Dengue Fever Based on Epidemiological Situation: Current Outbreak in Timor-Leste on January 2020 Until February 2022

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ABSTRACT

Background: The dengue Fever is the fastest emerging arboviral infection spread by Aedes mosquitos with superior in public health impact in over 100 tropical and sub-tropical in South East Asia, western Pacific and South and Central America. More up to 2.5 billion people globally lives under the threat of dengue fever and its severe forms dengue hemorrhagic fever (DHF) or dengue shock syndromes (DSS). More than 75% of these people, or approximately 1.8 billion, live in the Asia Pacific Region. As the diseases spreads to new geographical areas, the frequency of the outbreaks is increasing along with a changing disease epidemiology. It is estimated that 50 million people suffering of DHF required hospitalization each year, a must large proportion of whom (approximately 90%) are children less than five years old. About 2.5% of those affected with dengue die of the illness.

Objective: The study to spread knowledge of present situation of dengue fever and dengue hemorrhagic fever and dengue fever shock syndrome this occurs in Timor-Leste in January 2020 until February 2022 by epidemiological approach.

Research Design: The study adopted an analysis descriptive cross-sectional research based on data epidemiological health system information the Ministry of Health, Hospitals and Health Centers.

Subject and sampling: The total number of study subjects was 506 (48 health professionals 1451 caregivers and their children under 5 years and 29 managers on health care settings).

Setting: This investigation was carried out in the twenty-nine primary health settings affiliated in Health Municipality of Timor-Leste. Study tools: Three tools where use for data collection 1-Health professionals occupational and educational qualifications data assessment sheet. 2-Observation checklist of case management action. 3-Manager's feedback self-administrate questionnaire.

Results: Current results from died showed that 0.7% in 2020 and 1.3% actual 2022 and perception of new borne care suffering 3.8% for the dengue fever not mistake, that has good idea 96.2% he said understanding of DF, DHF and DSS.

Recommendations: The research recommended that DF-DHF evaluation and supervision need more implementation in service training have been adequate the health professionals care and the participation of population cleanup home and environmental just more importance the people to understanding real situation process in current and future of Timor-Leste.

Conclusions: The level of adherence of DF-DHF regarding children's case management of dengue fever of DSS status was poor for closely partial of situation associated less than one one-fifth presented good level observance.

Keywords
Dengue Fever, Arboviral infection, Aedes mosquitos.

Introduction
Dengue Fever is the dissolute emerging arboviral infection spread by Aedes mosquitos with major public health consequences in over 100 tropical and sub-tropical in South East Asia, western Pacific and South and Central America. Up to 2.5 billion people globally lives under the threat of Dengue fever and its severe forms dengue hemorrhagic fever (DHF) or dengue shock syndromes (DSS). More than 75% of these people, or approximately 1.8 billion, live in the Asia Pacific Region. As the diseases spreads to new geographical areas, the frequency of the outbreaks is increasing along with a changing disease epidemiology [1-4]. It is estimated that 50 million people suffering of DHF required hospitalization each year, a very large proportion of whom (approximately 90%) are children less than five years old. About 2.5 % of those affected with dengue die of the disease.

Dengue fever is most common in older children, adolescents and adults. It is generally an acute febrile illness and sometimes biphasic fever with severe headache, myalgia, arthralgia, rashes, leucopenia and thrombocytopenia may also be observed. Although DF may be benign, it could be an incapacity disease with severe headache, muscle, joint and bone pains (break bone fever) particularly in adults [5-7]. In dengue endemic areas, outbreaks of DF seldom occur among local people. Dengue hemorrhagic fever (DHF) is more common in children less than 15 years of age in hyper endemic areas, in association with repeated dengue infections. However, the incidence of DHF in adults is increasing [8]. DHF is characterized by the acute onset of high fever and is associated with signs and symptoms similar to DF in the early febrile phase. DHF occurs most commonly in children with secondary dengue infection.

Outbreaks of dengue fever in the many countries of the Asia Pacific Region led WHO detect and respond an emerging public health attention of this burden through prevention by promoting public health systems of this outbreak. DHF and DSS have become major international public health concerns. Over the past three decades, there has been a dramatic global increase in the frequency of dengue fever, dengue hemorrhagic and dengue shock syndromes and their epidemics [9,10]. Geographically, Timor-Leste have 13 municipalities with demographic population on 2015 is about 1.5 million peoples. Besides, a current situation of dengue outbreak has been occurred in Timor-Leste since early of years 2020 in January until February 2022, it has occurred predominantly in urban and semi urban areas, in capital Dili and other 12 municipals. Timor-Leste reported an outbreak in 2004 for the first time with 434 cases with Case Fatality Rate (CFR) 2 cases, in 2005 with 1.128 cases and CFR 40 cases, in 2006 with 162 cases with no CFR or 0 case, in 2007 with 227 cases and CFR 6 cases, in 2008 with 108 cases and CFR 1 case and the last report in 2009 with 175 cases with 0 case of CFR [11].

According to the World Health Report 1996,"re-emergence of infectious disease is a warning that progress achieved so far towards global security in health and prosperity may be wasted". The report further indicated that" infectious diseases range from those occurring in tropical areas such as malaria and DHF, which are most common in developing countries [12]. There is no specific treatment for dengue, but appropriate medical care frequently saves the lives of patients with the more serious dengue hemorrhagic fever. The most effective way to prevent dengue virus transmission is to combat the disease carrying mosquitos [13]. The burden of illness caused by dengue is measured by a set of epidemiological indicators such as the number of clinical cases classified by severity (DF, DHF, DSS), duration of illness episode, quality of life during the illness incident, case fatality rate and absolute number of deaths during a given period of time. All these epidemiological indicators are combines into a single health indicator, such as disability adjusted life years (DALYs) [14]. The experts of Tropical burden disease from WHO have conclude variable endemicity for DF/DHF in countries of South East Asian Region have categorized Timor-Leste which is include: a) Major public health problem., b) Leading cause of hospitalization and death among children., c) Hyperendemicity with all four serotypes circulating in urban areas., d) Spreading to rural areas.

Objective/ aims
- To spread knowledge of current situational of dengue fever, dengue hemorrhagic fever and dengue shock syndrome this occurs in Timor-Leste in January 2020 until February 2022 by epidemiological approach.
- To reinforce the surveillance system of DF, DHF and DSS report and data collecting to be more efficiency and adjustable and easy to understand for the readers. Furthermore, to be more attractive in presenting the epidemiological situation.

Method Investigation
The investigations adopted an analysis descriptive cross-sectional research based on data under epidemiological systems information the Ministry of Health, Hospitals and Health Centers. This study was more explorer out in health facility system in basic primary healthcare program on Dengue Hemorrhagic Fever the all Municipality in Timor-Leste. The setting in total dengue fiber 1451 cases and mortality rate 10 cases (0.7%) in 2020, and 2374 cases, the mortality rate 31 cases (1.3%) in 2022 on January until February. According to this data and team research follow-up the present data.

The perception of the people about the dengue fever-dengue hemorrhagic fever (DF-DHF) that has a good knowledge of the dengue fever (204) 96.2% who has said understanding and (8) 3.8% said had no idea of the of the dengue fever and dengue hemorrhagic fever. Who did not about dengue fever were informed of the issue, this is meant only small number of people said did not access to more information in hospital and health centers of Timor-Leste?

Epidemiological Situation

This is an epidemiological data collection through timeline presentation on January 2020 until February 2022 with a cross sectional approaching. All the data were a secondary data collection from the Surveillance and Vigilance Department of Ministry of Health Timor-Leste. Daily data reports are concluded and will presenting in this research. As we knew that by a set of epidemiological indicators such as the number of clinical cases classified by severity (DF, DHF, DSS), duration of illness episode, quality of life during the illness episode, case fatality rate and absolute number of deaths during a given period of time. Then, the burden of DF and DHF data will be show graphical in timeline approaching.

From table 1, above, dengue cases in 2020 shown the capital of Timor-Leste where the highest dengue is Dili, sequence Ermera municipals. Fortunately, Viqueque municipals with no case or zero case. Besides, a total mortality case was 10 cases, where Dili capital is the highest amongst other municipals. In 2021 dengue case were decrease, but mortality cases increase, unfortunately, in 2022 it has increase significantly even though there is only January and February and the mortality cases also significantly highest if compared with the others year.
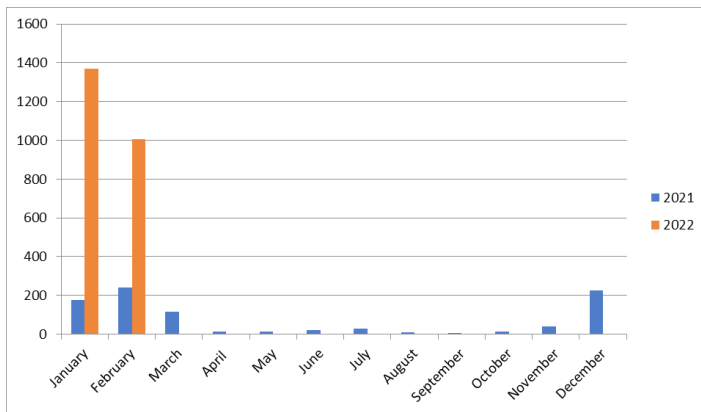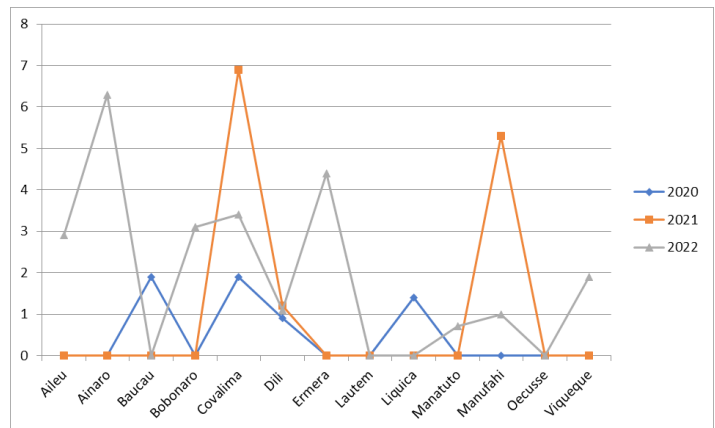

Graphic 1: Morbidity of each municipality between 2020, 2021 and 2022.
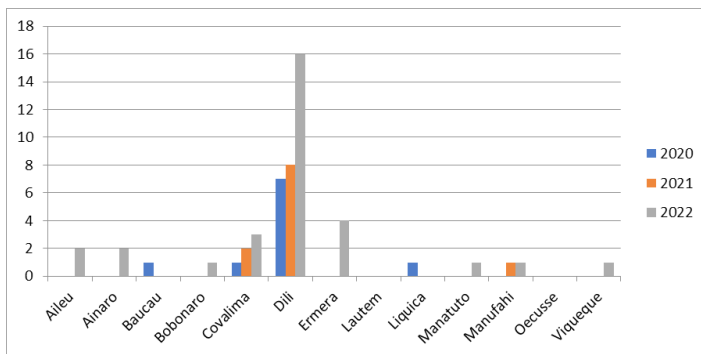
Graphic 2: Comparison of mortality each municipality among years 2020, 2021 and 2022.
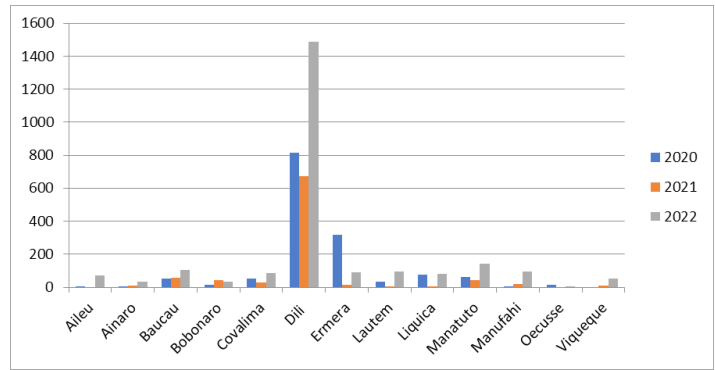
Graphic 3: Case Fatality Rate (CFR %) of each municipality among years 2020, 2021 and 2022.

Graphic 4: Comparison of dengue between years 2021 and 2022.

Discussion

Dengue fever is a phenomenal outbreak since 2020 till February 2022; in the table 1.1 above in 2020 total cases of dengue is 1.451 cases of morbidity and mortality is 10 cases with CFR 0.7%. Besides, Capital Dili is the highest morbidity and mortality among others municipals with 815 cases and 7 cases affected died. Occasionally, Viqueque municipal's there is no case or zero case of DF/DHF.

In 2021 dengue cases was decrease with total 901 cases of morbidity, but increase of mortality cases with 11 cases and also increase of CFR 1.2%. However, capital Dili is still the highest case of morbidity with total 672 cases and 8 cases of mortality among others municipals.

Unfortunately, in 2022 dengue cases is increasing significantly phenomenal into 2.374 cases of morbidity, mortality case increase into 31 cases and CFR 1.3%. Even though, years 2022 is still ongoing, capital Dili is on the first rank with total cases of morbidity is 1.488 cases, mortality cases increase into 16 cases and CFR 1.3%. However, in 2022 is only related for January and February 2022. In graphic 4. Comparison of dengue between 2021-2022 by presenting of monthly report with morbidly cases are 1.369 in January and 1.005 cases in February.

Table 1: Comparison of Morbidity, Mortality and Case Fatality Rate (CFR) from January 2020 until February 2022.

Municipals	2020			2021			2022		
	Case	Mortality	CFR (%)	Case	Mortality	CFR (%)	Case	Mortality	CFR (%)
Aileu	2	0	0	0	0	0	69	2	2.9
Ainaro	6	0	0	8	0	0	32	2	6.3
Baucau	53	1	1.9	56	0	0	105	0	0
Bobonaro	14	0	0	41	0	0	32	1	3.1
Covalima	53	1	1.9	29	2	6.9	87	3	3.4
Dili	815	7	0.9	672	8	1.2	1488	16	1.1
Ermera	318	0	0	13	0	0	90	4	4.4
Lautem	32	0	0	7	0	0	95	0	0
Liquica	74	1	1.4	7	0	0	82	0	0
Manatuto	64	0	0	41	0	0	142	1	0.7
Manufahi	7	0	0	19	1	5.3	96	1	1
Oecussi	13	0	0	0	0	0	3	0	0
Viqueque	0	0	0	8	0	0	53	1	1.9
Total	1451	10	0.7	901	11	1.2	2374	31	1.3

Source: Ministry of Health Timor-Leste, 2022.

Dengue transmission usually happens during the raining season, when the temperature and humidity are conducive for build-up of the vector population in secondary habitats as well as for longer mosquitos' survival. Timor-Leste has two seasons, there are rainy season and dry season, rain season occur on October until March, at the table and graphic shown there is a fluctuant increase when it has been occurring in rain season. Dengue fever or dengue hemorrhagic fever is characterized "iceberg" or pyramid phenomenon. At the base of the pyramid, most of the cases is symptomless, followed by DF, DHF and DSS [15]. Clusters of cases have been reported in particular household of neighborhoods due to the feeding behaviors of the vector.

Dengue outbreaks change quickly, requiring emergency actions to immediately control infected mosquitos in order to interrupt or reduce transmission or decrease or eliminate the breeding sites of the vector mosquitos [16]. The preparedness of surveillance and vigilance team of Ministry of Health Timor-Leste have done well early report in daily, weekly and monthly reports, their workforce of data collection is also quickly and rapidly. The WHO experts said there are two major components of the response to a dengue outbreak are:

1) Emergency vector control to curtail transmission of dengue virus as rapidly as possible.
2) Early diagnosis and appropriate clinical case management of dengue to minimize the number of dengue- associated deaths.

These two components should be implemented concurrently; the response will also differ depending on the endemicity in countries. For endemic nations, the overall aim is to reduce the risk of dengue outbreaks and strengthen control measures for any future epidemic in order to minimize the clinical, social and economic impact of the disease.

Furthermore, during an epidemic the aim of risk communication, generally through the media, is to build public trust [17]. It's done by announcing the epidemic early, communication openly and honestly to the public or transparency and particularly by providing accurate and specific information to people about what can do to make themselves and their community safer [18]. In endemic countries, involving the media before the occurrence of the seasonal increase in dengue enhances the opportunity to increase public awareness about the disease and the personal and community actions that can be taken to mitigate the risk [19].

Limitation
The limitation under field research could be introduce dengue fever and dengue hemorrhagic fever health care system to prevention in prime health care, could be in public health approach is very important to participate all populations in mobilization the cleanup in the house and environments.

Recommendations
1) Mobilization the routine evaluation that current situation dengue fever in more 3- or 6-month supervision support by centrals and municipality level to improve capacity health program.
2) DF/DHF in service training should be appropriately direct to community and health professionals' providers with sciences about the importance of cleanup home and environments.
3) Attractive the level of incorporation for interventions focusing on dengue fever and the treatment of childhood illness.
4) Optimalization the chances to strengthen the health promotion and follow-up of high-risk from mother to babies' care and children to promote personal hygiene and community to cleaning the house and take attention on environments.

Conclusion
Our research concluded that prevention of dengue fever-dengue hemorrhagic fever and improve the knowledge health workers of evaluation and supervision were among the public health problem in sanitation in family related the implementation of dengue fever. Moreover, the level of prevention is very fundamentals,

regarding babies and children's case management of prevention diseases in dengue fever cases, present situation of Timor-Leste in future.

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