DOI: https://doi.org/10.36489/nursing.2021v24i276p5642-5655

Analysis of the incidence of dengue in patients reported in Montes Claros between 2017 and 2019

ABSTRACT | Objective: to analyze the incidence of reported cases of dengue in Montes Claros. Method: descriptive, exploratory, documentary, retrospective, transversal study, quantitative, carried out at SINAN online of the Municipal Health Secretariat. The sample consisted of 10,879 patients notified between 2017 and 2019. The data treatment was done by simple descriptive epidemiology. Results: the incidence of cases in 2017 was low when compared to subsequent years. In 2018, the percentage increase compared to 2017 was 362.3%. In 2019, there was an exponential increase in the incidence, to reach 912.8% in relation to 2018 and 4,592.3% in relation to 2017. In addition, there was an increase in laboratory confirmed cases as positive in 2019 (3.8%). Conclusion: the incidence of reported cases of dengue disease was high in 2019 and progressive over time. The symptomatic increase of cases was very high, and the follow-up of these patients should be intensified.
Keywords: Dengue. Dengue virus. Disease notification. Incidence. Health information systems.

RESUMEN | Objetivo: analizar la incidencia de los casos reportados de dengue en Montes Claros. Método: estudio descriptivo, exploratorio, documental, retrospectivo, transversal, cuantitativo, realizado en el SINAN en línea de la Secretaría Municipal de Salud. La muestra estaba formada por 10.879 pacientes notificados entre 2017 y 2019. El tratamiento de los datos fue mediante epidemiología descriptiva simple. Resultados: la incidencia de casos en 2017 fue baja en comparación con los años siguientes. En 2018, el incremento porcentual respecto a 2017 fue del 362,3%. En 2019 se ha producido un aumento exponencial de la incidencia, de forma que se ha alcanzado el 912,8% respecto a 2018 y el 4.592,3% respecto a 2017. Además, hubo un aumento en el número de casos confirmados en los laboratorios como positivos en 2019 (3,8%). Conclusión: la incidencia de los casos reportados de la enfermedad del dengue fue alta en 2019 y progresiva en el tiempo. El aumento sintomático de los casos fue muy elevado, por lo que se debe intensificar el seguimiento de estos pacientes.
Palabras claves: Dengue. Virus de la dengue. Notificación de enfermedades. Incidencia.

RESUMO | Objetivo: analisar a incidência de casos notificados de dengue em Montes Claros. Método: estudo descritivo, exploratório, documental, retrospectivo, transversal, quantitativo, realizado no SINAN online da Secretaria Municipal de Saúde. A amostra foi constituída por 10.879 pacientes notificados entre 2017 e 2019. O tratamento dos dados se deu por epidemiologia descritiva simples. Resultados: a incidência de casos em 2017 foi baixa, quando comparada aos anos subseqüentes. Em 2018, o aumento percentual em relação a 2017 foi de 362,3%. Em 2019, houve um aumento exponencial na incidência, de modo a atingir 912,8% em relação a 2018 e 4.592,3% em relação a 2017. Ainda, houve aumento dos casos confirmados laboratorialmente como positivos em 2019 (3,8%). Conclusão: a incidência de casos notificados para a doença da dengue mostrou-se alta em 2019 e progressivo com o tempo. O aumento sintomático dos casos mostrou-se bem altos, devendo-se intensificar o acompanhamento desses pacientes.
Palavras-chaves: Dengue. Vírus da Dengue. Notificação de doenças. Incidência. Sistemas de informação em saúde.

Patrick Leonardo Nogueira da Silva

Nurse, Master's Student at the Postgraduate Program in Primary Health Care at the State University of Montes Claros (PPGCPS/UNIMONTES). Montes Claros, Minas Gerais, Brazil.
ORCID: 0000-0003-2399-9526

Ana Clara Rodrigues Marques

Academic of the undergraduate course in Nursing at the State University of Montes Claros (UNIMONTES). Montes Claros, Minas Gerais, Brazil.
ORCID: 0000-0002-7340-1572

Kamila Sampaio de Souza

Nurse, Technical Reference of Epidemiological Surveillance of the Municipal Health Department of Montes Claros (VE/SMS/MOC). Montes Claros, Minas Gerais, Brazil.
ORCID: 0000-0002-9951-5690

Maria Suely Fernandes Gusmão

Nurse, Master's Student at the Postgraduate Program in Primary Health Care at the State University of Montes Claros (PPGCPS / UNIMONTES). Montes Claros, Minas Gerais, Brazil.
ORCID: 0000-0001-9736-8933

Ana Patrícia Fonseca Coelho Galvão

Nurse, PhD student at the Graduate Program in Health Sciences at the Faculty of Medical Sciences of Santa Casa de São Paulo (PPGCS/FCMSCSP). São Paulo, São Paulo, Brazil.
ORCID: 0000-0003-3376-5678

Received on: 02/07/2021
Approved on: 03/04/2021

José Ronivon Fonseca

Nurse, Master in Primary Health Care, Professor in the Department of Nursing at the State University of Montes Claros (UNIMONTES). Montes Claros, Minas Gerais, Brazil.
ORCID: 0000-0002-4318-7114

INTRODUCTION

Dengue is an infectious disease caused by a virus, which is the Dengue Virus or Dengue Virus (DENV), consisting of Ribonucleic Acid (RNA), being an arbovirus of the genus Flavivirus, of the family Flaviviridae, whose main vector is Aedes aegypti. [1] Factors such as rapid urbanization, population growth, unfavorable conditions for sanitation and water su-

pply, the marked migratory movement and the mosquito's ability to adapt to the domestic environment contribute to the proliferation of the vector. [2] Dengue is endemic in several tropical and subtropical countries, like Brazil, which indicates that about 40% of the world population is at risk of becoming infected with the virus. [3] In the world, there are the circulation of four dengue serotypes (DENV-1, DENV-2, DENV-3 and DENV-4). [1] In view of the geographical scope, number of cases and severity of the disease, this arbovirus has social, economic and public health implications. [4] Thus, it represents a challenge to health care and epidemiological surveillance (ES). [5]

Infection with DENV can be symptomatic or asymptomatic. In situations where dengue is symptomatic, the disease has a broad clinical spectrum. It can vary from cases in which they have few symptoms to severe cases that may die. [1] In general, patients evolve to recovery after self-limited but debilitating dengue, characterized by abrupt onset fever, headache, adynamia, myalgia, arthralgia, retro orbital pain, inappetence and rash.[4,5,6] On the other hand, a small portion evolves to a severe form of the disease, which is characterized by bleeding, severe organ dysfunction or plasma leakage. [4,5] Before the evolution to the severe form of dengue, there are the appearance of alarm signs, which are: severe and continuous abdominal pain; persistent vomiting; accumulation of fluids such as ascites; pleural effusion and pericardial effusion; postural hypotension and/or lipothymia; hepatomegaly greater than 2,0 cm below the costal margin; mucosal bleeding; lethargy and/or irritability and progressive increase in hematocrit. (6) Thus, the diagnosis of dengue is essential for the correct clinical management for the benefit of the patient for ES and for research.[4]

The confrontation occurs from the simple adoption of routine measures, such as home visits (HV), the promotion of task forces and health education, which aim to eliminate the breeding sites of the vector and provide information to the population about the disease, until the elaboration of urban policies that seek to intensify combat actions. [7,8] Community Health Agents (CHA) and Endemic Combat Agents (ECA), together with the population, are primarily responsible for the identification and destruction of standing water reservoirs where mosquitoes proliferate. [9] In Brazil, dengue is a compulsory notification disease, where every suspected and/or confirmed case must be reported to the ES service through the Notifiable Diseases Information System (SINAN - Sistema de Informação de Agravos de Notificação). [5] The ES allows the monitoring of the numbers of cases and their territorial distribution, which makes it possible to identify the demand for intervention actions.[7]

In the State of Minas Gerais, dengue cases have been recorded since 1980 and have shown, over the years, a considerable increase in the number of outbreaks of A. aegypti. [10,11] In recent years, the city of Montes Claros, being one of the main cities in the north of Minas Gerais, has shown great concern in relation to dengue. The municipality with an estimated population of more than 409 thousand inhabitants, with a population density of 101.41 inhabitants/km2, was classified as at risk of an outbreak, according to the A. aegypti Rapid Index Survey (LIRAa - Levantamento de Índice Rápido do A. aegypt), by three years in a row. [11,12]

In this context, the present study aims to analyze the incidence of dengue cases notified in the municipality of Montes Claros, Minas Gerais, between 2017 and 2019.

METHOD

This is a descriptive, exploratory, documentary, retrospective, cross-sectional study with a quantitative approach, carried out at the Municipal Health Department of Montes Claros (SMS/MOC), Minas Gerais. Notification forms were used for patients with dengue who were registered with SINAN. The study population consisted of all residents in the municipality, which currently has 83 units of the Family Health Strategy (FHS) containing 141 health teams, six hospitals and an Emergency Care Unit (UPA), with coverage of 100% . Thus, the sample consisted of 10.879 patients notified during the period from January 2017 to December 2019.

The following eligibility criteria for inclusion in the study sample were listed: (1) living in Montes Claros; (2) having been notified at a health institution in the municipality of Montes Claros; (3) patient notified with dengue between 2017 and 2019; and (4) have the notification form registered at SINAN with all the data available in the system.

A letter of introduction and an Institutional Consent Form (TCI), along with a copy of the research project, was sent to the SMS/MOC's EV Coordination for study authorization. The institution was duly advised on the research guidelines and the SMS/MOC signed the TCI in order to authorize the study. Data collection was carried out in the 2nd semester of 2020, during the months of October and November, by the responsible researcher.

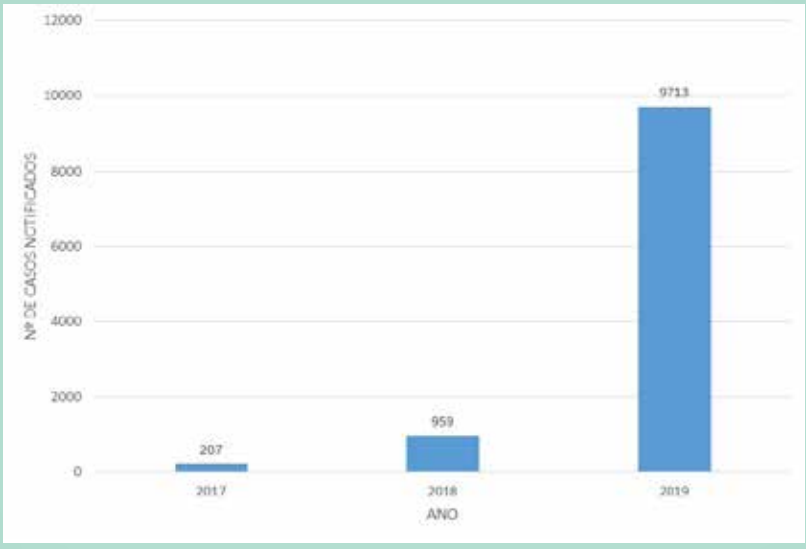
The study used secondary data available on SINAN online from SMS / MOC, which allow consultation by municipality of residence of the notified patient, which were tabulated in TABWIN, of the Department of Informatics of the Unified Health System (DATASUS), and associated with the information from the Zoonosis Control Center (CCZ). It should be noted that the CCZ is responsible for disseminating the survey of the number of outbreaks identified in the regions of the municipality of Montes Claros through LIRAa. A self-made semi-structured form, based on the dengue notification form available on the SINAN website,

was applied as a data collection instrument for sample collection.

The information collected was divided into six variables: sex; age group; number of cases; conducting serological tests; classification of cases according to the degree of complexity; and evolution of cases. The data found were stored in the software Statistical Package for the Social Sciences (SPSS), version 26, and represented by means of graphs and tables, constructed using Microsoft Excel®, Windows for Windows, version 2010, with absolute frequencies (n) and percentages (%) for better visualization and discussion of results. They were discussed according to simple non-parametric and non-probabilistic descriptive epidemiology.

The study followed the ethical precepts established by Resolution No. 466, of December 12th, 2012, of the National Health Council (CNS), which regulates the conduct of research involving human beings. [13] The research project was assessed and approved by the Research Ethics Committee of the State University of Montes Claros (CEP UNIMONTES) under consubstantiated opinion nº 4.272.176/2020, Certificate of Presentation for Ethical Appreciation (CAAE) nº 37459620.2.0000.5146.

Graph 1 – Incidence of dengue cases reported in the municipality of Montes Claros, Minas Gerais, in the years 2017, 2018 and 2019. Montes Claros (MG), 2020. (n = 10.879)



Source: SINAN/SMS/MOC, 2020.

Table 1 – Incidence of notified dengue cases according to sex and age group. Montes Claros (MG), 2020. (n=10.879)

Variables	2017		2018		2019*		Total	
	n	%	n	%	n	%	n	%
Sex								
Male	98	0,9	389	3,57	4.040	37,14	4.527	41,61
Female	108	1,08	570	5,23	5.673	52,06	6.351	58,37
Ignorado	01	0,02	0,0	0,0	0,0	0,0	01	0,02
Total	207	2,0	959	8,8	9.713	89,2	10.879	100,0
Age group (years)								
< 1	05	0,04	21	0,19	226	2,12	252	2,35
1-4	08	0,07	43	0,39	617	5,68	668	6,14
5-9	04	0,03	81	0,74	857	7,89	942	8,66
10-14	11	0,1	92	0,84	1.019	9,37	1.122	10,31
15-19	26	0,23	101	0,92	1.003	9,24	1.130	10,39
20-34	85	0,78	294	2,7	2.849	26,2	3.228	29,68
35-49	36	0,33	189	1,73	1.793	16,49	2.018	18,55
50-64	24	0,22	105	0,96	985	9,06	1.114	10,24
65-79	08	0,2	27	0,24	309	2,72	344	3,16
80 e +	00	0,0	06	0,09	51	0,43	57	0,52
Total	207	2,0	959	8,8	9.709	89,2	10.875	100,0

Source: SINAN/SMS/MOC, 2020. *In 2019, four notified forms did not present information on the age group.

RESULTS

The incidence of cases notified for dengue in 2017 was low when compared to subsequent years. In 2018, the percentage increase compared to 2017 was 363,28%. In 2019, there was an exponential increase in incidence, in order to reach 912,82% in relation to 2018 and 4.592,27% in relation to 2017 (Graph 1).

The data collected point to a slightly higher incidence for females (58,37%) in the three years surveyed, with 2019 being the year with the highest incidence of cases. As for the age group, the most affected was 20 to 34 years, with emphasis also on the year 2019 (n = 2.849; 29,33%). A small loss of data was identified in the cases by age group of the same year, with 9,709 cases being recorded, when the notified total was 9.713 (Table 1).

As for dengue cases analyzed through laboratory tests, there was an increase of 3,76% in cases tested and confirmed as positive since 2017 (n=9; 0,08%) to 2019 (n=417 ; 3,84%). Table 2 outlines the representation of laboratory results with a view to performing or not exams for the disease. It is noteworthy that a considerable portion of the sample was categorized as ignored/ blank or laboratory test not performed.

As for the classification of notified dengue cases according to their degree of complexity, there was a significant increase of 74,62% from 2018 to 2019 in relation to classic dengue. Also, in the years 2017 and 2018, discarded cases followed by classic dengue cases prevail, while in 2019, in contrast to previous years, classic dengue cases prevailed followed by discarded cases (Table 3).

Regarding the evolution of cases, the disease was cured in most cases, with a percentage of 89,02% cure in 2019 and a percentage increase of 80,28% cure in 2018 for the year 2019. The percentage of deaths from the disease, compared to the total sample, was not significant (0,11%), however the promotion and prevention measures must be intensified in order to avoid an increase in mortality (Table 4).

Table 2 – Incidence of dengue cases analyzed through laboratory tests. Montes Claros (MG), 2020. (n=10.879)

Result	2017		2018		2019		Total	
	n	%	n	%	n	%	n	%
Ignored/ Blank	70	0,64	574	5,27	8.683	79,82	9.327	85,73
Positive	09	0,08	237	2,17	417	3,84	663	6,09
Negative	34	0,31	146	1,34	612	5,63	792	7,28
Inconclusive	01	0,02	00	0,0	00	0,0	01	0,02
Unrealized	93	0,95	02	0,02	01	0,09	96	0,88
Total	207	2,0	959	8,8	9.713	89,2	10.879	100,0

Source: SINAN/SMS/MOC, 2020.

Table 3 – Distribution of the incidence of notified dengue cases as to their classification according to the degree of complexity. Montes Claros (MG), 2020. (n=10.879)

Result	2017		2018		2019		Total	
	n	%	n	%	n	%	n	%
Discarded	93	0,85	718	6,6	1.326	12,21	2.137	19,66
Classical Dengue	85	0,78	232	2,14	8.352	76,76	8.669	79,68
Dengue with alarm signs	00	0,0	03	0,02	30	0,28	33	0,3
Severe Dengue	00	0,0	03	0,02	00	0,0	03	0,02
Inconclusive	29	0,37	03	0,02	05	0,05	37	0,34
Total	207	2,0	959	8,8	9.713	89,2	10.879	100,0

Source: SINAN/SMS/MOC, 2020.

Table 4 – Prevalence of the evolution of notified dengue cases. Montes Claros (MG), 2020. (n=10.879)

Result	2017		2018		2019		Total	
	n	%	n	%	n	%	n	%
Cure	89	0,92	951	8,74	9.696	89,02	10.736	98,68
Death due to worsening	00	0,0	01	0,01	00	0,0	01	0,01
Death due other causes	01	0,01	04	0,03	03	0,02	08	0,07
Death under investigation	00	0,0	00	0,0	02	0,01	02	0,03
Ignored/Blank	117	1,07	03	0,02	12	0,15	132	1,21
Total	207	2,0	959	8,8	9.713	89,2	10.879	100,0

Source: SINAN/SMS/MOC, 2020.

DISCUSSION

During the years 2017, 2018 and 2019, there was a progressive increase in the number of dengue cases in the city of Montes Claros. The year 2019 presented a significant growth in relation to the previous years, and data from other scientific studies referring to Minas Gerais converge with this information when describing that in the same year the State presented alarming data of notified cases of dengue according to the proportion notifications registered at SINAN. [14,15]

The climate is a relevant factor for the proliferation of the dengue vector. Most of Brazil has a tropical climate, hot and humid, with periods of oscillation between rain and drought, which allows the adaptation of A. aegypti to the country and increases its speed of reproduction. [16] The Montes Claros Microregion is composed of 22 municipalities and is located in the northern Mesoregion of Minas Gerais. [17] The Montes Claros Microregion is composed of 22 municipalities and is located in the northern Mesoregion of

Minas Gerais.[18] With that, the climatic factor of the region can be a facilitator for the occurrence of infections by the dengue virus.

Socioeconomic, environmental and health variables can also be determinants in the infection. [14] The growth and demographic concentration resulting from the accelerated and disordered urbanization process, combined with the precariousness of basic sanitation, such as dumps exposed to open skies, solid waste thrown and burned in unused land and incorrectly stored water, are factors that can promote the dissemination of dengue in cities. [18] According to the 2020 census of the Brazilian Institute of Geography and Statistics (IBGE), Montes Claros has an estimated population of 413.487 people, the largest in the North of Minas Gerais. [12] De acordo com dados de 2010 da mesma instituição, 93.4% dos domicílios apresentam esgotamento sanitário adequado. [17] Montes Claros is a large municipality, which assigns a role in disseminating and/or receiving dengue. Precisely because it is the most populous city in the north of Minas Gerais, it is a reference in the sectors of economy, commerce and education, contributing to the great circulation of people in the city. The search for qualified health services, education, work and consumption contributes to the movement of people, who move from smaller cities to larger ones, so that this can play a significant role in epidemic events. [19] Further studies are needed to confirm this association. [20]

As for the diagnosis, of the 10,879 cases notified between the years 2017 and 2019, 663 tested positive according to laboratory tests. However, although the cases have been confirmed by laboratory examination, the result allows for bias, due to the period of collection of the blood sample. According to the protocol of the Ministry of Health (MH), serology, performed using the Enzyme-Linked Immunosorbent Assay (ELISA) method, one of the forms of laboratory confirmation of dengue, must be requested from the sixth day onset of symptoms. [6] It is possible that if the symptoms start to disappear before the sixth day, individuals will stop performing the laboratory exam, which is reflected in the statistics. It is understood that the other reported cases were confirmed through clinical and epidemiological examinations. However, it should be considered that the clinical picture of dengue can be confused with the pictures of other arboviruses such as Zika and Chikungunya due to the similarities, and this can interfere with the diagnosis records. [21]

> “Diagnostic errors, difficulties in accessing health services and the occurrence of asymptomatic infections are problems frequently related to underreporting, accurate notification is essential for the local reality to be identified and the effective planning of health actions is carried out by managers.”

Regarding the degree of complexity, classical dengue was found in most cases compared to severe dengue and dengue with alarm signs between the years 2017 and 2019. In contrast to other studies carried out in the municipality of Barreiras in the state of Bahia, between 2007 and 2013, and in the municipality of Fortaleza in the state of Ceará in the years 2001, 2006, 2008, 2011 and 2012, Montes Claros has a higher number of discarded and/or inconclusive cases than classic dengue, except in 2019. [22,23] These results may have been influenced by the population's lack of guidance and/or information about the importance of the diagnosis. In this sense, the available data may not reflect reality. Diagnostic errors, difficulties in accessing health services and the occurrence of asymptomatic infections are problems frequently related to underreporting, accurate notification is essential for the local reality to be identified and the effective planning of health actions is carried out by managers. [14]

Although the city had a high incidence of dengue cases, it was observed that the majority evolved to cure, with only one death due to illness in 2018. A survey conducted in the country found that the lethality rate of dengue is associated with the number of primary health care units, and the greater the population's access to primary care professionals, the lower the risk of death. [24] This fact can be observed in Montes Claros since

the city currently has 82 Family Health Strategies, with 100% coverage of the population. Another explanation would be the fact that the majority of registered cases are classic dengue fever, which is self-limiting. [5] However, it is also necessary to take into account the failure to investigate all deaths, since in 2017, for example, 1,07% of the causes of death were ignored.

The female sex was considered to be the most affected, which corroborates with another research carried out in the same municipality between the years 2007 and 2011 [25] and with other studies from different regions of the country. [20,22,26,27] This can be explained by the fact that A. aegypti has intra and peridomestic circulation, places that are generally more frequented by women. [26] Another possible explanation is the fact that they seek more medical assistance than men [20], which contributes to the underreporting of male cases.

Similar studies, carried out in other places, also found that the most affected age group is concentrated between 20 and 49 years old, being an economically active population, inserted in the job market. [20,22] The data also corroborate with a survey carried out in the region of the Americas that found a higher incidence of dengue in Brazil in young adults [28],and yet with another study carried out in the same municipality. [25]

The present study has limitations. Some data losses were identified during the research, which may have interfered with the analysis of some variables. Brazil still has the underreporting of dengue cases as a reality, the filling in of the notification forms needs to be improved. [29] In addition, there is a noticeable scarcity of studies related to the incidence of dengue in Brazilian territory that can serve as a comparison with other research. Health managers and professionals lack valid and reliable epidemiological data to assist in the implementation of measures according to the real needs of the population. [30]

“There has been a gradual increase in dengue notifications over the years, with an emphasis on 2019, which presented an alarming number of cases compared to other years. There was a higher incidence of reported cases in young, female adults, aged 20-34 years, in which they were responsible for the highest number of notifications.”

CONCLUSION

There has been a gradual increase in dengue notifications over the years, with an emphasis on 2019, which presented an alarming number of cases compared to other years. There was a higher incidence of reported cases in young, female adults, aged 20-34 years, in which they were responsible for the highest number of notifications. In 2017 and 2018, the majority of reported cases were discarded, while in 2019 the prevalence was of classic dengue cases evolving to cure in the last two years of the study.

Therefore, it is essential that the ES performs detailed and continuous monitoring of the incidence of dengue in the municipality. In view of this, the present study presented relevant information about the epidemiological situation of dengue in Montes Claros, paving the way for managers and health workers to carry out a reassessment of public policies combined with environmental management and interlocution between intersectoral service networks and society in order to implement new health and sanitation actions directed to the population to face dengue.

References

1. Ebi KL, Nealon J. Dengue in a changing climate. Environ Res. [Internet]. 2016 [cited 2020 Aug 21];151:115-23. doi: http://doi.org/10.1016/j.envres.2016.07.026
2. França LS, Macedo CMA, Lima JJP, Silva JM, Almeida MB, Vieira SNS. O que está errado? Percepção dos agentes comunitários de saúde e endemias sobre o combate ao Aedes aegypti. Enferm. Actual Costa Rica [Internet]. 2020 [cited 2020 Aug 26];38:61-74. doi: http://dx.doi.org/10.15517/revenf.v0i38.37115
3. Silva-Voorham JM, Tami A, Juliana AE, Rodenhuis-Zybert IA, Wilschut JC,

References

Smit JM. Dengue: a growing risk to travellers to tropical and sub-tropical regions. Ned. Tijdschr. Geneeskd. [Internet]. 2009 [cited 2020 Aug 26];153:A778. Available from: http://www.ncbi.nlm.nih.gov/pubmed/20025792

4. Guzman MG, Harris E. Dengue. Lancet. [Internet]. 2014 [cited 2020 Aug 27];385(9966):453-65. doi: http://doi.org/10.1016/S0140-6736(14)60572-9

5. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Coordenação-Geral de Desenvolvimento da Epidemiologia em Serviços. Guia de vigilância em saúde: volume único [Internet]. 2. ed. Brasília: MS, 2017 [cited 2020 Aug 26]. 705p. Disponível em: http://portalarquivos.saude.gov.br/images/pdf/2017/outubro/06/Volume-Unico-2017.pdf

6. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Departamento de Vigilância das Doenças Transmissíveis. Dengue: diagnóstico e manejo clínico – adulto e criança [Internet]. 5. ed. Brasília: MS, 2016 [cited 2020 Aug 21]. 58p. Available from: http://portalarquivos.saude.gov.br/images/pdf/2016/marco/30/dengue-manejo-adulto-crianca-5d.pdf

7. Freitas RM, Rodrigues CS, Almeida MCM. Estratégia intersetorial para o controle da dengue em Belo Horizonte (Minas Gerais), Brasil. Saúde Soc. [Internet]. 2011 [cited 2020 Aug 27];20(3):773-85. doi: http://doi.org/10.1590/S0104-12902011000300020

8. Alecrim J, Pereira GCA, Castro JM, Alves HNS, Góis RV. Dengue: o desafio das ações de controle sobre o agravo em um município do leste de Minas Gerais. In: Salgado YCS. Patologia das doenças 2 [Internet]. Ponta Grossa (PR): Atena Editora, 2018 [cited 2020 Aug 27]. p. 16-21. Available from: http://www.atenaeditora.com.br/wp-content/uploads/2018/11/patologia2.pdf

9. Zara ALSA, Santos SM, Fernandes-Oliveira ES, Carvalho RG, Coelho GE. Estratégias de controle do Aedes aegypti: uma revisão. Epidemiol. Serv. Saúde [Internet]. 2016 [cited 2020 Aug 27];25(2):391-404. doi: http://doi.org/10.5123/s1679-49742016000200017

10. Minas Gerais. Secretaria de Estado de Saúde. Deliberação CIB-SUS/MG nº 1.974, de 28 de outubro de 2014. Aprova o Plano de Contingência Estadual para o enfretamento da dengue e da febre do Chikungunya – 2014/2015. Belo Horizonte: SESMG, 2014 [cited 2020 Aug 26]. Available from: http://www.saude.mg.gov.br/images/documentos/Del%201974%20-%20Plano%20de%20contingência%20estadual%20para%20o%20enfrentamento%20da%20Dengue%202015.pdf

11. Minas Gerais. Secretaria de Estado de Saúde de Minas Gerais. Subsecretaria de Vigilância em Saúde. Superintendência de Vigilância Epidemiológica. Diretoria de Vigilância de Agravos Transmissíveis. Coordenação das Doenças Transmissíveis pelo Aedes. Boletim epidemiológico das doenças transmitidas pelo Aedes: dengue, chicungunya e zika [Internet]. Belo Horizonte: SESMG, 2020 [cited 2020 Aug 26]. Available from: http://www.saude.mg.gov.br/images/noticias_e_eventos/000_2020/jan_fev_mar/Boletins_Aedes/Boletim%2014-01-2020.pdf

12. Instituto Brasileiro de Geografia e Estatística. Montes Claros, MG: população [Internet]. Rio de Janeiro: IBGE, 2020 [cited 2020 Aug 26]. Available from: http://cidades.ibge.gov.br/brasil/mg/montes-claros/panorama

13. Brasil. Ministério da Saúde. Conselho Nacional de Saúde. Resolução nº 466, de 12 de dezembro de 2012 [Internet]. Regulamenta a realização de pesquisas envolvendo seres humanos e dá outras providências. Brasília: CNS, 2012 [cited 2020 Aug 26]. Available from: http://bvsms.saude.gov.br/bvs/saudelegis/cns/2013/res0466_12_12_2012.html

14. Mol MPG, Queiroz JTM, Gomes J, Heller L. Gestão adequada de resíduos sólidos como fator de proteção na ocorrência da Dengue. Rev. Panam. Salud Publica [Internet]. 2020 [cited 2020 Aug 21];44:e22. doi: http://doi.org/10. / RPSP.2020.22

15. Pereira JLO, Carvalho JT, Marçal JD, Gomes LVC, Carvalho DS, Ferreira RP. Situação epidemiológica da dengue, Chikungunya e Zika, no Brasil, em Minas Gerais e no Espírito Santo [resumo expandido]. In: Anais do II Simpósio de Enfermagem do UNIFACIG [Internet]. Manhuaçu: UNIFACIG, 2019 [cited 2020 Aug 21]. 2p. Available from: http://pensaracademico.facig.edu.br/index.php/simposioenfermagem/article/view/1141

16. Peixoto TM, Cerqueira EM, Andrade JN, Coelho MMP. Práticas educativas no controle da dengue: atuação dos agentes de combate às endemias e percepção dos moradores. REVISA [Internet]. 2020 [cited 2020 Aug 26];9(2):262-70. doi: https://doi.org/10.36239/revisa.v9.n2.p262a270

17. Minas Gerais. Secretaria de Estado de Saúde de Minas Gerais. Meso e microrregiões do IBGE [Internet]. Belo Horizonte: SESMG, 2010 [cited 2020 Aug 21]. Disponível em: https://www.mg.gov.br/sites/default/files/paginas/arquivos/2016/ligminas_10_2_04_listamesomicro.pdf

18. Silva FG, Magalhães SCM. Correlação entre fatores climáticos, socioambientais e a dengue na microrregião Montes Claros/MG. Cam. Geogr. [Internet]. 2017 [cited 2020 Aug 21];18(61):231-44. doi: https://doi.org/10.14393/RCG186115

19. Roseghini WFF, Mendonça F, Ceccato P, Fernandes K. Dengue epidemics in Middle-South of Brazil: climate contraints and some social aspects. Rev. Bras. Climatol. [Internet]. 2011 [cited 2020 Aug 21];(9):94-101. Available from: http://revistas.ufpr.br/revistaabclima/article/viewFile/27522/18336

20. Ferreira AC, Chiaravalloti Neto F, Mondini A. Dengue em Araraquara, SP: epidemiologia, clima e infestação por Aedes aegypti. Rev. Saúde Pública [Internet]. 2018 [cited 2020 Aug 27];52:18. doi: https://doi.org/10.11606/s1518-8787.2018052000414

21. Sobral MFF, Sobral AIGP. Casos de dengue e coleta de lixo urbano: um estudo na cidade do Recife, Brasil. Ciênc. Saúde Colet. [Internet]. 2019 [cited 2020 Aug 26];24(3):1075-82. doi: http://dx.doi.org/10.1590/1413-81232018243.10702017

22. Oliveira RMAB, Araújo FMC, Cavalcanti LPG. Aspectos entomológicos e epidemiológicos das epidemias de dengue em Fortaleza, Ceará, 2001-2012. Epidemiol. Serv. Saúde [Internet]. 2018 [cited 2020 Aug 27];27(1):e201704414. doi: https://doi.org/10.5123/s1679-49742018000100014

23. Costa IMP, Calado DC. Incidência dos casos de dengue (2007-2013) e distribuição sazonal de culicídeos (2012-2013) em Barreiras, Bahia. Epidemiol. Serv. Saúde [Internet]. 2016 [cited 2020 Aug 29];25(4):735-44. doi: https://doi.org/10.5123/s1679-49742016000400007

24. Paixão ES, Costa MCN, Rodrigues LC, Rasella D, Cardim LL, Brasileiro Alcione Cunha et al. Trends and factors associated with dengue mortality and fatality in Brazil. Rev. Soc. Bras. Med. Trop. [Internet]. 2015 [cited 2020 Aug 26];48(4):399-405. doi: https://doi.org/10.1590/0037-8682-0145-2015

25. Rodrigues EHR, Viveiros LL, Paixão ALG, Souto KFG, Barbosa TLA, Gomes LMX. Análise epidemiológica das dengues em Montes Claros, Minas Gerais, Brasil. EFDeportes [Internet]. 2012 [Cited 2020 Aug 28];17(175):1-6. Available from: https://www.efdeportes.com/efd175/analise-epidemiologica-das-dengues.htm

26. Scandar SAS, Vieira P, Cardoso Junior RP, Silva RA, Papa M, Sallum MAM. Dengue em São José do Rio Preto, Estado de São Paulo, Brasil, 2005: fatores entomológicos, ambientais e socioeconômicos. Bol. Epidemiol. Paul. (Online) [Internet]. 2010 [cited 2020 Aug 26];7(81):4-16. Available from: http://periodicos.ses.sp.bvs.br/scielo.php?script=sci_arttext&pid=S1806-42722010000900001&lng=pt

27. Andrioli DC, Busato MA, Lutinski JA. Características da epidemia de dengue em Pinhalzinho, Santa Catarina, 2015-2016. Epidemiol. Serv. Saúde [Internet]. 2020 [cited 2020 Aug 27];29(4):e2020057. doi: https://doi.org/10.5123/s1679-49742020000400007

28. Martín JLS, Brathwaite O, Zambrano B, Solórzano JO, Bouckenooghe A, Dayan GH et al. The epidemiology of dengue in the americas over the last three decades: a worrisome reality. The American journal of tropical medicine and hygiene [Internet]. 2010 [cited 2020 Aug 26];82(1):128-35. doi: https://doi.org/10.4269/ajtmh.2010.09-0346

29. Pinto RC, Castro DB, Albuquerque BC, Sampaio VS, Passos RA, Costa CF et al. Fatores preditores de mortalidade em pacientes com dengue grave no Estado do Amazonas, Brasil. Plos One [Internet]. 2016 [cited 2020 Aug 26];11(8):e0161884. doi: https://doi.org/10.1371/journal.pone.0161884

30. Martins AMEBL, Fonseca JR, Moura RSD, Gusmão MSF, Neves PCV, Ribeiro LG et al. Violência contra a mulher em tempos de pandemia da COVID-19 no Brasil. Rev. Enferm. Atual INDERME [Internet]. 2020 [cited 2020 Aug 29];93(esp):e020009. doi: https://doi.org/10.31011/reaid-2020-v.93-n.0-art.828