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Reported cases of dengue in Brazil from 2015 to 2024

Abstract

Introduction: Dengue is caused by the DENV virus, which is a single-stranded RNA virus of the flaviviridae family, transmitted by Aedes vectors. There are four main serotypes of this virus: DENV-1, DENV-2, DENV-3 and DENV-4. This virus has impacted global public health, especially the Eastern Mediterranean, Southeast Asia, Africa, the Western Pacific, and South America. In Brazil, the progression of the disease is a cause for constant concern and demonstrates a current growth trend.

Methodology: An exploratory, cross-sectional and descriptive epidemiological study of time series (2015 to 2024) was carried out, with data from DATASUS - SUS Information System, of the Ministry of Health, Brazil**.**

Results: There were n=16122017 reported cases of dengue in Brazil from 2015 to 2024, with an initial oscillating trend, but a continuous increasing trend since 2021, which peaked in 2024 (n=6452721) cases. More frequent in females with n=8838100 cases. The 20-39 age group had n=5828337 cases. The race was variable by region, being more frequent in the brown race in the Northeast, Midwest and North regions and more prevalent in the white race in the South and Southeast regions. The Unknown/white serotype was more prevalent. The unknown/white serotype was the most frequent (n=15839881), followed by DEN 1 (n=199796). Regarding the evolution, there was a predominance of unknown/white (n=3578656), followed by cure (n=12526508), deaths from dengue (n=12213) cases. Hospitalizations occurred in n=489729 reported cases of dengue.

Final considerations: Dengue in Brazil is a highly worrying epidemic, the exorbitant number of cases presented in 2024, demonstrating a continuous growing trend since 2021, is something that raises a public health alert and demonstrates difficulties for the Brazilian health system in preventing this disease.

Keywords: epidemiology, dengue fever, Brazil

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Introduction

Dengue is caused by the DENV virus, which is a single-stranded RNA virus of the flaviviridae family, transmitted through vectors of the genus Aedes. There are four main serotypes of this virus: DENV-1, DENV-2, DENV-3 and DENV-4, which have different genetic materials, although they share the same structural antigens.[1] It is important to emphasize that this differentiation of serotypes means that infection by the dengue virus can occur more than once, and that this reinfection can result in an increase in viremia, and, consequently, in more severe clinical conditions of the disease.[2]

According to the Brazilian Ministry of Health (2024),[3] dengue can occur either asymptomatically or symptomatically and presents three clinical phases: febrile, critical, and recovery. In symptomatic cases, this comorbidity may exhibit various manifestations such as fever, usually high and with sudden onset, as well as headache, fatigue, myalgia, arthralgia, retro-orbital pain, and/or maculopapular rash. In severe cases, where the critical phase occurs, dengue can still progress to death.

Worldwide, the dengue virus has infected almost 390 million people annually, causing approximately 500,000 hospitalizations and 20,000 deaths. The most affected regions are the Eastern Mediterranean, Southeast Asia, Africa, the Western Pacific and South America.[4] In turn, specifically in Brazil, approximately 18 million people have already been infected by the dengue virus in recent decades, with the mortality of the disease showing a geographic increase over time.[5]

However, as there is no specific treatment for this disease, the fight against dengue has occurred through the implementation of prevention measures that focus on public health, such as the control of the transmitting mosquito and vaccination.[6] It should be noted that dengue immunization began to be offered in a pioneering way in the Brazilian unified health system since February 2024, focusing on age group and priority locations.[3]

In this context, in order to understand the current reality of coping with this disease, this study aimed to investigate the epidemiology of dengue cases in Brazil, from 2015 to 2024.

Methodology

This research is a descriptive exploratory epidemiological study, with secondary data from the official database of the Brazilian Ministry of Health, called DATASUS, through TABNET/DATASUS, using the time series 2015 to 2024.

Data were collected in the TABNET/DATASUS: SINAN – Notifiable Diseases Information System, on Notified Cases of Dengue, using the following variables: Region of notification, year of notification (2015 to 2024), race, sex, age group, education, dengue by serotype, evolution, hospitalization, confirmation criteria, final classification.

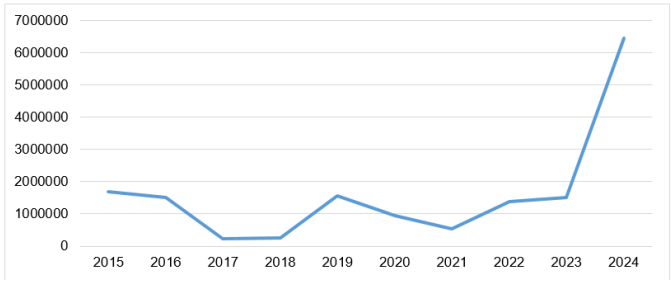
The data were collected in SINAN (Tabnet/Datasus) and exported to Excel, where graphs and tables were produced and informations explored in the Bioestat 5.3 Program for the extraction of statistical

data. The results were expressed as absolute and relative frequencies, mean, standard deviation and coefficient of variation.

As for the ethical aspects, this study does not require approval/submission to the Research Ethics Committee, as it uses data from an official database, which does not inform private individual data, but has population data that does not allow the identification of the individual, therefore complying with Law n° 14.874 of May 28, 2024[7] and other regulations regarding research in humans.

Results

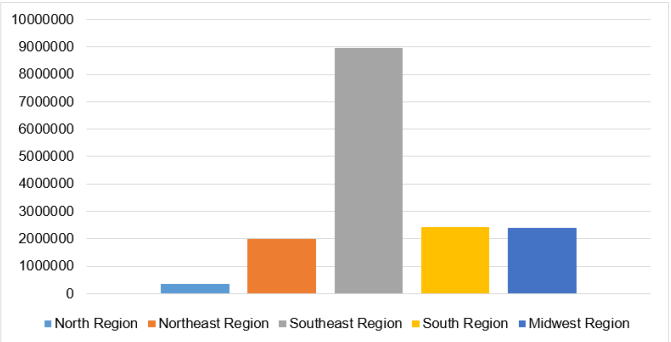
Dengue in Brazil (Graph 1) reached the exorbitant figure of n = 16122017 reported cases of dengue from 2015 to 2024 from 2015 to 2024. It has an oscillating temporal trend over the years, however with a worrying growing trend, even more relevant from 2023 onwards, with an incredible upward peak. In the other periods, it started with 2015 (n=1696340) notified cases, 2016 (n=1518858) and a descending peak until 2017 (n=243336) notified cases, remaining stable until 2018 (n=266386), with an ascending peak in 2019 (n=1556588) cases, a new descending peak in 2020 (n=952509) cases, and 2021 (n=531811) reported cases of dengue. From 2021 onwards, a continuous upward curve is observed in 2022 (n=1394532), 2023 (n=1508936) and culminates in an extraordinary increase in reported cases of dengue in 2024 (n=6452721). The mean = 1612201.7 (±17886990) and Coefficient of Variation (CV) = 110.95% were obtained.



Graph 1 Distribution of notified cases of Dengue in Brazil, from 2015 to 2024.

Source: Prepared by the authors with data from the Ministry of Health/SVSA - Notifiable Diseases Information System - Sinan Net, 2025.

With regards to the regions (Graph 2), it was observed that the Southeast region had the highest number of reported cases of Dengue, with n = 8948969, the South region occupied the second position, with n = 2433000, the Central-West region had n = 2386664, followed by the Northeast region, with n = 2000315 and the North region occupying the lowest position, with n = 35055.



Graph 2 Distribution of reported cases of Dengue in Brazil, by region, from 2015 to 2024.

Source: Prepared by the authors with data from the Ministry of Health/SVSA - Notifiable Diseases Information System - Sinan Net, 2025.

Regarding the distribution of Dengue cases by region for each year analyzed in Brazil, the Southeast region showed a decreasing oscillating trend from 2015 (n=1051063) to 2017 (n=538480), the year in which there was the largest decreasing peak for this condition in the region. After that, there was an upward trend that started in 2018 (n = 73143) and continued until 2019 (n = 1019992), from 2020 (n = 300512), there was a decreasing trend and subsequent decrease in the number of notifications in 2021 (n = 183366), in 2022 (n = 451185) there was a new upward trend, followed by 2023 (n = 793279) and the largest upward peak in 2024 with an impressive n = 4157682, representing the highest number of notifications of all regions throughout all the years studied. In the South region, there was an oscillating trend during the years analyzed, with a lower number of cases reported in 2018 (n = 1739) and an increasing trend in 2022 (n = 308706), which continued in 2023 (n = 390113) and presented the region's highest ascending peak in 2024 (n = 1212077).

As for the Northeast region, there was an oscillating increasing trend, with the lowest value reported in 2017 (n = 84845) and a decreasing peak in 2018 (n = 66561), in which the highest ascending peaks were in 2022 (n = 243133) and in 2024 (n = 350832) there was the highest value reported. In the Central-West region, there was an oscillating decreasing trend throughout the study period, with a smaller decreasing peak in 2017 (n=80052), relevant ascending peaks in 2022 (n=341205) and 2024 (n=674952). The North region followed the same oscillating trend in the years analyzed, with a smaller decreasing peak in 2018 (n = 17789) and slight ascending peaks of notifications in 2022 (n = 50303) and in 2024 (n = 57178).

Regarding the regions analyzed regarding race (Table 1), in the Northeast the Brown race prevailed (n = 1095420), followed by notifications in Blank/Ignored (n = 625917), in the Center-West the Brown race also predominated (n = 1084537), followed by notifications in Blank or Ignored (n = 728917), as well as in the North region the Brown race prevailed (n = 259025), followed by the White race (n = 40694). In the Southeast region, the White race predominated (n = 3572556), in second place the Brown race (n = 2631999), as well as in the South, where the White race prevailed (n = 1786733), in second place the Brown race (n = 347362). The yellow race had the lowest number of cases in the North (n=46639) and the Indigenous race had the lowest number of notifications in the other regions, totaling n=38946 throughout Brazil.

Regarding sex (Table 1), females prevailed in all regions analyzed, with female (n=8838100) and male (n=7259451) reported cases of dengue. Regarding age group, the 20-39 age group received the highest number of notifications, with n=5828337, throughout Brazil, followed by those aged 40-59 years, with n=4258409, in all regions. Regarding education, the highest values were found in blank or ignored notifications in the five regions, totaling n=8730735, with a higher incidence of cases in individuals with complete high school education, totaling n=2344567, throughout Brazil.

Regarding the reported cases of Dengue by serotype and region in Brazil, the notification of the serotype as unknown/blank prevailed in all regions, with a total of n=15839881 in Brazil. Dengue type 1 had a total of n=199796 notifications in Brazil and prevailed in the North (n=7305), Southeast (n=110996) and South (n=49526) regions. Dengue type 2 had a total of n=79343 reported cases in Brazil, prevailing in the Northeast (n=9527) and Central-West (n=26634) regions. As for Dengue type 3, it had a total of n=1933 notifications in Brazil, representing the smallest number of cases in the Northeast

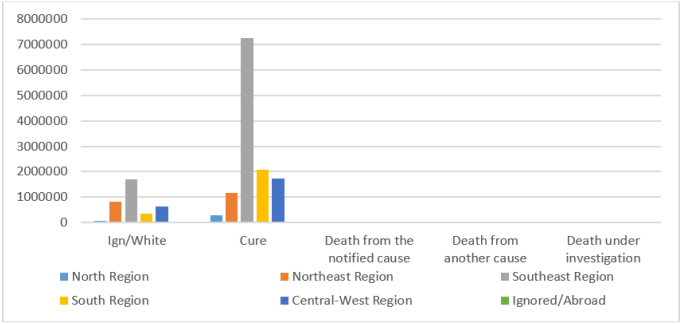
(n=50), South (n=206) and Central-West (n=32). Dengue type 4 had the lowest number of cases, totaling n=1064 notifications in Brazil, representing the lowest number of cases in the North (n=65) and Southeast (n=307).

Table 1 Distribution of reported cases of Dengue in Brazil, by race, sex, age group and education level, by region, from 2015 to 2024

	North Region	Northeast Region	Southeast Region	South Region	Midwest Region
Race					
Ign/blank	32070	625917	2218588	199155	728917
White	40694	190709	3572556	1786733	466862
Black	11963	68738	444102	74133	70437
Yellow	4639	13703	68124	20412	26262
Brown	259025	1095420	2631999	347362	1084537
Indigenous	4664	5828	13600	5205	9649
Sex					
Blank	14	113	157	24	20
Ignored	212	2965	15742	2030	3189
Male	164281	868619	4033685	1116365	1076495
Female	188548	1128618	4899385	1314581	1306960
Age range					
Blank/IGN	100	855	19400	324	635
<1 year	6806	40541	80168	15968	31238
01 to 4 years	13176	83053	202079	48674	71298
05 to 09 years	23685	141290	428366	114819	128310
10 to 14 years	31258	168037	607398	161105	165016
15-19 years	36741	193853	760659	197790	219379
20-39 years	135977	753060	3200059	845264	893977
40-59 years	78141	438219	2442631	677266	622152
60-64 years	9846	59279	412733	122886	89465
65-69 years	6924	44801	309579	96074	64528
70-79 years	7475	54450	350733	113004	72435
80 and + years	2908	22725	134858	39789	28131
Education					
Ign/White	135007	1251997	4839320	1115874	1388527
Illiterate	3656	15656	30741	16045	9776
1st to 4th grade incomplete of EF	21167	65557	273245	101517	62939
4th grade complete of EF	9569	34201	176047	62564	38705
5th to 8th grade incomplete of EF	30199	91629	448717	184740	120458
Elementary school completed	16136	49906	307761	115113	84740
Incomplete high school	24232	69259	437884	144434	113599
High school completed	56508	164886	1428117	401995	293061
High school completed	7601	17199	133554	46843	31913
Higher education completed	15847	35923	360485	118162	68837
Not applicable	33133	204102	513098	125713	174109

Source: Prepared by the authors with data from the Ministry of Health/SVSA - Notifiable diseases information system - Sinan Net, 2025.

Regarding the evolution of cases (Graph 3), the majority of reported cases of dengue in Brazil had unknown/null evolution (n=3578656) cases, cure (n=12526508), death due to the reported condition (n=12213), death due to another cause (n=3077) and death under investigation (n=1563) reported cases of dengue. Regarding the distribution of these cases by region, the cure prevailed in the Southeast region (n=7251265), in second place the South region (n=2088760), followed by the Central-West region (n=1739387), consequently the Northeast region (n=1172041) and the North region (n=275047) occupying the lowest position of cases of cure of the disease.



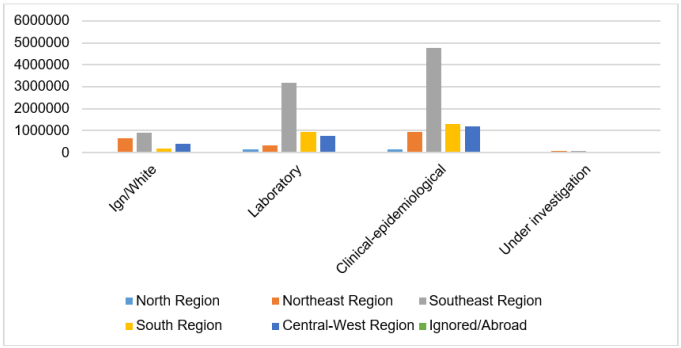
Graph 3 Distribution of reported cases of Dengue in Brazil, by evolution, by region, from 2015 to 2024.

Source: Prepared by the authors with data from the Ministry of Health/SVSA - Notifiable Diseases Information System - Sinan Net, 2025.

Regarding the evolution (Graph 3), the second highest prevalence was that of cases reported as blank/ignored, prevailing in the Southeast region (n=1689020), followed by the Northeast region (n=826181), Central-West (n=644462) and North (n=77634). The notification of death due to the disease had the highest number of cases in the Southeast (n=6439), in second place the South (n=2280), followed by the Central-West (n=2150), Northeast (n=1127) and North (n=217). Regarding deaths from other causes, notifications predominated in the Southeast region (n=1471), followed by the South (n=593), Central-West (n=517), Northeast (n=359) and North (n=137). Regarding deaths under investigation, there were more notifications in the Southeast region (n=774), followed by Northeast (n=607), Central-West (n=148), North (n=20) and South (n=14).

Regarding hospitalizations of dengue cases in Brazil, ignored/blank (n=5734676) cases, hospitalization: yes (n=489729) cases and no (n=9897612) reported cases of dengue. Regarding hospitalization/region, the Southeast region (n=5683915) had the highest number of notifications stating that hospitalizations of the cases were NOT necessary, followed by the South region (n=1750736), Central-West (n=1411906), Northeast (n=839071), and lastly the North (n=211977). Regarding the notifications that confirmed the need for hospitalization of cases, hospitalizations prevailed in the Southeast region (n = 201373), in the Central-West (n = 110494), followed by the Northeast (n = 79171), South (n = 78602) and lastly the North (n = 20088). Regarding the ignored/blank notifications on this hospitalization parameter, the Southeast region (n = 3063681) prevailed, in second place the Northeast region (n = 1082073), then the Central-West (n = 864264), followed by the South (n = 603662) and lastly the North (n = 120990).

About the confirmation criteria for dengue cases in Brazil (Graph 4), the Clinical-Epidemiological criterion predominated (n=8396472) cases, followed by the ignored/blank (n=2210602) and under investigation (n=204034) reported cases. Regarding the confirmation/region criterion, the Southeast region predominated (n=4787629), followed by the South (n=1307524), in third place by the Central-West (n=1202388), then by the Northeast (n=948478) and lastly by the North (n=150451). The second most prevalent criterion was the Laboratory, with the highest number of notifications in the Southeast (n = 3168075), followed by the South (n = 933518), Central-West (n = 754259), Northeast (n = 317145) and in last place by the North (n = 137901). Regarding these criteria, there was a significant number of notifications classified as ignored/blank, in which the Southeast region stood out (n = 904716), followed by the Northeast (n = 665354), Central-West (n = 399843), South (n = 182112) and in last place the North (n = 58576). Regarding notifications classified as Under Investigation, the Southeast region prevailed (n=88549), followed by the Northeast region (n=69338), then the Central-West (n=30174), the South (n=9846) and finally the North (n=6127).



Graph 4 Distribution of reported cases of Dengue in Brazil, by confirmation criteria, from 2015 to 2024.

Source: Prepared by the authors with data from the Ministry of Health/SVSA - Notifiable Diseases Information System - Sinan Net, 2025.

Regarding the final classification/region of reported cases of Dengue in Brazil (Table 2), the classification of Dengue prevailed, totaling n=1,3458,267, accounting for all regions analyzed. The second most prevalent classification was Inconclusive in the North (n=63,266), Northeast (n=692,259), Southeast (n=953,846), South (n=188,871) and Central-West (n=409,533) and the third position was occupied by the classification of Dengue with warning signs, also in the North (n=3,896), Northeast (n=22,637), Southeast (n=90,859), South (n=41,037) and Central-West (n=53,073) regions. The fourth most prevalent classification in all regions was Classic Dengue, totaling n=102,418 in Brazil. The lowest prevalence classification was Dengue Shock Syndrome, with only n=13 cases throughout Brazil during the entire study period.

Table 2 Distribution of reported cases of Dengue in Brazil, by final classification by region, from 2015 to 2024

Notification Region	**Northern Region**
Ign/White	745
Classic Dengue	2196
Dengue with complications	6
Dengue Hemorrhagic Fever	1
Dengue Shock Syndrome	0
Inconclusive	63266
Dengue	**282547**
Dengue with warning signs	3896
Severe dengue	398
Notification Region	**Northeast Region**
Ign/White	5120
Classic Dengue	22194
Dengue with complications	56
Dengue Hemorrhagic Fever	12
Dengue Shock Syndrome	3
Inconclusive	692259
Dengue	**1255507**
Dengue with warning signs	22637
Severe dengue	2527

Table 2 Continued...

Notification Region	**Southeast Region**
Ign/White	12038
Classic Dengue	62163
Dengue with complications	153
Dengue Hemorrhagic Fever	30
Dengue Shock Syndrome	9
Inconclusive	953846
Dengue	**7821084**
Dengue with warning signs	90859
Severe dengue	8787
Notification Region	**South Region**
Ign/White	3374
Classic Dengue	5053
Dengue with complications	25
Dengue Hemorrhagic Fever	1
Dengue Shock Syndrome	0
Inconclusive	188871
Dengue	**2191823**
Dengue with warning signs	41037
Severe dengue	2816
Notification Region	**Central-West Region**
Ign/White	2275
Classic Dengue	10812
Dengue with complications	36
Dengue Hemorrhagic Fever	8
Dengue Shock Syndrome	1
Inconclusive	409533
Dengue	**1907293**
Dengue with warning signs	53073
Severe dengue	3633
Notification Region	**Ignored/Exterior**
Ign/White	1
Classic Dengue	0
Dengue with complications	0
Dengue Hemorrhagic Fever	0
Dengue Shock Syndrome	0
Inconclusive	0
Dengue	**13**
Dengue with warning signs	0
Severe dengue	0
Brasil	Total
Ign/White	23553
Classic Dengue	102418
Dengue with complications	276
Dengue Hemorrhagic Fever	52
Dengue Shock Syndrome	13
Inconclusive	2307775
Dengue	**13458267**
Dengue with warning signs	211502
Severe dengue	18161

Source: Prepared by the authors with data from the Ministry of Health/SVSA - Notifiable Diseases Information System - Sinan Net, 2025.

Discussion

According to the data obtained by this study, more than sixteen million people were infected by the dengue virus in Brazil between 2015 and 2024. It is also important to highlight that the year 2024 showed a drastic increase in the number of DENV infections, this being the highest point in this historical series, with more than six million reported cases. This exacerbated increase, according to Gurgel et al.,[5] is a record in relation to other dengue epidemics in Brazil and may be associated with factors such as climate change, the disorderly growth of cities and the greater adaptation of the vector mosquito to the environment

In turn, for Sansone et al.,[8] the resurgence of the DENV-3 serotype in Latin America and, specifically, in Brazil, at the end of 2023, may help to explain the outbreak of dengue cases that occurred in 2024, since, after more than a decade without a widespread manifestation of DENV-3, the Brazilian population would have become more vulnerable to this serotype. However, the fact that in Brazil the notification of the serotype as unknown/blank prevails in all regions means that this last argument cannot be easily confirmed. Furthermore, among the serotypes identified, there was a greater occurrence of DENV-1, DENV-2 and, later, DENV-3 and DENV-4.

Regarding geographic distribution, a greater occurrence of cases was observed, in decreasing order: in the Southeast Region, in the South Region, in the Central-West Region, in the Northeast Region and, lastly, in the North Region. It should be noted that this same order was also followed regarding the number of hospitalizations, evolution to recovery and evolution to death in each Region, which demonstrates that these parameters are linked to the number of dengue infections in each area.

It is worth noting, however, that after downward peaks in 2017 or 2018, and subsequent fluctuations, all regions reached their upward peak in 2024, with particular emphasis on the Southeast Region, which presented almost twice as many cases as all other regions combined. Thus, it can be seen that despite the record cases of dengue fever in all regions in 2024, the major epidemic observed in Brazil in the aforementioned year was mainly driven by the Southeast of the country.

It is important to say that the Southeast Region presents several predisposing factors for the high numbers presented, since dengue transmission is essentially urban and this is the most populous and densely populated region in the country, in addition to having socio-environmental and climatic conditions conducive to the development of the vector mosquito.[9]

It is also important to emphasize that, while the largest number of reported cases of dengue in the Central-West, Northeast and North regions were among the mixed race, the majority of the population in these regions, the largest number of cases in the Southeast and South regions were among the white race, the majority of the population among those from the Southeast and South.

It is also interesting to note that the age group most affected by this disease was 20-39 years old, followed by 40-59 years old, that is, the economically active adult population, and that males have the highest number of cases. In this sense, according to Marczell et al.,[10] in addition to medical costs, dengue also causes serious economic damage by strongly impacting the Brazilian workforce, due to lost workdays, especially among those associated with the informal sector.

Finally, it is important to note that the clinical-epidemiological criterion was the most used in the classification of dengue cases,

followed by the laboratory criterion. This is because, although there has been significant development in the production of rapid and biomolecular tests, such diagnostic methods are still not accessible in poorer areas or, often, laboratories do not have the structure to meet the high demand.[11]

Likewise, severe cases of the disease, or those with warning signs, are still a minority. It is worth remembering that, according to the Brazilian Ministry of Health,[3] cases are considered severe when there is shock or respiratory distress, severe bleeding and/or severe organ damage, as well as symptoms such as: intense and continuous abdominal pain; persistent vomiting, fluid accumulation, postural hypotension, among others.

Final considerations

Dengue fever in Brazil is a highly worrying epidemic. The exorbitant number of cases reported in 2024, demonstrating a continuous upward trend since 2021, is something that raises a public health alert, demonstrating a certain suspicion of operational difficulties in the health system in preventing cases, although it demonstrates reasonable ability to manage the cases that have occurred, since the vast majority were not linked to death. Understanding that dengue fever is a preventable disease that depends on environmental factors and control of vector mosquitoes, it is important to reevaluate the health measures instituted to prevent dengue cases, aiming to stabilize or preferably prevent such cases.

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Conflicts of interest

The authors declare there is no conflict of interest.

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