



The Spread of the Chikungunya Outbreak in Solok District, West Sumatera Province - 2024

Yudi Pradipta¹, Elsi Novnariza¹, Muhammad Ilham Basgoro¹, Masrizal¹

^{1,2,3}Faculty of Public Health, Andalas University, Padang

Email correspondence : yudipradipta@ph.unand.ac.id

Track Record Article	Abstract
Revised: 30 May 2025 Accepted: 27 June 2025 Published: 30 June 2025 How to cite: Pradipta, Y., Novnariza, E., Basgoro, M. I., & Masrizal. (2025). The Spread of the Chikungunya Outbreak in Solok District, West Sumatera Province - 2024. Contagion: Scientific Periodical Journal of Public Health and Coastal, 7(1), 338–346.	<i>Chikungunya is one of the potential diseases of the outbreak in Indonesia. It is caused by the Chik Virus and transmitted through the bite of the Aedes aegypti mosquito. The severity of symptoms ranges from mild fever to, in some cases, temporary paralysis. In early January 2024, suspected chikungunya outbreaks were reported in several villages in Solok District. The Solok District Health Office conducted an epidemiological investigation to break the chain of transmission. This study aims to describe the epidemiological characteristics of Chikungunya cases in Solok District. We conducted a descriptive study on March – June 2024. Surveillance data of Chikungunya cases were collected from West Sumatera Provincial Health Office. Data analysis was performed by using open access software Epi Info 7, R-Studio, and QGIS. A total of 134 Chikungunya cases were reported. The investigation showed that the majority of Chikungunya cases were women (63.3%), aged 18-45 years (49.54%), most of cases lived in Cupak Village (20.86%), Kinari Village (20.14%), and Muara Panas Village (20.14%), the majority cases were students (28.38%), and housewives (28.38%). The majority of cases presented with fever (95.49%) and joint pain (90.23%), and overhalf developed a rash (55.97%), and no signs of bleeding (98.51%). The epidemic curve with a propagated type indicates the possibility of multiple waves of transmission through mosquito bites. Chikungunya outbreak in Solok District shows weaknesses in early warning and rapid response in disease control. The Solok District Health Office needs to strengthening surveillance system of Chikungunya and contact tracing on the field.</i> Keywords: Chikungunya, Mosquito, Outbreak, Vector Borne.

INTRODUCTION

Chikungunya is a disease that has the potential to cause outbreaks or epidemics in Indonesia. It is caused by the Chikungunya virus and transmitted through the bite of infected mosquitoes. Common symptoms include sudden onset of fever, rash, and joint pain. Chikungunya is a self-limiting illness that typically does not result in death and is followed by the development of immunity in affected individuals. Also known as "chik fever," the disease is transmitted by the same mosquito vector as dengue fever, namely *Aedes aegypti*. Human-to-human transmission occurs indirectly when a mosquito bites an infected person and subsequently bites another individual (Permenkes No 1501 Tentang Jenis Penyakit Menular Tertentu Yang Dapat Menimbulkan Wabah Dan Upaya Penanggulangan, 2010) & (Subdit Surveilans Direktorat Surveilans dan Kekarantinaan Kesehatan Kementerian Kesehatan RI, 2020).

Chikungunya is caused by the Chikungunya virus (CHIKV), a member of the genus Alphavirus within the family Togaviridae. It is classified as a re-emerging disease—an illness

that had previously declined in incidence but has reappeared and poses renewed public health challenges(Yuniarti, 2011). The virus was first identified in the Republic of Tanzania in 1952 and subsequently spread to other regions of Africa and Asia. The earliest recorded urban outbreaks occurred in Thailand in 1967 and in India during the 1970s. In recent decades, Chikungunya outbreaks have become increasingly frequent and widespread, partly due to viral adaptations that enhance transmission by the mosquito vector *Aedes albopictus*. As of 2022, Chikungunya has been reported in over 110 countries across Asia, Africa, Europe, and the Americas (World Health Organization (WHO), 2022).

Indonesia confirmed its first virologically verified Chikungunya outbreak in June 1982 in Jambi Province, Sumatra, followed by several epidemics between 1983 and 1984. After nearly two decades without reported cases, the virus re-emerged in early 2001, triggering multiple outbreaks in South Sumatra, Aceh, and West Java.(Maha & Subangkit, 2014) . Significant outbreaks occurred again in Western and Central Indonesia during 2009 and 2010, with the number of reported cases rising sharply from approximately 3,000 annually to 83,000 and 52,000 cases, respectively. Following 2010, reported cases declined to around 3,000 per year. However, outside of outbreak periods, the true incidence is likely underestimated, as diagnoses are often made based solely on clinical symptoms without laboratory confirmation (Harapan et al., 2019).

A deeper understanding of CHIKV epidemiology, clinical progression, and diagnostic strategies is essential, particularly given the presence of endemic areas in Indonesia. Despite the high number of Chikungunya cases reported in recent years, comprehensive epidemiological data remain limited (Sasmono et al., 2017). Although Chikungunya is not typically fatal, it can result in substantial economic losses. Moreover, in the absence of a specific antiviral treatment, the most effective approach is prevention through the interruption of transmission chains(Yuniarti, 2011).

In early 2024, the West Sumatera Provincial Health Office reported a Chikungunya outbreak in several districts, including Solok District. In response to the rising number of cases, the Solok District Health Office conducted an epidemiological investigation to support data collection and inform intervention strategies. Between October 2023 and April 2024, a total of 109 Chikungunya cases were recorded in Solok District, with cases reported across several sub-districts: Kubung, Gunung Talang, and Bukit Sundi (Dinas Kesehatan Provinsi Sumatera Barat, 2024).

The majority of cases presented with fever and joint pain—hallmark symptoms of Chikungunya—which typically lasted for several days. This study aims to describe the epidemiological

characteristics and transmission patterns of Chikungunya cases in Solok District to enhance understanding of the outbreak that has occurred.

METHODS

This descriptive study was conducted using secondary data obtained from active surveillance reports of the Chikungunya outbreak in Solok District, West Sumatera Province. The study period spanned from April to June 2024. The study population included all reported Chikungunya cases in Solok District from October 2023 to April 2024. Outbreak data were collected from the surveillance unit of the West Sumatera Provincial Health Office. All data were anonymized, and approval for further analysis was obtained from the West Sumatera Provincial Health Office.

The variables analyzed included age, gender, occupation, village of residence, date of symptom onset, and clinical symptoms (e.g., fever, rash, joint pain). Incomplete outbreak reports were excluded from the analysis. Data analysis was conducted using the open-access software Epi Info 7 to present the distribution and frequency of variables, RStudio to generate a daily epidemic curve illustrating transmission patterns, and QGIS to produce a spatial map of Chikungunya cases

RESULTS

A total of 109 cases were reported through active surveillance by the West Sumatera Provincial Health Office, with the following characteristics:

Table 1. Characteristics of Chikungunya Cases in Solok District (n=109)

Variables	f	%
Sex		
Male	40	36.70
Female	69	63.30
Age Group		
0-18 years old	24	22.02
18-45 years old	54	49.54
> 45 years old	31	28.44
Villages		
Cupak	29	26.61
Kinari	28	25.69
Koto Baru	21	19.27
Muara Panas	28	25.69
Parambahan	1	0.92
Selayo	2	1.83
Work		
Unemployed/retired	2	1.83
Student/College student	23	21.10
Freelance/others	8	7.34
Housewives	21	19.27
Civil Servant/ Sub-district/Village Officer	3	2.76
Teacher	3	2.76

Farmer/Trader/Laborer	11	10.10
Driver	2	1.83
Missing	35	32.11
Symptoms		
Fever		
Yes	108	99.08
Unknown	1	0.92
Rash		
Yes	63	57.80
No	46	42.20
Joint Pain		
Yes	97	88.99
No	12	11.01
Bleeding Sign		
Yes	2	1.83
No	107	98.17

Based on table 1, overhalf of chikungunya cases were female (51.49%), compared to male (29.85%). Most of cases were aged 18-45 years (40.30%) and more than 45 years old (23.3%). Most of cases were lived in Cupak (26.61%), Kinari (25.69%), and Muara Panas Village (25.69%). Most of cases worked as students/college students (21.10%) and housewives (19.27%), but 32.11% were unknown/missing. It might be caused by poor data collection in the field for type of work data. Based on clinical symptoms, majority of chikungunya cases had fever (99.08 %), joint pain (88.99 %), no bleeding sign (98.17%), and rash (57.80 %).

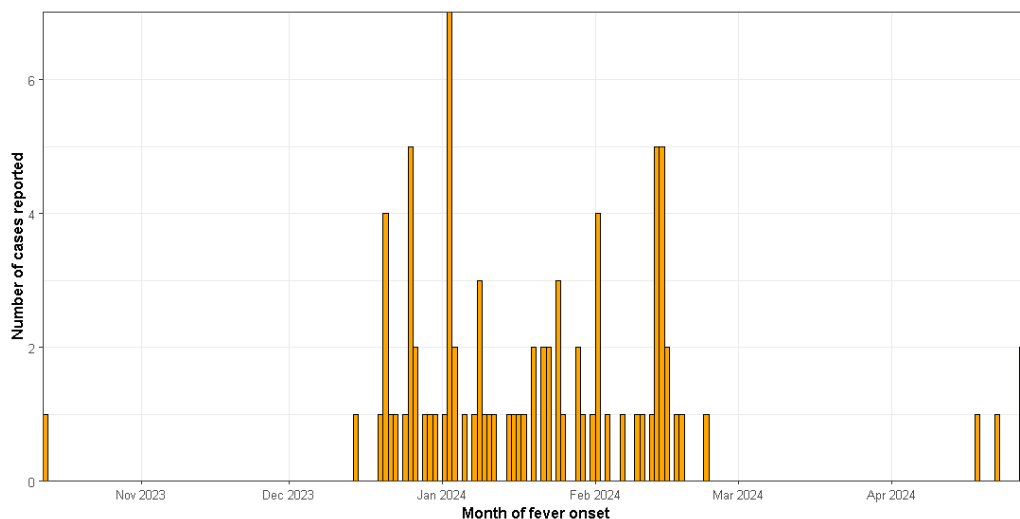


Figure 1. Daily Interval Epidemic Curve of Chikungunya Outbreak in Solok District

Figure 1 shows the number of incident cases reported monthly from November 2023 to April 2024, with fluctuating counts and notable peaks in January, February, and April 2024. First case was identified on October 2023 and starts reported widely on December 2023 until February 2025. First peak of the outbreak was occurred on January 2024, with second peak on middle of February 2024, and third peak was occurred in April 2024. It was indicated a multiple wave of transmission during these months.

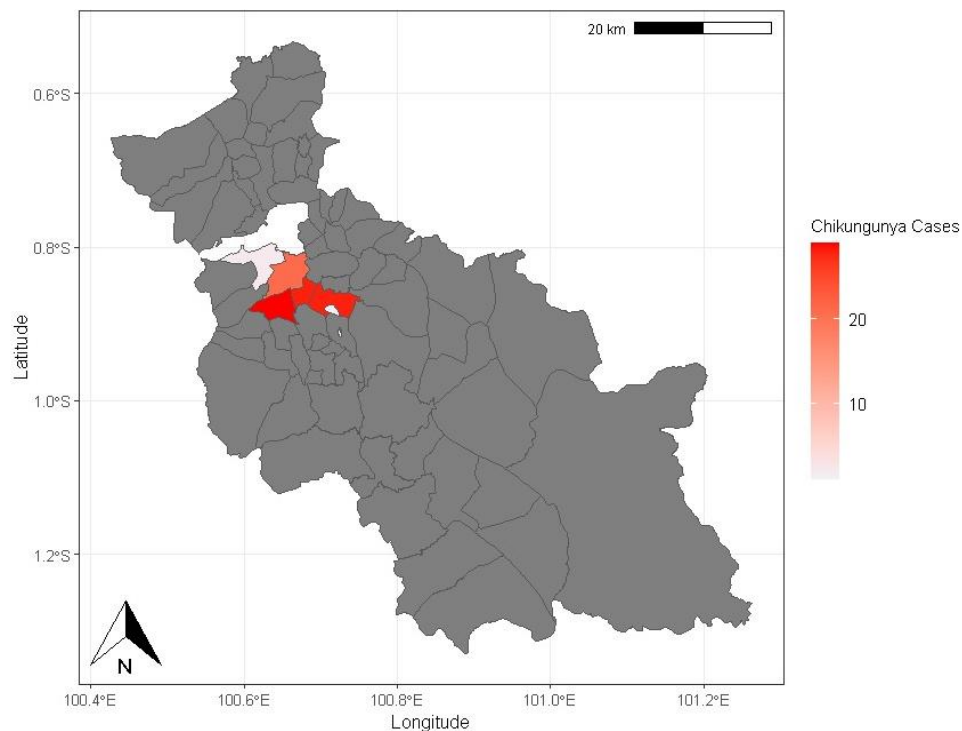


Figure 2. *Chikungunya outbreak in Solok District based on villages*

Chikungunya cases in Solok District were distributed across three sub-districts: Kubung, Gunung Talang, and Bukit Sundi. Six villages reported Chikungunya cases, namely Selayo, Muara Panas, Cupak, Kinari, Koto Baru, and Parambahan. Figure 2 presents a map using graduated color shading to indicate the number of cases, ranging from low to high. The red-shaded areas—Muara Panas, Kinari, and Cupak—represent villages with the highest number of reported Chikungunya cases.

DISCUSSION

his study found that the number of female cases was higher than male cases during the Chikungunya outbreak in Solok District. A meta-analysis conducted by Noor, Hossain, & Islam (2020) revealed that female patients had a 46% higher risk of developing Chikungunya compared to males. This finding is supported by other studies, which also indicate that women are at greater risk than men (Kawle et al., 2017; Mohanty et al., 2013).

In contrast, other studies have reported a higher number of male Chikungunya cases compared to female cases. This may be attributed to greater involvement of males in agricultural work, travel, and other occupational activities that increase exposure to mosquito bites. Several studies have documented varying susceptibility to Chikungunya infection based on gender. Therefore, these inconsistencies in findings highlight the need for further investigation into the association between gender and Chikungunya infection (Dagnaw et al., 2025; Huits et al., 2018).

According to Table 1, the majority of cases occurred in the 18–45-year age group, indicating that this demographic is at higher risk for Chikungunya infection. Previous research has shown that the incidence of Chikungunya tends to increase with age, peaking in older age groups before declining after the age of 70 in both sexes (Ammatawiyanon et al., 2023). Similarly, a study by Heath et al. (2018) identified increasing age as a significant risk factor for chronic CHIKV infection, with individuals aged 25 to 44 years exhibiting the highest risk. It has also been suggested that advancing age is associated with prolonged disease duration and persistent joint pain in the later stages of infection (Thiberville et al., 2013).

The 18–45-year age group represents a productive segment of the population, typically engaged in education or employment. In this outbreak, most Chikungunya cases occurred among students and housewives. This suggests that individuals in this age group—particularly students and housewives—may have a higher likelihood of exposure to mosquito bites in their homes and schools, where they spend the majority of their time. This finding is consistent with the biting behavior of *Aedes* mosquitoes, the primary vectors of Chikungunya, which are most active during the morning and evening hours. Six villages reported Chikungunya cases, with the majority of cases concentrated in Cupak, Koto Baru, Kinari, and Muara Panas. Based on Figure 1, the transmission map indicates that these six villages are geographically adjacent. Additionally, the villages are classified as rural areas, characterized by agricultural fields, dense vegetation, and forested surroundings. These environmental conditions may serve as potential breeding and resting sites for *Aedes* mosquitoes, the primary vectors of Chikungunya.

Multiple waves of transmission occurred during the Chikungunya outbreak in Solok District, with three distinct peaks observed between early January and April 2024. This pattern may reflect the virus's incubation period, which is estimated to range from 2 to 12 days. The second and third peaks of transmission could potentially have been prevented through timely interventions such as vector control, elimination of mosquito breeding sites, and the use of mosquito repellents. In relation to mosquito lifespan, a study conducted in China found that female *Aedes albopictus* mosquitoes can survive for approximately 27 days in indoor environments (Cui et al., 2021).

The typical symptoms of Chikungunya include high fever, severe arthralgia, arthritis, rash, and lymphopenia (CDC, 2024). Other literature identifies high fever, joint pain, headache, muscle pain, and occasional rashes as the most common clinical manifestations (Rodriguez et al., 2023). In this outbreak, the majority of cases presented with fever, rash, and joint pain. Recent studies have shown that CHIKV infection can manifest with a wide range of symptoms, most commonly fever, erythrodermic rash, arthralgia, and irritability. Non-specific symptoms

such as myalgia, oral lesions, and abdominal pain have also been reported (Tavares et al., 2025). Symptom presentation may vary by age group; for example, arthralgia is more frequently observed in individuals over five years of age, while vesicobullous rash and irritability are more common in children under five. Additionally, all children up to two years of age were found to experience pain syndrome (Tavares et al., 2025).

Chikungunya is a re-emerging disease that has spread epidemically across Africa, Asia, and the Americas over the past few decades, becoming a global health concern and causing outbreaks that have affected millions of people (Talib et al., 2025). Therefore, it is essential to emphasize the importance of mosquito bite prevention to the general public and to urge the Solok District Health Office to strengthen surveillance efforts and respond more proactively during outbreaks in order to interrupt the chain of transmission.

CONCLUSION

The Chikungunya outbreak in Solok District highlights weaknesses in the disease surveillance system, particularly in early detection and response. This study also identified gaps in the active surveillance data, including missing information, which reflects deficiencies in data recording quality. Since the Chikungunya virus can infect individuals of all genders and age groups, it is essential for all residents in vulnerable areas to take preventive measures against mosquito bites. Although Chikungunya is not typically fatal, it causes a range of symptoms—such as high fever, rash, and joint pain—that can significantly impact daily functioning.

We recommend that the Solok District Health Office strengthen its vector-borne disease surveillance system, enhance community-based vector control initiatives, improve health promotion efforts to raise public awareness about Chikungunya transmission, and provide routine training for health workers to ensure accurate and complete data recording.

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