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SPATIAL ANALYSIS OF DENGUE HEMORAGHIC FEVER (DHF) IN COASTAL AREA, KENDARI CITY, SOUTH-EAST SULAWESI, INDONESIA

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Abstract

Background. DHF mitigation still becoming global problems, especially in coastal area. Although the health paradigm exchange have been initiate in Indonesia which is curative becomes preventif action, it is not decreasing the DHF prevalence in Kendari City yet.


Objectives. This study aims to find distribution of DHF disease related to population density and health provider accessibility.

Methods. 156 DHF cases was collected in 2008 at Kendari City primary data as a coastal area in Indonesia. A buffering and overlay spatial analysis as descriptives study design was held to define a real-world perspectives.

Results. There are 12 health centers and 7 hospitals whose service 10 sub-districts (*Kecamatan*) in Kendari City. Thematics mapping describes that distribution pattern of DHF diseases randomized on health facilities. DHF cases are randomized of all su-districts. But, these cases are clustered with 335 live/km² population density on coastal teritory. Health provider accessibility representatives on 100.000 populations was counted with 750 metres buffering analysis. This results 3 health centers are not accessible to DHF cases.

Conclusions. Pattern of distribution DHF cases in Kendari City happen broadly in coastal teritory. Coastal teritory which near of beach have bigger population than other teritories with crowded density. *Aedes aegypti sp.* as a principal factors is related to coastal determinants on this finding research.

Keywords: *DHF, descriptive, spatial analysis, coastal area*



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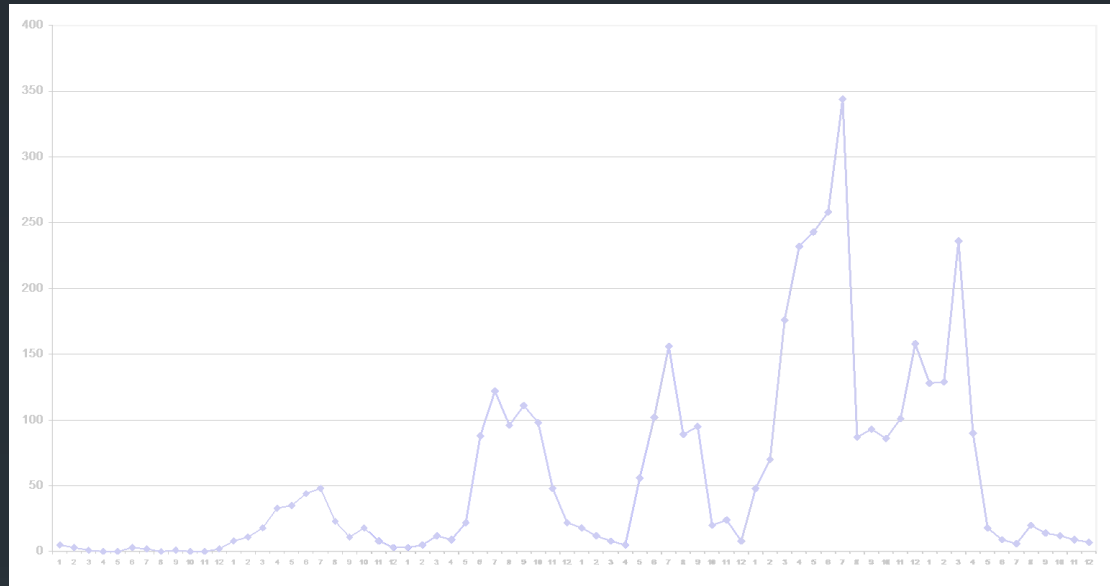
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INTRODUCTION

- Dengue hemorrhagic fever (DHF) still is one of the serious public health problem.
- Since the early 1970s, dengue has become a public health obstacle in Indonesia. DHF was first attacked in 1968 in Surabaya with the case of 58 people, 24 of whom died with CFR = 41.3%. The disease becomes endemic in many cities in Indonesia..
- The increase in the number of cases of dengue incidence is influenced by several factors.



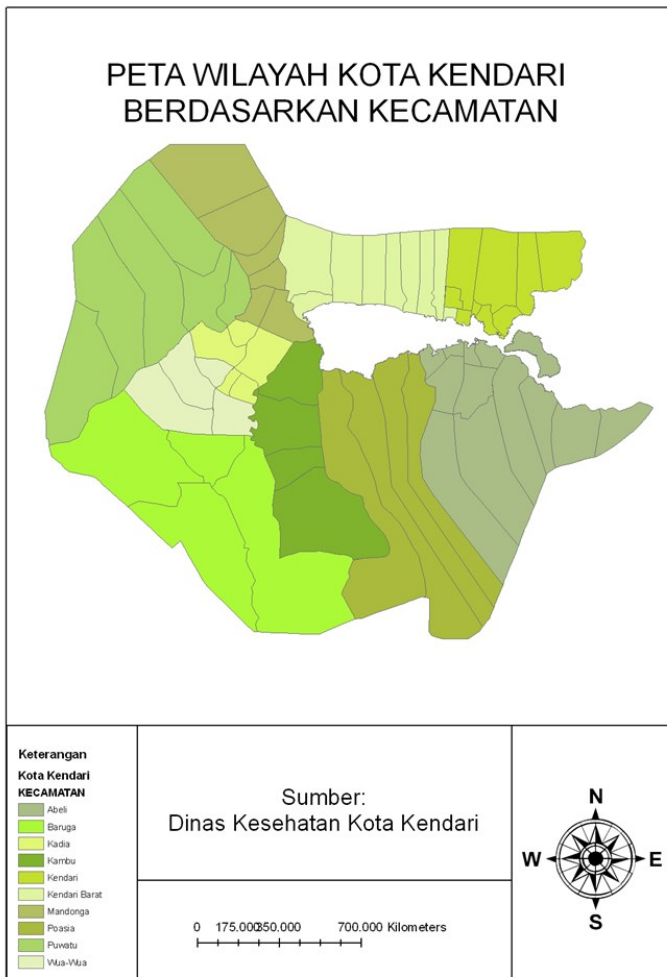
Trends in dengue fever patients by month of 2003 till 2008 in Kendari (Kendari City Health Office, 2009)

Methods

- Descriptive observational study with secondary data conducted during 2003 to 2008,

Num	Districts	Area (km ²)	Num. of subdistricts
1	Mandongga	22.65	6
2	Baruga	41.68	4
3	Poasia	52.52	6
4	Abeli	50.49	5
5	Kendari	14.19	4
6	Kendari Barat	21.31	4
7	Wua - Wua	11.63	13
8	Kadia	9.97	4
9	Puuwatu	42.70	8
10	Kambu	28.75	9
	Kota Kendari	295.89	64

Results



Kendari City area is located in the southeast peninsula of Sulawesi Island. Territory land is mostly found on the mainland (BPS Kendari City 2008).

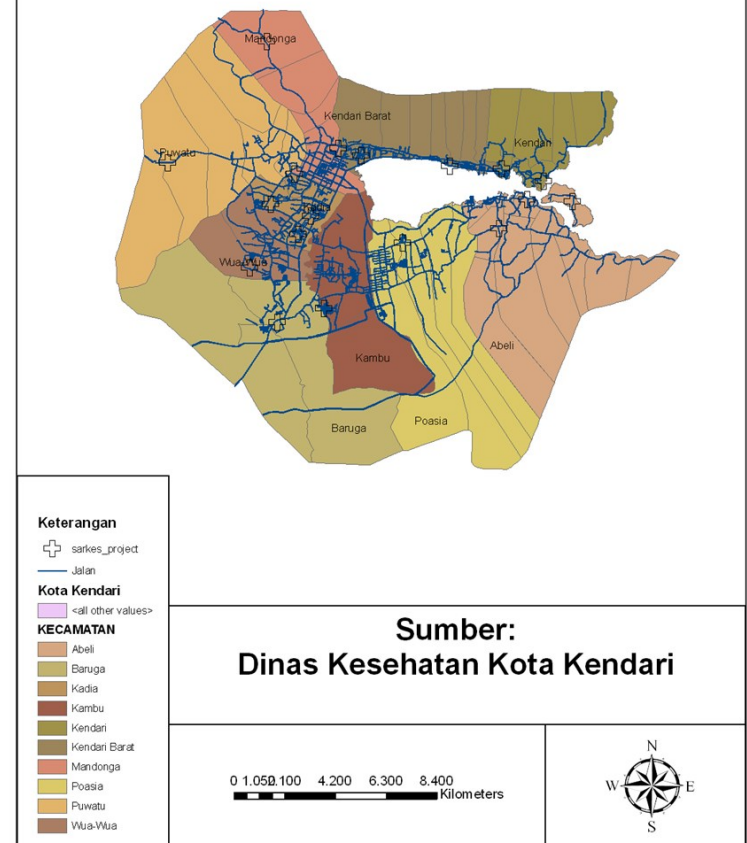
Kendari city is geographically located in the south of the equator is between 30 54 '30 " - 40 3' 11" south latitude (LS) and from west to east between 1220 23 ' - 1220 39' east longitude (BT). Kendari City area bordered by:

- Northern: Soropia Districts, Konawe Regency
- East: Kendari Sea
- South: Moramo and Konda Districts, Konawe Selatan Regency
- West: Ranomeeto District, Konawe Selatan Regency and Sampara District, Konawe Regency

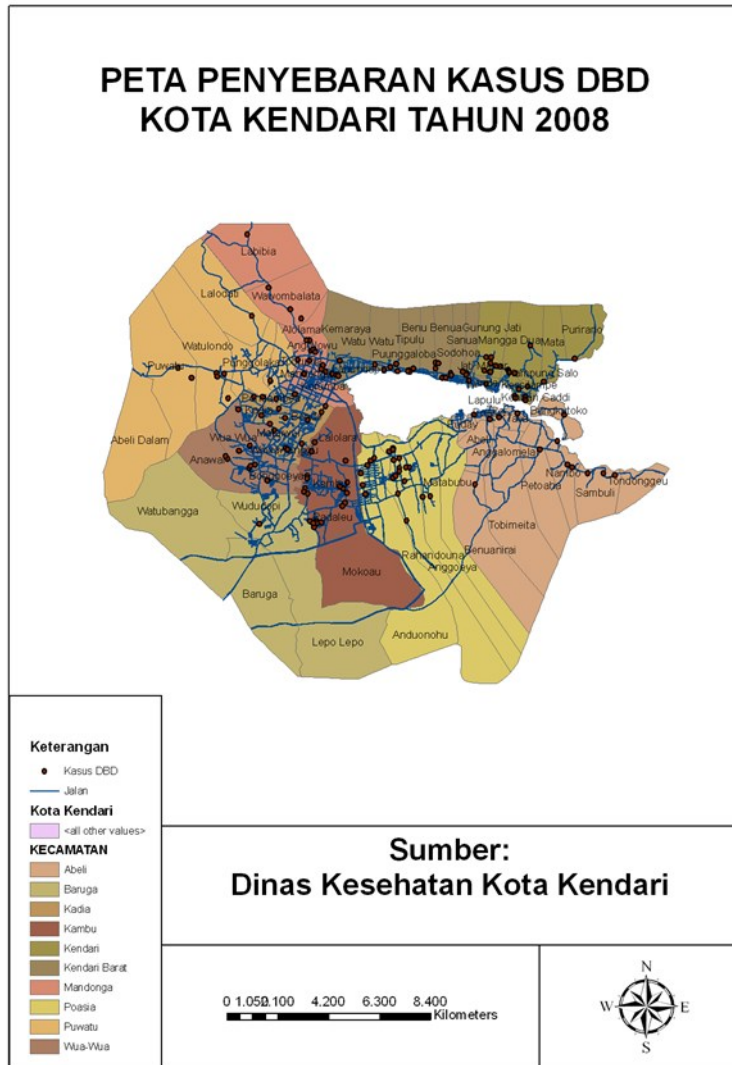
Health Facility Conditions

- Kendari City Health Offices overshadow 12 health centers and 7 hospitals. Health centers in Kendari City are Mandonga Health Center, Labibia Health Center, Mata Health Center, Benu-benua Health Center, Kemaraya Health Center, Lepo-lepo Health Center, Perumnas Health Center, Poasia Health Center, Mokoau Health Center, Abeli Health Center, Mekar Health Center, and Jati Raya Health Center. While seven hospitals are Abunawas Hospital, Hospital of Santa Anna, Red Cross Hospital, General Provincial Hospital, Dr. R. Iswoyo Hospital, Bhayangkara Police Hospital, Permata Bunda Hospital, and Griya Husada Hospital

PETA JALAN DENGAN SARANA KESEHATAN KOTA KENDARI 2008



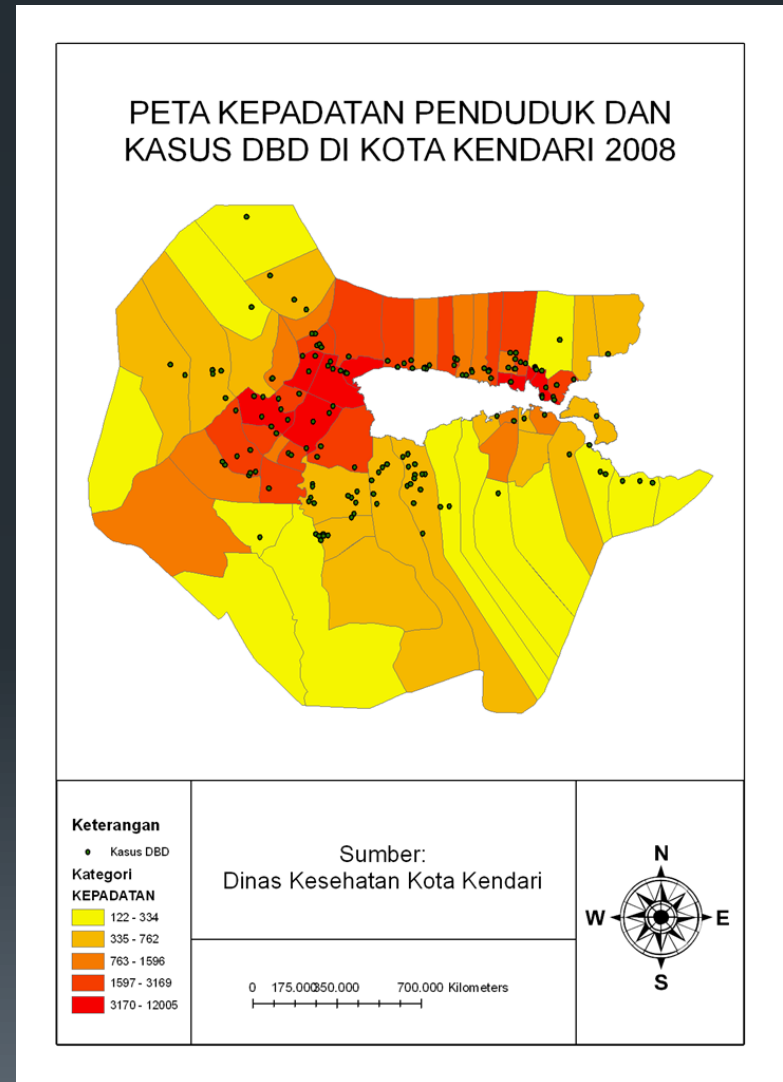
Pattern of DHF cases



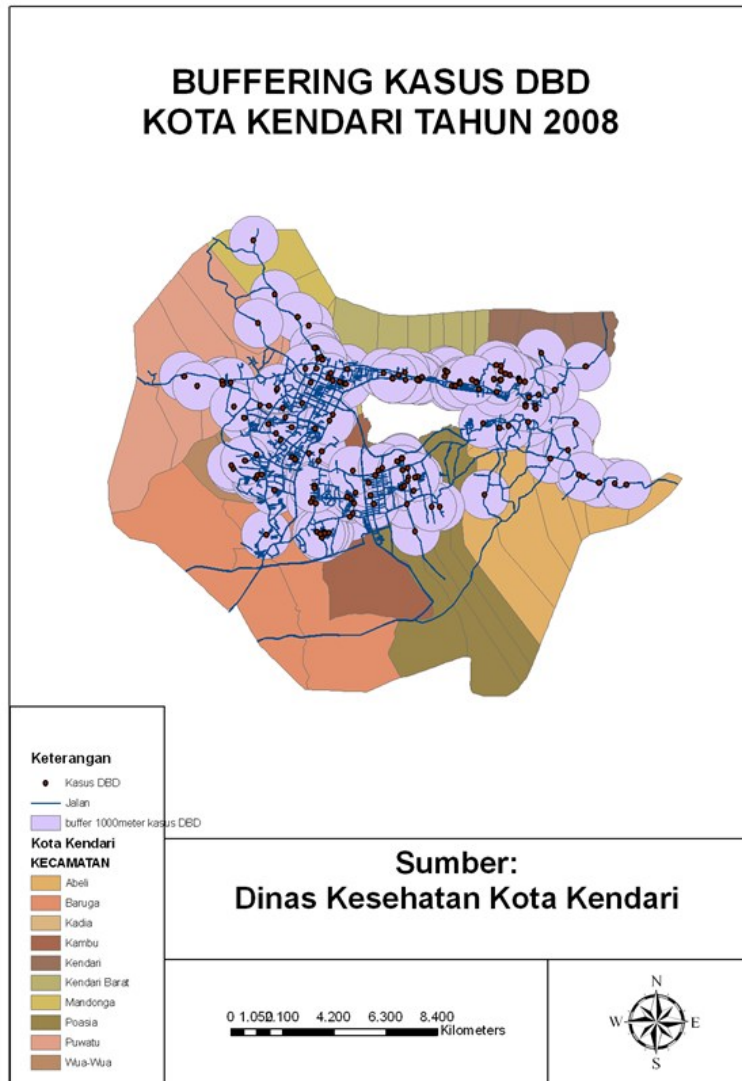
- The pattern of DHF cases in Kendari City spread across all districts. However, spreading in the district is not at all subdistricts. Spread pattern of DHF cases in Kendari City randomized in all districts, the distribution tends to clustered in areas with denser population than other districts, such as the Kadia District, Kendari Barat District and Kendari District. Baruga District have the fewest number of cases compared to other districts.

Overlay of DHF cases by Population Density

- Distribution of cases according to population density by subdistrict spread with density more than 335 man/km², cases clustered in dense settlements such as the Padaleu Subdistrict, Anggoeya District. Subdistrict with density population less than 335 people / km² has a little case such as Labibia, Lalodati, Sambuli, Nambo, Benuanirai, Matabubu. While Tondong and Baruga subdistricts have not DHF cases.
- Pattern of spread of DHF cases in Kendari City uneven in all districts. Spread patterns of DHF cases vary with most cases located on Poasia District, while fewer case happen in Lepo-lepo District.



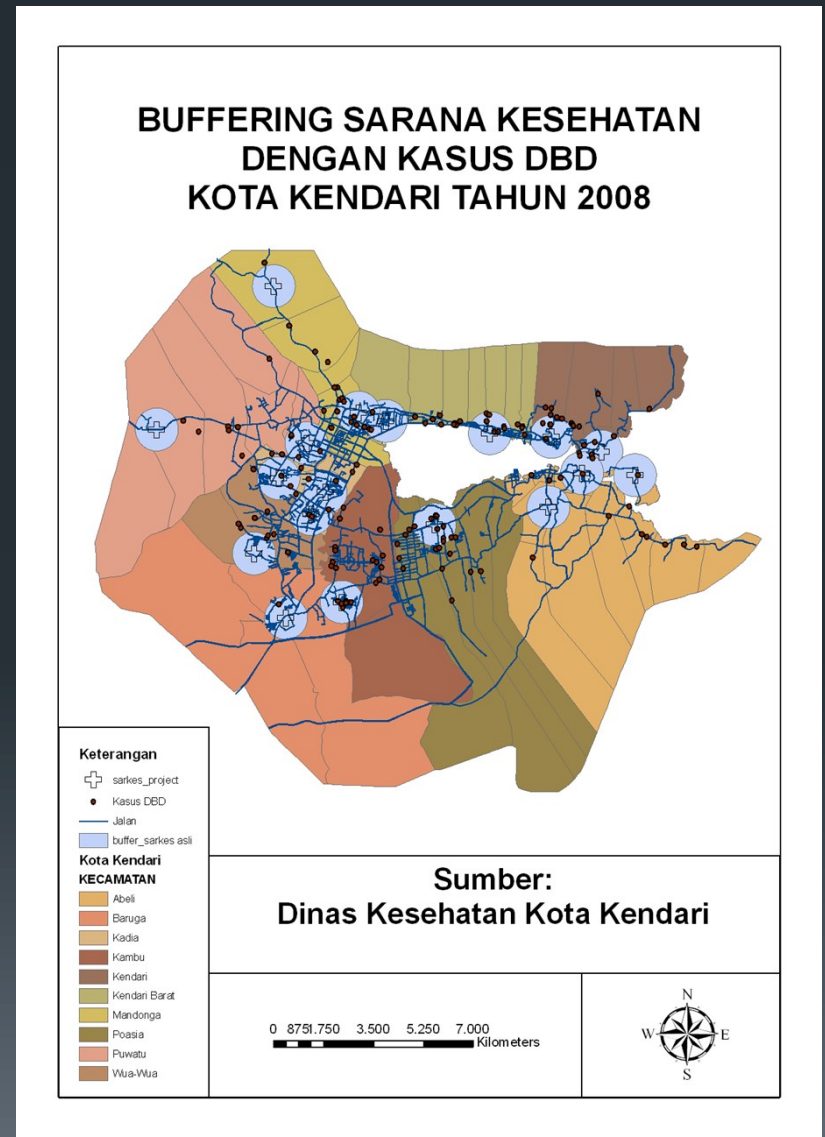
Buffering of DHF Cases



- Vector observation in DHF eradication strategy is mainly directed against *Aedes aegypti* as major vector which highly associated with DHF incidences. *Aedes aegypti* mosquito have 1000 meters flight range, so the buffer in each DHF case as 100 meters, it can be seen spread of DHF incidence.
- From the results of 156 DHF cases, which is buffering obtained that spread of DHF incidence significantly from one to each other entirely. It concluded that the spread of DHF cases in Kendari City affected by *Aedes aegypti* as the main vector of DHF disease.

Buffering Analysis of Health Facilities by DHF Case

- Based on the access to health services, the spread of dengue incidence in Kendari was happen significantly. Risk of DHF can be overcome by means of access to health facilities and infrastructure (road access) was good. Based on the Ministry of Health guidelines, that every 100,000 inhabitants must be at least one health-care facilities especially health center.
- This guideline assumed with 750 meter buffer of health facilities which people could be able to reach health-care. Results buffer generated DHF cases not covered by the health facilities located on Puuwatu, Abeli, and Labibia Districts territory, so from this three districts it can be concluded that the incidence of DHF occur due to lack of access to facilities and infrastucures to prevent and counter the occurrence of DHF events.





CONCLUSIONS

- Based on the spatial analysis of DHF incidence in Kendari City, it can be concluded that the overlay analysis showed DHF incidence uneven in all districts, the distribution tends to clustered in areas with a denser population.
- It shows the pattern of spread of DHF cases randomized. Buffering analysis showed DHF incidence in Kendari City affected by *Aedes aegypti* as the main vector of dengue disease. In addition, DHF occur due to lack of access to facilities and infrastructure in preventing DHF incidence.



Thank you

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