Dengue hemorrhagic fever in Konawe District, Southeast Sulawesi, Indonesia

Ramadhan Tosepu

Abstract

Background: Indonesia is a tropical country that has various health problems, one of which is dengue hemorrhagic fever (DHF), cases of which are reported every year, including in Konawe District. The control of cases of dengue hemorrhagic fever has been carried out intensively in Konawe District, but this action has not been able to reduce the number of dengue sufferers.

Methods: Data on DHF cases were obtained from the Health Office in Konawe from 2010 to 2016. Reported of cases included all reported clinical cases of DHF. Data were extracted from an annual health fact sheet published by the district health officer in Konawe. The research findings are presented in graphical format. This study analyzes the pattern of DHF cases in Konawe District from 2010 to 2016.

Results: In 2010, there were 115 cases of DHF in Konawe District. In 2011, there were 32 cases; 19 cases in 2012; 139 cases in 2013; 64 cases in 2014; 86 cases in 2015; and 313 cases in 2016. Annually, the peak in DHF cases occurred in February. In the period 2010-2016, there were four deaths due to DHF.

Conclusions: Deaths due to DHF in Konawe District still occur. Factors that cause increased cases of dengue fever are prodigious. Vector control and changing people's behavior are good actions to prevent DHF, for example health promotion

Key words: Dengue hemorrhagic fever, Konawe, Indonesia

Introduction

Dengue fever (DF) is an acute febrile illness found in the tropics (1). The disease is caused by one of four serotypes of the *Flavivirus* genus, *Flaviviridae* family (2,3). DF is spread to humans by *Aedes aegypti* mosquitoes (4,5). Severe forms of DF are called dengue hemorrhagic fever (DHF), and dengue shock syndrome (DSS) (6,7).

The dengue virus (DENV) has four serotypes: DENV-1, DENV- 2, DENV-3, and DENV-4. Disease symptoms appear after three to 14 days from first infected bite (8,9). Dengue is endemic in more than 100 countries in tropical and subtropical areas, especially in Southeast Asia, the Americas, the Western Pacific, Africa and Eastern Mediterranean regions (10,11). Dengue fever is also a health problem in Indonesia (12).

Konawe is one of the districts in Indonesia with high numbers of DHF cases (13). Many efforts have been made by the government to reduce the number of dengue hemorrhagic fever cases, but the incidence in Konawe District is still high and growing every year especially in 2014-2016 (14).The government has been intensively promoting the eradication of mosquito breeding by closing the container that can hold water so that female mosquitoes cannot lay eggs (15), clean the water reservoirs such as bathtubs, aquariums, and flower vases, burying used goods and using repellent (16). This brief study provides an analysis of the pattern of dengue hemorrhagic fever in Konawe District from 2010 to 2016.

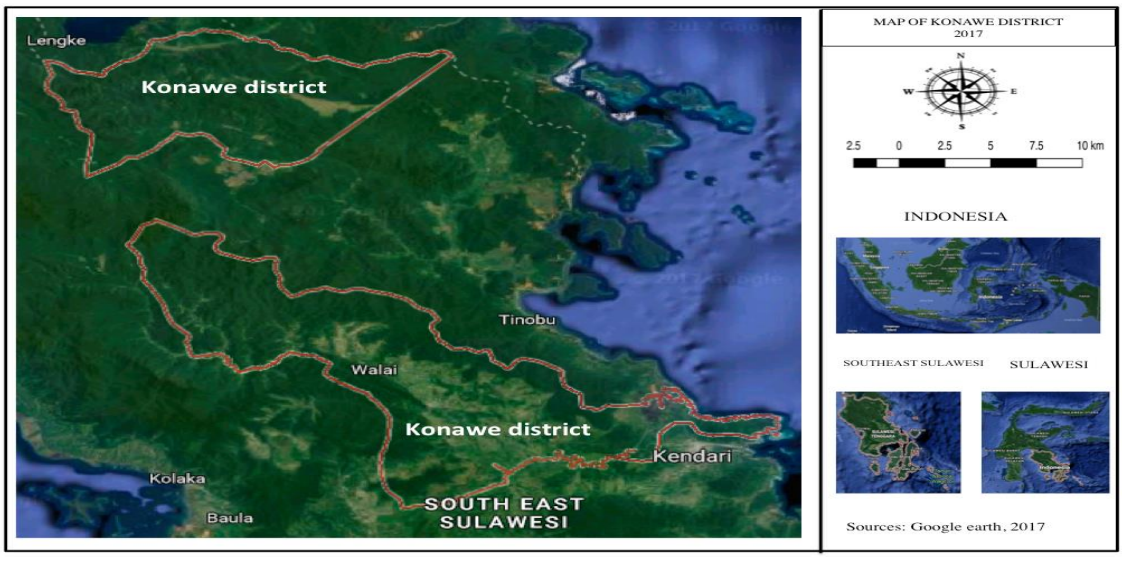

Figure 1: **Map of Konawe District, Southeast Sulawesi Province, Indonesia**

Faculty of Public Health, University of Halu Oleo, Indonesia, email: adhan_lpmi@yahoo.co.id

Methods

Study setting

It is located in the south of the Equator, across from north to south between 02^{o} 45' and 04^{o} 15' south latitude, and stretches from west to east between 121^{o}15' and 123^{o}30' east longitude.

Data collection: The study used from ministry of health Republic of Indonesia. Data on DHF cases were obtained from the Health Office Konawe from 2010 to 2016. Reported cases included all reported clinical cases of dengue hemorrhagic fever. Data were extracted from an annual health fact sheet published by the district health officer of Konawe. The map of Konawe District was sourced from www.google.com/maps. The research findings are presented in tabular and graphical format.

Results

The study reports the number of DHF cases in Konawe District per year and per month from 2010 to 2016.

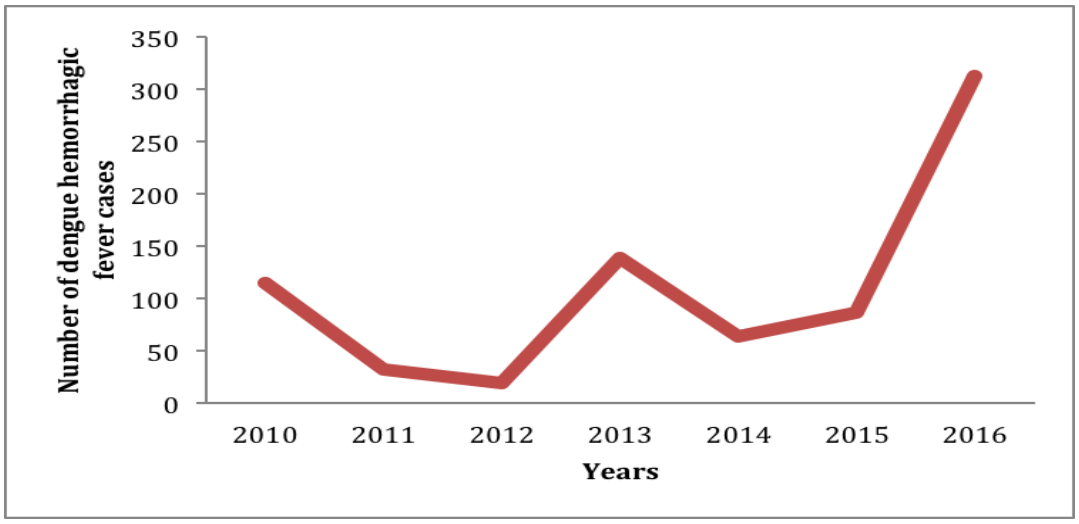

Figure 2: **Reported DHF cases by year in Konawe District, 2010-2016**

In Konawe District, the number of DHF cases fluctuated over the study period. In 2010, there were as many as 115 new cases; in 2011, this decreased to 32 cases and the decline continued in 2012, with just 19 cases. However, in 2013 the number of new cases increased to 139, declined to 64 cases in 2014, slightly increased to 86 cases in 2015, and in 2016 increased significantly to 313 new cases (Figure 2).

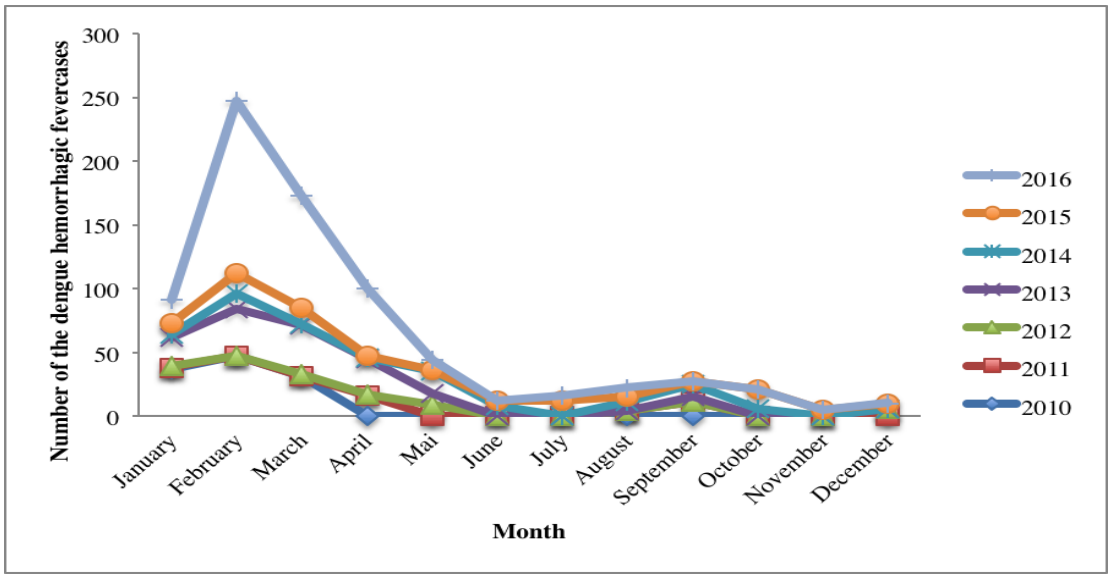

Figure 3: **Reported DHF cases by month in Konawe District, 2010-2016**

Annually, there was a peak in number of DHF cases in the month of February, with a general declining trend from March to December (Figure 3).

Discussion

Cases of dengue fever in Konawe District was reported every month, although the number of DHF fluctuates from month to month. Every year, cases of DHF begin to increase in January with the highest peak in February, and gradually decreases from March onwards. The occurrence of peak dengue cases in February is due to weather factors – December and January are the height of the rainy season. During this

period, mosquitoes have the opportunity to hatch their eggs and continue to breed to adulthood.

In India in the period 2006-2010, there were 1,600 cases of DHF treated in a Delhi hospital: 279 (58.9%) had DF, 178 (37.6%) had DHF, and 16 (3.38%) had DSS (17). An epidemiological investigation into dengue virus infection in patients in Russia revealed that the patients had visited countries in Southeast Asia[18]. In Taiwan, from 1998 to 2015, there were 77,569 cases, of which Kaohsiung had the highest proportion at 58.35% (2). Deaths due to DHF in Konawe District occurred in 2010, 2014, 2015, 2016, with one instance each year. In 2013, it was reported in Myanmar that dengue fever had caused an increase in cases and deaths (19).

Conclusions

Our findings are basic information to improve understanding of DHF in Konawe District. The study has public health implications for planning a control program for DHF in Konawe District, and is also very important in improving the community's response to the disease. These findings may help public health experts, and disease prevention and control officers, with early diagnosis and to plan for prevention of the disease.

This study shows that the DHF incidence in Konawe District is high. The peak of DHF occurrence occurred in February each year. So, before the peak in cases, early warning is needed of DHF, especially in December and January.

Conflict of interests

We declare that we have no conflict of interests.

References

1. Fahri S, Yohan B, Trimarsanto H, Sayono S, Hadisaputro S, Dharmana E, Syafruddin D, *et al*. Molecular surveillance of dengue in Semarang, Indonesia revealed the circulation of an old genotype of dengue virus serotype-1. PLoS Neglected Tropical Diseases. 2013;7(8):e2354.
2. Sanna M, Hsieh Y-H. Temporal patterns of dengue epidemics: The case of recent outbreaks in Kaohsiung. Asian Pacific Journal of Tropical Medicine. 2017;10(3):292-8.
3. Devaleenal B, Shanthi S, Rajasekaran S, Mehendale S. Dengue fever in Saidapet Health Unit District in Tamil Nadu: Trends from 2004 to 2011. Clinical Epidemiology and Global Health. 2015;3(2):94-8.
4. Lardo S, Utami Y, Yohan B, Tarigan SM, Santoso WD, Nainggolan L, Sasmono RT. Concurrent infections of dengue viruses serotype 2 and 3 in patient with severe dengue from Jakarta, Indonesia. Asian Pacific Journal of Tropical Medicine. 2016;9(2):134-140.
5. Park J-H, Lee D-W. Dengue fever in South Korea, 2006–2010. Emerging Infectious Diseases. 2012;18(9):1525-7.
6. World Health Organization. Handbook for clinical management of dengue. Geneva: WHO, 2012:4.
7. Villar LA, Rojas DP, Besada-Lombana S, Sarti E. Epidemiological trends of dengue disease in Colombia (2000-2011): a systematic review. PLoS Neglected Tropical Diseases.2015;9(3):e0003499.
8. World Health Organization. Global strategy for dengue prevention and control 2012-2020. Geneva: WHO, 2012.
9. Pun SB. Dengue: an emerging disease in Nepal. Journal of the Nepal Medical Association. 2011;51(184):203-8.
10. Sang S, Wang S, lu L, Bi P, Lv M, Liu Q. The epidemiological characteristics and dynamic transmission of dengue in China, 2013. PLoS Neglected Tropical Diseases. 2016;10(11):e0005095.
11. Arima Y, Matsui T. Epidemiologic update of dengue in the Western Pacific Region, 2010. Western Pacific Surveillance and Response Journal: WPSAR. 2011;2(2):4-8.
12. Ramadona AL, Lazuardi L, Hii YL, Holmner Å, Kusnanto H, Rocklöv J. Prediction of dengue outbreaks based on disease surveillance and meteorological Data. PloS One. 2016;11(3):e0152688.
13. Indonesia Ministry of Health. Report of Control Diseases 2014. Jakarta: IMOH, 2015:319.
14. Indonesia Ministry of Health. Profile Health of Souteast Sulawesi 2013.
15. Redaksi A. Buletin Jendela Epidemiologi, Volume 2, Agustus 2010. Buletin Jendela Epidemiologi Dbd. 2010;2:48.
16. Tosepu R. Trends of dengue hemorrhagic fever in Bau Bau District, Southeast Sulawesi Province, Indonesia 2009-2014. Public Health of Indonesia. 2017;3(4):147-51.
17. Sharma Y, Kaur M, Singh S, Pant L, Kudesia M, Jain S. Seroprevalence and trend of dengue cases admitted to a government hospital, Delhi – 5-year study (2006-2010): A look into the age shift. International Journal of Preventive Medicine. 2012;3(8):537-43.
18. Sergeeva EI, Ternovoi VA, Chausov EV, Berillo SA, Demina OK, Shikov AN, *et al*. Imported cases of dengue fever in Russia during 2010–2013. Asian Pacific Journal of Tropical Medicine. 2015;8(2):90-3.
19. Ngwe TMM, Kyaw AK, Makki N, Muthugala R, Nabeshima T, Inoue S, *et al*. Characterization of the 2013 dengue epidemic in Myanmar with dengue virus 1 as the dominant serotype. Infection, Genetics and Evolution. 2016;43(Supplement C):31-7.