SOCIAL INEQUALITIES AND THE PERSISTENCE OF TROPICAL DISEASES IN BRAZIL: CHALLENGES FOR PUBLIC HEALTH

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Abstract

This study aimed to analyze the influence of social inequities on the persistence of tropical diseases in Brazil, highlighting the structural determinants involved and their implications for public health. It is an integrative literature review with a qualitative and descriptive-analytical approach, conducted in the SciELO, LILACS, PubMed/MEDLINE, and Scopus databases between 2021 and 2026. Studies that explicitly addressed the relationship between tropical diseases and social inequalities in the Brazilian

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context were included. The results showed that diseases such as tuberculosis, dengue, leishmaniasis, leprosy, Chagas disease, leptospirosis, and venomous animal envenomings present spatial and social distributions associated with poverty, territorial inequality, structural racism, precarious housing conditions, and limited access to health services. Interventions focused exclusively on the biomedical model were found to have limited impact when not integrated with intersectoral public policies. In summary, the persistence of tropical diseases in Brazil is deeply related to structural inequities, requiring integrated strategies that combine health surveillance, strengthening of primary health care, social policies, and the promotion of equity.

Keywords: Primary Health Care, Social Determinants of Health, Social Inequality, Social Vulnerability, Neglected Diseases.

INTRODUCTION

Social inequities constitute a structuring element in determining the epidemiological profile of tropical diseases in Brazil, configuring one of the principal challenges for contemporary collective health. Despite institutional advances within the Unified Health System (SUS) and the expansion of public policies aimed at controlling health conditions, the persistence—and, in some contexts, the resurgence—of diseases such as tuberculosis, dengue, visceral leishmaniasis, leprosy, Chagas disease, leptospirosis, and envenomings by venomous animals can still be observed. This scenario makes evident that the dynamics of these diseases are deeply related to socioeconomic, racial, territorial, and health service access inequalities, going beyond the strictly biomedical dimension of the health-disease process.

In the global context, neglected tropical diseases and malaria remain strongly associated with historical patterns of inequality and poverty, with the highest burden of morbidity and mortality concentrated in vulnerable populations (Lin et al., 2025). In Brazil, this reality is manifested heterogeneously, reflecting regional disparities marked by processes of disordered urbanization, environmental degradation, and social exclusion. Studies indicate that the risk of these diseases correlates

directly with poverty, early ecosystem destruction, and the precariousness of living conditions, reinforcing the role of social determinants in their persistence (Magalhães et al., 2023).

Tuberculosis, for example, remains an important public health problem, especially in urban centers and in the Amazon region. Spatial and multilevel analyses demonstrate that social and territorial factors, such as low income, household overcrowding, and limited access to health services, significantly influence the distribution of the disease (Andrade-Sales et al., 2025). Models incorporating structural and intermediary determinants show that communities subjected to contexts of social vulnerability bear a greater burden of the disease (Giacomet et al., 2022). In Brazilian urban centers, the persistence of unfavorable epidemiological trends over the last decade reinforces the need for intersectoral strategies that address the social roots of the disease (Raony, 2025).

Similarly, dengue has become consolidated as an expression of urban inequalities, with recurrent epidemics associated with precarious basic sanitation, the expansion of peripheral areas, and fragile health surveillance systems (Oliveira et al., 2025). Leptospirosis, in turn, reveals the interaction between deficient urban infrastructure, soil sealing, and social vulnerability, especially in contexts of flooding and failures in drainage systems (Azevedo et al., 2025). These findings demonstrate that the social production of risk is directly related to the unequal organization of urban territories.

In the field of neglected diseases, visceral leishmaniasis presents space-time clusters concentrated in regions with high social vulnerability, reinforcing the association between poverty and exposure to the vector (Ribeiro et al., 2021). Leprosy, still present in Brazilian urban areas, shows a distribution linked to environmental and social determinants, such as population density and precarious housing conditions (Sérgio et al., 2025). Chagas disease, historically related to social exclusion, also reveals that control interventions affect not only health indicators but also dimensions of social development, demonstrating the interdependence between health policies and equity (Denton-Schneider; Montero, 2025).

Moreover, unequal access to health services intensifies the severity of preventable conditions. In the case of snakebite envenoming, geographic analyses indicate that the availability of antivenom directly

influences case severity, with rural and remote populations being the most affected by limited access (Isaacson et al., 2023). This reality is consistent with evidence that socioeconomic inequalities compromise the health system's capacity to respond to health emergencies, as observed during the COVID-19 pandemic in Brazil (Rocha et al., 2021), a phenomenon that also has repercussions for the response to tropical diseases.

It is important to highlight that health inequities in Brazil are crossed by structural markers such as race, gender, and social class. The literature indicates that systemic racism influences the distribution of and response to neglected tropical diseases, conditioning greater exposure and reduced access to therapeutic technologies for historically marginalized populations (Conceição et al., 2022). Furthermore, the incorporation of gender, equity, and human rights perspectives proves fundamental for formulating more inclusive and effective policies to combat these diseases (Rijk et al., 2021).

Given this panorama, the persistence of tropical diseases in Brazil cannot be understood merely as a technical failure or an insufficiency of biomedical interventions, but rather as a concrete expression of structural inequalities. For collective health, the challenge lies in articulating qualified epidemiological surveillance, the strengthening of primary care, intersectoral sanitation, housing, and social protection policies, as well as confronting structural racism and regional disparities. Thus, overcoming social inequities is an indispensable condition for the sustainable control of tropical diseases and for consolidating the right to health as a constitutional principle and effective practice throughout Brazilian territory.

This study aims to analyze the influence of social inequities on the persistence of tropical diseases in Brazil, highlighting the structural determinants involved and their impacts on the formulation of effective strategies within the scope of collective health.

METHODOLOGY

This is an integrative literature review, with a qualitative approach and a descriptive-analytical character, whose purpose was to gather and analyze scientific evidence regarding the relationship between social inequities and the persistence of tropical diseases in Brazil, in light of the framework of the social determinants of health and collective health.

The bibliographic search was conducted in the Scientific Electronic Library Online (SciELO), Latin American and Caribbean Literature in Health Sciences (LILACS), PubMed/MEDLINE, and Scopus databases, from January 2021 to February 2026. Controlled and uncontrolled descriptors were used, combined through the Boolean operators AND and OR, such as: “Neglected Tropical Diseases,” “Health Inequities,” “Health Inequalities,” “Social Determinants of Health,” “Social Vulnerability,” and “Brazil,” in addition to specific terms related to the principal diseases studied, such as “Tuberculosis,” “Dengue,” “Leishmaniasis,” “Leprosy,” “Chagas Disease,” and “Leptospirosis.” The descriptors were employed in Portuguese and English, according to the requirements of each database.

The inclusion criteria established were: (I) original articles, systematic reviews, or ecological studies published in peer-reviewed scientific journals; (II) publications from 2021 to 2026; (III) studies developed in the Brazilian context or presenting specific data on Brazil; (IV) research explicitly addressing the association between tropical diseases and social determinants, inequalities, or health inequities; and (V) full-text articles available in Portuguese, English, or Spanish.

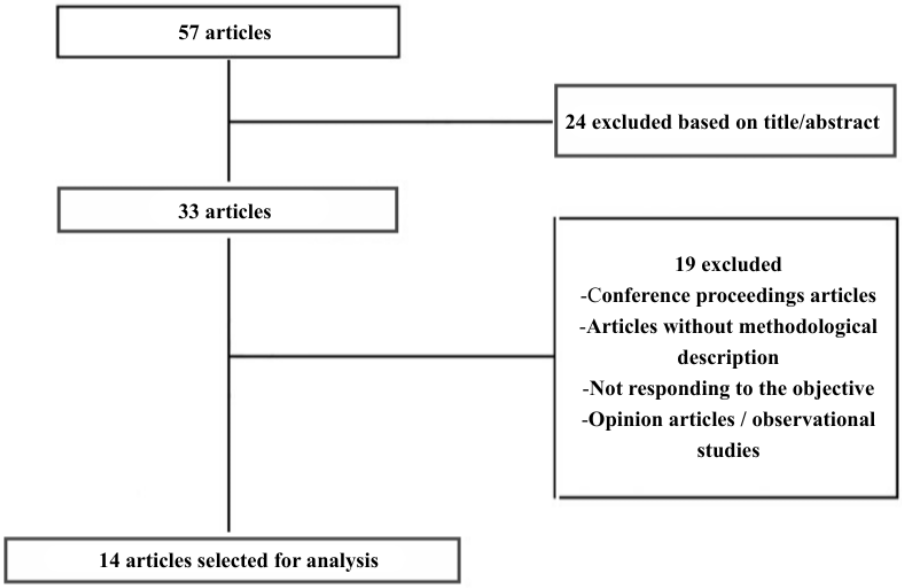
The exclusion criteria adopted were: (I) duplicate studies in the databases consulted; (II) publications that did not establish a direct relationship between tropical diseases and social inequities; (III) editorials, letters to the editor, experience reports, conference abstracts, dissertations, and theses; (IV) research with an exclusively laboratory or experimental focus, without analysis of social determinants; and (V) articles whose full text was not available for access.

The selection process occurred in sequential stages. Initially, the studies were identified in the databases, followed by the removal of duplicates. Subsequently, titles and abstracts were read for initial

screening. Potentially eligible studies were submitted to full-text reading, and those that fully met the established criteria were included in the review, as shown in the flowchart in Figure 1.

Figure 1

Flowchart of the study selection process



Source: Authors (2026)

After defining the final corpus, the data were organized into a specific instrument containing the following variables: author(s), year of publication, study location, methodological design, main results, and conclusions related to social inequities and the distribution of tropical diseases. The analysis was conducted thematically, allowing the categorization of findings into two central axes: structural determinants (poverty, regional inequality, structural racism, and access to health services) and intermediary determinants (housing conditions, basic sanitation, education, urban infrastructure, and territorial vulnerability).

The synthesis of results was carried out in a narrative and critical manner, articulating the empirical evidence found with the theoretical framework of collective health, in order to understand how structural inequalities influence the persistence and unequal distribution of tropical diseases across Brazilian territory.

RESULTS AND DISCUSSION

The selected studies showed that the persistence of tropical diseases in Brazil is intrinsically related to social inequities, expressed through inequalities of income, race, territory, gender, and access to health services. Convergently, the publications indicate that these diseases are not distributed randomly, but rather follow spatial and social patterns markedly associated with structural vulnerability.

In the global scenario, Lin et al. (2025) highlight that the burden of neglected tropical diseases and malaria remains concentrated in socially disadvantaged populations, with projections indicating the maintenance of inequalities if structural interventions are not implemented. This international panorama resonates in the Brazilian context, where poverty and social exclusion are central determinants in the persistence of these diseases.

With regard to tuberculosis, the findings reveal a strong association between social determinants and the spatial distribution of the disease. Andrade-Sales et al. (2025) demonstrate, in a multilevel analysis conducted in the state of Pará, that areas with greater socioeconomic vulnerability presented significant incidence clusters, evidencing the role of factors such as low income, high household density, and limited access to health services. Complementarily, Giacomet et al. (2022) emphasize that both structural determinants (income inequality and social exclusion) and intermediary determinants (housing conditions and urban infrastructure) directly impact communities in Eastern Amazonia, reinforcing the socially determined nature of the disease.

In urban centers, Raony (2025) observes that, over the last decade, tuberculosis has maintained persistent epidemiological patterns in peripheral areas, even with the expansion of primary care coverage. This evidence suggests that service expansion, although necessary, proves insufficient when not articulated with intersectoral policies aimed at overcoming structural inequalities.

Dengue also stands out as an expression of urban inequities. Oliveira et al. (2025) analyze a decade of epidemics in Brazil and identify higher incidence in territories marked by disordered urbanization, precarious sanitation, and weaknesses in health surveillance. These results are consistent

with the findings of Azevedo et al. (2025), who, when investigating leptospirosis in Campinas, show the interaction between soil sealing, failures in urban drainage systems, and social vulnerability as determining factors for the occurrence of outbreaks. Thus, it is observed that the unequal organization of urban space intensifies environmental and health risks.

In the field of neglected diseases, visceral leishmaniasis presents a strong correlation with social vulnerability. Ribeiro et al. (2021) identify space-time clusters of the disease in endemic regions characterized by poverty and precarious housing, indicating that exposure to the vector is associated with socio-environmental conditions. Similarly, Sérgio et al. (2025), in a systematic review on leprosy in urban areas, point out that environmental and social determinants, such as high population density and insufficient infrastructure, influence the persistence of the endemic disease.

Chagas disease, historically linked to social exclusion, also reveals the interdependence between health and development. Denton-Schneider and Montero (2025) argue that control strategies affect not only the reduction of transmission but also socioeconomic indicators, showing that health policies can contribute to reducing structural disparities when integrated with social development actions.

The relationship between access to health services and the severity of illnesses is also shown to be relevant. Isaacson et al. (2023) demonstrate that the geographic availability of antivenom directly influences the severity of snakebite envenomings, with rural and remote populations being the most harmed by their distance from referral centers. This finding reinforces that territorial inequalities affect not only incidence but also the clinical outcomes of tropical diseases.

Furthermore, the structural dimension of inequities is deepened by Conceição et al. (2022), who discuss the role of systemic racism in the production and persistence of neglected tropical diseases in Brazil. According to the authors, Black and socially marginalized populations are more exposed to risk conditions and face barriers in access to diagnostic and therapeutic technologies. Complementarily, Rijk et al. (2021) emphasize the importance of incorporating gender, equity, and human rights perspectives

into response strategies, highlighting that the absence of these approaches perpetuates historical vulnerabilities.

The structural fragility of the health system in the face of inequalities was also evidenced in a recent context. Rocha et al. (2021) demonstrate that socioeconomic inequalities compromised the Brazilian health system's response capacity during the COVID-19 pandemic, a scenario that can be extrapolated to the response to tropical diseases, especially in territories with weaker health infrastructure.

Transversally, Magalhães et al. (2023) reinforce that the risk of neglected tropical diseases correlates with poverty and early ecosystem destruction, indicating that processes of environmental degradation associated with disordered economic expansion increase population vulnerability, as summarized in Table 1.

Table 1

Summary of the principal findings on social inequities and tropical diseases in Brazil.

Author(s) / Year	Disease(s) Investigated	Main Social Determinants Identified	Main Findings	Implications for Collective Health
Andrade-Sales et al. (2025)	Tuberculosis (Brazilian Amazon)	Low income, household overcrowding, territorial inequality, limited access to health services	Identification of spatial clusters associated with socioeconomic vulnerability in the state of Pará	Need for territorialized strategies and strengthening of primary care in vulnerable areas
Giacomet et al. (2022)	Tuberculosis (Eastern Amazonia)	Structural determinants (income inequality) and intermediary determinants (housing conditions and urban infrastructure)	Modeling evidenced the direct impact of social determinants on the distribution of the disease	Integration between social policies and epidemiological surveillance actions
Raony (2025)	Tuberculosis (Brazilian urban center)	Urban peripheralization, social exclusion, socioeconomic vulnerability	Persistence of unfavorable epidemiological patterns over a decade	Expansion of intersectoral policies beyond care coverage
Oliveira et al. (2025)	Dengue	Disordered urbanization, precarious sanitation, weakness of health surveillance	Recurrent epidemics associated with urban inequalities	Strengthening of environmental surveillance and structural sanitation policies
Azevedo et al.	Leptospirosis	Soil sealing, failures in	Interaction between	Sustainable urban

(2025)		urban drainage, social vulnerability	precarious urban infrastructure and outbreak occurrence	planning as a preventive strategy
Ribeiro et al. (2021)	Visceral leishmaniasis	Poverty, precarious housing, socio-environmental vulnerability	Identification of space-time clusters in socially vulnerable areas	Integrated interventions among surveillance, housing, and vector control
Sérgio et al. (2025)	Leprosy	High population density, precarious housing conditions, urban inequality	Association between environmental determinants and persistence of the endemic disease	Intersectoral actions aimed at reducing territorial inequalities
Denton-Schneider; Montero (2025)	Chagas disease	Historical social exclusion, regional inequality	Disease control associated with improvements in development indicators	Integration between health policies and socioeconomic development
Isaacson et al. (2023)	Snakebite envenomings	Territorial inequality, limited access to specialized services	Geographic distance influences case severity due to difficulty in accessing antivenom	Strategic decentralization of supplies and strengthening of the emergency care network
Conceição et al. (2022)	Neglected Tropical Diseases	Structural racism, racial and socioeconomic inequality	Black and marginalized populations present greater exposure and less access to therapeutic technologies	Incorporation of the struggle against structural racism into public policies
Rijk et al. (2021)	Neglected Tropical Diseases	Gender inequality, barriers to access, human rights	Vulnerabilities intensified by the absence of an equitable approach	Formulation of policies based on equity, gender, and human rights
Magalhães et al. (2023)	Neglected Tropical Diseases	Poverty, early ecosystem destruction, environmental vulnerability	Correlation between environmental degradation and increased disease risk	Integration between health, environment, and sustainable development
Lin et al. (2025)	Neglected Tropical Diseases and malaria (global analysis)	Global socioeconomic inequality, structural vulnerability	Persistence of disease burden in socially disadvantaged populations	Need for global and national policies guided by equity
Rocha et al. (2021)	Systemic analysis (COVID-19 as a comparative parameter)	Socioeconomic inequality, structural vulnerability of the health system	Inequalities compromised the system's response capacity	Structural strengthening of the SUS with a focus on territorial equity

Source: Authors (2026)

Taken together, the results show that tropical diseases in Brazil constitute socially produced and territorially determined phenomena. The discussion indicates that interventions centered exclusively on biomedical control tend to have limited effectiveness when disconnected from public policies aimed at reducing poverty, expanding basic sanitation, strengthening primary care, and confronting structural racism.

Thus, the persistence of these diseases reveals not only epidemiological challenges but also political and social obstacles that require intersectoral responses. Collective health, as a theoretical-practical field committed to equity, must assume a strategic role in the formulation of policies that integrate health surveillance, social justice, and sustainable development, recognizing that overcoming tropical diseases in Brazil depends fundamentally on reducing the social inequities that sustain them.

CONCLUSION

The analysis of the scientific evidence demonstrates that the persistence of tropical diseases in Brazil is deeply rooted in the social inequities that structure the territory and social relations. The diseases investigated are not distributed randomly, but rather follow patterns determined by inequalities of income, race, gender, housing conditions, basic sanitation, and access to health services. This finding reinforces the understanding that the health-disease process is socially determined, requiring approaches that transcend the traditional biomedical model and incorporate structural dimensions into the formulation of public policies.

The findings also show that interventions centered exclusively on clinical and epidemiological control tend to have limited impact when disconnected from intersectoral policies aimed at reducing poverty, improving environmental conditions, and confronting structural racism. The territorialization of actions, the strengthening of primary health care, and the expansion of equitable access to strategic supplies are fundamental elements for mitigating the disparities observed. In this sense, collective health assumes a strategic role by articulating surveillance, health promotion, and social justice.

Additionally, it becomes essential to recognize that tropical diseases constitute an expression of historical processes of exclusion and unequal development. The incorporation of the perspectives of equity, human rights, and environmental sustainability is central to building more effective and lasting responses. Overcoming these diseases therefore requires political and institutional commitment to reducing the structural inequalities that sustain them, consolidating the right to health as a guiding principle of state action.

As a suggestion for future research, it is recommended that longitudinal and multicenter studies be conducted integrating spatial modeling, socioeconomic indicators, and environmental variables, in order to assess the impact of intersectoral policies on the reduction of tropical diseases in highly vulnerable territories. Investigations that incorporate race, gender, and territorial inequality perspectives may contribute to deepening the understanding of the mechanisms producing health inequities, thereby supporting more effective strategies within Brazilian collective health.

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