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Distribution Of Dengue Hemorrhagic Fever (DBD) Incidence In Jambi City

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Abstract:*Dengue Hemorrhagic Fever (DHF) is an infectious disease that is influenced by the environment and people's behavior. In Jambi City, Dengue Fever is still a public health problem. This research aims to distribute dengue hemorrhagic fever (DBD) incidence in Jambi City. This research uses Global Moran's analysis and Local Indicator of Spatial Association (LISA) to determine the Hot Spot and Cold Spot areas for dengue cases in Jambi City in 2018 -2022 with a sub-district analysis unit of 62 sub-districts. During 5 years of observation, the results showed that the distribution pattern of dengue fever cases was in the form of a clustered pattern (I>E[I]) in 2018-2022. The research results on the distribution of dengue fever cases from 2018-2022 showed that the lowest cases were in 2021, namely 132 cases, while the highest cases were in 2019, 698 cases. The results of this study are expected to provide an overview of the distribution of dengue fever incidence in Jambi City in 2018 - 2022 so that it becomes a recommendation material for the Jambi City Health Office or the Jambi City Government in an overview of environmental factors related to dengue fever incidence in Jambi City to prevent various diseases due to poor environmental sanitation in Jambi City. Knowing the distribution pattern of dengue fever can determine regional priorities in implementing dengue fever prevention and control intervention programs in Jambi City.*

Keywords: *Dengue fever, Mapping, Jambi City*

INTRODUCTION

Dengue fever (DHF) is an infection caused by the dengue virus through the bite of the mosquito vector Aedes aegypti and several other mosquito species such as Aedes albopictus, and Aedes polynesiensis. This disease can affect anyone and cause death, especially in children because the immune system against infectious viruses owned by children is still not formed (Astuti, Rejeki and Nurhayati, 2022).

Dengue is a global health problem because dengue virus infection can lead to endemicity. Dengue cases in the world have increased in various countries 30-fold in 50 years. These cases are not only found in urban areas but have spread to rural areas. An estimated 50 million dengue infections occur each year and 2.5 billion people worldwide live in dengue-endemic countries (Lubis, Sinaga and Mutiara, 2021). According to the World Health Organization (WHO), Indonesia is classified as one of the high dengue-endemic countries (Sadukh and Suluh, 2021).

The first outbreaks of DHF in Indonesia were in Surabaya and Jakarta in 1968. The number of DHF cases tends to increase and spread to various regions every year. Currently, DHF is one of the endemic diseases in almost all provinces and is one of the health problems that often increases the number of sufferers and the wider its spread in line with the increasing

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mobility and population density (Depkes RI, 2010), (Syukri *et al.*, 2022). This is due to the extraordinary events (KLB) of dengue that occur periodically within 3-5 years and dengue deaths occur mostly in children (Yusron, 2021).

In Indonesia alone, dengue cases in 2019 increased from the previous year, with an incidence rate of 24.75 to 51.53 per 100,000 population and a Case Fatality Rate (CFR) of 0.67% (Alfiyanti and Siwiendrayanti, 2021). DHF cases spread in all districts/cities in Jambi Province, one of which was in Jambi City. In 2020, Jambi Province had a DHF IR of 58.2 per 100,000 population, almost 20 points higher than the national DHF IR with a Case Fatality Rate of 0.7%. DHF cases have spread in all districts or cities in Jambi Province with the highest cases being in Jambi City with 724 cases which increased in 2021 where there were 131 cases of DHF with a death rate of 3 (three) people and in 2022 it increased to 249 cases of DHF in Jambi City, 5 (five) of whom died (Dinkes Jambi, 2022).

The increase in the distribution of DHF cases in Indonesia is not only influenced by human factors, but environmental factors can also cause DHF cases to differ from one region to another, such as population density, rainfall, proportion of urban areas, road density, and vegetation cover. The distribution of DHF cases based on area and environmental factors can be monitored through spatial analysis. Spatial analysis is an analysis that uses mathematical calculations to produce new data that has various meanings through the process of processing previous data (Wiwik Setyaningsih, 2019).

This spatial analysis activity can be carried out using Geographic Information Systems (GIS). Geographic information system is a system that can analyze spatial and non-spatial problems and provide solutions to these problems based on a spatial perspective. Spatial analysis with geographic information systems is useful in knowing the geographical location of infectious disease cases.

RESEARCH METHOD

This research is a descriptive study using DHF incidence data reported by the Jambi City Health Office from 2018-2022. The data used in the study are secondary data including data on the number of positive dengue cases in Jambi City in 2018-2022. In addition, administrative maps of Jambi City and demographic data were also used, namely population, and gender obtained from Bapeda and the Jambi City Statistics Center Agency.

The design of this research is time series, which is research by observing data at a certain time series. The data includes data on positive DHF patients who have been registered at the Jambi City Health Office. This research uses a quantitative method that is presented

descriptively which aims to describe the incidence of DHF in Jambi City with the help of supporting tools, namely using the Geoda 1.18 program.

RESULT AND DISCUSSION

Geographically, Jambi City is located at $1^{0}30'2.98"$- $1^{0}40'1.07"$ South latitude and $103^{0}40'1.67"$-$103^{0}40'0.22"$ East longitude and an average altitude of 10 to 60 meters above sea level. Jambi City is bordered on the north, west, south and east by Muaro Jambi Regency, in other words, Jambi City is surrounded by Muaro Jambi Regency.

Jambi City administratively has 11 sub-districts consisting of Telanaipura Sub-district, Jambi Selatan Sub-district, Jambi Timur Sub-district, Pasar Jambi Sub-district, Pelayangan Sub-district, Danau Teluk Sub-district, Sub-district Kota Baru, Sub-district Jelutung, Sub-district Alam Barajo, Sub-district Danau Sipin, Sub-district Paal Merah and has 62 sub-district.

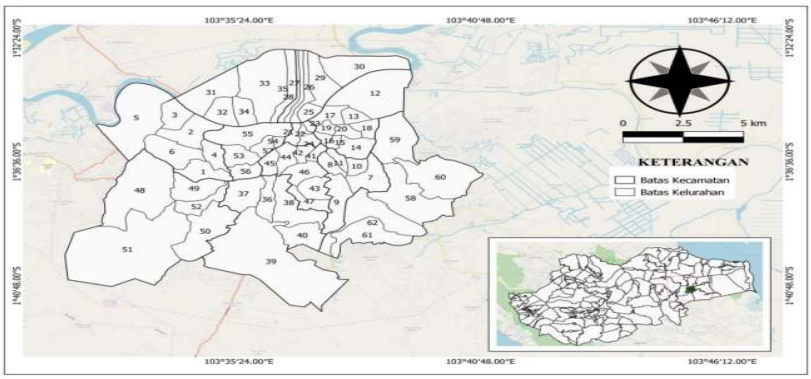
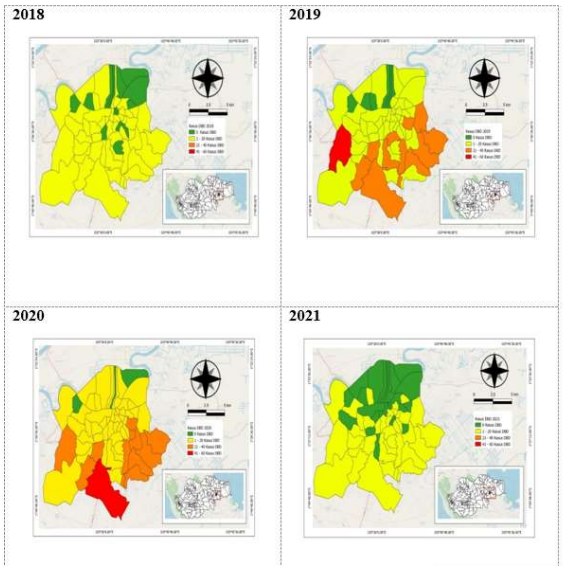


Image 1. Administrative Map of Jambi City



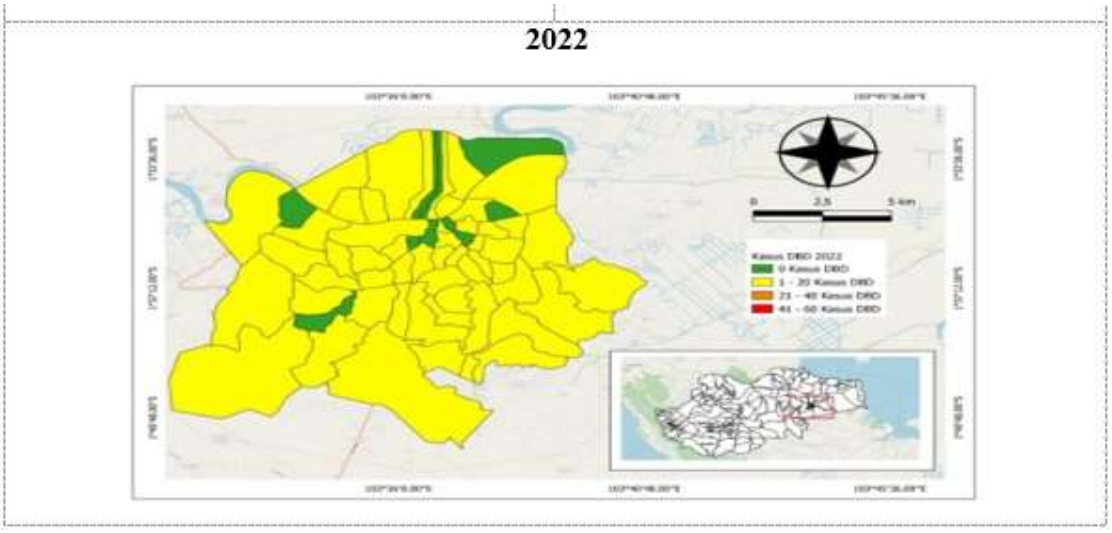


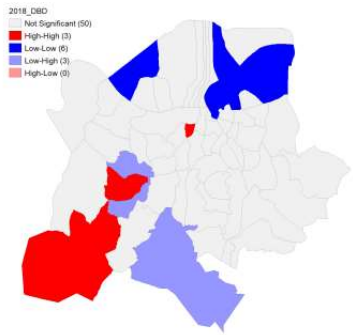
Image 2. Map of the distribution of dengue cases in 2018-2022

Based on the results of the distribution map of DHF cases above, it can be seen that from 2018-2022 the lowest cases were in 2021, namely 132 cases, while the highest cases were in 2019, totaling 698 DHF cases.

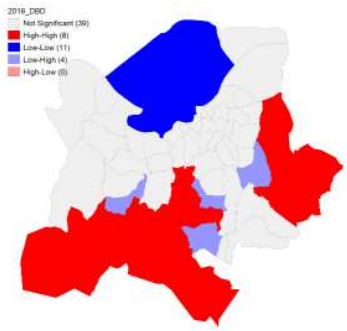
Autocorrelation of Local DHF Cases

The results of the local spatial autocorrelation analysis of DHF cases are as follows:

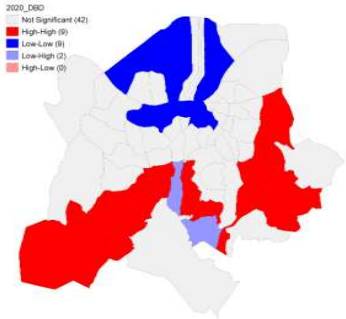
2018



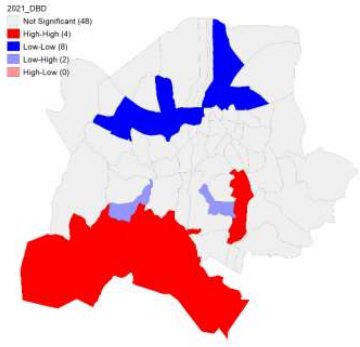
2019



2020



2021



2022

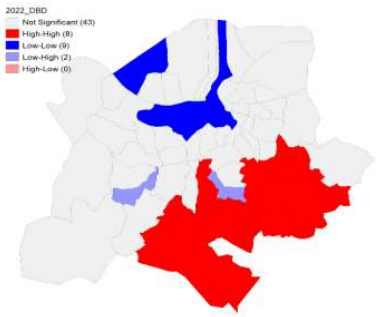


Image 3. LISA autocorrelation results

Based on the LISA autocorrelation results above, it can be seen that urban villages with the HH (High-High) category or referred to as DHF Hot Spot areas, where urban villages that have high dengue cases are surrounded by high dengue cases, were found in 2018, namely Bagan Pete Village, Rawasari and Murni Village. In 2019, namely Suka Karya Village, Paal Lima, Kenali Asam Bawah, Mayang Mangurai, Bagan Pete, Talang Bakung, Payo Selincah and Eka Jaya Village. In 2020, the villages are Pasir Putih, Simpang III Sipin, Paal Lima, Mayang Mangurai, Bagan Pete, Beliung, Talang Bakung, Payo Selincah and Paal Merah. In 2021, the villages are Thehok, Kenali Asam Bawah, Mayang Mangurai, Bagan Pete. In 2022, the villages are Pasir Putih, Thehok, Paal Lima, Kenali Asam Bawah, Kenali Asam Atas, Talang Bakung, Lingkar Selatan and Paal Merah.

In the observation results, some villages have consistently been in quadrant I (High-High) for several years, namely Bagan Pete Village, Mayang Mangurai, Paal Lima, and Kenali Asam Bawah. In Hot Spot areas or Quadrant I (High-High), the Jambi City Health Office can design intervention programs in vector prevention and control efforts, in addition to the Jambi City Health Office, the community can also play an active role in dengue prevention efforts to prevent the spread of the dengue virus to other villages.

CONCLUSIONS AND RECOMMENDATIONS

The results of this study are expected to provide an overview of the distribution of dengue fever incidence in Jambi City in 2018 - 2022 so that it becomes a recommendation material for the Jambi City Health Office or the Jambi City Government in an overview of environmental factors related to dengue fever incidence in Jambi City to prevent various

diseases due to poor environmental sanitation in Jambi City. Knowing the distribution pattern of dengue fever, it can determine regional priorities in implementing dengue fever prevention and control intervention programs in Jambi City.

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REFERENCES

Alfiyanti, U.N. and Siwiendrayanti, A. (2021) 'Analisis Spasial Dan Temporal Kejadian Dbd Di Kota Semarang Tahun 2016-2019', *JURNAL KESEHATAN LINGKUNGAN: Jurnal dan Aplikasi Teknik Kesehatan Lingkungan*, 18(1), p. 39. Available at: https://doi.org/10.31964/jkl.v18i1.286.

Astuti, S.D., Rejeki, D.S.S. and Nurhayati, S. (2022) 'Analisis Autokorelasi Spasial Kejadian Demam Berdarah Dengue (DBD) di Kabupaten Klaten Tahun 2020', *Jurnal Vektor Penyakit*, 16(1), pp. 23–32. Available at: https://doi.org/10.22435/vektorp.v16i1.5817.

Depkes RI (2010) 'Demam Berdarah Dengue', *Buletin Jendela Epidemiologi*, 2.

Dinkes Jambi (2022) *Profil Kesehatan Kota Jambi Tahun 2022*. Kota Jambi.

Lubis, R., Sinaga, B.J. and Mutiara, E. (2021) 'Pengaruh Pemakaian Kelambu, Kawat Kasa dan Kondisi Geodemografis Terhadap Kejadian Malaria di Kabupaten Batu Bara', *Jurnal Kesehatan Lingkungan Indonesia*, 20(1), pp. 53–58. Available at: https://doi.org/10.14710/jkli.20.1.53-58.

Sadukh, J.J.P. and Suluh, D.G. (2021) 'Analisis Spasial Kejadian Demam Berdarah Dengue (DBD) Berdasarkan Kepadatan Penduduk dan Luas Pemukiman Di Wilker PKM Sikumana, Kota Kupang Tahun 2019', *Oehònis : The Journal of Environmental Health Research*, 4(2), p. 1.

Syukri, M. *et al.* (2022) 'Autokorelasi Spasial Kasus Demam Berdarah di Kota Jambi Tahun 2020', *Gema Wiralodra*, 13(2), pp. 764–771. Available at: https://doi.org/10.31943/gemawiralodra.v13i2.283.

Wiwik Setyaningsih, D.A.S. (2019) 'ANALISIS SPASIAL TEMPORAL DENGAN SISTEM INFORMASI GEOGRAFIS (SIG) PADA KEJADIAN PENYAKIT DEMAM BERDARAH DENGUE (DBD) DI KABUPATEN SRAGEN', pp. 1–23.

Yusron, M., Nurmala, I. and Soedirham, O. (2021) '"Relationship of Waste Management towards the Event of DHF in the Work Area of Puri Health Center, Mojokerto Regency in 2021"', *Budapest International Research and Critics Institute*, 5(1), pp. 1653–1659.