J-Kesmas: Jurnal Fakultas Kesehatan Masyarakat
(The Indonesian Journal of Public Health)
Available at http://jurnal.utu.ac.id/jkesmas
p-ISSN: 2355-0643, e-ISSN: 2355-0988
Vol. 11, No. 01, April, 2024
Open Access
RESEARCH ARTICLE

Trend of Dengue Hemorrhagic Fever (DHF) in the Last 5 Years in North Sumatra Province, 2018-2022

[1]Raisa Daffa Zuhair, [2]Eka Syah Putri, [3]Mauliza Zahra,[4]Tazkia Vaudi,[5]Nofi Susanti

[1,2,3,4,5]State Islamic University of North Sumatera, Medan
Corresponding author: Raisa Daffa Zuhair, e-mail:raisadz3010@gmail.com
Co-author nofisusanti@uinsu.ac.id : SM: nofisusantid, AK: raisadz3010@gmail.com
Submitted:12/11/2023 **Revised:** 18/01/2024 **Accepted:** 15/03/2024 **Published online**: 30/04/2024

doi: https://doi.org/10.35308/j-kesmas.v7i2.7274. **How to cite this article**: Zuhair, D.Z., Putri, E.S., Zahra, M., Vudi, T., & Susanti, N. (2023). Trend of Dengue Hemorrhagic Fever (DHF) in the Last 5 Years in North Sumatra Province, 2018-2022. *J-Kesmas: Jurnal Fakultas Kesehatan Masyarakat (The Indonesian Journal of Public Health)*. 11 (1): 13-16

Abstract

Dengue Hemorrhagic Fever is a disease caused by the dengue virus identified by the appearance of fever for 2 to 7 days. This disease belongs to the Arthropod-Borne Virus class, the genus Flavivirus, and belongs to the Flaviviridae family. Dengue infection is an infectious disease that has the potential to become an outbreak (extraordinary event). In addition, this disease can also be caused by the environment and people's behavior, which is transmitted through the bite of the *Aedes aegpty and Aedes albopictus mosquitoes*. This research uses descriptive methods and this research uses secondary data. In 2018-2022 the highest peak of DHF cases occurred in 2020, this was due to high rainfall and high humidity making the development of mosquitoes even higher. Of the several districts/cities, the prevalence rate was higher in Deli Serdang and Medan districts. The CFR rate increased in 2019 compared to 2018. The description of dengue hemorrhagic fever in the last 5 years in North Sumatra Province in 2018-2022 is fluctuating. It can be seen that in 2020 the peak of DHF cases was found in North Sumatra with a prevalence rate of 7,769 cases. Meanwhile, based on the description of the CFR, many occurred in 2019 with a percentage of 18.202%, then in the following year there was a decrease of 0.256%.
Keywords: Dengue Hemorrhagic Fever; Case Characteristics; North Sumatra; Province

Introduction

Dengue infection is a disease that is familiar to the public. However, people usually know this disease as Dengue Hemorrhagic Fever (DHF). Dengue Hemorrhagic Fever is a disease caused by the dengue virus identified by the appearance of fever for 2 to 7 days. This disease belongs to the Arthropod-Borne Virus class, the genus Flavivirus, and belongs to the Flaviviridae family. Dengue Hemorrhagic Fever can be found with specific signs such as headaches, rashes on the skin, muscle and bone pain, decreased platelets, and the presence of hemoconcentration (blood coagulation due to plasma leakage). Dengue fever still needs attention today, because this disease occurs every year and attacks all age groups, both children and adults, even males and females, there is no difference because all of them can be infected with the dengue virus (Bestari et al. , 2022) .

According to WHO data for 2021, it is stated that Dengue Hemorrhagic Fever in recent years has spread to all regions of the world, namely approximately 390 million people are infected with the dengue virus. As many as 128 countries with a total of 3.9 billion people are at risk of being infected with dengue virus and the most are found in Asia, around 70% are at risk. The highest Dengue Hemorrhagic Fever case is in the Philippines which is in first place with a case rate of 52%. Ranked second with a case rate of 30%, namely in Thailand and Indonesia are in third place with cases of 29% (Nurdiani Risma Dewi, 2021)

When WHO announced that the Covid 19 pandemic caused by the SARS-CoV-2 virus had emerged, the number of dengue cases was increasing in several countries, especially Indonesia. The occurrence of Dengue Hemorrhagic Fever is often associated with seasonal changes. In Indonesia, an increase in cases of Dengue Hemorrhagic Fever occurs from January to February, which is the peak of the rainy season. Based on data from the Ministry of Health, there were 71,633 cases of dengue infection in July 2020 and 459 deaths throughout Indonesia, while DKI Jakarta province had 4,227 cases. In mid-March 2020, when the first case of COVID-19 was detected, there were 6,500 cases of dengue. This shows the possibility of co-infection between patients with COVID-19 and Dengue Hemorrhagic Fever, namely being infected with two viruses that attack the public body, so that the impact of the COVID-19 and DHF outbreaks can seriously harm risk groups (Tan et al., 2022) .

In 2019 there were 7,584 cases of DHF and the number of deaths was 37 people, the number of cases increased compared to 2018 with the number of cases of DHF 5,786 cases and 26 deaths. The number decreased in the previous year, namely in 2017 there were 5,454 cases and 28 people died. In 2016 there were 8,715 cases, which is an increase compared to 2017. Whereas in 2015 there were 5,695 cases. The fatality

rate (CFR) in 2019 was 0.5%. Based on 33 administrative districts/cities in North Sumatra, cases of dengue infection were found in almost all districts/cities. The three regencies/cities with the highest number of DHF cases were Deli Serdang Regency with 1,326 cases, Medan City with 1,068 cases, and Simalungun Regency with 736 cases. Regions/cities with low coverage of dengue infection cases have 0 cases in North Nias District.

Based on the background statement above, there are several descriptions of Dengue Hemorrhagic Fever in terms of place, time, and people both in terms of age and gender. Therefore this study aims to find out the description of Dengue Hemorrhagic Fever cases in North Sumatra Province in 2018-2022.

Methods

This research uses a descriptive research method. The descriptive method is used to see the description of natural data that is happening at this time. The data used is secondary data obtained from the North Sumatra Provincial Health Office in 2018-2022.

Results

Based on the data that has been collected from the North Sumatra Provincial Health Office for 2018-2022, univariate analysis will then be carried out to see the epidemiological trend of DHF cases in North Sumatra from the prevalence of DHF in North Sumatra, the age at risk of DHF infection, and the Case Fatality Rate (CFR).

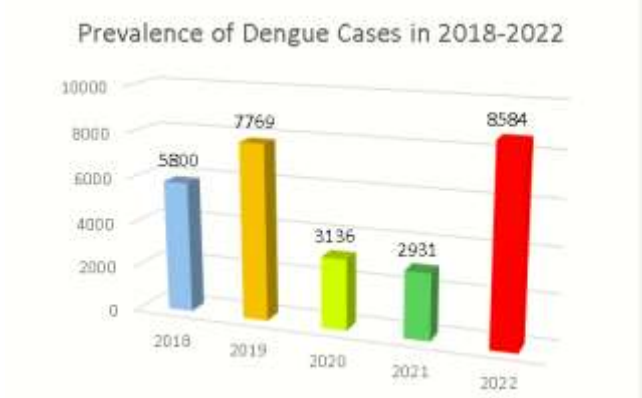

Figure 1. Dengue Prevalence Figures Period 2018-2022
Source: North Sumatra Provincial Health Office, 2023

Based on graphic image 1 above, it can be seen that the trend in the prevalence of DHF cases in North Sumatra in the last 5 years, namely 2018-2022, is fluctuating or it can be said that it is not fixed or can change every year. In Graph 1 above, it can be seen that in 2022 the peak of DHF cases will be found in North Sumatra with a prevalence rate of 8,586 cases.

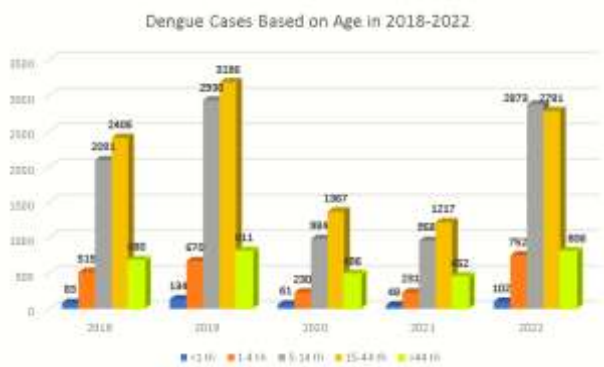

Figure2. DHF Cases Based on Age in Period 2018-2022
Source: North Sumatra Provincial Health Office, 2023

Based on graphic image 2 above, it can be seen that the prevalence of 15-44 years of age is higher for who are infected with DHF in 2018-2021. In 2022 there will be an increase in the age of 5-14 years with a prevalence of 2,873 people compared to the age of 15-44 years which is 2,781 people.

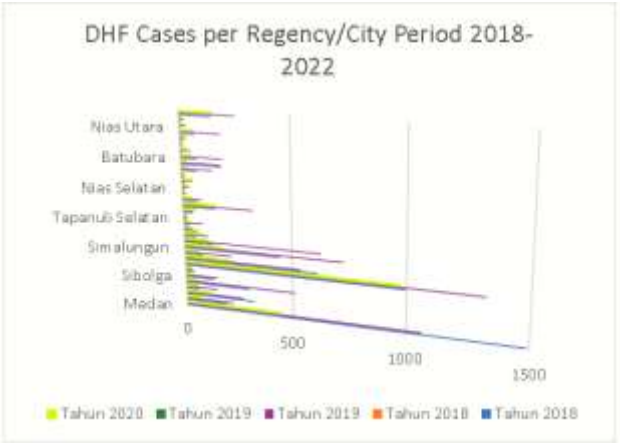

Figure 3. DHF Cases per City/District
Source: North Sumatra Provincial Health Office, 2023

Based on graph 3 above, it can be seen that in 2018 the highest cases were found in Medan City with 25.81% (1,490) cases. In 2019-2021 the highest cases were found in Deli Serdang district with cases in 2019 of 17.15% (1,326), in 2020 of 31.14% (803), and in 2021 of 27.52% (803) case. In 2022 the highest spike in DHF cases in the last 5 years will be in the Medan City area of 26.54% (2,262) cases.

Figure 4. CFR Year 2018-2022

Source: North Sumatra Provincial Health Office, 2023

Based on graph 4 above, it can be seen that the Case Fatality Rate occurred a lot in 2019 with a percentage of 18.202%, then in the following year there was a decrease of 0.256%, namely almost 95% decreased in deaths due to DHF cases in North Sumatra province. However, death cases rose again in 2021, namely by 0.445%, which means that death cases increased by 0.189%.

Discussion

Dengue prevalence in Period 2018-2022

Based on the results described above, that in the last 5 periods DHF cases have been active fluctuating, which means they change every year. In 2018-2020 there was a spike in DHF cases, and the peak of the cases occurred in 2020. The countermeasures that the government can take to suppress DHF cases are surging again, namely by carrying out PSN (Eradication of Mosquito Nests). The role of health workers also plays a role in helping the course of dengue prevention. The health workers and cadres took part in carrying out the program that had been given by the local government, apart from carrying out PSN, the government also implemented 3M, namely draining the water storage area, closing the water reservoir and burying used goods (Hidayani, 2020) . In 2021 there will be a significant decrease, namely more than 50% of DHF cases. This can be categorized as the government's success in suppressing the prevalence rate of DHF in North Sumatra Province.

Dengue Cases Based on Age in Period 2018-2022

Dengue fever can affect both children and adults. In the 2022 case it occurs in the 5-14 year age group. However, in the past 4 years, namely in 2018-2021, many DHF cases were found in the productive age group. According to research from (Mayasari et al., 2020) said that productive age has high mobility and is in line with the smooth development of transportation, so there is a greater possibility of contracting the dengue virus than people who just stay at home.

DHF Cases Per City/District

Based on the results of graph 3 above, it can be seen that in 2019-2021 the highest DHF cases consecutively occurred in Deli Serdang Regency. This happened because that year there was prolonged rainfall, especially in the Deli Serdang area which experienced an additional 18 rainy days (Siregar et al., 2021) . Increased rainfall makes mosquito larvae grow, because there are many stagnant waters and are breeding grounds for mosquitoes. According to (Asmuni et al., 2020) said that high rainfall can stabilize the development of aedes mosquitoes and will continue to increase after the rainy season.

The minimum temperature for mosquitoes to develop is 25-27 ºC. In addition, at a temperature of 20-30ºC is a good temperature for the development of mosquitoes and the life cycle of mosquitoes. The longer the life of the mosquito, the more the frequency of mosquito bites will increase and the higher the transmission factor for DHF. The results of Nissa's research which were put forward by research (Mayasari et al., 2020) said that temperature, humidity and rainfall have a weak correlation in the positive direction but not significant, which means that if temperature increases, DHF cases increase, humidity increases, DHF cases decrease , and if the rainfall increases then the DHF cases also increase. Therefore, in 2020 cases of rainfall will increase, especially in the Deli Serdang area, resulting in a higher prevalence in that area compared to other regions.

Case Fatality Rate Period 2018-2022

Case Fatality Rate is the proportion of deaths from a disease to the total number of people diagnosed with the disease for a certain period of time. CFR is used to measure the severity of a disease, causing death in that disease. In North Sumatra, it can be seen from chart 4 above that it can be seen that the highest cases were in 2019, with many deaths of 18,202, which increased from the previous 2018. In 2020 the CFR case fell significantly to 0.26, which means almost 98% of the CFR rate fell. However, when the CFR number fell, DHF cases increased as shown in graph 1 above. This can happen because of public awareness in tackling a disease, and the lack of sensitivity of the government and health workers to carry out disease prevention for DHF sufferers. In addition, based on resources, attention must also be paid to and priority in resolving health problems, including the availability of health workers such as medical staff and paramedics and laboratory staff (Irma & Masluhiya AF, 2021) .

Conclusion

The description of dengue hemorrhagic fever in

the last 5 years in North Sumatra Province in 2018-2022 is fluctuating. It can be seen that in 2020 the peak of DHF cases was found in North Sumatra with a prevalence rate of 7,769 cases. Based on age description 15-44 years more are infected with DHF in 2018-2021. However, in 2022 there will be an increase in the age of 5-14 compared to the number of cases aged 15-44 years. In 2018 Medan City was ranked number one with the highest cases, while for 4 consecutive years, from 2019-2022 the highest cases were found in Deli Serdang Regency. Meanwhile, based on the description of C FR, many occurred in 2019 with a percentage of 18.202%, then in the following year there was a decrease of 0.256%. However, death cases rose again in 2021, namely by 0.445%, which means that death cases increased by 0.189%.

Acknowledgment

The researchers' gratitude was given to all contributors to this manuscript

Author Contribution and Competing Interest

Contributing authors for this research are interested in cellecting and analyzing data and compiling the manuscript.

References

Asmuni, A., Khairina, N., Pramesti, N. E., & Lusida, N. (2020). Korelasi Suhu Udara dan Curah Hujan terhadap Demam Berdarah Dengue di Kota Tangerang Selatan Tahun 2013-2018. *Jurnal Kedokteran Dan Kesehatan*, *16*, 164–171.

Bestari, R. S., Tristanti, I. Z., & Dewi, S. P. (2022). Penyuluhan Pemberantasan Sarang Nyamuk (Psn) Vektor Demam Berdarah Dengue (Dbd) Kepada Siswa Sma. *Jurnal Pengabdian Masyarakat Medika*, *May 2021*, 43–47. https://doi.org/10.23917/jpmmedika.v2i1.513

Dinas, K., Provinsi, K., & Utara, S. (2020). *Lakip 2020 Program Pencegahan Dan Pengendalian Penyakit*.

Hidayani, W. R. (2020). DEMAM BERDARAH DENGUE : Perilaku Rumah Tangga dalam Pemberantasan Sarang Nyamuk dan Program Penanggulangan Demam Berdarah Dengue. *Paper Knowledge. Toward a Media History of Documents*, 1–20.

Irma, I., & Masluhiya AF, S. (2021). Trend Penyakit Demam Berdarah Dengue (DBD) di Sulawesi Tenggara Berbasis Ukuran Epidemiologi. *JUMANTIK (Jurnal Ilmiah Penelitian Kesehatan)*, *6*(1), 70. https://doi.org/10.30829/jumantik.v6i1.7968

Mayasari, R., Arisanti, M., Nurmaliani, R., Sitorus, H., & Ambarita, L. P. (2020). Karakteristik penderita, hari dan curah hujan terhadap kejadian Demam Berdarah di Kabupaten Ogan Komering Ulu. *Journal of Health Epidemiology and Communicable Diseases*, *5*(1), 23–29. https://doi.org/10.22435/jhecds.v5i1.1300

Nurdiani Risma Dewi, S. (2021). Demam Berdarah Dengue. *Buletin Jendela Epidemiologi*, *2*, 48. https://webcache.googleusercontent.com/search?q=cache:aA1gj8Jm9uwJ:https://www.dinkes.pulangpisaukab.go.id/wp-content/uploads/2020/09/Isi-Buku-DBD-2017.pdf+&cd=3&hl=id&ct=clnk&gl=id

Siregar, C. P., Pusparini, N., Simbolon, T. G., Rajagukguk, S. C., Chodijah, S., Ariantono, J. Y., Tari, C. A., Jhonson Arizona Saragih, I., P Siregar, A. C., Klimatologi Deli Serdang, S., Meteorologi Klimatologi dan Geofisika, B., Serdang, D., Meteorologi Kualanamu, S., & Sejarah Artikel, I. (2021). Pengaruh La Nina Terhadap Curah Hujan Di Provinsi Sumatera Utara the Effect of La Nina To the Rainfall in North Sumatera Province. *Jurnal Manajemen Bencana (JMB)*, *7*(2), 109–120. https://doi.org/10.33172/jmb.v7i2.751

Tan, S., Yuliana, Y., Devita, A., & Machrumnizar, M. (2022). *Penyuluhan Kesehatan Demam Berdarah Dengue di Masa Pandemi COVID-19*. *1*(11), 1374–1379.

****