

## TRENDS OF DENGUE HEMORRHAGIC FEVER IN BAU BAU DISTRICT, SOUTHEAST SULAWESI PROVINCE, INDONESIA, 2009-2014

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### ABSTRACT

**Objectives:** To analyze trends of dengue hemorrhagic fever in Baubau district from 2009 to 2014

**Methods:** We used the national data on annual reported cases from the Health Office Baubau and population data from Statistics of Baubau regency, 2009-2014.

**Results:** The findings have shown a downward trend of the number of dengue cases. In 2009 the DHF cases were 117, decreased to 18 cases in 2010, and continued to decrease to 11 cases in 2011. While in 2012 the cases have increased to 45 cases, and steeply increased to 111 cases in 2013, but then in 2014 decreased to 79 cases.

**Conclusions:** We conclude that the temporal tendency of DHF increases every March. This trend of dengue highlights the need for a more systematic surveillance and reporting of the disease.

**Key words:** Dengue hemorrhagic fever, Baubau, Indonesia

### INTRODUCTION

Dengue hemorrhagic fever (DHF) is an infectious disease caused by dengue virus (DEN) and is transmitted through mosquito bites.<sup>1</sup> Mosquitoes that can transmit the virus are *Aedes aegypti* and *Aedes albopictus*.<sup>2</sup> The taxonomic dengue virus belongs to the RNA virus group of the genus *Flavivirus* and *Flaviviridae* family.<sup>3</sup> There are 4 types of dengue virus serotypes are DEN-1, DEN-2, DEN-3 and DEN-4.<sup>4</sup> People infected with a dengue serotype will be immune to the serotype but not immune to other serotypes. DEN-3 is the

most serotype found in Indonesia.<sup>5</sup> DHF is still a problem to date with high morbidity and mortality rates.<sup>6,7</sup> The incidence of dengue infection increases rapidly.<sup>8</sup> WHO estimates annually globally about 50-100 millions of dengue virus infections with a 2.5% mortality rate. To date, dengue fever has been endemic in 100 countries, especially in Latin America, Africa, South and Southeast Asia.<sup>9</sup>

Dengue Hemorrhagic Fever has spread to all areas in Southeast Sulawesi Province.<sup>10</sup> DHF cases in Southeast Sulawesi province in 2012 amounted to

419 cases. The incidence rate of DHF in 2012 was 18.16 per 100,000 population and CFR of 0.48%.<sup>11</sup> Southeast Sulawesi Province has 17 districts. Baubau is one of the districts in Southeast Sulawesi with a population of 130,862 in 2009.<sup>12</sup> Baubau district is also one of the areas with the highest number of DHF cases amount of 117 cases in 2009.<sup>11</sup> Various programs have been undertaken to reduce the incidence of DHF disease in the smell of the district. “*Pemberantasan Sarang Nyamuk*” (PSN) program, PSN is an Indonesian program to reduce DHF cases. The most important PSN activities is, ie closing the water reservoir, draining the tub, burying used goods and using repellent.<sup>13</sup> This study analyzes the trends of dengue fever incidence in Baubau district from 2009 to 2014.

## METHODS

This study used from various data from the governments of Indonesia. Data of dengue hemorrhagic fever cases were obtained from the Health Office Baubau from 2009 to 2014 and population data from Statistics of Baubau regencys, 2009-2014. Reported cases included all clinical cases of DF and DHF. Data were extracted from an annual health fact sheet published by district health offices smells bad. The research findings were presented in figure format.

## RESULTS

Figure 1 shows that Baubau district population is increased every year. In 2009 the population amounted to 130,862, then in 2010 increased to 136,991, until 2014 the population of Baubau reached 151,482.

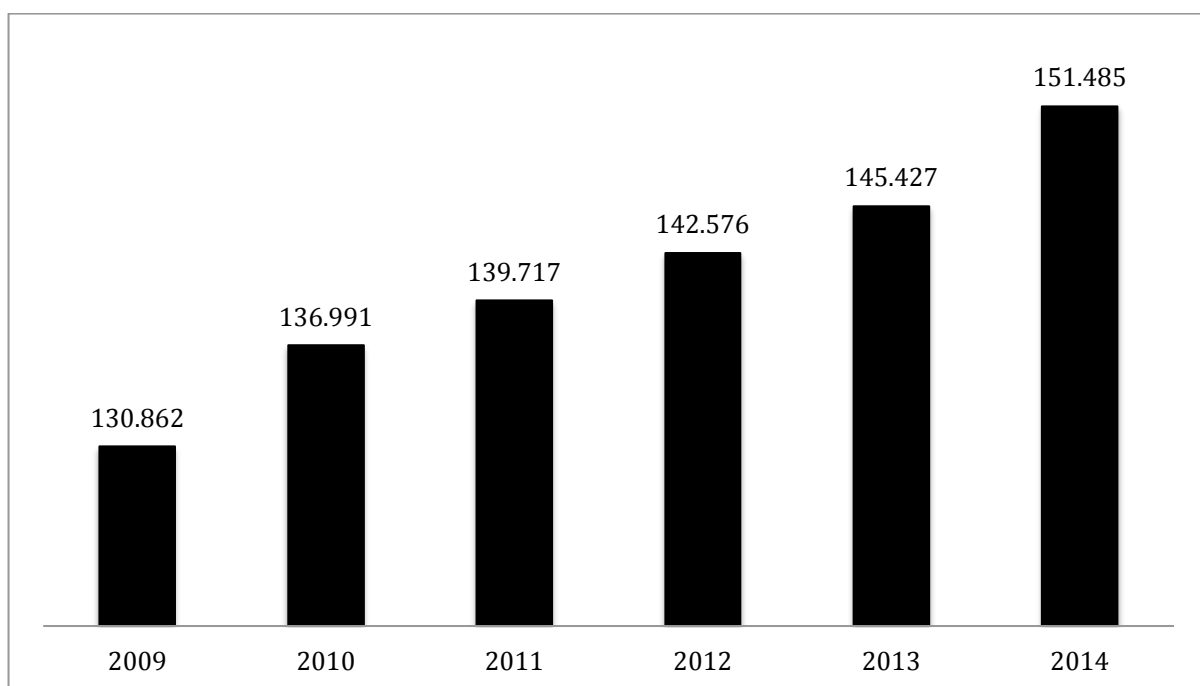


Figure 1. Populations of Bau-bau district, 2009-2014

Figure 2 shows that the cases of DHF in Baubau district occur voluntarily. In 2009 the number of DHF cases was 117, then decreased to 18 cases in 2010, which

continued to decrease in 2011 by 11 cases. The increase started in 2012 with a total of 45 cases, continuing to increase to 111 cases by 2013.

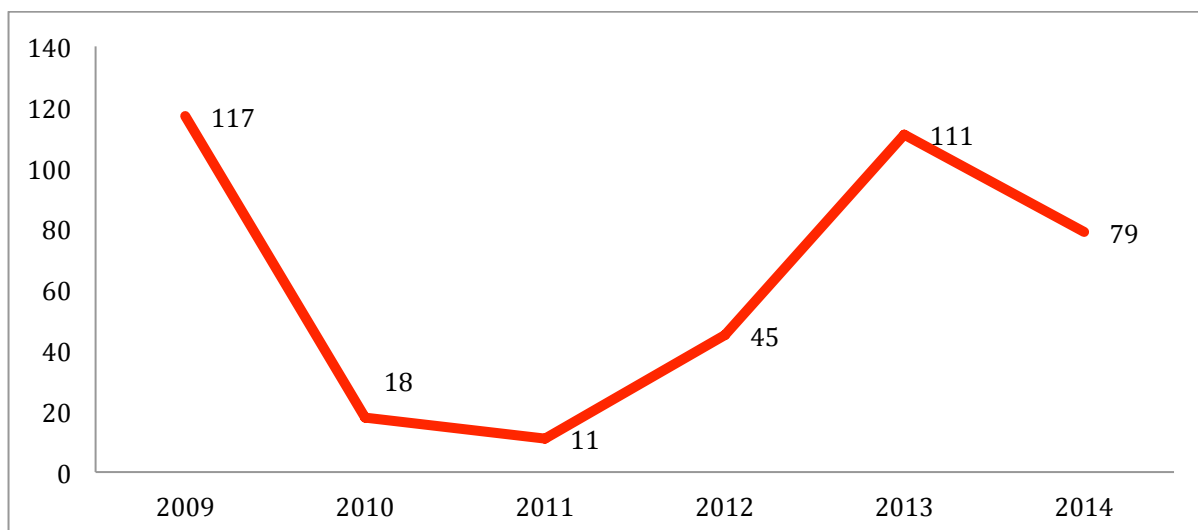


Figure 2. Cases of Dengue hemorrhagic fever in Baubau district, 2009-2014

Figure 3 shows that the incidence of dengue hemorrhagic fever reaches its peak

in March every year, and again decreased in April.

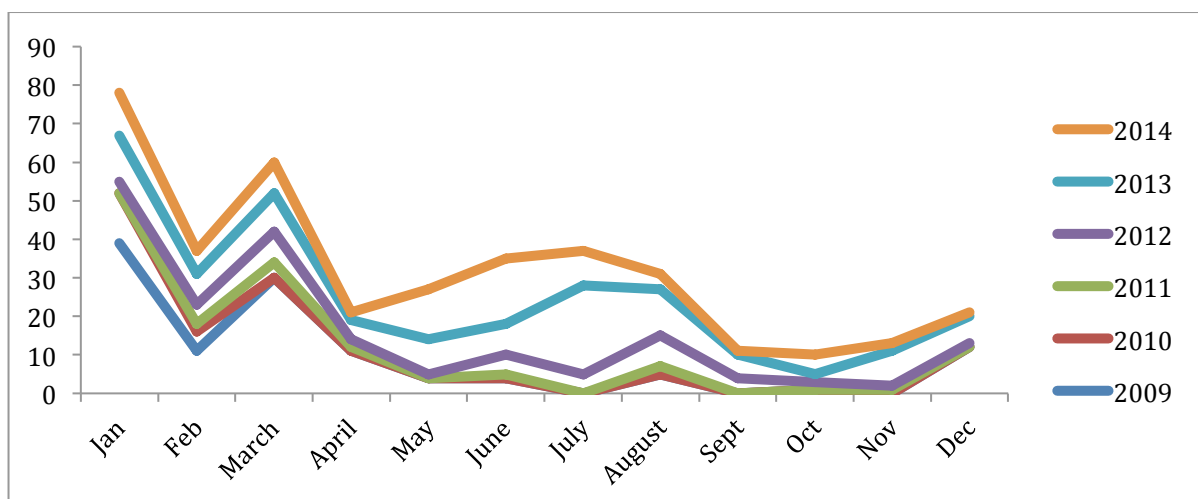


Figure 3. Cases of Dengue hemorrhagic fever by months in Bau-bau, 2009-2014

## DISCUSSION

Astronomically, Baubau district is located on the south of the equator between  $5.21^{\circ}$  -  $5.33^{\circ}$  South Latitude and between  $122.30^{\circ}$  -  $122.47^{\circ}$  East Longitude. With the area of Baubau district changed to  $293.18 \text{ km}^2$ . One of the factors causing the increase of Baubau district area is coastal reclamation, which consists of 8 districts namely: Betoambari, Murhum, Batupoaro, Wolio, Kokalukuna, Sorawolio, Bungi dan Lea-Lea.<sup>14</sup>

The monthly case epidemic curve shows an almost identical pattern of dengue incidence in Baubau district, which is the peak increase in cases occurring in March in 2009. The same thing happens every year, and again decreased in April. Later in June and July there was an increase, but unlike in March. Thus, prevention efforts to increase DHF can be done in December, January and February. So in March the DHF cases can be suppressed or eliminated.

Baubau district is a region in Southeast Sulawesi, which has the largest port, so the population mobilization is very high. Population mobility is possible as a series of diseases entering into a particular region.<sup>15</sup> In Korea, there has been concern that an increasing number of infectious diseases are imported, including dengue fever. International travel mobility in Korea in the period 2003-2012 increased the number of cases of diseases such as dengue.<sup>16</sup> The topography of Baubau district generally has a mountainous, bumpy and hilly surface.

S. Sungkar *et al* found in North Jakarta that in 2009 the peak incidences of DHF in March were 1,048 cases, then in 2010 the same thing that the peak case in March with 723 cases.<sup>17</sup> In Jaipur (Rajasthan) India found that dengue hemorrhagic fever infections increased in July.<sup>18</sup> In Hanoi, Vietnam found that a trend of cases of DHF epidemic in 2009.<sup>19</sup>

The most important factor for the incidence of DHF is environmental cleanliness.<sup>20,21</sup> Potential places for mosquito breeding such as bathtubs, water reservoirs, hangers, and plants around the neighborhood.<sup>22</sup> Tree hole or bamboo root that has been cut and the leaves can be a place of longing for mosquitoes.<sup>23,24</sup> In addition, water can naturally also affect the humidity and lighting in the house, making it a place that is preferred by *Aedes aegypti* to breed.<sup>25</sup>

## CONCLUSION

Analysis of temporal pattern of DHF case shows case peak occurs every month, particularly in March. Surveillance and control strategy should be implemented not only in districts where dengue outbreak has occurred, but also in some districts in Southeast Sulawesi province. Further research is needed to link climate and dengue hemorrhagic fever in Baubau district.

*Conflict of interest: None declared.*

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