Volume 3, No. 4 March 2024 (0000-0000)
p-ISSN 2980-4868 | e-ISSN 2980-4841
https://ajesh.ph/index.php/gp

Factors Related to the Chikungunya Outbreak (Extraordinary Events) in Wonoboyo Sub-District, Wonogiri District, Wonogiri District

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ABSTRACT
Chikungunya, a viral disease transmitted by Aedes aegypti or Aedes albopictus mosquitoes, poses a significant public health threat. In Wonoboyo Village, according to data from the Wonogiri Health Office, there were 119 reported cases in 2020, and 61 cases in 2021, highlighting the local impact of this disease within Wonogiri Regency. This study endeavors to investigate the factors contributing to the Chikungunya outbreak specifically in Wonoboyo Village. The research adopts an analytical observational approach with a cross-sectional design. The study's variables include the state of the landfill, the presence of larvae, occupancy density, landfill maintenance habits, hygiene practices, and mosquito repellent usage. The dependent variable is the occurrence of the Chikungunya outbreak (KLB Chikungunya). Data collection involves questionnaires and observations among the residents of Wonoboyo Village, with a sample size of 357 households selected through simple random sampling. Analysis utilizing Chi-square tests, with a significance level of 5%, reveals correlations between various factors and the Chikungunya outbreak. Specifically, the condition of the landfill, presence of larvae, occupancy density, landfill maintenance habits, hygiene practices, and mosquito repellent usage are significantly associated with the outbreak. Based on the findings, it is recommended that residents of Wonoboyo Village adhere to PSN 3M activities regularly and maintain cleanliness both indoors and outdoors to mitigate the transmission of Chikungunya.

Keywords: **Chikungunya Outbreak, Aedes Aegypti Mosquito, Occupancy Density.**

INTRODUCTION

Chikungunya is a disease caused by a virus and transmitted by the mosquito Aedes aegypti or Aedes albopictus (Kemenkes RI, 2012). Factors related to the Chikungunya outbreak first the state of the Water Reservoir (TPA) (Badoni et al., 2023; de Souza et al., 2024; Ngwe Tun et al., 2023). In the rainy season, the population of Aedes aegypti will increase because the eggs that had not had time to hatch will hatch when the breeding habitat (landfill is not a daily and natural necessity) begins to fill with rainwater (Kemenkes RI, 2012). Second, the presence of larvae in the home environment, such as in used bottles and cans, plastic cups, and other fields (Oktisari FY, 2008). All three densities are categorized into meeting the standard (2 persons per 8 m^2) (Kemenkes RI, 2017).

The four habits are draining the water reservoir (TPA), draining the bathtub, or draining the water reservoir (TPA) at least once a week (Kemenkes RI, 2012). Fifth is the habit of closing the Water Reservoir (TPA); in a landfill that is always closed tightly, the chance of mosquitoes laying eggs becomes very small, affecting their existence in the landfill. The six habits of burying used mosquito breeding sites, such as used cans, old tires, bottles, coconut shells, plastic, and others thrown in any place (Kemenkes RI, 2010).

The seventh habit of hanging clothes, clothes that hang indoors is a preferred place for Aedes aegypti mosquitoes to rest after sucking human blood (Dinas Kesehatan Jawa Tengah, 2014). The eight habits of using mosquito repellents, such as essential oils and plant extracts, are natural repellent staples such as citronella oil, lemongrass oil, and neem oil (such as mahogany). Chemical repellents such as DEET (N-Diethyl-m-Toluamide) may protect Aedes aegypti and Aedes albopictus (Clarkson et al., 2021; Haleem et al., 2020)

Chikungunya data in Indonesia in 2020 found 1,689 cases of Chikungunya fever, much lower than in 2019, which was 5,042 cases (Santoso et al., 2022). Central Java Health Office data on In 2009 there were 5,095 people with the highest number of chikungunya cases occurring in Kendal 1,412 cases, Banyumas 945 cases, Kebumen 768 cases, and Sukoharjo 518 cases (Dinas Kesehatan Jawa Tengah, 2014). According to data from the Wonogiri District Health Office (DKK), in 2020, there were 119 cases of chikungunya in Wonoboyo Village, while in 2021, there were a total of 61 cases (Dinas Kesehatan Wonogiri, 2021). data from UPTD Puskesmas Wonogiri 1, in 2021 March, there were 243 cases, and Purwosari Village had as many as 12 cases. In 2020, Bulusulur Village had 34 cases, Pokoh Kidul Village had 128 cases, and Manjung Village had 22 cases (UPTD Puskesmas Wonogiri I, 2021).

This study aims to describe and analyze the relationship between factors related to the outbreak of Chikungunya, an extraordinary event, in Wonoboyo Village, Wonogiri District, Wonogiri Regency (Castellanos et al., 2021; Keat-Chuan Ng et al., 2023; Liu et al., 2020; Webb et al., 2022). The data indicates that factors such as the state of water reservoirs, the presence of larvae in household environments, and community habits in managing mosquito breeding sites are of primary concern. Additionally, habits such as draining water reservoirs, securely closing

waste disposal areas, and burying mosquito breeding sites have been identified as effective prevention measures. Although the number of Chikungunya cases in Indonesia decreased from 2019 to 2020, data from Wonoboyo Village show significant variation in case numbers between 2020 and 2021. This study aims to analyze the relationship between these factors and Chikungunya outbreak events, providing new insights into disease control strategies at the local level.

RESEARCH METHODS

The type of analytical observational quantitative research with a cross-sectional design is a cross-sectional study that only observes once, and measurements are made on subject variables at the time of the study (Notoatmodjo, 2010). The research was conducted in July-August 2022 in Wonoboyo Village, Wonogiri District, Wonogiri Regency. The research population of the Wonoboyo Village community amounted to 3306 households. The research sample of Wonoboyo Village residents amounted to 357 households. The sampling technique used is simple random sampling. The research instruments used are questionnaires and observations. A questionnaire is a data collection technique that gives respondents a set of questions or written statements to answer (Sugiyono & Puspandhani, 2020). Observations are systematic and planned studies that aim to obtain data controlled for validity and reality (Alwasilah, 2010).

RESULTS AND DISCUSSION

Variable Distribution with factors related to the Chikungunya outbreak

1. The Variable Frequency Distribution of KLB Chikungunya can be seen in the following table:

Table 1. Variable Frequency Distribution of Chikungunya KLB

Chikungunya outbreak	Frequency (n)	Percentage (%)
Ever	211	59,1
Never	146	40,9
Total	**357**	**100**

Source: Primary Data, 2022

In the Chikungunya outbreak variable, the majority of respondents, namely 211 respondents (59.1%), had suffered from Chikungunya.

2. The Variable Frequency Distribution of the Landfill State can be seen in the following table:

Table 2. Landfill State Variable Frequency Distribution

Landfill state	Frequency (n)	Percentage (%)
Exist	181	50,7
None	176	49,3
Total	**357**	**100**

Source: Primary Data, 2022

In the variable state of the landfill, most respondents, namely as many as 181 (50.7%), have a landfill.

3. The variable frequency distribution of the presence of larvae can be seen in the following table:

Table 3. Variable frequency distribution of the presence of larvae

The existence of larvae	Frequency (n)	Percentage (%)
Exist	187	52,4
None	170	47,6
Total	**357**	**100**

Source: Primary Data, 2022

In the variable of larvae, the majority of respondents, namely as many as 187 respondents (52.4%), had mosquito larvae.

4. The Variable Frequency Distribution of Occupancy Density can be seen in the following table:

Table 4. Variable Frequency Distribution of Occupancy Density

Occupancy Density	Frequency (n)	Percentage (%)
Non-standard	165	46,2
Standard	192	53,8
Total	**357**	**100**

Source: Primary Data, 2022

In the variable occupancy density, most respondents, as many as 192 (53.8%), met occupancy standards.

5. The distribution of variable frequency of landfill drain can be seen in the following table:

Table 5. Variable Frequency Distribution Drains Landfill

Draining landfill	Frequency (n)	Percentage (%)
Not routine	189	52,9
Routine	168	47,1
Total	**357**	**100**

Source: Primary Data, 2022

In the variable of draining landfills, the majority of respondents, namely as many as 189 respondents (52.9%), do not routinely drain landfills.

6. The Variable Frequency Distribution of Closing Landfill can be seen in the following table:

Table 6. Variable frequency distribution closes landfill

Closing the landfill	Frequency (n)	Percentage (%)
Does not close	188	52,7
Shut	169	47,3
Total	**357**	**100**

Source: Primary Data, 2022

In closing the landfill, most respondents, namely as many as 188 (52.7%) did not close the landfill.

7. The variable frequency distribution of burying used goods can be seen in the following table:

Table 7. Variable frequency distribution of burying scrap

Burying Used Items	Frequency (n)	Percentage (%)
Unfamiliar	192	53,8
Familiar	165	46,2
Total	**357**	**100**

Source: Primary Data, 2022

In the variable of burying used goods, most respondents, namely as many as 192 respondents (53.8%), are not used to burying used goods.

8. The variable frequency distribution of hanging clothes can be seen in the following table:

Table 8. Variable frequency distribution of hanging clothes

Hanging Clothes	Frequency (n)	Percentage (%)
Unfamiliar	157	originality44
Familiar	200	56
Total	**357**	**100**

Source: Primary Data, 2022

In the variable of hanging clothes, the majority of respondents, namely as many as 200 respondents (56%), are accustomed to hanging clothes.

9. The Variable Frequency Distribution Using Mosquito Repellent can be seen in the following table:

Table 9. Variable frequency distribution using insect repellent

Using insect repellent	Frequency (n)	Percentage (%)
Unfamiliar	183	51,3
Familiar	174	48,7
Total	**357**	**100**

Source: Primary Data, 2022

In the variable of mosquito repellent, the majority of respondents, namely as many as 183 respondents (51.3%), are not used to using insect repellent.

Variable Test Results with factors related to the Chikungunya outbreak

Table 10. Cross Table of Landfill Conditions with Outbreaks (Extraordinary Events) Chikungunya

Landfill state	KLB Cikungunya				Total		p-value	C
	Ever		Never					
	N	%	N	%	N	%		
Exist	117	64,6	64	35,4	181	100	0,031	0,113
None	94	53,4	82	46,6	176	100		
Total	211	59,1	146	40,9	357	100		

Source: Primary Data, 2022

Based on Table 10 above, of the 181 respondents, the majority of whom had TPA, 117 respondents (64.6%) had suffered from Chikungunya disease, and 64 respondents (35.4%) had never suffered from Chikungunya. The results of statistical tests using chi-square show a p-value = 0.031< 0.05 and a correlation coefficient value of 0.113, meaning that the state of the landfill has a weak relationship with the Chikungunya outbreak.

Table 11. Cross Table of the Existence of Larvae with the Outbreak (Extraordinary Occurrence) of Chikungunya

The existence of larvae	KLB Cikungunya				Total		p-value	C
	Ever		Never					
	N	%	N	%	N	%		
Exist	129	69	58	31	187	100	0,000	0,206
None	82	48,2	88	51,8	170	100		
Total	211	59,1	146	40,9	357	100		

Source: Primary Data, 2022

Of the 187 respondents, the majority of whom had larvae in the home environment, 129 respondents (69%) had suffered from Chikungunya, and 58 respondents (31%) had never suffered from Chikungunya. The results of statistical tests using chi-square show p-value = 0.000 < 0.05 and have a correlation coefficient value of 0.206, meaning that the presence of larvae has a weak relationship with the Chikungunya KLB.

Table 12. Cross Table of Occupancy Density with Outbreaks (Extraordinary Events) Chikungunya

Occupancy Density	The Incident of Cikungunya				Total		p-value	C
	Ever		Never					
	N	%	N	%	N	%		
Non-standard	76	46,1	89	53,9	165	100	0,000	0,239
Standard	135	70,3	57	29,7	192	100		
Total	211	59,1	146	40,9	357	100		

Source: Primary Data, 2022

Of the 192 respondents, the majority had standard occupancy density, 135 respondents (70.3%) had suffered from Chikungunya and 57 respondents (29.7%) had never suffered from Chikungunya. The results of statistical tests using chi-square show p-value = 0.000 < 0.05 and have a correlation coefficient value of 0.239, meaning that residential density has a weak relationship with the Chikungunya KLB.

Table 13. Cross Table Drains Landfill with Chikungunya Outbreak (Extraordinary Event)

	KLB Cikungunya	Total	p-value	C

Draining landfill	Ever		Never					
	N	%	N	%	N	%		
Not routine	100	52,9	89	47,1	189	100	0,012	0,132
Routine	111	66,1	57	33,9	168	100		
Total	211	59,1	146	40,9	357	100		

Source: Primary Data, 2022

Of the 168 respondents, the majority of whom used the habit of draining landfills, there were 111 respondents (66.1%) who had suffered from Chikungunya, and 57 respondents (33.9%) had never suffered from Chikungunya. The results of statistical tests using chi-square show p-value = 0.012 < 0.05 and have a correlation coefficient value of 0.132, meaning that the habit of draining landfills has a weak relationship with the Chikungunya outbreak.

Table 14. Cross Table Closing Landfill with Outbreaks (Extraordinary Events) Chikungunya

Closing the landfill	KLB Cikungunya				Total		p-value	C
	Ever		Never					
	N	%	N	%	N	%		
Does not close	101	53,7	87	46,3	188	100	0,029	0,115
Shut	110	65,1	59	34,9	169	100		
Total	211	59,1	146	40,9	357	100		

Source: Primary Data, 2022

Of the 169 respondents, the majority of whom made the habit of closing landfills, 110 respondents (65.1%) had suffered from Chikungunya and 59 respondents (34.9%) had never suffered from Chikungunya. The results of statistical tests using chi-square show p-value = 0.029 < 0.05 and has a correlation coefficient value of 0.115, meaning that the habit of closing landfill has a weak relationship with the Chikungunya outbreak.

Table 15. Cross Table Burying Scrap with Outbreaks (Extraordinary Events) Chikungunya

Burying Used Items	KLB Cikungunya				Total		p-value	C
	Ever		Never					
	N	%	N	%	N	%		
Unfamiliar	135	70,3	57	29,7	192	100	0,000	0,239
Familiar	76	46,1	89	53,9	165	100		
Total	211	59,1	146	40,9	357	100		

Source : Primary Data, 2022

Of the 192 respondents, the majority of whom practiced the habit of burying used goods, there were 76 respondents (70.3%) who had suffered from Chikungunya and 89 respondents (29.7%) had never suffered from Chikungunya. The results of statistical tests using chi-square show p-value = 0.000 < 0.05 and have a correlation coefficient value of 0.239, meaning that the habit of burying used goods has a weak relationship with the Chikungunya outbreak.

Table 16. Cross Table Hanging Clothes with KLB (Extraordinary Occurrence) Chikungunya

Hanging Clothes	KLB Cikungunya				Total		p-value	C
	Ever		Never					
	N	%	N	%	N	%		
Unfamiliar	50	31,8	107	68,2	157	100	0,000	0,441
Familiar	161	80,5	39	19,5	200	100		
Total	211	59,1	146	40,9	357	100		

Source: Primary Data, 2022

Of the 157 respondents, the majority of whom practice the habit of hanging clothes, 161 respondents (31.8%) have suffered from Chikungunya and 39 respondents (68.2%) have never suffered from Chikungunya. The results of statistical tests using chi-square show p-value = 0.000 < 0.05 and have a correlation coefficient value of 0.441, meaning that the habit of hanging clothes has a moderate relationship with the Chikungunya outbreak.

Table 17. Cross Table Using Mosquito Repellent with Outbreaks (Extraordinary Events) Chikungunya

Using insect repellent	KLB Cikungunya				Total		p-value	C
	Ever		Never					
	N	%	N	%	N	%		
Unfamiliar	94	51,4	89	48,6	183	100	0,002	0,159
Familiar	117	67,2	57	32,8	174	100		
Total	211	59,1	146	40,9	357	100		

Source: Primary Data, 2022

While of the 174 respondents, the majority of whom are accustomed to using mosquito repellent, there are 117 respondents (67.2%) who have suffered from Chikungunya and 57 respondents (32.8%) have never suffered from Chikungunya. The results of statistical tests using chi-square show p-value = 0.002 < 0.05 and have a correlation coefficient value of 0.159, meaning that the habit of using mosquito repellent has a weak relationship with Chikungunya outbreaks.

CONCLUSION

Based on the results of research on factors related to the Chikungunya Extraordinary Event (KLB) in Wonoboyo Village, Wonogiri District, Wonogiri Regency, it can be concluded that most of these areas have Water Reservoir (TPA) conditions that do not meet standards, the presence of Aedes aegypti or Aedes albopictus mosquito vector larvae that are quite significant, occupancy standards that tend to be dense, and habits that do not support disease control such as drain landfills, close landfills, bury used goods, and use mosquito repellent. Statistical analysis showed a significant relationship between the state of the landfill, the presence of mosquito vector larvae, occupant density, the habit of draining the landfill, closing the landfill, burying used goods,

hanging clothes, and using mosquito repellent with the Chikungunya outbreak in the region, although the strength of the association varied from weak to moderate. This highlights the importance of environmental management and community behavior change in efforts to prevent and control Chikungunya disease.

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