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Large-Scale Social Restriction (LSSR) Policy and Dengue Hemorrhagic Fever Cases during the COVID-19 Pandemic in Indonesia: A Case Study of Five Subregions of East Java Province

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Abstract

The first case of coronavirus disease 2019 (COVID-19) in Indonesia was announced in March 2020. Since then, the number of COVID-19 cases has continued to rise. This prompted the government to adopt *Pembatasan Sosial Berskala Besar* (PSBB) or large-scale social restrictions (LSSR). Certain areas within dengue fever endemic regions face two challenges: simultaneously tackling COVID-19 and dengue hemorrhagic fever (DHF). Five economic growth centers (a city and four districts) in East Java Province (Gresik, Bangkalan, Surabaya, Sidoarjo, and Lamongan) were affected by the COVID-19 pandemic and a dengue fever outbreak. This is a quantitative research with a comparative study design that used the Wilcoxon test to compare cases of DHF pre-COVID-19 versus during the COVID-19 pandemic. The Wilcoxon test result showed no significant difference at a p-value of 0.319 (p-value > 0.05). It can be concluded that DHF still became a challenge in five regions in East Java Province, even though LSSR were implemented. Additional effort is required to tackle DHF. A method of preventing and controlling DHF during the COVID-19 pandemic is to build community independence through the "one house, one health cadre movement."

Keywords: COVID-19, dengue hemorrhagic fever, large-scale social restrictions

Introduction

On March 11, 2020, the World Health Organization (WHO) declared coronavirus disease 2019 (COVID-19) a global pandemic.[1,2] In Indonesia, public health emergency status was announced on March 31, 2020, through Presidential Decree No. 11 of 2020. On the same day, the Indonesian government adopted *Pembatasan Sosial Berskala Besar* (*PSBB*) or a large-scale social restrictions (LSSR) policy as a form of government intervention to prevent the spread of COVID-19. The policy was issued through Government Regulation No. 21 of 20203 and implements LSSR to reduce the spread rate of COVID-19.[3,4] The LSSR policy leads to limited community activity and mobility, including efforts to control dengue hemorrhagic fever (DHF).[2,5]

Dengue hemorrhagic fever is an infectious disease caused by the dengue virus and is transmitted through mosquito vectors of the *Aedes aegypti* and *Aedes albopictus* species, which attack approximately 400 million people worldwide annually. Dengue fever is caused by four closely related dengue virus serotypes (which contributes to its endemicity as serotypes tend to mutate over time) and morbidity due to secondary and subsequent dengue infection has a higher likelihood of developing into dengue fever.[6] As of June 25, 2021, there were 2,072,867 confirmed cases of COVID-19 in Indonesia, with a death toll of 56,371 people, across 510 cities and districts in 34 provinces. The provinces with the highest cases of COVID-19 are Jakarta, West Java, and Central Java.[7] As of April 19, 2021, there were 6,122 cases of dengue fever, with a death rate of 65 people. The cases were spread over 252 cities and districts in 20 provinces.[8]

The LSSR have the effect of limiting community activities due to measures such as social distancing, imposing work from home (WFH) arrangements on workers, school from home, closing offices, and limiting religious activities.[9,10] Regarding DHF, East Java Province is one of ten provinces with a high case fatality rate (CFR). The CFR is considered high when a province has an CFR above 1%, and East Java Province's CFR is approximately 1.34%. The other nine provinces are Gorontalo (2.18%), North Sulawesi (1.55%), Southeast Sulawesi (1.47%), Central Kalimantan (1.37%), Central

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Java (1.24%), West Papua (1.23%), Riau Islands (1.20%), West Kalimantan (1.16%), and Papua (1.12%).[11] A high CFR indicates that steps must be taken to improve the quality of health services in that province.

The Surabaya Metropolitan Area, known locally as *Gerbangkertosusila* (an acronym of Gresik-Bangkalan-Mojokerto-Surabaya-Sidoarjo-Lamongan), is the country's second-largest metropolitan area, after the Jakarta metropolitan area.[12] It is the most crowded area in the East Java Province and its subregions of Gresik, Bangkalan, Surabaya, Sidoarjo, and Lamongan have become the center of economic growth in East Java Province. The government implemented the LSSR to prevent the spread of COVID-19, considering the various activities that typically take place in the area. However, no study has been conducted to determine whether LSSR impacts the spread of endemic communicable diseases, such as DHF. Hence, this research was undertaken to determine whether there is a significant difference between the number of DHF cases in the year before the COVID-19 pandemic (2019) and during the COVID-19 pandemic (2020). This research concentrated on the impact of the LSSR on the prevalence of DHF in five subregions of East Java Province (Gresik, Bangkalan, Surabaya, Sidoarjo, and Lamongan).

Method

This is a quantitative research with a comparative study design. This study compared the number of DHF cases in five subregions of East Java Province (Gresik, Bangkalan, Surabaya, Sidoarjo, and Lamongan) during a pre-COVID-19 pandemic period (2019) against the COVID-19 pandemic period (2020). The data used in this research include monthly DHF data for 2019 as data for the pre-LSSR period and monthly DHF data for 2020 as DHF data for the period during which the LSSR was implemented. This data was obtained from the health offices of each district and city: the Health Office of Gresik District, Health Office of Bangkalan District, Health Office of Surabaya City, Health Office of Sidoarjo District, and the Health Office of Lamongan District. The data obtained was ratio data, which was edited, processed, cleaned, and then described. Next, the normality of the data was determined to select a suitable statistical test. The normality test was performed to assess the condition of the data and ascertain what tests could be performed. Because the data is not a normal distribution (Table 1), the Wilcoxon test was used. The Wilcoxon test was performed to determine whether there is a significant difference between the prevalence of DHF cases in 2019 (before the COVID-19 pandemic) and in 2020 (during the COVID-19 pandemic). The results of the analysis are presented as tables and narratives.

Table 1. Normality Test for the Data

Data	Cities/Districts	DHF Cases	Normality Test
2019	Gresik	441	0.000
	Bangkalan	172	
	Surabaya	277	
	Sidoarjo	367	
	Lamongan	381	
2020	Gresik	84	0.003
	Bangkalan	104	
	Surabaya	73	
	Sidoarjo	148	
	Lamongan	111	

Table 2. Wilcoxon Test

Data	Cities/Districts	DHF Cases	Wilcoxon Test ($\alpha = 0.05$) p-value
2019	Gresik	441	0.319
	Bangkalan	172	
	Surabaya	277	
	Sidoarjo	367	
	Lamongan	381	
2020	Gresik	84	
	Bangkalan	104	
	Surabaya	73	
	Sidoarjo	148	
	Lamongan	111	

Data sources: a.) Bangkalan District Health Office, b.) Lamongan District Health Office, c.) Gresik District Health Office, d.) Sidoarjo District Health Office, e.) Surabaya City Health Office

Results

The Wilcoxon test returned a p-value score greater than α (0.05). The result indicated that there was no significant difference between the prevalence of DHF cases during the pre-COVID-19 pandemic period (2019) and the COVID-19 pandemic period (2020).

Discussion

The COVID-19 pandemic has become the major health focus for all countries because of its high mortality and morbidity rates. The health care system in Indonesia has been affected, with most of the available resources diverted to tackling COVID-19. Consequently, LSSR were implemented to prevent a rise in the number of COVID-19 cases.[13] The LSSR policy was issued by the central government through the Ministry of Health of the Republic of Indonesia to overcome the COVID-19 pandemic.[14] This policy is stated in the Regulation of the Minister of Health of the Republic of Indonesia No. 9 of 2020 concerning Guidelines for Large-Scale Restrictions in Handling Coronavirus Disease 2019 (COVID-19). Regarding government policies linked to the COVID-19 pandemic, the government of the Lamongan District also adopted policies to reduce the spread of the disease. The Lamongan District Government issued Lamongan District Government Regulation No. 35 of 2020 concern-

ing Guidelines for Preventing and Controlling the COVID-19 in the Emergency Transition to Recovery, which established a COVID-19 Acceleration Handling Task Force/*Gugus Tugas Percepatan Penanganan (GTPP)* to accelerate the handling of COVID-19.[15]

The Ministry of Health projected that the spread of COVID-19—with the number of cases and deaths increasing— across the globe would impact the political, economic, social, cultural, and defense and security facets of the Indonesian nation, as well as the welfare of the people in Indonesia.[16] In East Java Province, Greater Surabaya has a relatively high COVID-19 spread rate. As a critical business center in the East Java Province, Surabaya has direct regional interaction with Sidoarjo and Gresik Districts.[17] Mutation of the causative pathogen cannot be discounted in an epidemic, nor should conditions that facilitate its adaption to new behaviors such as limiting people's activity to prevent the spread of the virus. For example, the era of the new normal, during which the people of Indonesia are unignorably impacted by a DHF epidemic and have to adjust to the epidemic. This was also done in the face of the global COVID-19 pandemic.[18]

There is a cyclical pattern, with DHF virus transmission increasing during the rainy season. The interaction between temperature and rainfall is an essential determinant of dengue virus transmission because colder temperatures improve the survival rate of adult mosquitoes, which in turn affects the rate of dengue virus transmission.[19] In addition, rainfall and temperature affect diet and mosquito reproduction and increase the density of vector mosquitoes.[20] In the COVID-19 pandemic situation—currently being experienced—the model of the independent *juru pemantau jentik (jumantik)* program (one house, one health cadre movement) is the most effective method for preventing DHF. The success of this dengue fever prevention effort is determined primarily by the cohesiveness and awareness of the community as a whole, because mosquitoes—as disease vectors—have high mobility to move from place to place, spreading disease. Therefore, it is hoped that through the activities of the independent jumantik program, participants can socialize and proliferate their respective areas in their neighborhoods with mosquito repellent plants.[21]

Conclusion

It can be concluded that DHF is still a challenge in five sub-regions of East Java Province. Adopting LSSR have no impact on resolving the spread of DHF because there is no significant relationship between the prevalence of DHF prior to the COVID-19 pandemic and during the COVID-19 pandemic. The COVID-19 pandemic did not make the prevalence of DHF any different from the rates recorded in the previous year. Therefore, additional effort is required to reduce the number of dengue cases occurring during the COVID-19 pandemic. An effective method for lowering the growing prevalence of DHF is to build community independence through the one house, one health cadre movement.

Abbreviations

COVID-19: coronavirus disease 2019, CFR: Case Fatality Rate, WHO: World Health Organization, DHF: Dengue Hemorrhagic Fever, LSSR: Large-Scale Social Restrictions, WFH: Work from Home, GTPP: Gugus Tugas Percepatan Penanganan (Acceleration Handling Task Force)

Ethics Approval and Consent to Participate

Permission to use the data used in this study was granted by the Research Center, Faculty of Dental Medicine, Universitas Airlangga Ethical Clearance Commission (number: 276/HRECC.FODM/VI/2021).

Competing Interest

The authors declare that there are no competing interests to disclose.

Availability of Data and Materials

The data used in this study are available in the COVID-19 Task Force database of the Ministry of Health, Republic of Indonesia, and existing literature related to DHF data during the COVID-19 Pandemic.

Authors' Contribution

The research design was developed jointly by AYT and MAM. MFDL and HBN performed the analysis, and RY drafted the manuscript.

Acknowledgment

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