

# Chikungunya Outbreak in Bali: An Epidemiology Investigation

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## ABSTRACT

Chikungunya is a viral disease through the bite of *Aedes aegypti* mosquito or *Aedes albopictus* acts as an intermediary or vector carrying chikungunya virus in its body. It is common in the tropics and often causes endemics, densely populated areas, high population mobility, and many water reservoirs, natural habitats (e.g. bamboo cuts, coconut shells and leaf busts). Chikungunya fever is often confused with dengue fever because the symptoms are almost the same, but the symptoms of joint pain are an important symptom of chikungunya fever. Data collection in outbreak area at Selemadeg Barat Public Health Center, Tabanan Regency through direct interview with patient or local resident who know of chikungunya disease. The results of data collection found 98 cases in Mundeh Kauh village, 28 cases in Lumbung Kauh village and 37 cases in Mundeh village. The first case of Jembrana Regency where the case of Chikungunya outbreak has developed before the incident in the Region of West Selemadeg Puskesmas this. Based on interviews most patients are adults who used to go to the Garden, so it can be suspected the source of transmission is a mosquito as a vector Chikungunya which is widely found in the garden of the population. The spread of cases is the area of the affected villages in the West Selemadeg Puskesmas area is a forest and plantation area that allows the development of mosquitoes as a vector of infectious diseases. On the Side the conditions on the ground indicate that many breeding places allow mosquitoes to breed such as coconut shells, brown skin, banana leaves and water filled trees.

**Keywords:** Chikungunya, environmental health, Bali.

## INTRODUCTION

Chikungunya is a viral disease that attacks humans through the bite of *Aedes aegypti* or *Aedes Albopictus* mosquitoes. This mosquito acts as an intermediary or vector, an organism that carries the chikungunya virus in its body without being infected. Both are the same types of mosquitoes that cause dengue fever. The causes and similar symptoms cause chikungunya disease is often diagnosed incorrectly as dengue fever. The *Aedes aegypti* mosquito lives a lot and is found in tropical and subtropical regions, while *Aedes (Ae.) Albopictus* lives in the area medium and cooler temperatures. Both types of mosquitoes are commonly found especially in the morning and evening.

The Chikungunya case itself has been identified in around 60 countries in Asia, Africa, Europe and America. On September 26, 2017, 183 cases have been reported in Italy, mid-December 2017 to February 3, 2018, Ministry of Health of Kenya reported 453 cases, including 32 laboratory confirmed cases and 421 suspected cases, chikungunya from Mombasa City.

Chikungunya is found mainly in the tropics and often causes endemic at certain intervals (5-10 years), several factors that influence the emergence of chikungunya, among others, the low immune status of the community, the mosquito population density because of the many mosquito breeding places that usually occur in the rainy season.

In general, it occurs in densely populated areas, high population mobility, and many places that allow the proliferation of infectious mosquitoes, such as water reservoirs (TPA), such as bathtubs, latrines, drums, jars, buckets, non-landfill (for example: tires and other used items that can hold rainwater, gutters, flower vases, ponds); and natural habitats (for example pieces of bamboo, coconut shell and leaf midrib).

Transmission of chikungunya fever occurs when the patient who is sick (in a state of viremia) is bitten by an infectious mosquito, then the mosquito bites another person. Usually there will be transmission from person to person, this disease usually lasts for several days, then heals itself with an incubation period between 1-12 days (generally 2-4 days).

Chikungunya fever is caused by chikungunya virus infection, this virus is still one family with Dengue Virus, the cause of Dengue Hemorrhagic Fever (DHF). This virus enters the human body through the bite of *Aedes aegypti* or *Aedes Albopictus* mosquitoes which are also dengue-transmitting mosquitoes. Chikungunya fever is often confused with DHF because it has the

same initial symptoms, but symptoms of joint pain are important symptoms in chikungunya fever. But to be sure to distinguish it is by laboratory blood tests on day 3 fever. The attack of chikungunya fever in the form of outbreaks (extraordinary events) has often occurred, especially in the rainy season.

Based on information from the Selemadeg Barat Community Health Service (Puskesmas) surveillance officer on February 12, 2010 there was an Extraordinary Event (KLB) in the Mundeh Kauh, Mundeh and Lumbung Kauh Villages. According to the results of an epidemiological investigation, while the suspected outbreak was a Chikungunya case based on the symptoms and clinical signs experienced by patients, namely heat, joint pain, headaches and reddish spots on the skin. The W1 report from the Tabanan District Health Office on February 16, 2010 showed that the number of temporary cases was 146 cases, while the search results of the Team from the Tabanan District Health Office and the Selemadeg Barat Health Center had recorded 161 cases of infection in 3 villages namely Mundeh village, Lumbung Kauh and Lumbung.

The Selemadeg Barat Health Center is located in the middle of the Selemadeg Sub-district, with a population of around 23,000. And the number of villages as many as 11 villages, the average livelihood of the population is farmers, the Selemadeg Barat Health Center is easily accessible.

The temporary actions taken by the Team from the Tabanan District Health Office and the Selemadeg Barat Health Center were: case tracking, fogging, abatization, eradication of mosquito nests, and 10 samples of blood samples taken from patients. The patient's blood sample has been received by the Bali Provincial Health Office which will then be sent to the Indonesian Ministry of Health's Research and Development Agency.

## MATERIAL AND METHODS

The time and location of the epidemiological investigation was carried out on 2 March 2010 in the KLB area at the Selemadeg Barat Health Center, Kaban District and the investigator of the Chikungunya Outbreak was conducted by a team consisting of the Bali Health Office, Litbangkes, Kaban District Health Office and Selemadeg Health Center. West.

Data collection from primary data and obtained through direct interviews with patients or local residents who are aware of the onset of chikungunya disease. Secondary data were obtained from reports from Selemadeg Barat Health Center, village midwives, community and other health services in the KLB region.

The population or target are all people with chikungunya and people who are at risk of contracting chikungunya in the KLB area.

## RESULTS & DISCUSSION

Symptoms of Chikungunya fever are high fever, abdominal pain, nausea, headache, vomiting, joint and muscle aches, and red spots, especially on the body and hands, although the symptoms are similar to dengue hemorrhagic fever, severe bleeding, shock (chikungunya). shock or death. The incubation period is two to four days, while the manifestation is three to ten days.

Caused by the family virus *Togaviridae* (genus *alphavirus*) and transmitted by *Aedes aegypti* mosquitoes. The same mosquito also transmits dengue hemorrhagic fever (DHF). There are seven findings of epidemiology investigation from Bali Provincial Health Office on March 2. Firstly, the number of cases recorded at the Selemadeg Barat Health Center increased to 163 cases, with the spread of cases: 98 cases in Mundeh Kauh Village, 28 Cases in Lumbung Kauh Village and 37 Cases in Mundeh Village. Selemadeg Barat Puskesmas surveillance officers do not have data on the population of each village so that the attack rate per village cannot be calculated. The collected patient data has been deposited with the Tabanan District Health Office surveillance officer, so that surveillance officers in both the Puskesmas and supporting Puskesmas do not have data records of patients who have been interviewed.

Secondly, from the results of interviews with officers of the Auxiliary Health Center in each village, the number of cases of patients is slightly different from the data from Selemadeg Barat Health Center surveillance officers. This is because there has been an increase in the number of sufferers.

**Table 1. Attack Rate per Village of Chikungunya outbreak in the West Selemadeg Health Center (February 2010)**

No	Villages	Population	Chikungunya Patients	Attack rate (%)	Case Fatality Rate (%)
1	Mundeh Kauh	1460	120	82	0
2	Mundeh	2598	40	15	0
3	Lumbung Kauh	1138	23	20	0

Thirdly, from the results of the field investigation, it can be assumed that the index case (first case) was a timber merchant in the name of Mr. Btr who had visited Yeh Embang Kangin (Jembrana District) where the Chikungunya outbreak case had developed before the incident in the Selemadeg Barat Health Center.

Another finding, based on interviews, most sufferers are adults who usually go to the garden, so that it is suspected that the source of transmission is mosquitoes as a vector of Chikungunya which is widely found in the people's gardens.

In addition, the risk factors that support the spread of cases are the rural areas affected by the cases in the Selemadeg Barat Health Center are forest areas and plantations that allow the development of mosquitoes as a vector for transmitting diseases. In addition, conditions on the ground indicate that many breeding sites allow mosquitoes to breed, such as coconut shells, brown bark, banana midribs and trees filled with water.

Then, when investigating outbreaks, the progress of the case was still ongoing and the puskesmas had not conducted a mapping. Patient data has been collected but all data is submitted to the Tabanan District Health Office, so that Puskesmas officers do not have patient records.

The last finding, at the time of the KLB Chikungunya investigation in Tabanan Regency, efforts were made to control the Jembrana District Health Office and Mendoyo Health Center:

- a. The new focus fog was carried out in several hamlets because the fogging machine that was in a damaged condition was given a new machine from the Tabanan District Health Office.
- b. Group Counseling through officers of the Auxiliary Health Center and individual counseling through a door to door system
- c. Abatization by involving village and hamlet officials and community members.
- d. Treatment of sufferers in Puskesmas and through supporting Puskesmas.

There are no vaccines or special medicines for chikungunya. Simply take symptomatic drugs (symptomatic relief) such as febrifuge or pain relief. The important thing is to have enough rest, drink, and nutritious food. This chikungunya virus, including self-limiting disease, will disappear by itself. However, the pain will remain in a matter of weeks. For sufferers, it is highly recommended to eat nutritious foods, enough carbohydrates and especially protein and drink as much as possible. Increase consumption of fresh fruits. Better drink fresh fruit juice. After five days, the fever will gradually subside, the pain and pain in the joints and muscles decrease, and the sufferer will heal as before. Vitamins that increase endurance are also useful for dealing with this disease. A good body resistance and adequate rest can make the pain in the joints quickly disappear. Drinking lots of water is also recommended to relieve symptoms of fever.

## CONCLUSION & RECOMMENDATION

Based on the description above, it can be concluded that there has been an outbreak of suspected Chikungunya cases in the Selemadeg Barat Puskesmas area which occurred in three villages namely Mundeh Kauh, Mundeh, and Lumbung Kauh villages. to breed. From the results of epidemiological investigations, the village with the highest attack rate (AR) is Mundeh Kauh village which is 82 %. Whereas from three affected villages there were no cases of death (CFR; 0%).

From the results of epidemiological investigations and situation analysis in the field, the following recommendations can be formulated.

- a. Selemadeg Barat Health Center to continue to monitor the progress of the Chikungunya case that occurred in the village of Mundeh Kauh Mundeh, and Lumbung Kauh, by making a spot map so that the progress of the case can be monitored.
- b. District and Puskesmas officials must conduct intensive countermeasures in the areas affected by the outbreak so that transmission can be suppressed and the spread of cases does not extend to other hamlets / villages.
- c. District Officers to improve the reporting system using the agreed W1 format (Report on Outbreaks) and improvement of the Early Warning Alert Response and System (SKD-KLB) so that detection of outbreaks can be done earlier.
- d. Selemadeg Barat Public Health Center staff and Tabanan District Health Office to continue to educate the public about the risk factors and conditions that allow the spread of the outbreak case.
- e. The Puskesmas is to make data files as material for analysis and surveillance by describing cases based on epidemiological variables so that countermeasures can be more focused.
- f. To the Puskesmas Officer to work together with village and hamlet officials in mobilizing community participation to eradicate mosquito nests.

## REFERENCES

1. Dinas Kesehatan Provinsi Bali. 2011. PROFIL KESEHATAN PROVINSI BALI TAHUN 2010.

2. Dinas Kesehatan Provinsi Bali. 2017. PROFIL KESEHATAN PROVINSI BALI TAHUN 2016.
3. Dinas Kesehatan Kabupaten Tabanan. 2013. PROFIL KESEHATAN KABUPATEN TABANAN TAHUN 2012.
4. Dinas Kesehatan Kabupaten Tabanan. 2017. PROFIL KESEHATAN KABUPATEN TABANAN TAHUN 2016.
5. Amirullah, DKK. CHIKUNGUNYA: TRANSMISI DAN PERMASALAHANNYA. Aspirator Vol. 3 No. 2 Tahun 2011 : 100-106 <http://ejournal.litbang.depkes.go.id/index.php/aspirator/article/viewFile/2964/2149>
6. Buku Pedoman Pengendalian Demam Chikungunya. Edisi 2. Direktorat Jendral Pengendalian Penyakit dan Penyehat Lingkungan. Kementerian Kesehatan Republik Indonesia. 2012.
7. SEJARAH CHIKUNGUNYA DI INDONESIA, SUATU PENYAKIT *RE EMERGING*. Wibowo\* \*Pusat Penelitian dan Pengembangan Biomedis dan Farmasi. Suplemen Media Penelitian dan Pengembangan Kesehatan Volume XX tahun 2010.
8. Ardanty Nuary Kasih. FAKTOR RISIKO LINGKUNGAN DAN PERILAKU TERHADAP KEJADIAN CHIKUNGUNYA DI WILAYAH KERJA PUSKESMAS GUNUNGPATI TAHUN 2013. JURUSAN ILMU KESEHATAN MASYARAKAT FAKULTAS ILMU KEOLAHRAGAAN 2015. <http://lib.unnes.ac.id/20619/1/6411409022-S.pdf>
9. Melisa Putri Anggraini. GAMBARAN KINERJA EARLY WARNING ALERT RESPONSE SYSTEM (EWARS) PUSKESMAS DI DINAS KESEHATAN KABUPATEN TRENGGALEK TAHUN 2016. Jurnal Berkala Epidemiologi, Volume 5 Nomor 3, September 2017, hlm. 286-297
10. <https://www.alodokter.com/chikungunya>. Diunduh pada tanggal 03 juli 2018 tentang Pengertian Chikungunya
11. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5657184/>
12. <https://dokterairlangga.wordpress.com/2017/10/03/gejala-dan-penanganan-demam-chikungunya/>
13. <http://kumpulan-makalah-dan-artikel.blogspot.com/2013/05/Contoh-Makalah-Tentang-Penyakit-Chikungunya.html>