the Global North and in such countries as Australia and New Zealand (Anderson et al., 2016; Connolly, 2019; Ferdinand et al., 2020).

In 2000, a brief review article observed that it was not "possible to delineate a minimally reliable panorama regarding the health conditions of Indigenous populations and, much less, articulate productive discussions about the interfaces between health and social inequalities" (Coimbra Jr. & Santos, 2000). The text emphasized that the near inexistence of data about Indigenous peoples in national health databases ("demographic and epidemiologic invisibility") impeded analyses

based on reliable statistics that would allow comparison with other ethnic-racial groups, which is fundamental to substantiating, proposing, and initiating changes to health policies to reduce inequalities (see also Coimbra Jr. & Santos, 2004).

In the two decades since this characterization, substantial increases in the production of analyses of the health profiles of Indigenous peoples in Brazil have occurred due to accelerated field investigations and greater availability of health data from different kinds of national information systems. If the “demographic and epidemiologic invisibility” of Indigenous peoples in Brazil has been partially overcome, what emerges is a scenario of health transition marked by the persistence of an elevated load of infectious and parasitic diseases, accompanied by the rapid emergence of noncommunicable chronic diseases and other forms of harm caused by environmental and sanitary conditions, as well as violence.

Indigenous Peoples in Brazil: Historical and Demographic Background

Over the course of the history of colonization by Europeans (mostly Portuguese), beginning in the 16th century, the Indigenous population inhabiting what became the geographic area of Brazil – one of the largest countries in the world in territorial terms – experienced a huge demographic reduction due to epidemics, slavery, genocide, and countless other episodes of violence (Hemming, 1987). Although it is difficult to produce reliable demographic estimates for the beginning of the 16th century, given the absence of consistent data, archaeological and historical evidence suggests that the Indigenous population in the area that came to be known as Brazil at the time of the arrival of European colonists was of the order of several million individuals, belonging to thousands of different societies, and speaking as many as 1,000 distinct languages (Cunha, 1992; Denevan, 2003; Hemming, 1987; Whitehead, 1993).

Five hundred years later, the Indigenous population in Brazil totalled approximately 900,000 people (nearly 0.5% of the total Brazilian population), as reported in the 2010 national census (Instituto Brasileiro de Geografia e Estatística [IBGE], 2012; Santos et al., 2019).³ Despite the small relative size of the Indigenous population in Brazil, it has enormous ethnic and linguistic diversity. Presently, as many as 300 Indigenous ethnic groups, speakers of over 250 distinct languages, are recognized in the country, thus constituting one of the national Indigenous populations with the greatest Indigenous ethnic and linguistic diversity in the world (Coimbra Jr. et al., 2013; Santos et al., 2019).⁴

The current spatial distribution of the Indigenous population in Brazil reflects, to a large degree, the trajectory of European colonization over the centuries. The eastern portion of the country that follows the Atlantic coast, which runs nearly the entire north–south span of the country, received the earliest waves of colonization from Europe and suffered the greatest immediate impacts to its Indigenous residents, especially depopulation due to infectious disease epidemics, invasion of their territories, slavery, and in some cases migration into the interior to escape such unbearable conditions (Hemming, 1987; Monteiro, 1994; Moreira Neto, 1988). This history is reflected in the distribution of federally recognized Indigenous lands, which occupy smaller spaces and are less numerous in regions that were colonized earliest (Figure 1). Most of these lands are little more

than residential lots, insufficient to ensure even basic conditions necessary for physical and cultural survival. In contrast, approximately 98% of Indigenous lands by area are in the North, predominately Amazonia, most of which was colonized relatively late. On average, Indigenous lands in the North and Central-West regions of the country are 39 times larger in area than those in other geopolitical areas (Santos et al., 2019). Even in such low-density locations, economic interests (such as agribusiness, mining, logging, and land invasion) oppose the native fight to legally occupy their traditional territories. These are “endemic conflicts” that have worsened under certain governmental administrations that have sought to dismantle environmental policy and Indigenous peoples’ rights (Cunha et al., 2017; Lima & Oliveira, 2019). Overall, Indigenous lands officially recognized by the Brazilian state occupy approximately 13% of the overall Brazilian territory.

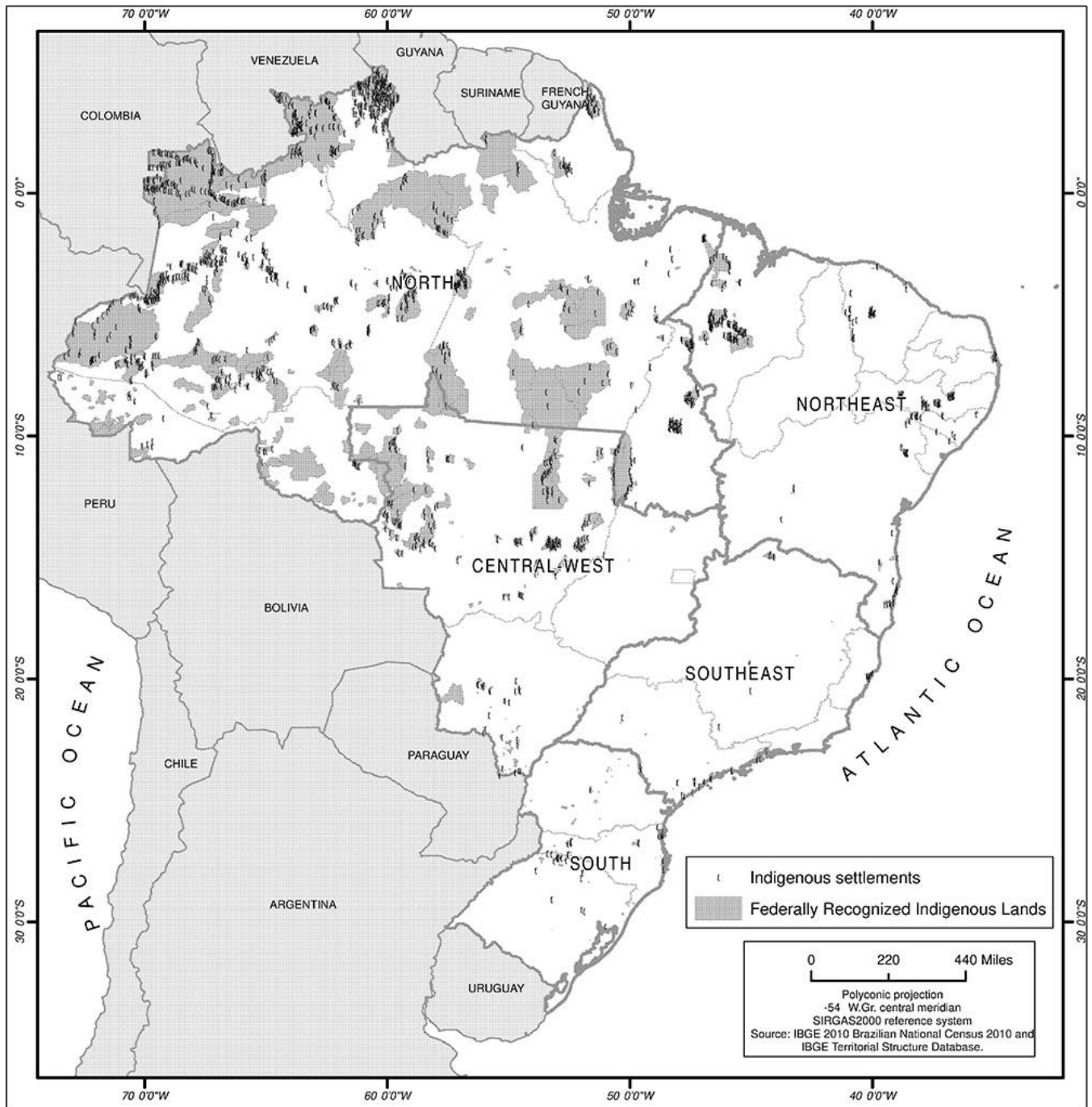


Figure 1. Map showing current location of federally recognized Indigenous lands in Brazil.

Source: Adapted from Santos et al. (2019).

Distribution of the Indigenous population according to rural and urban residence is a central question linked to territorial recognition by the federal government and implementation of diverse public policies. In this regard, there is considerable heterogeneity throughout the country. Overall, 64% of the country’s Indigenous population lives in rural areas, and 38% resides in the North, where the largest rural Indigenous lands are located (Table 1). Just 11% of the Indigenous

population lives in the populous and economically developed Southeast region, where 80% live in urban areas. In comparison, the general Brazilian population is 85% urban, with 42% residing in the Southeast and just 11% in the North (adapted from Santos et al., 2019).

Table 1. Distribution of the Indigenous Population by Region and Urban/Rural Residence, 2010 National Census

Region	Urban Indigenous Population		Rural Indigenous Population		Total Indigenous Population*	
	Population	Percent	Population	Percent	Population	Percent
Brazil	324,834	36.2%	572,083	63.8%	896,917	100.0%
North	61,565	18.0%	281,271	82.0%	342,836	38.2%
Northeast	114,401	49.2%	118,338	50.8%	232,739	25.9%
Southeast	79,272	80.0%	19,865	20.0%	99,137	11.1%
South	34,440	43.7%	44,333	56.3%	78,773	8.8%
Central-West	35,156	24.5%	108,276	75.5%	143,432	16.0%

* Percentages in reference to total Indigenous population in Brazil.

The Indigenous population residing in rural areas in Brazil presents a differentiated sociodemographic profile, with a significant proportion residing in federally recognized Indigenous lands, accompanied by innumerable groups seeking to retake traditional territories that were usurped in the past (Bernal, 2009; Lima & Oliveira, 2019; Oliveira, 2018). In demographic terms, the rural Indigenous population presents a young age profile (43.9% being < 15 years old) as compared with the Brazilian national population (24.1% < 15 years old), reflecting elevated birth rates (Figure 2; Santos et al., 2019; Wong, 2016). In turn, the profile of Indigenous residents of urban areas is older, with 21.1% < 15 years old, which is even lower than the percentage in the overall population of the country (Santos et al., 2019). Analyses based on data from the 2010 national census show a total fertility rate (TFR) for Indigenous women (TFR = 3.8) substantially higher than for non-Indigenous women (TFR = 1.9; Cavenaghi & Alves, 2016; Wong, 2016). Also, rural Indigenous women's fertility (TFR = 4.8) was markedly elevated in comparison to those living in urban areas (TFR = 2.8; Wong, 2016).

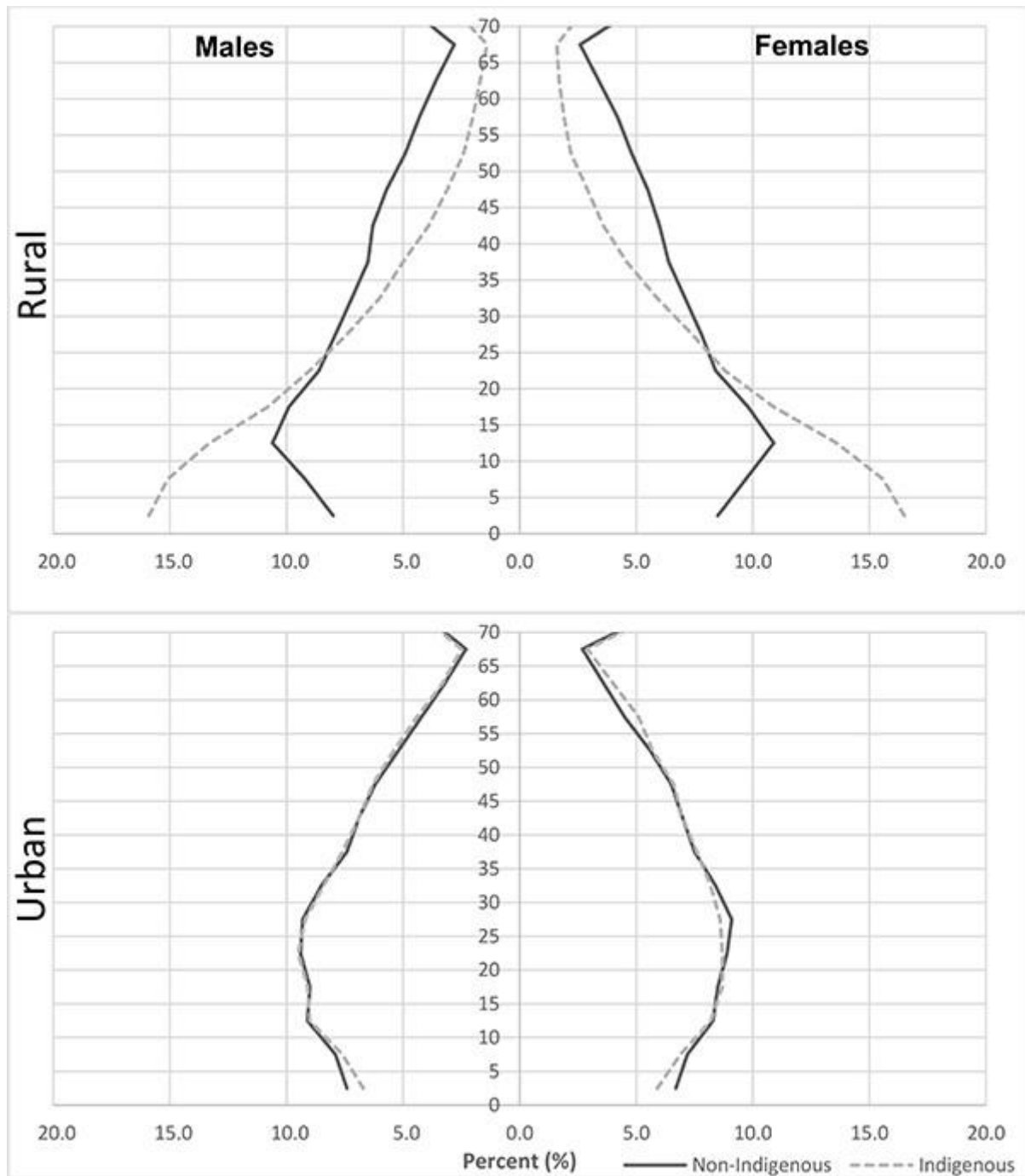


Figure 2. Age distribution of Indigenous and non-Indigenous populations by sex and urban/rural residence, according to the 2010 national census.

Source: Adapted from Santos et al. (2019).

The presence of Indigenous people in cities is a topic that has attracted anthropological attention for considerable time but has gained renewed visibility due to attention by the Indigenous social movement as well as early 21st century official statistics, such as those deriving from national censuses, showing that a major segment of the country’s Indigenous population, nearly a third, resides in urban areas (Santos et al., 2019). Many small to medium- size Brazilian cities,

especially in municipalities containing Indigenous lands in the North, Northeast, and Central-West regions, have elevated concentrations of Indigenous residents. There are also numerous Indigenous residents in the country's major metropolitan regions (nearly 20% of the total Indigenous population), although with less notable concentration. Thus, Indigenous peoples in Brazil are present in rural areas and Indigenous lands, but also in cities.

Given the negative historical repercussions of epidemics and violence for Indigenous peoples in Brazil, into the 1970s discussions at the interfaces of anthropology, demography, and history commonly presumed or anticipated the disappearance of Indigenous peoples as ethnically differentiated segments of the national population (Lima & Oliveira, 2019). However, in the 1970s and 1980s, based on initiatives by the Indigenous social movement and allied nongovernmental organizations, studies were undertaken to document the sizes of the country's many Indigenous groups (Oliveira, 2012; Santos et al., 2019). These efforts mapped in much greater detail than previously the existence of Indigenous peoples throughout the country, confirming the pattern of increasing, rather than diminishing, Indigenous populations, a pattern that has been confirmed since 2010 based on public statistical data, such as those derived from national censuses. Current demographic information suggests that the Indigenous population in Brazil continues to experience growth, even though mortality rates remain elevated. Thus, negative predictions of their disappearance have given way to verification of the permanence of Indigenous peoples despite their exposure to substantial social vulnerability.

Burden of Disease: Case Studies and National Surveys Addressing Indigenous Peoples' Health in Brazil

Before the consolidation of national data sources about Indigenous peoples in Brazil, which has occurred gradually after 2000, local community case studies were the primary sources of information about Indigenous peoples' health in Brazil (Coimbra Jr. et al., 2013). Even with the availability of national statistics addressing this population segment, case studies remain an important source of information that complements national sources, which tend to permit less nuanced analyses and, therefore, less insight into health and disease processes. The discussion here of several illustrative diachronic case studies from the second half of the 20th century to the early 2020s shows how the studies contributed importantly to scientific understandings of Indigenous peoples' health in Brazil. Attention is then turned to oral health, environmental health, sanitation, and insights contributed by national studies and surveys in the early 2010s.

The earliest of the scientific case studies addressed here, which also entailed a major health service component that continues to the present, is the Xingu Project. Initiated in 1965 by the late Roberto G. Baruzzi in collaboration with a team of researchers and students from the Federal University of São Paulo, the project originated at a time when there were serious epidemics of measles, influenza, and malaria among the Indigenous population in Mato Grosso state (Baruzzi, 2007; Baruzzi & Franco, 1981; Baruzzi et al., 1977). In addition to researching and publishing about very diverse health topics, Baruzzi and collaborators implemented a preventative medicine and health assistance program for the Indigenous peoples in the Upper Xingu River Basin, and the program continues to be operated by a team from the same university in collaboration with local

health personnel (Novo, 2010). A major proportion of the preventative initiatives undertaken in Indigenous communities are performed by Indigenous Health Agents (Indigenous community health workers with at least fundamental education), trained by professors from the Federal University of São Paulo, which places value on the potential of Indigenous health work at the interface between Indigenous culture and scientific medicine (Novo, 2010). This local research and service agenda was among the first to demonstrate the enormous potential of Indigenous peoples' health work for close patient follow-up over long periods of time.

The second case study involves the Suruí-Paíter in Rondônia state, whose health and nutritional status were studied from the 1980s by Carlos E. A. Coimbra, Jr. and Ricardo V. Santos from the National School of Public Health, Oswaldo Cruz Foundation. Studies among the Suruí addressed a broad range of health issues, including the interrelationships among changes in settlement patterns, economic and environmental transformations, and locally emergent infectious diseases, such as paracoccidioidomycosis and multidrug-resistant tuberculosis (Basta et al., 2006; Coimbra Jr. et al., 1994; Santos & Coimbra Jr., 1998). Most nutritional studies carried out in Brazil in the 1990s did not yet utilize the National Center for Health Statistics (NCHS) reference to assess child growth, although it was strongly recommended. A study undertaken among the Suruí-Paíter was the first to collect anthropometric data for the entire population and to compare them with the NCHS reference. Results indicated elevated prevalence of low height for age (46.3%) among children from birth to 8.9 years old, a finding that drew substantial attention from the Brazilian public health community. This finding was discussed in terms of the rapid sociocultural and economic transformations underway in Suruí society, including intragroup socioeconomic differentials, with implications for the nutritional status of children whose family members had more or less financial resources, which at the time came from the sale of rubber, Brazil nuts, or timber (Coimbra Jr. & Santos, 1991; Santos & Coimbra Jr., 1996).

A subsequent nutritional survey in the same population revealed a new set of circumstances. Comparison of data from 2005 and 1987 showed marked reduction in low height for age among children under 9 years of age (26.7%) and the emergence of overweight among children (3.9%; Orellana et al., 2006). Notably, in the interval between the surveys, the Suruí experienced a diversification of income sources, including employment and social services, and the new income was used to buy food and, potentially, affected nutritional conditions. The Suruí case study was the first diachronic comparison of undernutrition among children in different decades. The findings were important for motivating the formulation of a nutritional policy for Indigenous peoples in Brazil, as well as for showing that Indigenous children are not "naturally" short, as many in the scientific community still think. The Suruí study showed that, given improvements in health and nutritional conditions, Indigenous children can grow within acceptable parameters according to international reference curves.

The third case is an innovative birth-cohort study being undertaken among the Guarani, residents of 60 local communities in the South and Southeast regions of Brazil. The study's principal objective is to analyze the magnitude of acute respiratory diseases during the first year of life and associated factors, and the initial results showed high rates of child mortality, mainly due to acute respiratory disease (Cardoso et al., 2011), and high rates of hospitalization due to pneumonia (Cardoso et al., 2010, 2013). The study also documented elevated prevalence of

chronic undernutrition and anemia among children, highlighting the grave health and nutrition inequalities that affect the Guarani population, considering that the study region is the most affluent in the country (Barreto et al., 2014).

The fourth case study involves diachronic health and nutritional evaluation of several A'uwẽ (Xavante) communities in Central Brazil. Among the most studied Indigenous groups in Brazil, the A'uwẽ were first evaluated in the early 1960s from a biomedical perspective, when epidemics of measles and malaria were still rampant (Neel et al., 1964). Subsequently, the A'uwẽ have continued to be studied by a series of researchers who have collaborated to produce what is probably the temporally deepest diachronic databank for any Indigenous population in Brazil (Coimbra Jr. et al., 2002). Research beginning in the mid-2010s has addressed child growth and nutrition transition, including an open cohort study carried out in the Pimentel Barbosa and Etênhiritipá communities (Welch et al., 2020). An important study derived from this cohort constructed growth curves for A'uwẽ children from birth to 5 years old (Ferreira et al., 2016), showing an elevated burden of chronic undernutrition during childhood (low height for age among girls = 18.7%, and among boys = 20.4%). The study showed that although A'uwẽ children were born with adequate height, growth was impaired during the first year, followed by inconsistent recovery before 10 years. These findings reflect health and well-being disparities in relation to the Brazilian national population and a failure of primary healthcare provided for Indigenous children.

A comparison of contemporary data with historical information collected in 1962, 1990, and 2006 in the same community allowed a diachronic perspective on anthropometric changes associated with ecological and socioeconomic transformations. The results showed that the adult population has experienced rapid and substantial increase in adiposity, as indicated by significant differences in mean values for weight and BMI between 1962 and 2006, while stature remained stable. A dramatic finding is that, on average, adult Xavante males and females are 8.9 and 13.8 kg heavier, respectively, than in 1962 (Welch et al., 2009). Obesity, diabetes mellitus, and hypertension are new diseases for the A'uwẽ that now significantly affect their healthcare needs. Some A'uwẽ communities are undergoing what is considered an epidemic of metabolic syndrome, with 66.1% of the adult population being diagnosed with obesity, diabetes mellitus, and hypertension (76.2% of women, 55.6% of men; DalFabbro et al., 2014; Soares et al., 2015).⁵

For much of Brazil's Indigenous population, industrialized and ultraprocessed foods (e.g., sugar, pasta, rice, soda) became part of their everyday diet, overwhelmingly influencing the course of health and nutritional transitions, contributing to the onset of chronic diseases, and promoting rapid increases in caries, periodontal disease, and loss of teeth (Alves-Filho et al., 2013; Arantes et al., 2010). Unfortunately, there has not been a nationally representative oral health survey of the rural Indigenous population in Brazil that allows comparison with the results of periodic national surveys of the general population.⁶ Such surveys are essential for identifying trends in oral health profiles and for producing indicators that permit continual evaluation of health services (Roncalli et al., 2012). Consequently, the principal sources of information about oral health among Indigenous populations in Brazil are studies of specific communities and ethnic groups, which have increased substantially since 1990. This growing body of literature converges with respect to

at least two common findings – very high levels of dental caries in children and younger adults and edentulism among middle-aged adults and the elderly (Arruda & Moreira, 2014; Guisilini et al., 2021; Lemos et al., 2018; Vieira et al., 2011).

In a review article on oral health inequalities among Indigenous peoples in five countries, including Brazil, the authors highlighted that preventive interventions have been scarce in Indigenous communities, even though many studies document serious health disparities (Tiwari et al., 2018). The studies reviewed illustrated a wide range of preventive oral health initiatives and indicated that “preferred intervention methodologies included community-based research approaches, culturally tailored strategies, and use of community workers to deliver the initiative” (Tiwari et al., 2018, p. 876).⁷

In the field of environmental health, assessment of Indigenous communities in areas of high risk of drinking water and food (e.g., fish) contamination with toxic metals (e.g., organic mercury) and agricultural pesticides found very high rates of contamination in Indigenous men and women of all ages in several communities (Gonçalves et al., 2012; Pinto et al., 2019; Vega et al., 2018). It is important to note that mercury has been intensively used in gold mining in South America since early colonial days. According to Malm (1998, p. 73), “It is estimated that between 1550 and 1880, nearly 200,000 metric tonnes of mercury was released to the environment.” The explosive gold rushes reported in Brazilian Amazonia beginning in the 1980s were responsible for releasing at least 2,000 tons of mercury into the environment in just two decades (Malm, 1998). Since the mid-1980s, extensive research about the impact of environmental contamination by mercury on the human population, particularly Indigenous peoples and riverine caboclos who rely on fish in their daily diet, has documented serious health impacts (Castilhos et al., 2015; Lino et al., 2018; Vega et al., 2018). Despite the severity of this situation, there has been no report of any significant governmental move to stop illegal gold mining (the major source of mercury) and pesticide use in or upriver from Indigenous lands.

Community assessments of sanitation independently carried out in different regions of Brazil recurrently point to absence of access to safe-water sources, inadequate disposal of sewage, and lack of acceptable management of solid waste (Pena & Heller, 2008; Silva & Dourado, 2019). According to the researchers, despite there being many basic sanitation plans and programs developed by the Special Secretariat of Indigenous Health in Brasília for implementation in Indigenous communities, the services in fact offered to them are fragmented and insufficient to alter their inadequate local conditions. Notably, the results of Indigenous community case studies showing inadequate sanitation conditions converge with those of investigations based on data from the 2010 national census (Raupp et al., 2020).

Turning to national sources of data on Indigenous health and demography, since the early 2000s, studies have begun to employ national databases to generate comparisons between mortality levels among Indigenous and non-Indigenous people in the country, and they have found marked inequities (Cardoso et al., 2005). Using data from the 2010 national census, Campos et al. (2017) presented mortality estimates for Indigenous and non-Indigenous people in age groups from birth to 60 years. The results indicate significant differences in the probabilities of death for all age groups and both sexes. The differences were most pronounced during infancy (birth to 4

years), when the risks of death among Indigenous children are double those documented for non-Indigenous children. A comparative study of Indigenous people < 20 years old residing in rural and urban areas shows mortality rates substantially more elevated among the Indigenous population than among the non-Indigenous population (Santos et al., 2020; Figure 3). Another study, based on data from national health information systems under the purview of the Unified Health System, showed the infant mortality rate among Indigenous children (47.2 per thousand) to be approximately three times higher than that reported for the general Brazilian population (Caldas et al., 2017).

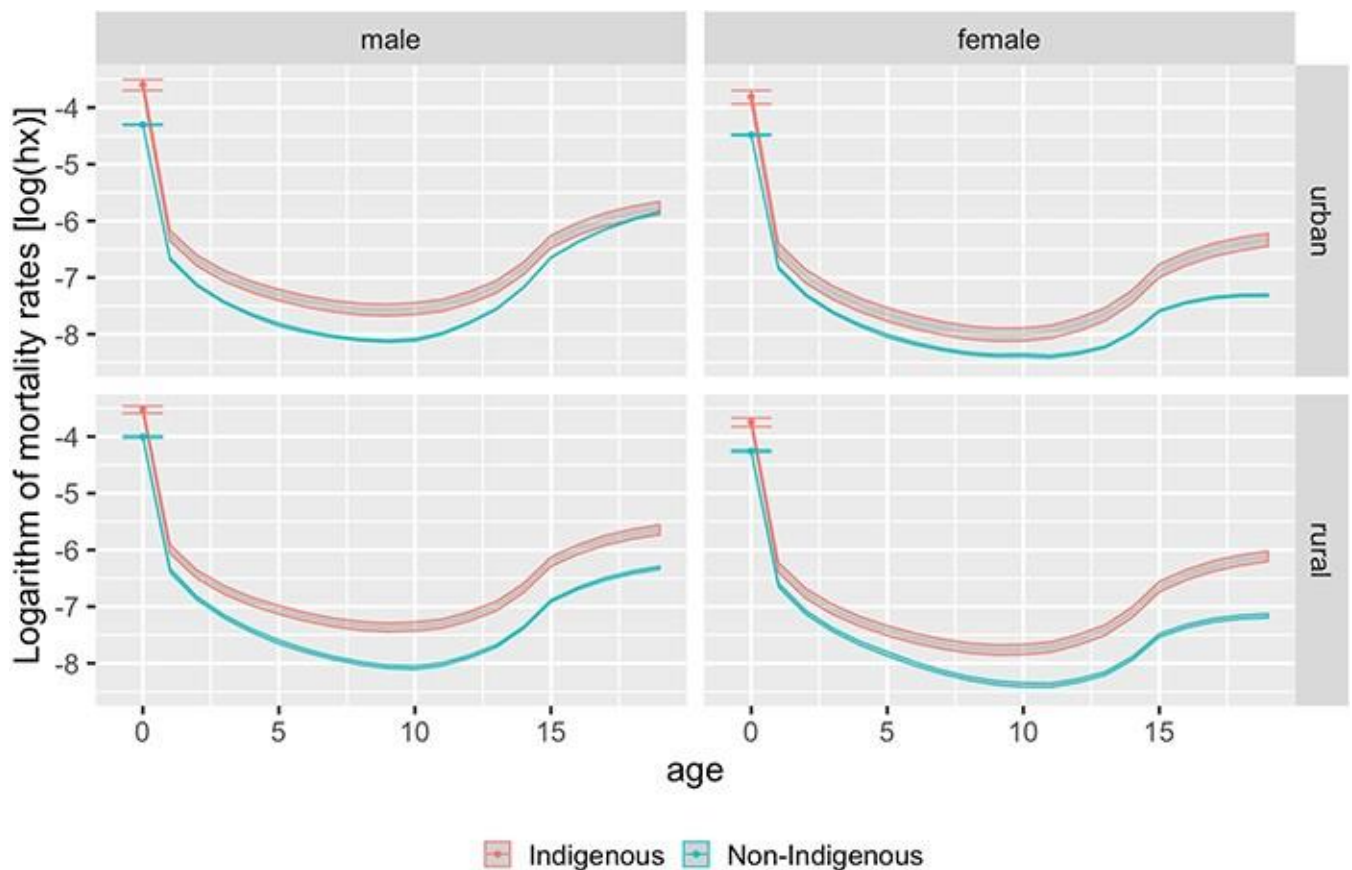


Figure 3. Mortality estimates (\log_{10}) and associated 95% confidence intervals in Indigenous and non-Indigenous Brazilian populations < 20 years old, by sex and urban/rural residence, according to the 2010 national census.

Source: Adapted from Santos et al. (2020).

Particularly striking are the findings of another study, based on data from the same health information system, which showed that the proportions of total deaths among children < 1 year old in relation to the total deaths in the entire Indigenous population remained basically unchanged from 2010 to 2018 (15.3% to 16.2%, respectively), while this proportion for the general Brazilian population fell substantially over the same period (7.2% to 2.7%, respectively; Alves et al., 2021). The consistently elevated concentration of deaths in Indigenous children < 1 year old

over the course of nearly two decades suggests marked inequities in such factors as sanitary conditions, nutrition, and exposure to infectious diseases, as well as coverage by, and accessibility of, health services.

Infectious diseases, such as measles and influenza, which decimated entire Indigenous groups into the second half of the 20th century, have lately had smaller impacts on the morbidity and mortality of Indigenous populations in Brazil, especially due to increased access to primary healthcare services, vaccinations, and other resources after 1999, with implementation of the Indigenous Healthcare Subsystem. Nevertheless, other infectious diseases, such as diarrhea, pneumonia, malaria, tuberculosis, and syphilis, continue to affect Indigenous peoples more significantly than they affect the general Brazilian population (Benzaken et al., 2017; Coimbra Jr. & Basta, 2007; Coimbra Jr. et al., 2013; Escobar et al., 2015; Leandro-Reguillo et al., 2015).

The trends in infectious diseases, which have been documented by multiple community case studies, have been corroborated since 2020 by analyses based on national health information systems data. A study utilizing data from the Mortality Information System found respiratory causes and infectious and parasitic diseases were responsible for approximately 20% of deaths among the Indigenous population from 2000 to 2016 (Lima et al., 2020). According to this study, perinatal diseases, infectious and parasitic diseases, and respiratory diseases caused 23.7%, 18.5%, and 17% of deaths, respectively (2020, p. 88).

Although violence against Indigenous peoples has always been present in Brazil, since 2000 it has increased. Just since 2010, cases of homicide increased by more than 20% (Cerqueira, 2021). Other forms of violence have also increased over this period, especially death threats, bodily injuries, and rape. The spatial distribution of homicides of Indigenous people is concentrated in the North and Central-West regions, which are also the regions where Indigenous territorial tensions and disputes are most common, due to increased illegal invasion of Indigenous lands by miners and loggers (Conselho Indigenista Missionário [CIMI], 2019; Machado, 2020; Wanzinack et al., 2019). It is notable that the two regions with the highest rates of homicide of Indigenous people also coincide with areas presenting the highest documented rates of suicide among Indigenous people, particularly in the states of Mato Grosso do Sul and Roraima, where land disputes are prevalent. From 2006 to 2010, the Indigenous mortality rates due to suicide in the North and Central-West regions were 15.1 and 42.5 per 100,000 deaths, respectively, contrasting with 5.3 per 100,000 for the general Brazilian population during the same period (Souza & Orellana, 2012; Wanzinack et al., 2019). Fear, territorial invasion, humiliation, experiences of racism, and even torture are among the long list of aggressions that Indigenous peoples continue to be subjected to daily in Brazil. Given this context, it is both unsurprising and appalling that of a total of 47,806 deaths of individuals classified as Indigenous reported to the national Mortality Information System, external causes were responsible for the highest proportion of deaths among individuals from 5 to 59 years old and were responsible for 57.1% of deaths in the group 10 to 19 years old (Lima et al., 2020).

A landmark study outside the purview of public national information systems and databases was the robust nationally representative First National Survey of Indigenous People's Health and Nutrition (henceforth, the National Survey), which collected data in 2008–2009 with a focus on

women of reproductive age and children < 5 years old living in Indigenous lands throughout the country (Coimbra Jr. et al., 2013). This was the first study to evaluate health and health determinants based on a nationally representative sample of the country's Indigenous population. One of the main objectives of the National Survey was to generate data about health indicators that could serve as a baseline at a moment close to the implementation of the National Healthcare Policy for Indigenous Peoples in Brazil, one of the expressions of which was the creation of the Indigenous Healthcare Subsystem in 1999 (unfortunately, follow-up surveys have not yet been undertaken to measure alterations).

Specifically, the National Survey sought to characterize the nutritional status and other health indicators in women between 14 and 49 years old and children < 5 years old based on a nationally and regionally representative sample of the Indigenous population residing in communities located in federally recognized Indigenous lands. The study was statistically stratified into four major geopolitical regions (North, Northeast, Central-West, and South/Southeast). The studied sample included 113 local communities and approximately 6,600 women and 6,100 children.

The National Survey detected significant inequalities between Indigenous and non-Indigenous people in Brazil with regard to sanitation conditions (Coimbra Jr. et al., 2013), child undernutrition (Horta et al., 2013), anemia (Leite et al., 2013), and hospitalization rates for conditions sensitive to basic healthcare, such as diarrhea and acute respiratory infections (Cardoso et al., 2015; Escobar et al., 2015). The investigation also revealed overweight and obesity (Coimbra Jr. et al., 2021) and an elevated prevalence of anemia (Borges et al., 2016) among women. Furthermore, the quality of prenatal consultations among Indigenous women was shown to be deficient, including late initial consultations, low quantity of consultations, inadequate vaccination coverage, and insufficient laboratory exams (Garnelo, Horta, et al., 2019). Overall, results of the National Survey revealed a worrying national health profile that demands critical revision of the performance of the Indigenous Healthcare Subsystem.

As pointed out by Coimbra Jr. et al. (2013, pp. 16–17), the National Survey's

results provide for the first time the information necessary to characterize the health and nutrition profile of Indigenous peoples in Brazil on a national scale. One of its most important potential contributions is to identify the social and health inequities that continue to exist among the Indigenous peoples in Brazil, as compared to the non-Indigenous population, despite the country having made major public health advances in recent decades.

Health Policies for Indigenous Peoples and Multiple Challenges in Their Implementation

The Brazilian democratic constitutional reform introduced at the end of the 1980s incorporated the universal right to health as a fundamental principle for the entire Brazilian population (Paim et al., 2011). At the same time, the sociocultural and territorial rights of Indigenous peoples were unequivocally recognized, helping to pave the way, a decade later, for the formulation of a

specific health policy for this population. Thus, in 1999, the Indigenous Healthcare Subsystem was created by presidential decree. The subsystem assigned responsibility for the administration and provision of primary healthcare to a network of health posts mostly located within federally recognized Indigenous lands (Cornwall & Shankland, 2008; Pontes & Santos, 2020). Within the hierarchical structure of Brazil's Ministry of Health, the subsystem is managed at the federal level by the Special Secretariat of Indigenous Health in Brasília, established in 2010. Two decades after the creation of the subsystem, a persistent debate focuses on whether or how to guarantee access to healthcare for the population residing outside Indigenous lands or in urban centers.

An important dimension of the Indigenous Healthcare Subsystem is a series of participatory modalities, whereby Indigenous representatives engage in the planning, operation, and follow-up dynamics of health services. A federal-level instance of this participatory model is the Intersectorial Commission on Indigenous Health, which includes Indigenous representatives in addition to representatives of health administrators and workers. At the local level, Indigenous participation occurs via Indigenous health councils. These instances of participation in healthcare governance by Indigenous healthcare service users and their representatives mirror similar participatory governance organization present in the Unified Health System that attends to the general Brazilian population. Specialists in the field of Indigenous peoples' health policy have questioned whether the reality of participatory governance has lived up to its promises on paper, due to governmental foot-dragging and active disregard of Indigenous voices (Mendes et al., 2018; Pedrana et al., 2018; Pontes & Santos, 2020). Also, the specialists have drawn attention to potential incompatibilities between a model of participatory governance designed for the Brazilian national population and culturally distinct Indigenous perspectives regarding "participation" based on different sociocultural references. Both shortcomings point to the fact that the government has much additional work to do to ensure that Indigenous participation in healthcare policy is both substantial and impactful.

After two decades of implementation of the Indigenous Healthcare Subsystem, it is important to recognize that Indigenous peoples' health policy has advanced in some aspects, such as: extension of the coverage of health initiatives and installation of a care network that did not exist previously; a significant increase in the allocation of human and material resources dedicated to Indigenous peoples' health; implementation of instances of participatory governance through Indigenous representatives; and progressive restructuring of the modes of interaction between state agents and ethnic minorities, with potential to overcome the tutelary practices that predominated in the past. However, great challenges persist, such as the fragmentation, irregularity, and low quality of services provided at the local level, as well as the absence of intersectoral actions capable of attending to basic needs, such as food safety, sanitation, and health promotion. Additionally, implementation of genuinely culturally differentiated health services, as called for by the National Healthcare Policy for Indigenous Peoples, remains an elusive goal. In the two decades since the subsystem was created, recognition and empowerment of the use of traditional medicines and healthcare practices by Indigenous people have continued to be separated from the daily practices of healthcare professionals who attend to Indigenous populations (Langdon & Garnelo, 2017; Mendes et al., 2018).

A related perpetual challenge is the unmet need for the subsystem to provide the necessary conditions for qualified health professionals to competently work in intercultural contexts, which would require an ample and elaborate administrative effort to provide favorable educational resources and work conditions. As a result, there is an urgent need to improve models of contracting, accompanying, and educating the professionals working in the Indigenous Healthcare Subsystem. Considering the itinerant work regime of most multidisciplinary health teams due to the remoteness of many Indigenous communities, Indigenous Health Agents are the main guarantee of access to, and continuity of, care offered by the subsystem. However, there is no professional development program for these agents and their profession lacks standardization, drawbacks that have been discussed for many years without a favorable outcome (Diehl et al., 2012; Garnelo, Sampaio, & Pontes, 2019; Novo, 2010). Also, retaining medical doctors, nurses, and other health professionals on staff has proven difficult, especially in districts that attend to more distant Indigenous communities.

An additional major challenge for the Indigenous Healthcare Subsystem is how to attend to Indigenous peoples in voluntary isolation. Especially in the Amazon region of Brazil, there are approximately 115 groups of Indigenous peoples who reside in situations of isolation or semi-isolation from Brazilian national society (Loebens & Neves, 2011; Ricardo & Gongora, 2019). For decades, Brazilian indigenist policy has been to protect and monitor these groups, in contrast to the previous policy of actively contacting them. From the health perspective, an additional layer of protection is necessary to address potential outbreaks of epidemics, even in the absence of non-Indigenous intrusions. Since isolated groups may have indirect contact through Indigenous communities that do not maintain voluntary isolation, they may be faced with epidemic situations that threaten their survival. The existing health assistance model is geared toward routine primary healthcare and therefore is not adequately prepared to combat epidemics that, once established, require agile and resolute strategies to address and control them. This kind of intervention requires professionals specially trained in controlling infectious disease crises. In the absence of such expertise, the response to epidemics among isolated groups can be slow and can lack coordination, potentially resulting in elevated numbers of serious cases and deaths.

The various issues related to health policy for Indigenous peoples in Brazil mentioned in this section are all related to greater or lesser degrees to what might be called the “intercultural competency” of state agendas and agents, within which “differentiated care” is a key point. Although the principal parameters of the National Healthcare Policy for Indigenous Peoples are progressive insofar as they recognize the right of Indigenous peoples to receive health services that respect their sociocultural specificities, their implementation and routine operation have demonstrated a major gap between what was intended and what has materialized in practice. Consequently, there is an ongoing unmet need for critical intercultural reflection in the subsystem to recognize and support Indigenous epistemologies and traditional systems of care and healing, in order to implement culturally sensitive health initiatives for Indigenous peoples in the country (Langdon & Garnelo, 2017; Mendes et al., 2018; Pedrana et al., 2018).

The many problems with the administration and operation of the Indigenous Healthcare Subsystem have become even more apparent during the Covid-19 pandemic, which has had a particularly negative impact on the Indigenous population, with many studies showing higher

levels of Covid infection, mortality, and case fatality than were observed in the non-Indigenous population in Brazil (Hallal et al., 2020; Pontes et al., 2021; Soares et al., 2021). The comprehensiveness of service provision, a guiding principle for health policy in Brazil that refers to attending to everything from preventative to curative needs, was determinative for the epidemiologic scenario of the pandemic in the country's Indigenous population. A complex combination of factors involving dimensions as diverse as population mobility, poor sanitation, food insecurity, territorial invasions, healthcare access, and fragility in the planning and execution of interventions, as well as preventive measures by the Special Secretariat for Indigenous Health (such as Covid-19 testing coverage in the Indigenous population and among healthcare professionals and implementation of social distancing measures), played an important role in determining the high levels of exposure, illness, and death recorded. The impact caused by the pandemic may have been even more pronounced for Indigenous peoples living in urban centers, who faced barriers to accessing priority vaccination and may have suffered from underestimated infection and mortality counts due to ethnic/racial misclassification.

On the other hand, important improvements were achieved through proactive efforts by the Indigenous social movement at the national and international levels, including taking legislative and judicial action to call attention to the seriousness of the situation and to reduce the pandemic's impacts (Alarcon et al., 2022). These initiatives were fundamental for pressuring the Brazilian government to act on various fronts, such as including the Indigenous population among the country's priority vaccination groups.

Concluding Remarks

In the Latin American context, there is a great heterogeneity of colonial histories to which Indigenous peoples were and continue to be subject, and this is reflected in differences in their demographic representations within their respective national populations, the degrees of recognition of their socioculturally differentiated rights, and legislative guarantees to territories. Despite this heterogeneity and Indigenous peoples' usually low visibility in public statistics, national information systems, and academic research, there is an increasing body of evidence suggesting that Indigenous peoples in diverse countries present social (literacy, income, etc.) and health indicators that situate them in positions of disadvantage relative to their national populations. This scenario reflects to a large degree their historically produced vulnerability on a global scale (Anderson et al., 2016; Paradies, 2018). The case of Indigenous peoples in Brazil exemplifies a scenario of social marginalization, which is reflected in health indicators.

A tendency in public health considerations in Brazil since the 1990s, which aligns with international perspectives, has been to emphasize the importance of social determinants related to the ethnic/racial dimension (National Commission on the Social Determinants of Health, 2008; Victora et al., 2011). It was within this context that interest in analyses of various aspects of Indigenous peoples' health expanded, gaining visibility in analysis of inequities in the country. Not only local case studies, but also demographic and epidemiologic analyses made possible through the expansion of information systems and other databases, such as national studies and

demographic censuses, have indicated that the Indigenous population presents strongly unfavorable indicators related to various dimensions of health and disease processes. Comparing debates regarding Indigenous peoples' health in Brazil with those in other parts of the world suggests that patterns observed nationally have important parallels with structural questions on a global scale (Anderson et al., 2016; Paradies, 2018).

The trajectory of construction and implementation of Indigenous health policies in Brazil, has been marked by tensions, advances, and setbacks. The democratic climate that followed periods of dictatorship throughout Latin America, which in the Brazilian case was from 1964 to 1985, favored the recognition of Indigenous peoples' rights, including the right to health, which translated after some years into the creation of the Brazilian Indigenous Healthcare Subsystem. Importantly, analyses in the early 2020s highlight that the construction of public health policies in contemporary Brazil involved Indigenous participation and protagonism, which have received very little attention in previous studies about the trajectory of the conception and implementation of the National Healthcare Policy for Indigenous Peoples (Ferdinand et al., 2020; Pontes & Santos, 2020).

The fragilities of the Indigenous Healthcare Subsystem are increasingly evident as its operation appears to be ever more distant from the values, principles, guidelines, and technical standards that guided its implementation. As Indigenous leader Ailton Krenak commented in 2021, although the National Healthcare Policy for Indigenous Peoples is, in principle, an important advance in public policy, "the enthusiasm that the Indigenous peoples had with the approach of the health system is in crisis" (Krenak, 2021: cover presentation). Many other Indigenous leaders who also experienced the daily realities of the subsystem expressed their viewpoints in terms that approximate how diverse academic analyses have characterized the current limitations of the subsystem. If it is undeniable that the subsystem and its coverage of regions previously lacking any formal health services were accomplishments for the Indigenous, indigenist, and health movement, it is also agreed that its practices still require improvement.

The Brazilian experience demonstrates that recognition of Indigenous rights through the 1988 federal constitution and specific pieces of legislation, such as the laws creating and governing the Indigenous Healthcare Subsystem, were crucial steps in social justice. Although the subsystem's implementation continues to be fraught with difficulties, often marked by political and administrative backtracking, there are even greater concerns about possible reversal of the laws that seemingly guarantee its existence. Although some decades ago it was imagined that the Indigenous peoples in Brazil would soon disappear through assimilation, ceasing to exist as socioculturally differentiated segments of the Brazilian population, this 0.5% of the national population, a minuscule fraction that encapsulates an enormous diversity of peoples, languages, and culturally distinct modes of life, is seeking to guarantee its basic rights. The field of health is an important political arena for contemporary Indigenous peoples in Brazil, where their influence on public policy has been felt.

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Notes

1. Improvements in social indicators in Brazil, amply documented in the scientific literature since the early 1990s (see Kleinert & Horton, 2011), have undergone important inversions not only due to the Covid-19 pandemic, but also as consequences of the Bolsonaro administration policies, which have exacerbated the political-economic crisis, with impacts on social security, education, public health, environmental protection, and scientific research, among other strategic areas (Lima, 2021; Stevenson, 2020; Tollefson, 2019, 2021).
2. Unfortunately, the limitations of health data are even more profound for Indigenous peoples living in urban spaces outside of Indigenous lands.
3. Various information systems connected to the Unified Health System and the great majority of nationwide population-based surveys undertaken in Brazil have collected data for the category “Indigenous” following the introduction of the term as one of five possible responses in the 1991 national census. Nevertheless, findings regarding Indigenous peoples are not always adequately addressed in the reports and publications derived from these surveys. A recurrent problem is that results for this category are not reported at all or are merged with other categories due to its reduced size and consequential challenges for representativeness. Also, racial-ethnic classificatory volatility and inconsistency between databases may influence vital statistics generated for Indigenous populations (Muniz & Bastos, 2017).
4. According to the 2010 census, the Indigenous population in Brazil was 896,000 people (IBGE, 2012). Although a 2020 census was not undertaken due to the Covid-19 pandemic, the Brazilian Institute of Geography and Statistics undertook a preliminary quantification of the country’s Indigenous population in 2020–2021, mostly focusing on federally recognized Indigenous lands and specific rural and urban areas known to present higher densities of Indigenous populations, for the sake of planning vaccination efforts, arriving at an estimate of over 1,100,000 people (IBGE, 2021). However, data from the 2010 census are still used, because the later estimate does not include stratification by sex, age, region, or other variables of interest.
5. In addition to the case studies described in this section, it is also important to recognize the important contributions made by João Paulo Botelho Vieira Filho at the Federal University of São Paulo. Beginning in the 1960s, he conducted long-term health research with several Indigenous communities, especially in the states of Mato Grosso and Pará, publishing important papers about such emergent problems as diabetes mellitus and other noncommunicable chronic diseases (see Soares et al., 2015; Tavares et al., 2003; Vieira-Filho, 1996).
6. Based on data from the 2010 National Oral Health Survey undertaken in Brazil, analyses of the occurrence of caries in the Indigenous population were published (Miranda et al., 2018). As mentioned by the authors, a limitation of the study was the sample methodology, which only included Indigenous residents of urban areas and therefore did not contemplate the Indigenous contingent resident in rural areas.
7. Case studies undertaken in Indigenous communities in Brazil show that oral health transition is a dynamic process, and each specific setting has its own particularities and determinants of caries and oral disease. The Xavante case is illustrative, demonstrating how the implementation of a well-structured oral health program appropriate to local Indigenous realities can invert an ongoing trend of oral health deterioration caused mainly by changes in dietary patterns, significantly reducing the caries levels and increasing the percentage of youth free of caries (Arantes et al., 2018).

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