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EPIDEMIOLOGICAL PROFILE OF NOTIFIED CASES OF DENGUE IN CHILDREN UNDER ONE YEAR, IN THE STATE OF BAHIA, IN THE PERIOD FROM 2010 TO 2019

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Abstract: Dengue is an acute infectious disease, caused by the Dengue Virus - DENV, and which quite often affects populations residing in places of precarious conditions, therefore, it is considered a neglected disease. Objective: to describe the epidemiological profile of reported cases of dengue in children under one year of age, in the state of Bahia, from 2010 to 2019. Material and Methods: An ecological, descriptive study with a quantitative approach, carried out from data collected from the Notifiable Diseases Information System – SINAN. Data analysis and processing were performed in Microsoft Office Excel 2010 software, where the relative and absolute frequencies of the selected variables were calculated. Results: During the period studied, 13,190 cases of the disease were reported, the highest number of cases occurred between February and July. A female predominance was observed. As for race/color, 6,255 (47.4%) cases were of mixed race. 4,418 (33.5%) notifications were classified as inconclusive. Of the total, 4,883 (37.0%) cases were confirmed by clinical-epidemiological criteria. 7,675 (58.19%) progressed to cure. The Regional Health Center - NRS Centro-Leste had the highest concentration of cases, with around 2,749 notifications. Discussion: In recent years dengue has become the most important arbovirus in Public Health in Brazil and in the world, it is a Notifiable Disease - DNC, and all suspected or confirmed cases must be notified to the Epidemiological Surveillance Service - VE. Final considerations: In view of the above, it is necessary to invest in articulated actions between government and society, aiming to prevent and control the disease, so that the impacts caused by it are minimized.

Keywords: Dengue Virus; *Aedes aegypti; Arbovirus; Children.*

INTRODUCTION

Dengue is an acute infectious disease caused by the Dengue Virus (DENV) etiologic agent belonging to the genus: *Flavivírus*, and to the family *Flaviviridae,* having as a transmitting agent the *Aedes aegypti*, and to a lesser extent, the species Aedes albopictus, which can be further classified into four different serotypes: DENV-1, DENV-2, DENV-3 and DENV-4 (JÚNIOR et al, 2013; DIAS et al, 2010; COSTA; FAÇANHA, 2011; PAN AMERICAN HEALTH ORGANIZATION, 2019).

In recent decades, dengue has become a major public health problem worldwide. This fact is justified by the high number of records of cases of the disease annually, making it the arbovirus that most frequently affects humans. The disease can affect people of any age, however, in some countries it is a public health problem that mainly affects the pediatric population (DIAS et al, 2010; JAIN; CHATURVEDI, 2010).

The disease is suspected when there is a high fever (40°C) associated with at least two symptoms: headache, retro orbital pain, myalgia, arthralgia, nausea, vomiting, swollen glands and skin rash. Symptoms last around 2 to 7 days, after the incubation period of 4 to 10 days after the bite of the infected mosquito (PAN AMERICAN HEALTH ORGANIZATION, 2019).

According to the Epidemiological Bulletin (BE) released by the Superintendence of Health Protection and Surveillance (SUVISA), up to the 48th Epidemiological Week of 2019, of the 417 municipalities in the state, 385 (92.3%) reported probable cases of Dengue. Of these, 57 (14.8%) have an Incidence Coefficient (CI) above 1,000 per 100,000 inhabitants.

Thus, it is essential to carry out studies that address this issue, so that they are used as a planning instrument and guides for control actions, as well as the elaboration of contingency plans directed to the areas of occurrence of the disease., making it possible to adopt measures according to the severity of the incident (DIAS JÚNIOR, 2017).

In view of the information presented, also considering the high number of notifications of the disease in the state of Bahia in recent years, with emphasis on the population under one year of age, the present study emerged with the objective of describing the epidemiological profile of the cases reported cases of dengue in children under one year of age, in the state of Bahia, from 2010 to 2019.

MATERIALS AND METHODS

This is an ecological, descriptive study with a quantitative approach, having the state of Bahia as the field of study. Located in the northeast region of Brazil, the state is made up of 417 municipalities, occupying a total area of 564,760,427 km2 and a population of 14,873,064 people (BAHIA, 2020; IBGE, 2019).

The study was carried out using secondary data extracted from the Notifiable Diseases Information System (SINAN) of the Ministry of Health (MS) through the Superintendence of Health Surveillance and Protection System (SUVISA) of the state of Bahia.

The collection in the SINAN database took place in April 2020, where the following variables were selected to compose the study: Year of notification; Month of notification; Sex; Race/color; Classification; Confirmation/Discard; Health Region Evolution; Regional Health Nucleus; Epidemiological weeks.

Data analysis and processing were performed in Microsoft Office Excel 2010 software, where the relative and absolute frequencies of the selected variables were calculated, followed by the elaboration of graphs and tables for the presentation of the results. The study is in line with Resolution 466 of December 12, 2012, of the National Health Council (CNS) and as it was developed

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based on secondary data, access to which is in the public domain, there was no need for it to be submitted. to the Ethics and Research Committee

RESULTS

During the study period, 13,190 cases of dengue were reported in children under one year of age in the state of Bahia, with an annual average of 1,319 cases and a median of 1,546. At the beginning of the series, there was a slight drop in the number of records in 2011, followed by a considerable increase in 2012 and 2013, around 1,715 and 1,800 cases, respectively. In 2014, there was a large decline in these numbers, a new growth in 2015 and 2016, again a decline in 2017 and 2018, with 324 and 313 cases registered, respectively, these being the years that presented the lowest numbers of cases during throughout the period studied, finally, the year 2019 had the highest number of notifications, reaching a peak with about 2,076 cases, equivalent to 16% of the total. (Graphic 1)

In the distribution by gender, there was a predominance of females, corresponding to approximately 6,826 (51.74%) of the total number of reported cases, followed by males with 6,341 (48.09%) and 23 (0.17%) cases were ignored.

As for race/color, about 6,255 cases were registered as brown, corresponding to (47.4%) of the total notifications, followed by white with 1,548 (11.7%) and about 4,562 ignored/white cases, equivalent to 34.6%. The race/color that presented the lowest numbers were indigenous to yellow, with 96 (0.7%) and 82 cases (0.6%) respectively.
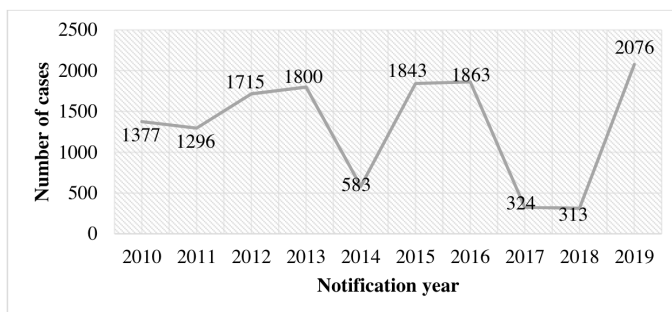
Graph 1: Distribution of reported cases of dengue in children under one year of age, by year of notification, in the state of Bahia, from 2010 to 2019.

Source: SESAB/SUVISA/DIVEP/SINAN.
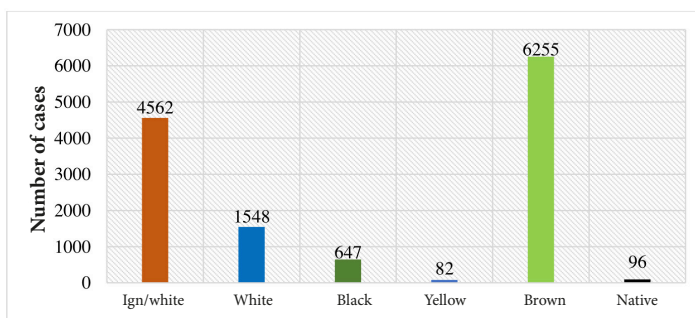
Graph 2: Distribution of reported cases of dengue in children under one year old by race/color, in the state of Bahia, from 2010 to 2019.
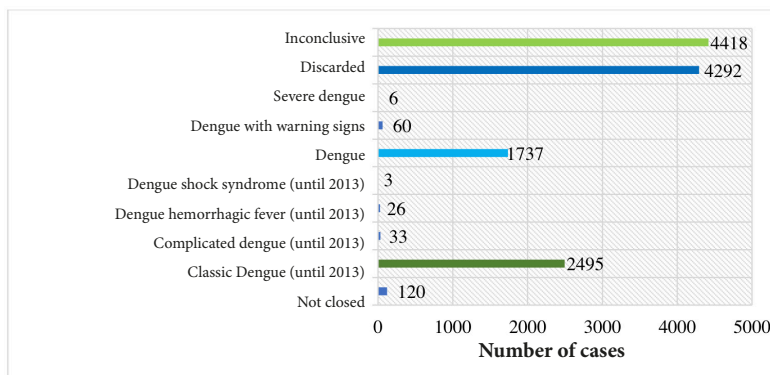
Source: SESAB/SUVISA/DIVEP/SINAN.

As for the classification, about 4,418 notifications were of inconclusive cases, representing 33.5% of the total, and 4,292 discarded cases, equivalent to 32.5%. Among the confirmed cases, we highlight the large number of cases of classic dengue (classification used until the year 2013), about 2,495 (18.9%) notifications, and finally, the cases classified as SCD and DG, corresponded to 0.02% and 0.05% respectively. (Graph 4).

Regarding the evolution of reported cases of dengue in children under one year of age in the state of Bahia, in the historical series from 2010 to 2019, 7,675 (58.19%) evolved to cure, 3 (0.02%) died as a result. disease, and 16 (0.12%) for another cause. Despite the positive record of the number of cured, the study revealed a very worrying data, about 5,492 (41.64%) notifications were registered as white or ignored. (Graph 5)

When analyzing the distribution by Regional Health Center (NRS), it was possible to observe that the NRS Center East concentrated the largest number of dengue notifications during the years 2010 to 2019, about 2,749 cases, equivalent to 20.8% of the total of records, followed by the South NRS, with 2,473 (18.7%) and the East NRS with 2,184 (16.6%). The highest record for the period occurred in the NRS Center East in 2019, where 944 cases of the disease were reported, the lowest number of notifications was recorded in the year 2017 in the NRS, with the occurrence of only 4 cases. (Table 3)

Graph 4: Distribution of reported cases of dengue in children under one year old according to classification, in the state of Bahia, from 2010 to 2019.

Source: SESAB/SUVISA/DIVEP/SINAN.
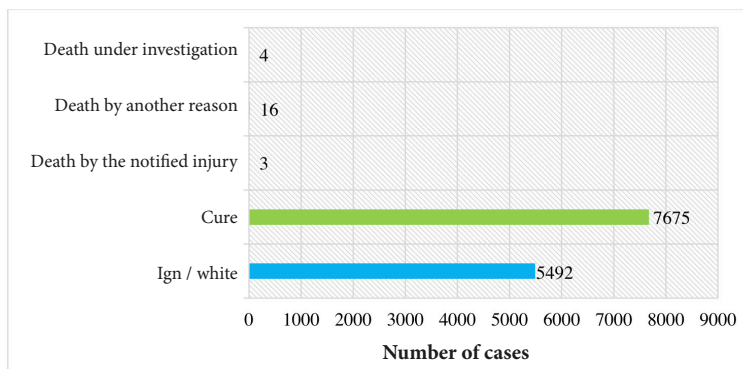
Graph 5: Distribution of reported cases of dengue in children under one year old according to evolution, in the state of Bahia, from 2010 to 2019.

Source: SESAB/SUVISA/DIVEP/SINAN.

	Year of notification										Total	(%)
NRS	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**		
Center East	309	240	387	252	121	314	130	28	24	944	2749	20,8
Center North	218	124	201	218	24	140	76	28	14	186	1229	9,3
Extreme South	119	155	130	229	43	97	215	79	31	63	1161	8,8
East	300	285	249	168	190	330	129	87	61	385	2184	16,6
Northeast	15	71	93	29	20	70	48	4	6	84	440	3,3
North	68	78	154	81	48	163	142	15	37	51	837	6,3
West	53	104	26	154	33	202	79	24	80	127	882	6,7
Southeast	116	67	134	346	29	76	308	26	33	100	1235	9,4
South	179	172	341	323	75	451	736	33	27	136	2473	18,7
Total	1377	1296	1715	1800	583	1843	1863	324	313	2076	13190	100

Table 3: Distribution of reported cases of dengue in children under one year of age by Regional Health Center (NRS), in the state of Bahia, from 2010 to 2019.

Source: SESAB/SUVISA/DIVEP/SINAN.

DISCUSSION

In recent years, dengue has become the most important arbovirus in Public Health in Brazil and in the world, both because of the significant number of people living in endemic areas at high risk of infection, and because of the increase in severe and fatal clinical forms of the disease. (SANTOS, 2012)

Also, Neto et al., (2020) points out the urbanization process, the increase in population and the disorderly use of the land, the low income, the level of education, and the large number of residents per residence; inhospitable housing conditions, such as water supply and the lack of collection and treatment of household waste; people's living habits; the large flow of people between regions internationally; and global warming, as strong determinants commonly related to the occurrence of dengue.

The study carried out by Araújo et al., (2017), whose objective was to describe the main metrics on dengue generated by: *Global Burden of Disease (GBD) Study 2015*, for the 27 federated units of Brazil, in the years 2000 and 2015, revealed an increase of 232.7% in the number of cases and of 639.0% in the number of deaths between the years 2000 and 2015 in the country.

According to the aforementioned authors, the incidence rate varied by 184.3% and the mortality rate was low, but with an increase of 500.0% in the evaluated period. In 2015, the highest estimates for mortality rates were recorded in children under 1 year of age (0.70), a trend also identified with regard to rates of years of life lost due to premature death (YLL per 100,000 inhabitants)11, 8 and 59.9 in 2000 and 2015, respectively.

In the period from 2010 to 2019, the state of Bahia recorded 13,190 cases of dengue in children under 1 year of age, analyzing the distribution by month of notification, it was found that there was a record of the disease in every month of the studied period, with highlights for the months between February and July, a period that converges with summer, autumn, and winter, similar to the study carried out by Melo et al (2010), whose objective was to identify the pattern of progression of dengue virus circulation in the state of Bahia., in the period from 1994 to

2000, where it was possible to show that the circulation of the virus occurred in all climatic zones of the state, including the arid and semi-arid region, where conditions are quite inhospitable for Aedes aegypti, thus revealing its high adaptive power.

Also as a result of the analysis of this study, we highlight the highest number of occurrences of dengue in female children, corroborating the results of other studies developed by Rabelo et al., (2020) in Belo Horizonte – MG (2009 to 2014); by Macedo et al., (2014) in Rio de Janeiro - RJ (2014), and by Silva (2016) in São Paulo (2007 to 2014). When analyzing the race/color variable, the findings were similar to the outcome of the study carried out in Alagoas (2011 to 2015) by Santos et al., (2019), however, no studies were found in the literature that related the occurrence of this arbovirus to a certain race/color.

Also according to Santos et al., (2019), the high number of occurrences in females may be related to Brazilian sociocultural characteristics, due to the fact that women spend most of their time at home, and the fact that men look for less. the health service. However, these statements do not apply to the present study because we are addressing the occurrence of the disease in people with a detailed age (children under one year of age), it is also worth mentioning that there is a huge shortage of scientific production directed to the approach of this theme to the population studied in this work.

Analyzing the results by classification, we identified that about 4,418 notifications were of inconclusive cases, which represents 33.5% of the total, an extremely important finding that causes a lot of concern. According to Assis et al., (2014) an inconclusive case reveals that it was not possible to make the diagnosis or discard the case after the investigative process, leading to the understanding that such event

occurred as a result of lack of information, that is, absence of data. available. Another point worth mentioning in the analysis of this variable is the different classifications of dengue.

Also according to the authors, 8 cases were fatal (3%), all progressing to severe dengue according to the revised scheme. The 1997 WHO schedule classified 6 of the 8 fatal cases (75%) as SCD and 1 case (12.5%) as DHF due to bleeding complications. A fatal case with shock without hemorrhagic manifestations could not be classified into any specific category.

The authors then concluded that using the 1997 WHO scheme, 28.5% of patients could not be classified in any category, on the other hand, the revised 2009 scheme classified all patients. Analyzes of classified cases concluded that the revised regimen had better sensitivity (86.8%, P<0.001), while the traditional regimen had better specificity (93.4%, P<0.001) for detecting severe forms of the disease.

In the analysis by confirmation/discard criteria, cases confirmed by clinical-epidemiological criteria are highlighted, followed by cases recorded as ignored or blank. According to Biassoti and Ortiz (2017), accurately diagnosing dengue is a crucial factor for the clinical management of patients, and for carrying out the differential diagnosis against other infections, as well as for controlling the most severe forms of the disease. Nowadays, there are several techniques that make it possible to confirm DENV infection, ranging from clinical-epidemiological tests to serological and virological tests. In order to avoid a late diagnosis and, consequently, the worsening of the patient's clinical condition, it is considered necessary to carry out specific laboratory tests, the blood count, serology for the detection of antibodies and the NS1

test (test that allows the qualitative detection of the protein DENV NS1 in human serum or plasma) associated with clinical-epidemiological analysis.

In this study, we also draw attention to the outcome of dengue cases, the data revealed that, of the 13,190 reported cases of the disease, only 3 (0.02%) evolved to death, which would be a positive result if it were not for the high number of cases. notifications registered in SINAN as ignored/blank, a total of 5,492 (41.64%), leaving an unknown, leading us to several other outcomes for these data, thus, biasing the present study.

According to Cavalli et al., (2019) most deaths as a result of dengue are preventable, but for this to happen, there must be an effective organization of health service networks, in addition to the quality of care provided. Therefore, the qualification of professionals involved in care is crucial, including equipping them to become capable of identifying potentially serious patients.

Pointing out that the findings of these studies corroborate the statements made by the aforementioned authors would be a faulty and irresponsible act, since the data do not allow us to clearly make any statement regarding the reported cases of death as a result of the disease, as well as, affirm that there were mistakes in the notifications of the other evolution categories.

As a result of the analysis of the Evolution variable, we also highlight the high number of cases registered as ignored/white. For Assis et al., (2014) these findings are a reflection of professional lack of motivation or insufficient time to fill out the notification forms completely, due to the prioritization of other demands in health services. Another reason would be the fact that most health professionals in the country consider the completion of these instruments as a bureaucratic activity and of secondary importance.

Starting with the analysis of the NRS, the Midwest NRS presented the highest number of cases, with the RS of Feira de Santana being responsible for the largest amount, then the South NRS, with emphasis on the RS of Ilhéus and Itabuna, and for Finally, the NRS East having the RS of Salvador responsible for the largest number of notifications.

FINAL CONSIDERATIONS

The findings of this study show the real importance of knowing the epidemiological characteristics of diseases and conditions that affect the population. The data revealed that the policies to combat the dengue vector have not been effective in the state of Bahia, evidenced by the high number of occurrences of the disease in the state, especially in the RS of Feira de Santana, responsible for the highest amount of notifications, which may be reflection of the great adaptive power of Aedes aegypt to varied environmental conditions.

The study has as a limitation, the impossibility of calculating the incidence rate due to the fact that the study population is of a specific age (under 1 year of age) and the minimum age range of the population of the states/cities available on the IBGE website includes people from 0 to 4 years of age, another limiting factor is the lack of data in SINAN regarding the circulating serotypes in the studied periods, thus making it impossible to know the characteristics of the agent causing the disease and which consequently generated the notification.

In view of the above, it is necessary to invest in articulated actions between government and society, aiming to prevent and control the disease, so that the impacts caused by it are minimized, it is also extremely important to invest in basic sanitation works and the directing of resources. for the construction of housing for people in conditions of extreme poverty, and who live in improvised places

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without the minimum condition of hygiene. Also, investments aimed at health education for the population, and in permanent education of professionals who carry out notifications and technicians responsible for entering data both at the municipal and state levels. Finally, we highlight the need to carry out new studies aimed at the occurrence of dengue specifically in children under one year old, addressing the triggering factors of the most severe form of the disease in this population, as well as studies that use methodologies applied to the analysis of underreported cases.

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