

STACTISTICAL DATA ANALYSIS OF THE COVID-19 VIRUS IN CENTRAL JAVA PROVINCE

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Abstract

This study examines the dynamics of COVID-19 transmission in Central Java Province throughout 2021 using a literature review method based on secondary data from the Central Bureau of Statistics (BPS), scientific journals, and research articles. Central Java was among the provinces with the highest number of COVID-19 cases in Indonesia, ranking third after Jakarta and East Java. The data show a total of 486,916 confirmed cases, 455,599 recoveries, and 30,287 deaths. Semarang City recorded the highest number of cases, influenced by high population mobility, dense urban settlements, and inconsistent adherence to health protocols. Other contributing factors to the high infection and mortality rates include comorbidities, limited healthcare capacity during the Delta variant surge, and public negligence in preventive measures. On the other hand, the relatively high recovery rate was supported by improved healthcare facilities, mass vaccination programs, and community-based initiatives such as *Jogo Tonggo*, which strengthened social solidarity and patient recovery. This research highlights that effective pandemic management requires not only medical interventions but also behavioral changes, public awareness, and community empowerment. The findings provide a comprehensive overview of the COVID-19 situation in Central Java and propose recommendations for improving future policy responses.

Keywords: COVID-19; Central Java; Pandemic; Public Health; Jogo Tonggo; Vaccination; Community Empowerment

1. INTRODUCTION

Coronavirus disease, or COVID-19, has become a global concern. To date, this topic is still frequently discussed. COVID-19 is a new disease that emerged in Wuhan, China, in December 2019. Previously, this virus had never been found before. Then, in January 2020, the World Health Organization (WHO) declared COVID-19 a pandemic. This decision was made due to the widespread transmission of COVID-19 in various countries around the world (Purwoko, S., et al. 2021).

COVID-19 is a virus that causes disease in animals and humans. In humans, this virus causes respiratory problems. Early symptoms range from the common cold to more severe illnesses such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) (Arianda A. 2021). COVID-19 can be transmitted through droplets from infected people. Therefore, there are many things that can be done to avoid exposure to COVID-19.

The WHO says prevention measures include washing your hands with soap or hand sanitizer, avoiding touching your face, and wearing a mask. This virus spreads mainly through droplets of saliva or nasal mucus when an infected person coughs or sneezes, so it is important

for everyone to practice cough etiquette by coughing into a bent elbow or tissue, then disposing of the tissue in a trash bin and washing their hands (WHO, 2020).

In Indonesia, the first COVID-19 cases appeared in March 2020. Since then, COVID-19 has continued to spread until 2021. Currently, the number of positive COVID-19 cases in Indonesia has reached 4.07 million, with 132,000 deaths (Indonesian Ministry of Health, 2021).

The emergence of COVID-19 has caused losses for many countries, including Indonesia. The emergence of this new virus means that not many people know how to prevent it. However, over time, governments in several countries have begun to issue policies for the prevention of COVID-19 (Afrianto, Y., et al. 2021). Indonesia is also one of the countries that.

COVID-19 is highly contagious, resulting in the number of COVID-19 cases continuing to increase every day. Considering this, the government has begun to issue policies to prevent the spread of the virus through lockdowns or PSBB (Large-Scale Social Restrictions), as well as preventive measures such as wearing masks, maintaining social distancing, and so on (Afrianto, Y., et al. 2021). These are necessary measures to reduce the daily spike in cases. Several provinces in Indonesia have also experienced a high spike in cases.

Efforts to deal with the surge in Covid-19 cases include the implementation of Emergency Community Activity Restrictions (PPKM). Emergency PPKM was implemented in all districts and cities in Java and Bali that had a pandemic situation assessment level of 3 and 4, and was carried out from July 3, 2021 to July 20, 2021 (Mendagri, 2021). Emergency PPKM was then renamed Level 3 and Level 4 PPKM and extended from July 21-25, July 26-August 2, August 3-9, August 10-16, August 17-23, and August 24-30 (Ministry of Home Affairs, 2021). Several regulations related to Emergency PPKM include restrictions on learning activities, non-essential and essential sectors, eating and drinking in public places, places of worship, transportation, and other activities that cause crowds (Mendagri, 2021).

The implementation of the 5M health protocol, namely wearing masks, washing hands, maintaining physical distance, avoiding crowds, and reducing mobility, has also been tightened in the Emergency PPKM (Minister of Home Affairs, 2021). The implementation of health protocols is a form of active community participation in preventing the spread of Covid-19. According to Intermountain Healthcare, the use of masks by both sick and healthy individuals can reduce the risk of transmission by up to 98.5%. Maintaining physical distance is also necessary to reduce the risk of infection. When speaking and coughing, droplets can reach a distance of 2 meters, while when sneezing, droplets can reach 6 meters. According to research by Beale et al., washing hands with soap or hand sanitizer can reduce the risk of transmission by up to 35% (Covid-19 Task Force, 2021).

Prevention of Covid-19 spread in accordance with Emergency PPKM instructions continues to be carried out by the government in the form of strengthening 3T, namely testing, tracing, and treatment. Testing is targeted to match the positivity rate, tracing of cases is targeted at 15 close contacts per confirmed case, and treatment given to patients must be in accordance with the severity of Covid-19 symptoms (Minister of Home Affairs, 2021). Testing is an effort to determine a person's Covid-19 status. Covid-19 testing can be done with Genose, Antigen Swab, and PCR Swab. Tracing is an effort to identify people infected with Covid-19 by tracking people who have had contact with Covid-19 patients. Treatment for individuals with symptoms or who test positive for COVID-19 can be conducted at home independently or in a hospital, depending on the severity of the patient's symptoms (COVID-19 Task Force, 2021).

The COVID-19 pandemic has had a widespread impact on Indonesian society, not only in the health sector but also economically, especially for the poor and marginalized. Central Java Province is one of the most severely affected areas, ranking fourth in the red zone category in Indonesia. This situation has prompted the Central Java Provincial Government to issue community-based pandemic response policies.

In response to this situation, the Central Java Provincial Government launched the Jogo Tonggo Program, which comes from the Javanese language and means “caring for neighbors.” This program operates at the village (RW) level and involves various elements of society such as Karang Taruna (Youth Organization), Posyandu (Integrated Health Posts), Linmas (Community Protection Units), and local residents. The program covers four main areas: health, social and security, economy, and arts and entertainment, utilizing local wisdom and a spirit of cooperation as its foundation.

However, this study concludes that the implementation of the Jogo Tonggo program has not been maximized. Many people are still unaware of the dangers of Covid-19 and ignore government appeals. Therefore, several improvements are needed, including increasing Jogo Tonggo members' understanding of their rights and obligations, as well as evaluating and optimizing the use of social media as a means of communication and education for the wider community.

2. MATERIALS AND METHODS

2.1. Study Area and Period

The study area focused on in this research is Central Java Province. The author selected Central Java Province as the research subject because it is the second-largest province in Indonesia with the widest and fastest spread of COVID-19. The data period analyzed covers the entire course of the pandemic throughout 2021.

2.2. Research Design

The research method employed is library research. This approach was chosen to explore quantifiable data using mathematical, statistical, and computational systems. Through library research, the researcher can establish a strong theoretical foundation, understand the development of previous research, and identify gaps or issues that can be further explored without duplicating existing studies.

2.3. Data Collection and Sources

The data used in this study are secondary data, meaning data obtained from other sources or through intermediaries, rather than through direct field observations. The primary data collection instruments consist of official reports from the Central Statistics Agency (BPS), supplemented by scientific literature such as research articles and journals relevant to the topic of COVID-19. The collection process was conducted by identifying, reading, reviewing, and recording important information from published documents with high credibility.

2.4. Data Analysis Procedures

The research process was carried out through the following systematic stages:

- a. Identification: The researcher identified and selected documents and data sources that were valid and relevant to the topic of COVID-19 dynamics in Central Java.
- b. Content Analysis: After the secondary data was collected, it was analyzed using content analysis techniques. This stage aims to identify patterns of transmission, statistical trends, and factors influencing case surges across various regions.
- c. Synthesis: The results of the data analysis are then combined and synthesized into a detailed narrative. This provides a comprehensive overview of the pandemic's dynamics without the need for primary data collection, instead focusing on the utilization of available historical data to gain a deep understanding of the phenomenon.

3. RESULTS AND DISCUSSION

Central Java is one of the provinces in Indonesia with a high number of COVID-19 cases, ranking third after DKI Jakarta and East Java at the end of August 2020 (Khoerunnisa & Adi, Y. A. 2021). This condition shows that Central Java is one of the regions with a high level of alertness to the spread of the virus. The high number of cases has had an impact on the entire population of Central Java. In addition, this has also impacted health services, which have had to work extra hard to care for patients. Local governments have also been required to take strategic steps to reduce the rate of transmission through the policies that have been implemented. This study obtained data on the number of cases, recoveries, and deaths due to the COVID-19 pandemic in 2021. This data, Table 1, was collected from all districts/cities in Central Java.

Table 1. COVID-19 Case Data in Regencies in Central Java in 2021

City	Number of infected cases	Recovered cases	Deaths
Cilacap	14.377	13.331	989
Banyumas	27.150	25.994	1.082
Purbalingga	9.754	9.351	398
Banjarnegara	9.509	8.996	459
Kebumen	17.257	16.076	1.139
Purworejo	16.546	15.729	795
Wonosobo	12.959	12.414	534
Magelang	14.885	14.138	672
Boyolali	10.317	9.867	407
Klaten	25.062	23.269	1.525
Sukoharjo	11.760	10.603	1.127
Wonogiri	11.793	10.472	1.314
Karanganyar	15.727	14.738	922
Sragen	14.326	13.126	1.156
Grobogan	9.761	9.238	519
Blora	9.904	9.277	620
Rembang	7.325	6.640	681
Pati	9.359	8.325	1.029
Kudus	15.120	13.945	1.170
Jepara	17.849	17.178	668
Demak	8.875	8.070	801
Semarang	16.784	15.949	822
Temanggung	10.978	10.496	477
Kendal	13.957	13.216	725
Batang	6.151	5.746	397
Pekalongan	5.846	5.432	396
Pemalang	11.199	10.445	742
Tegal	16.048	15.145	900
Brebes	10.960	10.060	865

The data Table 2 shows that the number of infected cases is very high. According to data from the Central Java Statistics Agency, in 2021, the number of infected cases in Semarang reached 53,289. The high number of COVID-19 cases in Semarang compared to other cities is due to several factors. First, the mobility of Semarang's population is high because the city is a center of economy, education, and government. This causes more intensive interaction between

individuals. Second, preventive measures have not been implemented consistently. Many residents still ignore health protocols. Third, the population density in the Semarang area increases the risk of transmission compared to areas with smaller populations.

Table 2. COVID-19 Case Data in Cities in Central Java in 2021

City	Number of infected cases	Recovered cases	Deaths
Magelang	7.717	7.368	342
Surakarta	22.987	21.724	1.209
Salatiga	6.391	6.174	183
Semarang	53.289	48.845	4.418
Pekalongan	5.840	5.523	317
Tegal	5.412	5.026	383

In addition to these factors, Figure 1, epidemiological reports show that COVID-19 cases in Semarang City are also influenced by the flow of people entering and leaving the city, which increases the potential for virus transmission (Nabilah S. 2022). Therefore, social and behavioral factors play a decisive role in the high number of COVID-19 cases. This means that mitigation strategies must not only focus on medical aspects, but also on increasing public awareness and discipline regarding health protocols.

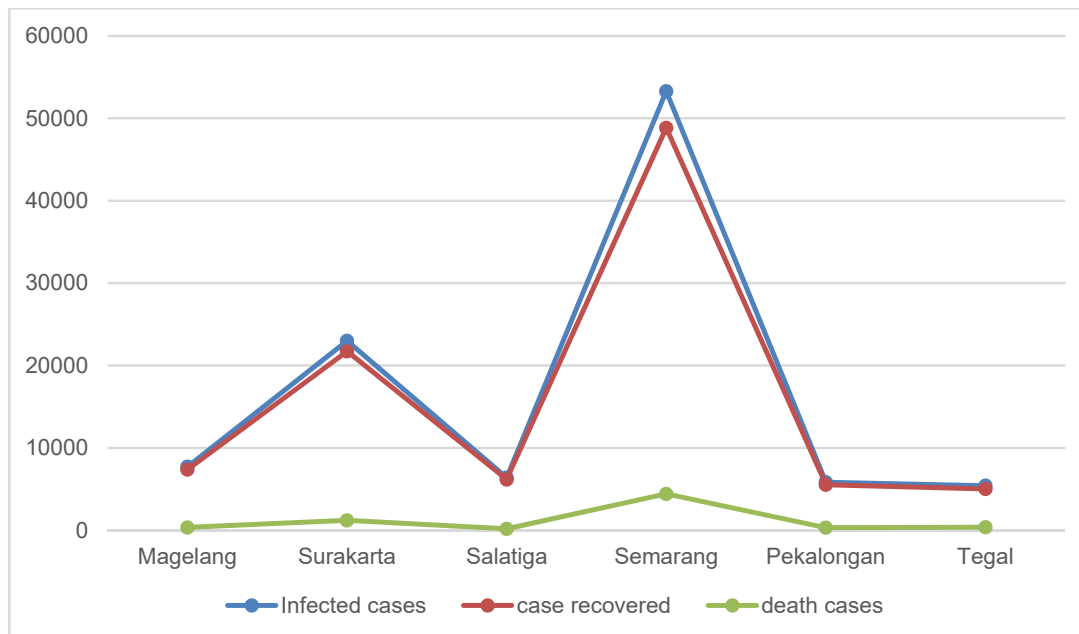


Figure 1. COVID-19 Case Data in Central java in 2021

The pie chart, Figure 2, shows that 47% of COVID-19 cases across the district have recovered. This high recovery rate is influenced by several important factors. First, there has been an increase in health service capacity in various regions, including isolation facilities and referral hospitals, which has accelerated the treatment process for patients (Damayanti et al., 2022). Second, the mass vaccination program organized by local governments has contributed to reducing the severity of cases, thereby increasing the chances of recovery (Khoerunnisa & Adi, 2021). Third, the community has begun to strictly comply with health protocols (Nabilah, 2021). In addition, support from local communities such as Jogo Tonggo has also strengthened

social solidarity and accelerated patient recovery (Hayati & Pawenang, 2021). These measures have increased the recovery rate of COVID-19 cases in Central Java in 2021.

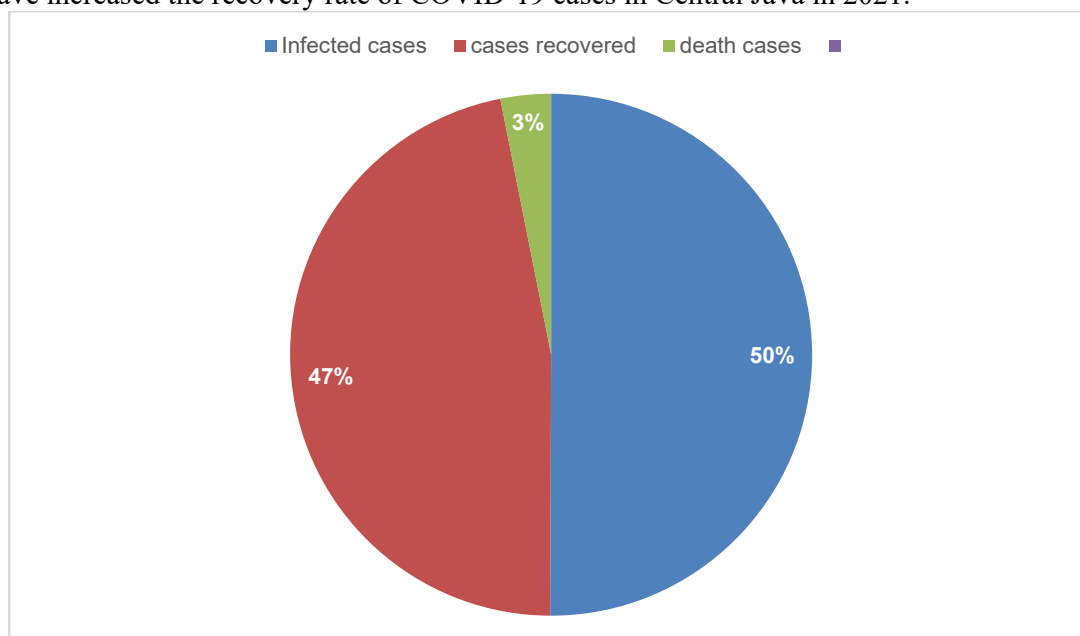


Figure 2. COVID-19 Infection Cases in ALL Regencies in Central Java in 2021

The diagram shows, Figure 3, that the COVID-19 mortality rate in Central Java in 2021 reached 3%. This was influenced by several factors. The high number of deaths was related to healthcare capacity, especially during the Delta variant wave, which caused a sudden surge in the number of patients (Rahmita Damayanti, 2022). In addition, underlying health conditions such as hypertension, diabetes, and heart disease can increase the risk of death. Inconsistent non-compliance with health protocols by the community also contributed to the high number of cases and deaths (Zaimatun Nabilah, 2021). Environmental conditions and population density in Central Java also increase vulnerability to transmission, thereby increasing the likelihood of death (Hayati & Pawenang, 2021). Therefore, medical, behavioral, and environmental factors are the main causes of the high COVID-19 mortality rate in Central Java in 2021.

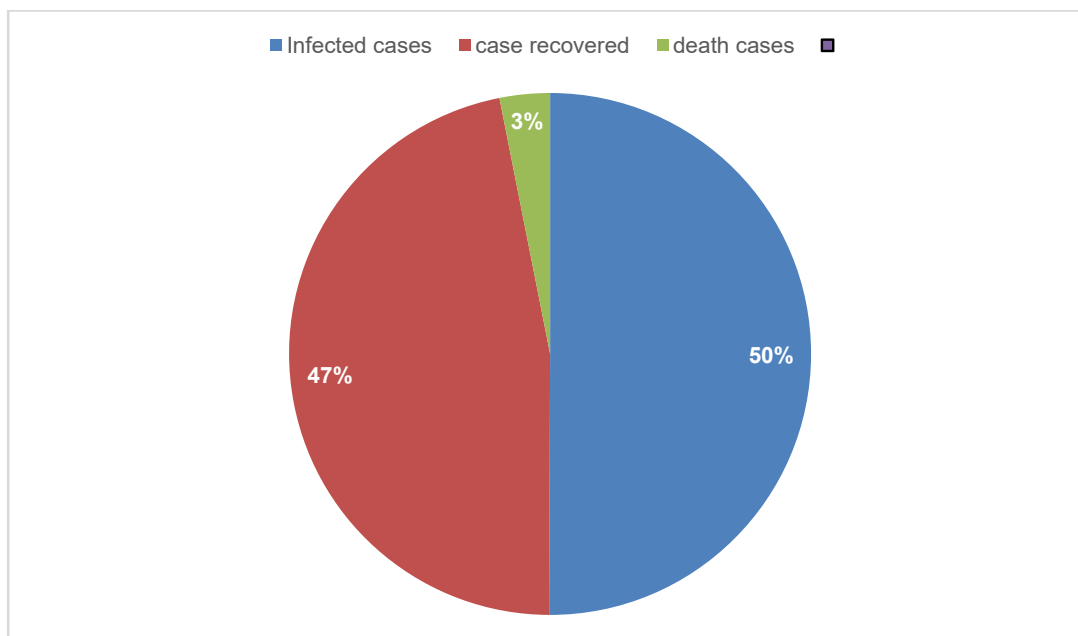


Figure 3. COVID-19 Infection Cases in Central Java in 2021

4. BATIK MOTIFS

Philosophy of motif batik is:

a. Straight Line Motif

Motif garis lurus dalam batik ini melambangkan lonjakan kasus COVID-19 yang terus meningkat sepanjang tahun 2021. Garis yang tegas dan berkesinambungan mencerminkan grafik epidemiologi yang menunjukkan tren kenaikan tajam jumlah kasus terinfeksi. Motif ini menjadi simbol visual dari ketegangan dan urgensi yang dirasakan masyarakat serta tenaga kesehatan selama masa puncak pandemi.

The straight line motif on this batik symbolizes the surge in COVID-19 cases that continued to rise throughout 2021. The thick, continuous lines reflect epidemiological graphs showing a sharp upward trend in the number of infected cases. This motif has become a visual symbol of the tension and urgency felt by the community and health workers during the peak of the pandemic.

b. Leaf Line Motif

The leaf line motif depicts life continuing despite the challenges posed by the pandemic. Its organic and flowing shape symbolizes hope for social and economic recovery. Leaves, as a symbol of growth and sustainability, remind us that even in times of crisis, society continues to adapt and strive to bounce back.

c. Circle Motif

The circular virus motif represents the real threat of COVID-19 that has attacked the world. Its shape is similar to the SARS-CoV-2 virus, which has protrusions around it, becoming a visual icon of the global pandemic. This motif reminds us not to forget the origin of the crisis and the importance of remaining vigilant against infectious diseases.

d. Dot Motif

The dotted lines symbolize the rapid, widespread, and massive spread of the virus. The dots scattered in a batik pattern reflect how COVID-19 spreads from one individual to another, crossing regional and social boundaries. This pattern symbolizes the unpredictable and

comprehensive nature of the pandemic, while reminding us of the importance of health protocols and solidarity.

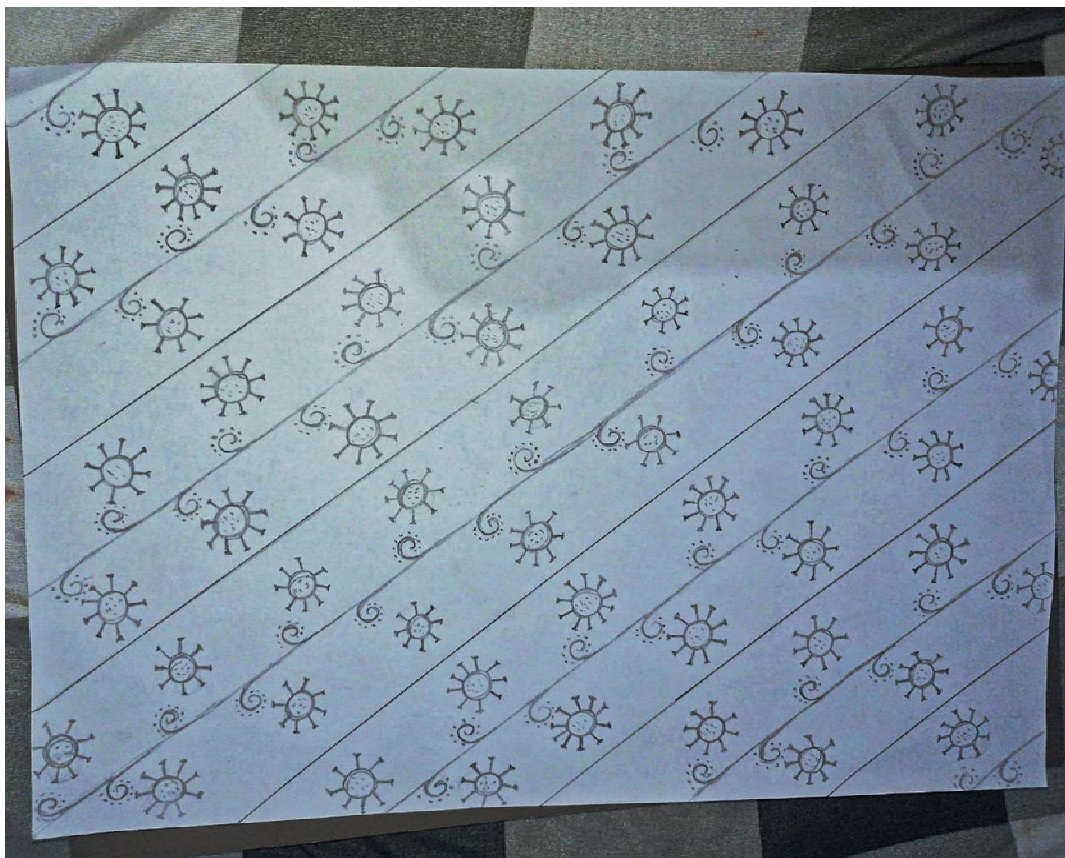


Figure 4. Batik Motifs

5. CONCLUSION

This study shows that Central Java Province experienced a significant impact from the COVID-19 pandemic throughout 2021, with 486,916 cases infected, 455,599 recovered, and 30,287 deaths. The city of Semarang had the highest number of cases, influenced by high mobility, population density, and a lack of public discipline in following health protocols. On the other hand, the relatively high recovery rate reflects the success of various efforts such as improving health facilities, mass vaccination programs, and community support through the Jogo Tonggo program. This study emphasizes that handling the pandemic requires not only a medical approach, but also community-based strategies, public education, and strengthening social solidarity. The batik motifs proposed in this study serve as visual symbols of the pandemic's dynamics, with philosophies reflecting the surge in cases, hopes for recovery, the threat of the virus, and its massive spread. Therefore, the results of this study provide a comprehensive overview and important recommendations for future pandemic management policies.

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