

THE 5th INTERNATIONAL CONFERENCE ON HEALTH POLYTECHNICS OF
SURABAYA (ICOHPS)
2nd International Conference of Environmental Health(ICoEH)

**The Changing of Age Trend DHF Incidence in the Tanjungpinang City: a 6-year
Secondary Data Analysis**

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ABSTRACT

Children are the most common age group suffering from Dengue Hemorrhagic Fever (DHF). However, in the last few decades, observations of changes in the age distribution of DHF cases have been observed in most countries both in Southeast Asia and Latin America. Tanjungpinang City is an endemic area of DHF and there is no specific research that describes the pattern of DHF incidence based on age and gender. This type of research was a descriptive observational study with a retrospective time approach. Research variables include characteristics of people, characteristics of places, and characteristics of the time of occurrence of DHF. The data source was secondary data from the Tanjungpinang City Health Office with the period for recording DHF cases from January 2013 to December 2019. Data analysis used descriptive analysis methods, namely narratively analyzing data, and visualizing data using tables and graphs. In the 2014-2019 age trend in Tanjungpinang City and also in East Tanjungpinang District, the highest cases were dominated by the age range of 5-9 years and then 10-14 years. However, in the last 2 or 3 years, there is a tendency to increase cases in the age group of 15 years and over, although in the age group under 15 the cases are still high. Trends in the incidence of DHF that occurred in the Pinang Kencana Village, East Tanjungpinang District, showed a tendency for most cases to be female. The results of this study can be input for controlling the DHF program, especially to increase awareness of increasing cases through routine eradication of mosquito nests.

Keywords: Dengue, Age, Incidence, Tanjungpinang

BACKGROUND

Dengue Hemorrhagic Fever (DHF) is a viral infection transmitted by mosquitoes that are common in warm tropical climates. Infection is caused by one of four closely related dengue viruses called serotypes and these can cause a wide spectrum of symptoms, including some that are so mild or so subtle that they may require medical intervention and hospitalization. In severe cases, death can occur. There is no treatment for the infection itself but the symptoms the patient experiences are manageable(WHO, 2022a).

Before 1970, only 9 countries experienced severe dengue epidemics. The disease is now endemic in more than 100 countries in the WHO regions of Africa, the Americas, the Eastern Mediterranean, Southeast Asia, and the Western Pacific. The Americas, Southeast Asia, and Western Pacific regions were the worst affected, with Asia representing 70% of the global burden of the disease(WHO, 2022b).

Dengue epidemics tend to have a seasonal pattern, with transmission often peaking during and after the rainy season. There are several factors contributing to this increase and they include high mosquito population levels, susceptibility to circulating serotypes, favorable air temperature, rainfall, and humidity, all of which affect the reproduction and diet of the mosquito population, as well as the incubation period of the dengue virus. Lack of proactive control interventions and staff are some of the other challenges (WHO, 2022a).

DHF was first discovered in Indonesia in the city of Surabaya in 1968, this disease spread widely throughout Indonesia (Kementerian Kesehatan RI, 2018). The DHF Incidence Rate (IR) in 2016 in Indonesia was 78.9 per 100,000 population, which relatively decreased in 2017 and 2018 (26.1 and 24.8) and increased again in 2019 to 51.5. The incidence rate of dengue fever in 2020 is 40 per 100,000 population. Riau Archipelago is the province with the fifth highest DHF incidence in Indonesia (78.2) (KEMENKES RI, 2020)

Fluctuations in dengue cases in Tanjungpinang City in the last 7 years based on DHF incidence data from the City Health Office (2018) showed that in 2013 there were 168 cases, which increased dramatically to 559 cases and 1 person died in 2014. In 2015 there were 358 cases and 1 death, in contrast to 2016 cases of DHF reported 308 cases with 1 death. While in 2017 there was a decrease in cases, namely 79 people but there was still 1 death due to DHF, In 2018 there were 150 cases and in 2019 there were 346 cases, DHF tends to increase in the Tanjungpinang City area (Dinkes Kota Tanjungpinang, 2021).

Meanwhile, in Tanjungpinang Timur District, every year the district is the largest contributor to the incidence of DHF. Based on the data for the last 7 years in 2013 there were 66 cases, 317 cases in 2014, and in 2015 there were 216 cases. The 2016 report showed 120 cases in 2017 there were 37 cases, in 2018 there were 31 cases and in 2019 there were 185 cases. Deaths due to DHF always occur in East Tanjungpinang District with the last incident at the beginning of 2019 (Dinkes Kota Tanjungpinang, 2021).

Demographic and social changes such as population growth, urbanization, and modern transportation play an important role in increasing the incidence and geographic spread of the dengue virus (Gubler, 2002). Furthermore, travelers from non-endemic countries to dengue endemic areas are at risk of contracting dengue fever and pose a health threat to non-endemic areas where competent mosquito vectors are currently found (Calisher, 2005) (Wilder-Smith, 2012). WHO mentions urbanization (especially unplanned) is associated with the transmission of dengue fever through various social and environmental factors: population density, human mobility, access to reliable water sources, and water storage practices. The community's risk of dengue fever also depends on the knowledge, attitudes, and practices of the population towards dengue fever, as well as the implementation of routine sustainable vector control activities in the community (WHO, 2022b).

Historically, children were the most common age group suffering from DHF. However, in the last few decades, observations of changes in the age distribution of DHF cases have been observed in most countries in both Southeast Asia and Latin America (Guha-Sapir and Schimmer, 2005) (Beatty *et al.*, 2010) (Thai *et al.*, 2011). It is currently reported that a significant proportion of DHF cases occur among adolescent and adult patients in Southeast Asia (Ooi and Gubler, 2009) (Muhammad Azami *et al.*, 2011), as well as in Latin American countries (San

Martín *et al.*, 2010). No research explains the condition of the incidence of DHF based on age and sex in the Archipelago area, specifically in Tanjungpinang City, Bintan Island. This research is needed so that the trend of dengue cases can be known and can be used for appropriate strategies and prevention programs by the government.

RESEARCH METHODS

This type of research is a descriptive observational study with a retrospective time approach. Research variables include characteristics of people, characteristics of places, and characteristics of the time of occurrence of Dengue Hemorrhagic Fever. Characteristics of people include age and gender. The characteristics of the place are divided according to the Kelurahan, and the characteristics of the time are divided according to the year of occurrence of DHF.

The data source comes from secondary data from the Tanjungpinang City Health Office with a period of recorded dengue cases from January 2013 to December 2019. Data analysis uses descriptive analysis methods, namely narratively analyzing data, and visualizing data using tables and graphs.

RESULTS AND DISCUSSION

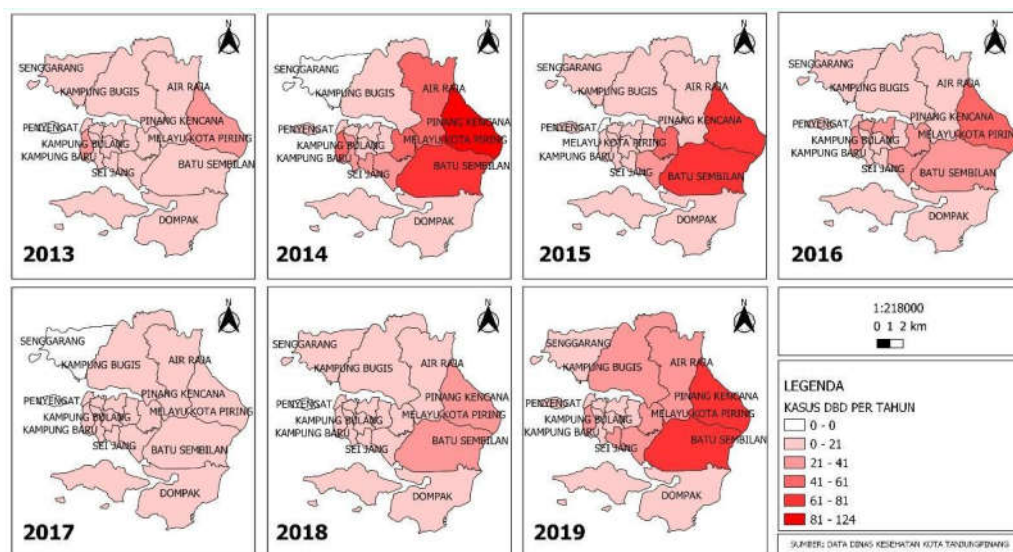


Figure 1. Map of DHF Cases Based on Kelurahan in Tanjungpinang City, 2013-2019

In figure 1, it can be seen that the trend of DHF cases per year per village for the last 7 years. The red color indicates the higher the number of dengue cases per year. The village located in the Tanjungpinang Timur sub-district is a village that is often categorized as red every year, especially the Pinang Kencana and Batu Sembilan villages.

Age Characteristics of DHF Patients per District in Tanjungpinang City 2014-2019

Figure 2 the distribution of DHF incidence seen from the age group per District in Tanjungpinang City in 2014-2019 it is known that the highest age of DHF sufferers in 2014-2017 is in East Tanjungpinang District with the age range is 5 – 9 years while age range > 15 years was the highest cases in 2018-2019.

Characteristics of the age of DHF sufferers per sub-district during 2014-2019 in Tanjungpinang City generally occurred in patients under 15 years of age. This pattern was very clearly seen from 2014 to 2017 in almost all sub-districts in Tanjungpinang City. The highest cases were dominated by the age range of 5-9 years and then 10-14 years. However, it is different in the last two years where there is a tendency to increase cases in the age group of 15 years and over although in the age group under 15 the cases are still high (Figure 2).

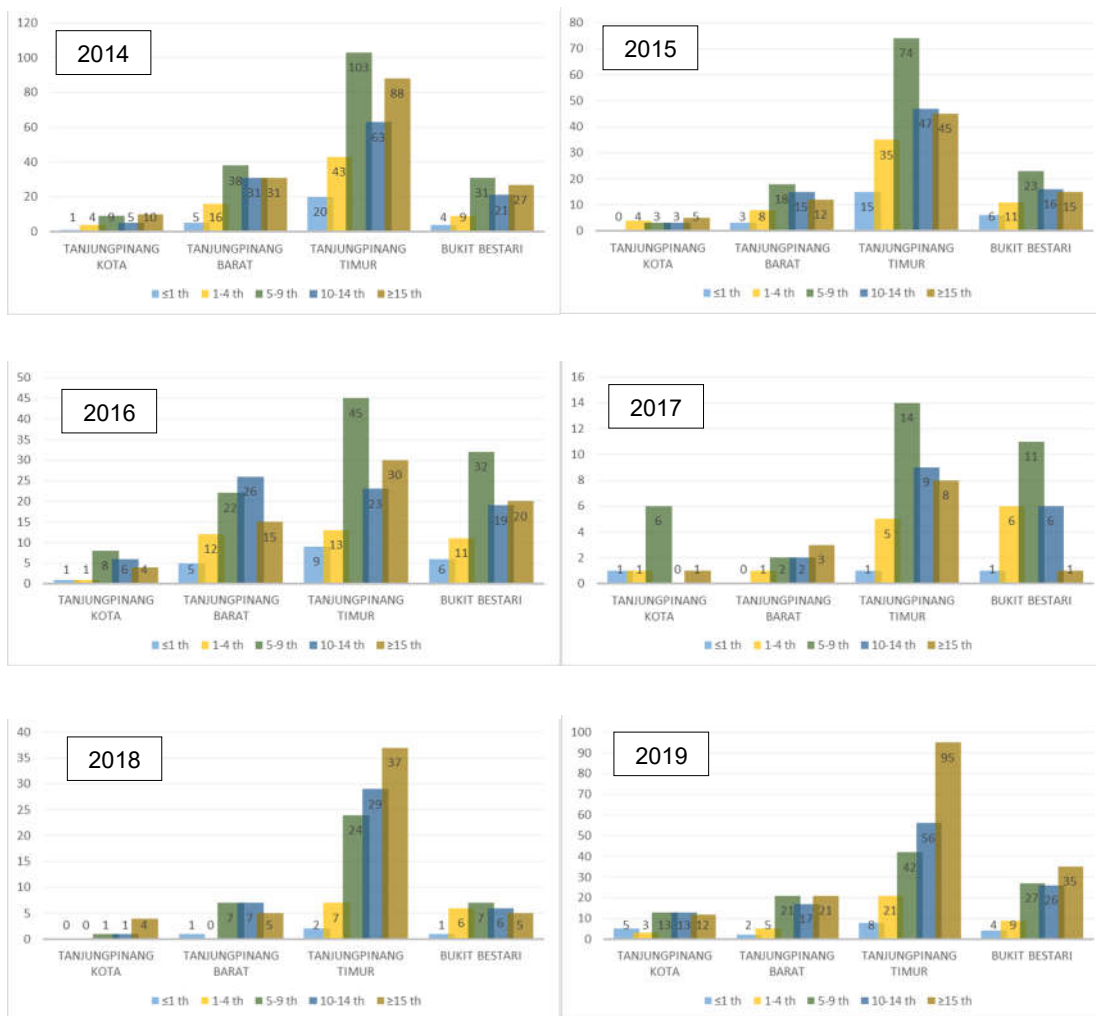


Figure 2. Distribution of DHF Cases by Age Group by District in Tanjungpinang City, 2014-2019

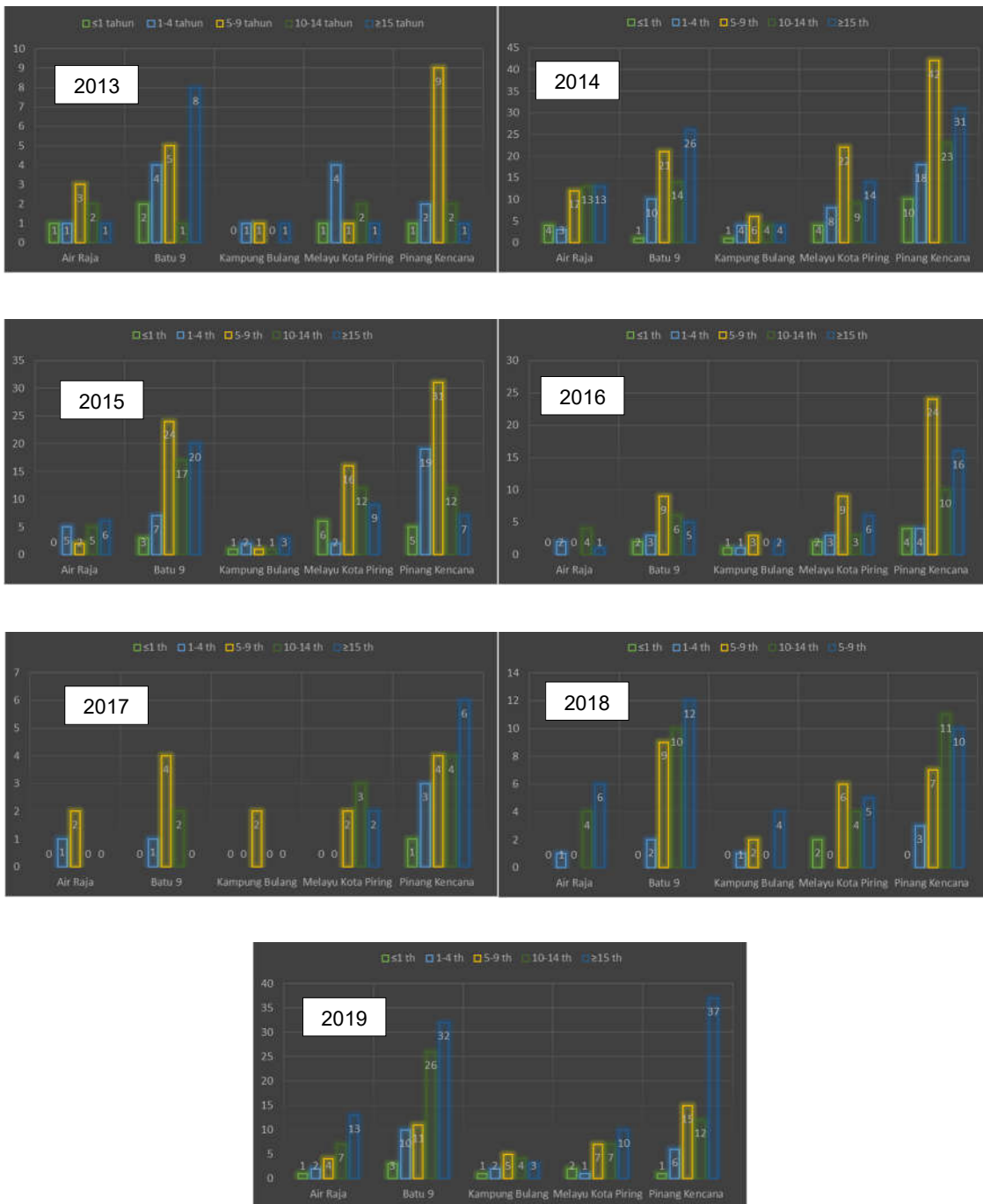


Figure 3. Distribution of DHF Cases by Age Group Per Village in Tanjungpinang Timur District, 2013-2019

Age Characteristics of DHF Patients per Kelurahan in Tanjungpinang Timur District 2013-2019

The distribution of DHF incidence was seen from the age of patients per Kelurahan in Tanjungpinang Timur District in 2013-2019, it is known that the highest age of DHF sufferers in 2013-2016 is in Pinang Kencana village with an age range of 5-9 years in 2017 was found in Pinang Kencana village with an age range of > 15 years while in 2018 and 2019 there were Kelurahan Batu 9 with a range of age 10-14 years and age > 15 years (Figure 3).

Figure 3 shows that there is an age pattern of DHF patients per Kelurahan. The pattern is almost the same as the previous graph regarding the age characteristics of DHF patients per sub-district in East Tanjungpinang City. DHF generally occurs in patients under the age of 15 years. The highest cases were dominated by the age range of 5-9 years and then 10-14 years. This pattern occurs every year in all villages in Tanjungpinang Timur District except in 2017, 2018, and 2019 there is a trend of increasing cases at the age of 15 years and over in Pinang Kencana, Batu Sembilan, and Air Raja villages.

Gender Characteristics of DHF Patients per District in Tanjungpinang City 2014-2019

Figure 4 from year to year there are variations in DHF patients between male and female sexes, but in general, there is no significant difference in data on DHF patients by gender in each sub-district in Tanjungpinang City in 2014-2019.

Gender Characteristics of DHF Patients per Kelurahan in Tanjungpinang District Timur 2013-2019.

Figure 5 seen the pattern of DHF incidence by gender in East Tanjungpinang District in the last 7 years. In contrast to the previous sub-district per year in Tanjungpinang City, specifically, the incidence of DHF in Tanjungpinang Timur District per Kelurahan shows that there is a tendency for more DHF occurrences in one gender, especially in two urban villages, namely Batu Sembilan Village and Pinang Kencana Village.

Age characteristics of DHF sufferers per sub-district during 2014-2019 in Tanjungpinang City generally occurred in patients under 15 years of age. This pattern is very clearly seen from 2014 to 2017 in almost all sub-districts in Tanjungpinang City. The highest cases were dominated by the age range of 5-9 years and then 10-14 years. However, it is different in the last two years where there is a tendency to increase cases in the age group of 15 years and over although in the age group under 15 the cases are still high. DHF has attacked all age groups in society, even more in the productive age. Dengue fever can affect children or adults, men, and women. From 1993 to 1998 the largest age group for DHF cases was the age group <15 years. In the last decade, the tendency of DHF sufferers has increased in the adult age group compared to the age group of 5-14 years (Kementerian Kesehatan RI, 2018). Looking at this data the possibility of transmission not only at home but at school or work. So, the PSN movement needs to be encouraged at school and work. It seems that there has been a change in the pattern of dengue fever, in the past DHF was a disease in children under 15 years old, now it has attacked all age groups, even more in the productive age. It is necessary to further investigate how it affects it, whether it is due to an increasingly virulent (malignant) virus, changes in dengue serotype characteristics, or due to other influences (Kementerian Kesehatan RI, 2018). According to Fajarani et al, 2020, the increase in cases of dengue infection in an area is related to changes in circulating viral serotypes. Alternating circulation of dengue virus serotypes may occur in areas with rapid urbanization (Fajarani, Martini, and Adi, 2020).

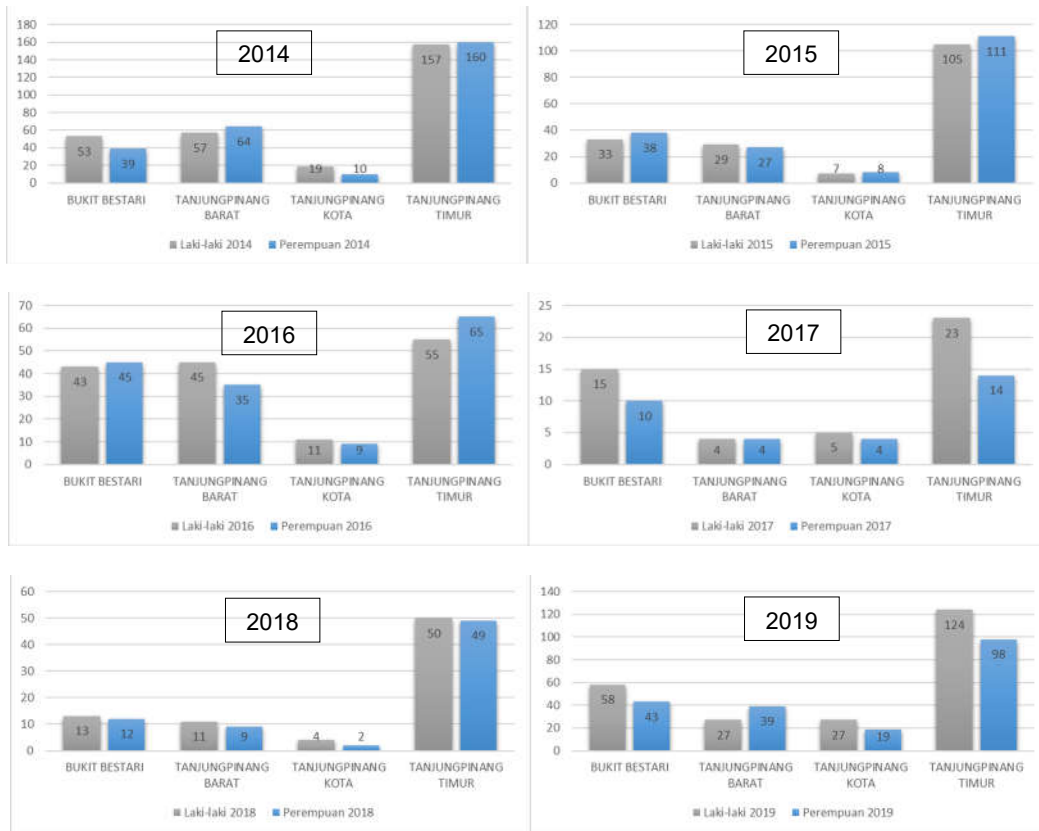


Figure 4. Distribution of DHF Patients by Gender per District in Tanjungpinang City, 2014-2019

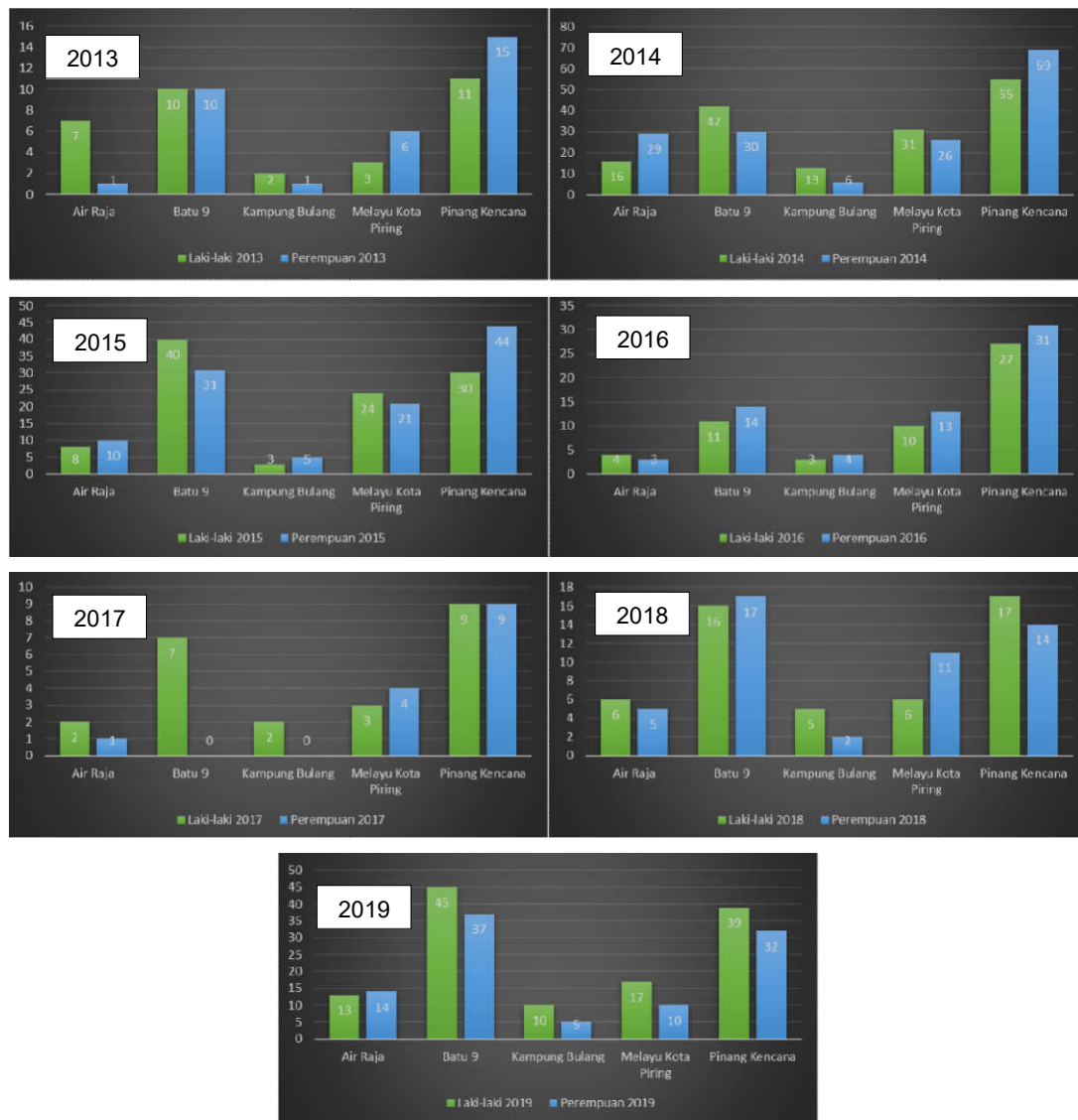


Figure 5. Distribution of DHF Cases by Gender per Kelurahan in Tanjungpinang Timur District, 2013-2019

The results of research conducted by analyzing cases of DHF in Indonesia in the last 45 years conducted by Karyanti et.al, 2014 show that the incidence of DHF has increased substantially over the last 45 years. However, the case-fatality ratio markedly decreased over the same period. There has been a shift in the age pattern of DHF patients towards an older age group (above 15 years) in other words, the incidence of DHF over the last 45 years has shifted from children to an older age group(Karyanti *et al.*, 2014). The results of this study are the same as those in Tanjungpinang City, although using a shorter data period. Changes in age patterns should have consequences for targeted surveillance and prevention.

There were variations in DHF patients between the male and female sexes, but in general, there is no significant difference in data on DHF patients by gender in each sub-district in

Tanjungpinang City in 2014-2019. Specifically, the incidence of DHF in Tanjungpinang Timur District per Kelurahan shows that there is a tendency for more DHF occurrences in one gender, especially in two Kelurahan, namely Batu Sembilan Village and Pinang Kencana Village. In general, men and women have the same opportunity to get DHF, it can be said that the incidence of DHF is not influenced by gender (Kementerian Kesehatan RI, 2018). Trends in the incidence of DHF that occurred in the Pinang Kencana Village, Tanjungpinang Timur District which showed a tendency for most cases to be female, it is necessary to conduct further research to find out this. Are there mobility and work factors where they are more likely to be infected at home or by other factors?

CONCLUSION AND RECOMMENDATION

In the 2014-2019 age trend in Tanjungpinang City and also in East Tanjungpinang District, the highest cases are dominated by the age range of 5-9 years and 10-14 years. However, in the last 2 or 3 years, there is a tendency to increase cases in the age group of 15 years and over, although in the age group under 15 the cases are still high. Trends in the incidence of DHF that occurred in the Pinang Kencana Village, East Tanjungpinang District, showed a tendency for most cases to be female. The results of this study can be input for controlling the DHF program, especially to increase awareness of increasing cases through routine eradication of mosquito nests. Changes in age patterns should have consequences for changing targeted surveillance and prevention.

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