MORTALITY IN ELDERLY PEOPLE DUE TO DENGUE IN THE FEDERAL DISTRICT IN 2024: AN EPIDEMIOLOGICAL ANALYSIS

https://doi.org/10.56238/sevened2025.001-019

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ABSTRACT

This article focuses on analyzing the mortality of elderly people due to dengue in the Federal District in 2024, highlighting epidemiological and sociodemographic aspects. Dengue, transmitted by the Aedes aegypti mosquito, represents a serious public health problem in tropical areas, with the Federal District being an intensely affected region. In 2024, the Federal District had the highest number of dengue cases in Brazil, with older adults being particularly vulnerable due to comorbidities and weaker immune systems. The research used a cross-sectional and quantitative approach, analyzing data on confirmed and notified cases of dengue among the elderly, considering variables such as gender, age and geographic region. Based on the results, the research sought to understand the specific risk factors for mortality in the elderly, proposing strategies to prevent the advance of the disease and reduce mortality. The analysis concludes that, given the high incidence and lethality among the elderly, it is crucial to implement adapted public health policies that prioritize the protection of the most vulnerable populations and promote effective actions against the spread of dengue.

Keywords: Mortality of the Elderly. Interculturality. Epidemiology. Public health. Dengue fever.

INTRODUCTION

Dengue is an infectious disease caused by an RNA genome virus, of the genus Flavivirus, family Flaviviridae, of which four serotypes are known (DENV-1, DENV-2, DENV-3 and DENV-4), which represents a significant public health problem in several tropical and subtropical regions of the world (Amin P, 2017; Vargas LDL, 2021). In Brazil, dengue has been a growing concern, especially in the Federal District, where recurrent outbreaks have been recorded over the years. In 2024, the profile of dengue deaths in all age groups and especially in elderly people reveals important epidemiological and sociodemographic aspects that require a detailed analysis for the formulation of effective control and prevention strategies (SVS, 2024).

The Aedes aegypti, the mosquito responsible for transmitting dengue, exhibits active behavior during the day and prefers to lay its eggs in stagnant and clear waters, commonly found in residential areas. The process of transmission of the dengue virus begins when this mosquito bites an already infected individual, allowing the virus to enter its digestive system and proliferate in the midgut. Subsequently, the virus travels to the mosquito's salivary glands, from where it is transmitted to other humans through subsequent bites (Barbosa, 2011).

After an individual is infected with the dengue virus, viral replication occurs in striated and smooth muscle cells, fibroblasts, and regional lymph nodes, resulting in viremia. Symptoms manifest themselves subsequently during the incubation period, which varies from 2 to 10 days after exposure to the virus through a bite (Figueiredo, 1999).

The spread of dengue is affected by several factors, including high population density and insufficient basic sanitation infrastructure. In addition, human mobility and changes in the environment contribute to the expansion of the vector. The disease has a varied spectrum of manifestations, ranging from asymptomatic to severe forms. The initial signs, often generic, include fever and headache, and may progress to more critical states, which include shock and hemorrhagic phenomena (Brasil, 2024a; Brazil, 2023).

Vulnerability to the dengue virus is widespread, however, it is imperative to consider risk factors specific to the individual, such as age group, ethnicity, existing comorbidities, and the occurrence of secondary infections, which can influence the severity of the disease manifestation. In addition, individuals over the age of 65 are in a higher risk category due to greater susceptibility to complications, attributed to a weaker immune system, the presence of other pathologies, and a greater tendency to dehydration (Oliveira, 2024).

Epidemiological studies indicate that the severity of dengue in older people can be attributed to several factors, including the presence of chronic comorbidities, such as

diabetes, hypertension, and cardiovascular disease, which can aggravate the clinical course of the disease (Martelli et al., 2015). In addition, the weakened immune system of the elderly may contribute to a less effective response to the dengue virus, increasing the risk of serious complications and death (Silva et al., 2018).

In 2024, the Federal District led the dengue incidence coefficient in Brazil, with 9,640.9 cases per 100,000 inhabitants, followed by Minas Gerais with 8,074.1, reflecting the severity of the situation both in the capital and in the Southeast. In the South, Paraná and Santa Catarina recorded coefficients of 5,528.3 and 4,650.7, respectively, while Rio Grande do Sul had a much lower value, of 1,810.0, evidencing the influence of local variables on the spread of the disease. In addition, densely populated states such as São Paulo and Rio de Janeiro, with coefficients of 4,393.3 and 1,741.8, demonstrate that intense urbanization does not protect against dengue, underlining the complexity of its control (COE, 2024).

In view of the above, the research is justified because the analysis of the profile of deaths in elderly people due to dengue is important to understand the specific risk factors and develop targeted intervention strategies. The objective of this study is to describe the profile of deaths in elderly people due to dengue in the Federal District in 2023/2024, providing a detailed analysis of the epidemiological and sociodemographic factors involved. Understanding these factors is essential for the formulation of effective public policies that can reduce mortality among the elderly and control the spread of dengue in the region.

METHOD

This is a cross-sectional, quantitative, retrospective and descriptive research. The study population consisted of intentional selection of dengue cases among elderly residents in the Federal District.

This study includes all confirmed cases notified in the Notifiable Diseases and Information System (SINAN) within the scope of the Federal District, Brazil, published in the Epidemiological Bulletin Year 19, No. 36 of the Undersecretariat of Health Surveillance, of the Secretariat of State and Health, in the period Year 19, No. 36, September 2024 and the Emergency Operation Center (COE). Report: issue nº 21 | SE 01 to 26/2024.

The variables analyzed included: gender, age, geographic distribution of the disease; cumulative number of positive cases; deaths of residents; distribution, incidence and frequency of confirmed cases hospitalized; case fatality rate; and

To calculate the incidence, the numerator considered the confirmed cases by state of residence and, in the denominator, the resident population by state and year, and the result was multiplied by 100 thousand, according to the following calculation method:

$$\text{INCIDENCE} = \frac{\text{Number of new cases occurring in a place X in a given time}}{\text{Total number of individuals in the baseline population (at risk) of place X at the given time}} * 10n$$

The case fatality rate is commonly used to determine the proportion of fatal cases among the total number of cases; and thus assess the severity of an epidemic25. To calculate lethality in the Federal District, the numerator considered the number of death records due to COVID-19 among the cases classified as confirmed that were notified in SINAN.

$$\text{LETHALITY} = \frac{\text{Number of deaths from disease A}}{\text{Total cases of disease A}} * 10n$$

The study used aggregated secondary data, in the public domain, presented in a consolidated manner and with total omission of the subjects' identity, available in the database of the Health Surveillance Secretariat of the Federal District, Brazil. For this reason, it was not necessary to submit and analyze a Research Ethics Committee (REC). This research followed the criteria of Resolution No. 510/2016 of the Brazilian National Council for Ethics in Research (CONEP).

RESULTS AND DISCUSSION

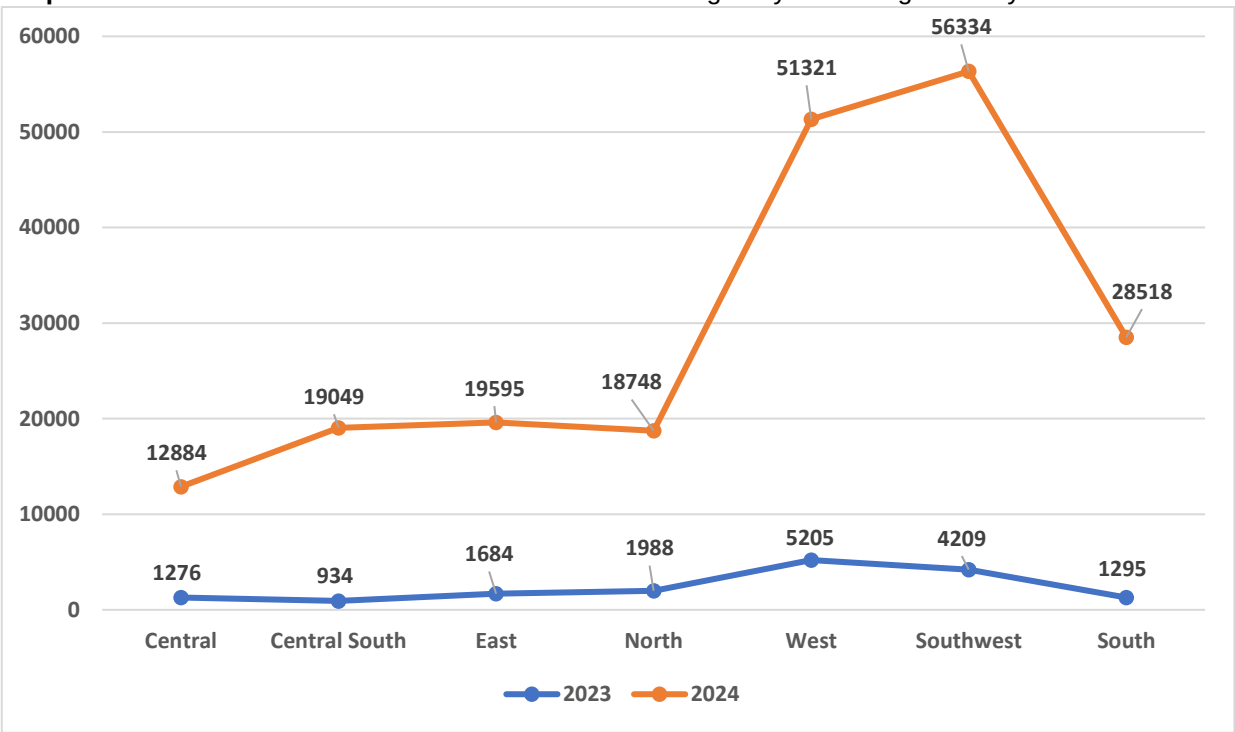
On January 25, 2024, the governor of the Federal District promulgated Decree No. 45,448, making official the state of public health emergency in the Federal District. This measure was taken in response to the threat of an epidemic caused by diseases transmitted by the Aedes vector. According to the aforementioned decree, the emergency declaration authorized the implementation of important administrative measures to contain the health crisis. Among these measures, the permission to carry out emergency public procurement of inputs and materials stood out, as well as the contracting of services indispensable for the effective fight against the emergency situation.

The Federal District has an area of 5,789.16 km², equivalent to 0.06% of the country's area. The territory of the Federal District is organized into 7 (seven) Health Regions, namely: Central Health Region, Central-South Health Region, East Health Region, North Health Region, West Health Region, Southwest Health Region and South Health Region. These health regions are composed of the Administrative Regions (AR) of

the Federal District, whose physical limits define the jurisdiction of government action for the purposes of administrative decentralization and coordination of public services. Each of these health regions of the Federal District, depending on their cultural, social, economic, and environmental characteristics, presents a different epidemiological scenario in relation to the disease situation.

The Southwest health region had the highest number of probable cases (56,334), followed by the West (51,321 cases), South (28,518 cases), East (19,595 cases), Central-South (19,049 cases), North (18,748 cases) and Central (12,884 cases) up to EW 36.

Graph 1. Distribution of notified and confirmed cases of dengue by health region and year of notification.



Source: SINAN Online. Data extracted on 09/09/2024 at 10 am, subject to change.

Table 1 – Distribution of the number and variation (%) of probable cases of dengue by health and administrative region of residence. DF, 2023 and 2024, until epidemiological week 17.

Health Region	Dengue Cases		Change %
	2023	2024	
Central	1,276	12,884	909,7
South Center	934	19.049	1939,5
East	1.684	19.595	1063,6
North	1.988	18.748	843,1
West	5.205	51.321	886,0
Southwest	4.209	56.334	1238,4
South	1.295	28.518	2102,2

Source: SINAN Online. Data extracted on 09/09/2024 at 10 am, subject to change.

The evolution of dengue cases in the Federal District (DF) between the years 2023 and 2024, up to epidemiological week 36, reveals an alarming scenario and demands immediate attention from health authorities and the population. According to data extracted

from SINAN on September 09, 2024, there has been a significant increase in confirmed dengue cases, including those with alarm signs, severe cases, and, unfortunately, deaths.

In 2023, the Central region recorded 48 cases with alarm signs, but there were no serious cases or deaths. However, in 2024, that same region saw a jump to 790 cases with alarm signs, 38 severe cases, and 45 deaths. This significant increase was also reflected in other regions, such as the Center-South, which went from 30 cases with alarm signs in 2023 to 908 in 2024, in addition to registering 54 severe cases and 48 deaths.

The West region had the highest number of cases in 2024, with 3,120 cases with alarm signs, 90 severe cases, and 87 deaths, a drastic increase compared to 2023 figures. The Southwest region also showed a worrying increase, going from 47 cases with alarm signs and 3 serious in 2023 to 2,418 and 153, respectively, in 2024, in addition to an increase in deaths from 1 to 130.

The Eastern, Northern, and Southern regions, while experiencing fewer cases compared to other areas, have also experienced significant increases in all aspects of the disease. Notably, the region classified as "Blank" saw an increase in cases with alarm signs from 57 in 2023 to 1,823 in 2024, but recorded no deaths in 2024.

In total, the DF saw an increase from 289 confirmed cases of dengue with alarm signals in 2023 to a staggering 11,799 in 2024. Severe cases increased from 9 to 506, and deaths from 2 to 440 in the same period.

Table 2 – Confirmed cases of dengue with alarm signs, severe dengue and dengue deaths by health region of residence. DF, 2023 and 2024, until epidemiological week 17.

Health Region	Confirmed Cases of Dengue					
	2023			2024		
	Alarm Signs	Grave	Deaths	Alarm Signs	Serious	Deaths
Central	48	1	0	790	38	45
South Center	30	1	0	908	54	48
East	14	1	0	894	51	41
North	37	1	0	1112	45	41
West	45	1	1	3120	90	87
Southwest	47	3	1	2418	153	130
South	10	1	1	713	58	48
Blank	57	1	0	1823	17	0
DF	289	9	3	11.799	506	440

Source: SINAN Online. Data extracted on 09/09/2024 at 10 am, subject to change.

According to the table above, until epidemiological week 36 of 2024, 440 confirmed cases of death from dengue were registered, revealing a worrying distribution between the different sex groups and age group. Analysis of these data provides critical insight into the impact of the disease on the population and highlights the need for targeted public health strategies.

Regarding the distribution by sex, it is observed that deaths from dengue affected women slightly more, with 230 cases, representing 52.4% of the total, while males registered 209 cases, corresponding to 47.6%. This distribution suggests that dengue is a significant threat to both sexes, requiring equal attention in terms of prevention and treatment.

Analysis by age group reveals that dengue has a disproportionately greater impact on older age groups. Notably, individuals aged 80 and over were the most affected, with 117 deaths, which represents 26.7% of the total. This group was closely followed by those between 70 and 79 years old, with 101 deaths, corresponding to 23% of the total. These data indicate that the elderly population is particularly vulnerable to the severe effects of dengue, possibly due to comorbidities and a weaker immune system.

On the other hand, the younger age groups had a relatively low number of deaths. Children under 1 year old and in the 5 to 9 year old group each had 5 deaths registered, which represents 1.1% of the total cases. Adolescents and young adults, especially in the 20-29 age group, recorded 18 deaths, or 4.1% of the total, highlighting that, although less affected, dengue still represents a significant threat to these age groups.

Table 3 – Confirmed cases of death from dengue, according to sex, age group and place of residence. DF, 2024, until epidemiological week 36.

Gender	**Frequency**	**%**
Male	209	47,6
Female	230	52,4
Age Group	**No.**	**%**
Minor 1 year old	5	1,1
1 to 4 years	1	0,2
5 to 9 years	5	1,1
10 to 14 years old	2	0,5
15 to 19 years old	3	0,7
20 to 29 years old	18	4,1
30 to 39 years old	21	4,8
40 to 49 years old	43	9,8
50 to 59 years old	55	12,5
60 to 69 years old	68	15,5
70 to 79 years old	101	23,0
80 years and over	117	26,7
Total	**440**	**100,0**

The analysis of data on dengue incidence in the Federal District (DF) up to epidemiological week 36 of 2023 and 2024 reveals an alarming situation that requires a robust and coordinated response from public health authorities and society. The Federal District, despite representing only 0.06% of the total area of the country and being organized into seven Health Regions, showed a significant variation in the distribution of

dengue cases, reflecting the complexity of the epidemiological scenario influenced by cultural, social, economic, and environmental factors.

The percentage change in probable dengue cases from 2023 to 2024 is remarkably high in all regions, with the South Region showing the highest percentage increase (2102.2%), followed by the Center-South Region (1939.5%) and the Southwest Region (1238.4%). These significant increases indicate an accelerated spread of the disease, requiring a detailed analysis of the control and prevention strategies in place.

The distribution of confirmed dengue cases with alarm signs, severe cases, and deaths by health region of residence in 2024 illustrates an uneven impact of the disease. The West Region, followed by the Southwest Region, recorded the highest number of severe cases and deaths, which can be attributed to several factors, including population density, waste management practices, and access to health services. This regional inequality in the incidence of severe cases and deaths highlights the need for personalized public health policies focused on the most affected regions.

The analysis of dengue deaths by sex and age group in 2024 reveals that females were slightly more affected than males, with 230 cases against 209. In addition, the distribution by age group shows a significantly higher vulnerability among the elderly, especially those aged 80 years and over, followed by the 70 to 79 age group. These data suggest that, in addition to general prevention strategies, specific interventions are needed to protect the most vulnerable groups, particularly the elderly, who are more susceptible to severe complications from the disease.

CONCLUSION

The analysis of data on dengue in the Federal District (DF) up to epidemiological week 36 of 2024 reveals an alarming increase in cases, including those with alarm signs, severe cases, and deaths. This scenario highlights the complexity of combating dengue, a disease influenced by varied cultural, social, economic and environmental factors. The uneven distribution of cases and deaths by region and the increased vulnerability of certain demographic groups, such as the elderly, underline the need for a multifaceted and inclusive approach.

The fight against dengue in the Federal District, therefore, is not only a challenge for health authorities, but a responsibility shared by the whole society, requiring joint efforts for effective prevention and rapid response to outbreaks.

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