

# The Characteristics of Zoonotic Malaria Patients in Kuala Pilah District, Negeri Sembilan

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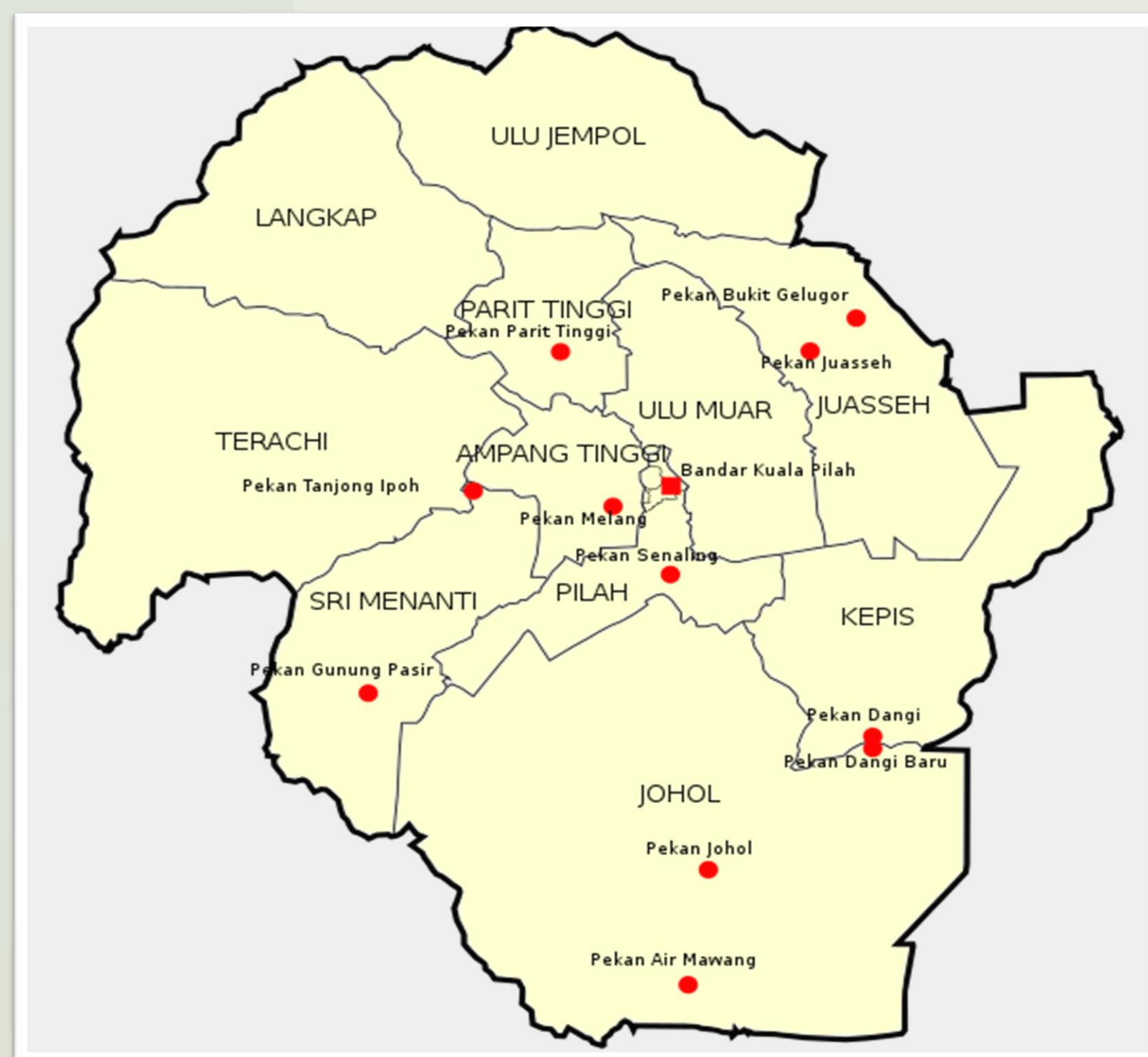
## SUMMARY

Malaysia is moving towards the elimination of Human Malaria. Since 2018, there is no reported Indigenous Human Malaria in our country. However, Zoonotic Malaria has risen since then and contributed to the majority number of Malaria cases. This study aimed to determine the characteristics of Malaria infected patients in Kuala Pilah district, Negeri Sembilan from 2018 to 2022. This study shows most of the zoonotic Malaria patients were Malay, male, and aged between 16 and 64. Otherwise, the symptoms of Malaria infections were non-specific and the majority had delayed diagnosis as most of the cases were diagnosed after 4 days of having symptoms.

**Keywords:** Malaria, *Plasmodium knowlesi*, Delayed Diagnosis, Socio-demographic, Kuala Pilah.

## INTRODUCTION

Since early 2000, it was reported Zoonotic Malaria was the main type of Malaria infection in Malaysia and other several countries (1). In Kuala Pilah, Zoonotic Malaria contributes 88% of Total Malaria cases from 2018 to 2022. It was found that the contributing factors due to environmental and ecological changes (1). The long-tailed and pig-tailed macaques are known to be the main reservoirs of Zoonotic Malaria (2). Therefore, the understanding of this disease among local exposed risk groups and healthcare personnel should be improved to prevent mortality and morbidity. This study aimed to determine the characteristics of Malaria infected patients in Kuala Pilah District, Negeri Sembilan.

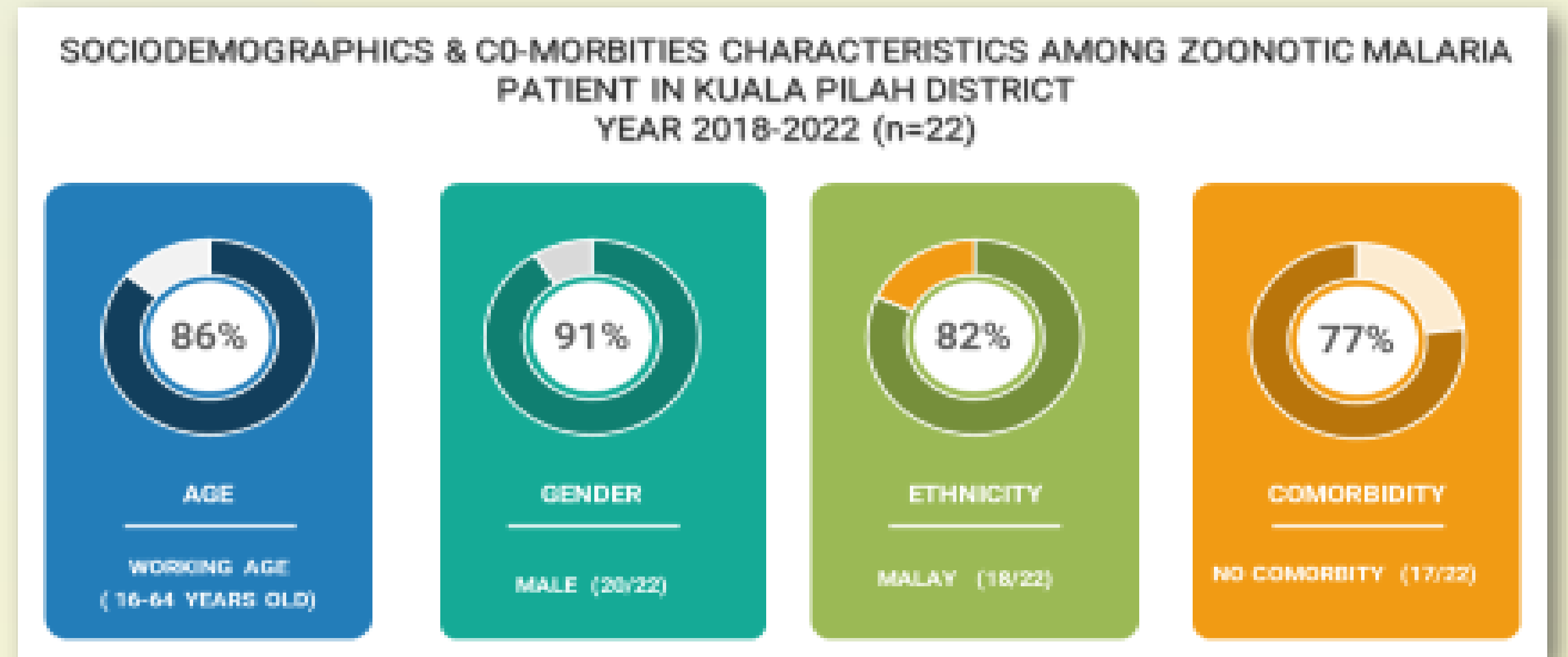


## METHODS

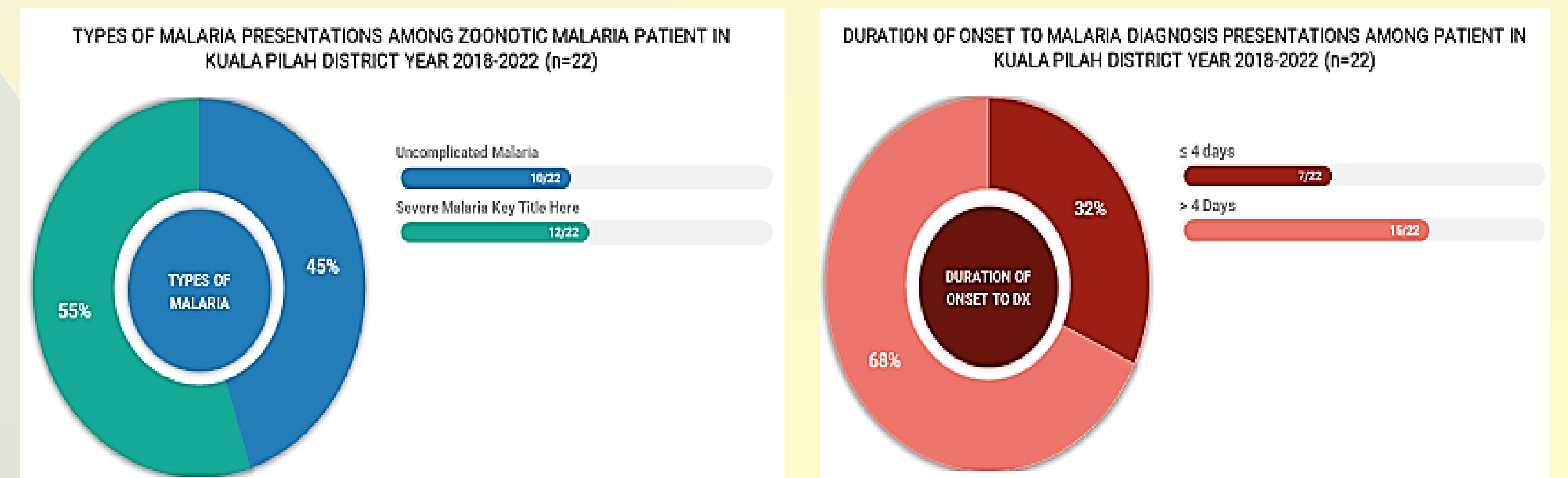
This study uses a cross-sectional study design. All cases were selected based on those that had been registered into the Kuala Pilah district's E-Notification CDCIS system between 2018 and 2022. A confirmatory test utilizing Blood Film for Malaria Parasite (BFMP) must be done prior to notification with a result of Plasmodium Knowlesi infection. All Human Malaria cases were excluded. We gathered information based on sociodemographic variables (age, race, gender, and comorbidities) and clinical variables (symptoms, duration from onset to diagnosis, and types of malaria infection) for each of these cases.

## RESULTS AND DISCUSSION

During the 5 years period, there were a total of 22 cases of Zoonotic Malaria in Kuala Pilah. There is an increase in the trend of cases observed from 2020 until 2022. In the year 2022, Kuala Pilah recorded its highest number of Zoonotic Malaria cases with 9 cases. From the total number of cases, none of the cases were from young ages, 19 cases were from the working age group (86%) and 3 cases were from the elderly (14%), mean age was 44 with a standard deviation of 15.40. Most of these cases are male, contributing to 20 cases (91%). Regarding race, 18 (81.8%) cases were Malay; the rest were Orang Asli with 4 (18.2%). When it comes to comorbidities, we found out that 17 (77%) cases had no comorbidities and 5 (23%) cases had history of comorbidities.



All cases (100%) exhibit fever symptoms from a clinical standpoint. Besides, other clinical manifestations were headache (63%), gastrointestinal symptoms (27.3%) and arthralgia (22.7%). Most of the cases were categorized as severe or complicated infections (12, 54.5%), while the remaining cases were categorized as uncomplicated infections. The duration between the onset of symptoms and the time of diagnosis was another factor that was observed. 7 cases were diagnosed within 4 days (31.8%) and the rest were more than 4 days (68.2%) with a mean of 6 days and a standard deviation of 3.25.



This study shows majority had delayed diagnosis which accounts for 68.2% of cases that did not meet the standard requirement by World Health Organisation (WHO). WHO has suggested diagnosis of Malaria should be made within 24 hours after the onset of symptoms (3). A study by Bastaki et al uses the definition of delayed diagnosis of more than 4 days from the onset of symptoms (4). Besides, most Malaria-infected cases in Kuala Pilah exhibit non-specific symptoms. There is a need to determine the contributing factor towards the delayed in diagnosis. For example, a study showed the reason for the delay in diagnosis of Malaria infection was due to poor health-seeking behavior and delay in diagnosis by healthcare personnel (5).

## CONCLUSION

Further study should be done to determine the cause of the delay in diagnosis of Malaria infection among patients from the district of Kuala Pilah, Negeri Sembilan, and its relation to cases of severe Malaria. Creating awareness of Malaria among high-risk groups is essential to ensure health-seeking behavior in the community. Regular discussion among healthcare regarding the situation of Malaria will prompt awareness and improves the index of suspicion for diagnosing Malaria infection.

## REFERENCES

- Dian ND, Rahim MAFA, Idris ZM. Plasmodium cynomolgi: An emerging threat of zoonotic malaria species in Malaysia? Asian Pac J Trop Med. 2022 Jan 1;15(1):4-6.
- Sam J, Shamsusah NA, Ali AH, Hod R, Hassan MR, Agustar HK. Prevalence of simian malaria among macaques in Malaysia (2000-2021): A systematic review. Vol. 16, PLoS Neglected Tropical Diseases. Public Library of Science; 2022.
- Health Organization W. WHO Guidelines for malaria - 25 November 2022 [Internet]. 2022. Available from: <http://apps.who.int/bookorders>.
- Bastaki H, Carter J, Marston L, Cassell J, Rait G. Time delays in the diagnosis and treatment of malaria in non-endemic countries: A systematic review. Vol. 21, Travel Medicine and Infectious Disease. Elsevier USA; 2018. p. 21-7.
- Than MM, Min M, Aung PL. The Determinants of Delayed Diagnosis and Treatment Among Malaria Patients in Myanmar: A Cross-Sectional Study. Open Public Health J. 2019 Mar 19;12(1):78-85.

