

THE ROLE OF FACILITY - BASED DATA FOR EFFECTIVE CONTROL OF DENGUE HEMORRHAGIC FEVER IN YOGYAKARTA

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ABSTRACT

Background: Data collected in community health centers and hospitals are not properly used to strengthen Dengue Hemorrhagic Fever (DHF) surveillance system due to their fragmented reporting.

Objective: The purpose of this study is to integrate facility-based data from *puskesmas* (community health center) and hospitals for early warning and effective control of DHF.

Methods: Data on reported cases diagnosed as DHF were obtained from community health centers (Kraton, Yogyakarta municipality and Depok I, Sleman district) and computerized discharged summaries at Dr. Sardjito Hospital. Interviews were conducted to describe how DHF cases were diagnosed, and how community interventions were implemented based on the reports of DHF cases.

Result: The findings of this study suggested that virtually all DHF cases were diagnosed in hospitals, yet investigations of possible DHF transmissions in the community were carried out by epidemiologists at the community health centers based on reports by community members. The decision to do fogging and other DHF control measures was made in the district health office.

Conclusions: Fragmented DHF information system slows down effective DHF control. It is therefore suggested that facility-based data should be integrated and evaluated at least weekly so that proactive DHF control program can be planned and implemented based on epidemiology evidence.

Keywords: dengue hemorrhagic fever, information system, facility-based

INTRODUCTION

Dengue is an important and potentially fatal mosquito-borne viral disease. It is estimated that more than 50 million human dengue infections occur in endemic areas annually and that, since 1958, more than 60,000 children have died due to DHF.¹ Yogyakarta has been a DHF endemic area since the late 1960s. Surveys carried out in Yogyakarta indicated that 70% to 90% respondents had basic knowledge about the danger signs of DHF and how to look for help when cases of DHF were suspected. More than 60% respondents were able to mention that DHF was transmitted by mosquito vector, *Aedes aegypti* (unpublished reports by medical students, Gadjah Mada University, from 1992-2003). Information system for DHF con-

trol directly involves the community in the detection and reporting of DHF cases and vector (larval) density. DHF is an important notified infectious disease, and a report to the primary health center (*puskesmas*) is mandatory when there is a case confirmed as DHF in a neighborhood. In response to the report, epidemiologists from the health center should do an investigation in the area where the reported case lives. When they think there is a transmission of dengue in the area, they should notify the district health office. A decision to do fogging or further interventions is made in the health office. A joint decree by the Ministry of Health and Ministry of Home Affairs stipulated that concentrated efforts of DHF control should be coordinated by the head of the sub district.

Community reporting for DHF control is generally not dependable, especially when *Puskesmas* (community health center) is not the ultimate choice for diagnosis and treatment of DHF. Suspected DHF cases are always referred to a hospital. When they are discharged from the hospital, there is no guarantee that they will report to the *Puskesmas*. Simple indicators can be constructed from hospital-based data to improve the surveillance of DHF, even when malaria is also endemic.²

Routine reporting of larvae (*Aedes aegypti*) found in and around the houses depends on the ability for community mobilization at the local level. Community interventions to improve DHF control program have to put a greater emphasis on skills necessary for community members to keep containers free of mosquito larvae.³ The objective of this study is to identify possible ways to strengthen community based data collection as the backbone of DHF information system by the utilization of data collected in the community health center and the hospital.

SUBJECTS AND METHODS

Secondary data analysis was conducted based on records available in *Puskesmas* Kraton, Yogyakarta municipality, and *Puskesmas* Depok, Sleman district, Yogyakarta, to estimate the burden of DHF cases in the community. Data of patients admitted to Dr. Sardjito Hospital from January 1995 to December 2002, diagnosed as DHF, were obtained from the computerized discharge summaries available in the medical record department. Interviews with doctors, nurses, public health administrators and laboratory technicians were carried out to describe how DHF was diagnosed and managed in the community health centers, and how DHF preventive programs were planned and implemented. An important limitation of this study is that silent DHF epidemics may be undetected by a surveillance system relying primarily on the reporting of cases.⁴

RESULTS AND DISCUSSION

Puskesmas is not equipped with facilities, or skilled technicians to diagnose DHF. Case definition is based on clinical grounds, such as fever less than 7 days, bleeding, positive tourniquet test, and shock. Although platelet counts, hematocrits measurement, and atypical lymphocyte counts theoretically can be done in *puskesmas*, these procedures are considered as cumbersome by lab technicians in *puskesmas*. The office hours for *Puskesmas* are rarely beyond noontime. It is safer and more appropriate to refer suspected DHF patients to a hospital where patients can be continuously monitored and treated, especially when serious complications of DHF (massive bleeding and shock) occur. Patients, with clinically and laboratory confirmed DHF, report to *Puskesmas* with a letter from the hospital, explaining that the final diagnosis is DHF. This is usually done by the relatives of the patients, and only rarely by the heads of the hamlets or villages. Community reporting of DHF cases is considered satisfactory by personnel in *Puskesmas* Depok I. Some hospitals sent feedback to the health center about the patients they referred to the hospitals, however, these hospitals did not provide notification that the patients had DHF and should report to the health center. Upon the receipt of notification about a DHF case, an epidemiological investigation is carried out to look for fever cases and the abundance of *Aedes aegypti* larvae in the neighborhood. The report is sent to the district health office for further actions, such as fogging, community education, and abate distribution. Mapping where and when DHF cases are detected have been done in *Puskesmas* Kraton and *Puskesmas* Depok I. Monthly data on DHF cases reported to *Puskesmas* Depok I show that there was an outbreak of DHF in 1998 (Figure 1). Since 2000 there has been a small increase in monthly incidence of DHF in Depok (Catur Tunggal and Maguwoharjo), however the total number of cases in a month was usually below 10. When-

ever it increases above 10, aggressive measures to prevent DHF in Depok have to be intensified. Zero tolerance against DHF is an ideal situation.

Surveys on the presence of *Aedes aegypti* larvae in the neighborhood are crucial activities to create awareness in the community about the importance of keeping their home environ-

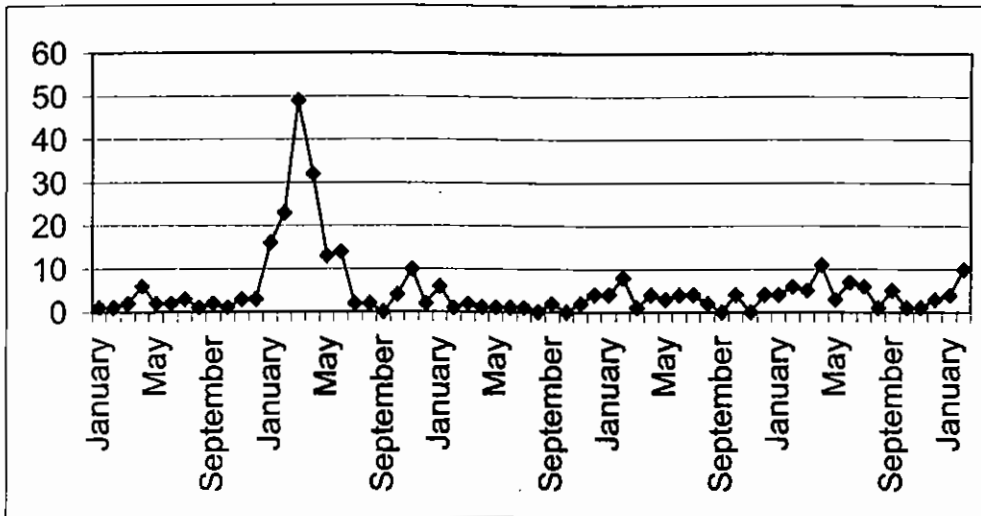


Figure 1. Monthly incidence of DHF reported to Puskesmas Depok I

The abrupt increase of cases in January, February, March and April of 1998 was confirmed by data on the discharge of DHF cases admitted to Dr. Sardjito Hospital (Figure 2). The hospital data indicated the diagnosis, length of stay and co morbidities of DHF, classified according to the 10th revision of International Classification of Disease (ICD X). A map suggesting the possible time-space clustering of DHF cases in Sleman district from 2000 to 2001 constructed from the data (Figure 3) showed that the number of DHF cases in Depok sub district reflected the level of incidence and spread of DHF in the district.

ment free from the DHF vectors. *Rotary Club* provided forms for *dasawisma* (a group of ten households) in Kraton Subdistrict to keep track of *Aedes aegypti* larvae in the *dasawisma*. The total number of households and the number of households with larvae are put together for each hamlet (RW) and then reported to the health center. The presence of larvae in and around the houses (mostly in the water reservoirs in the bath room) and the amount of abate distributed to the households (1 gram per 10 liters) are also reported in the same form. Abate is applied only to the water reservoirs which are difficult to clean regularly or hardly protected from *Aedes* mosquitoes.

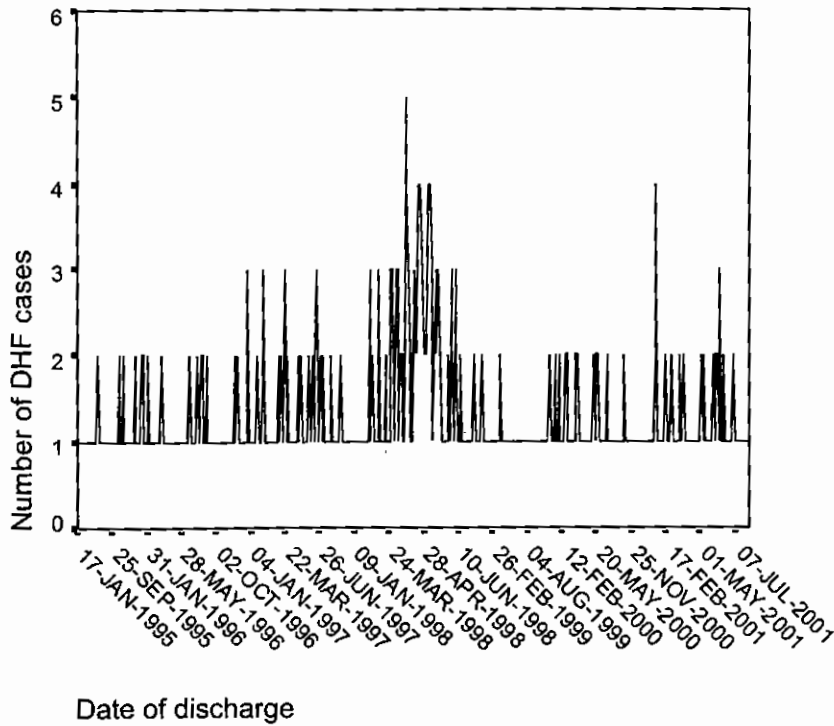


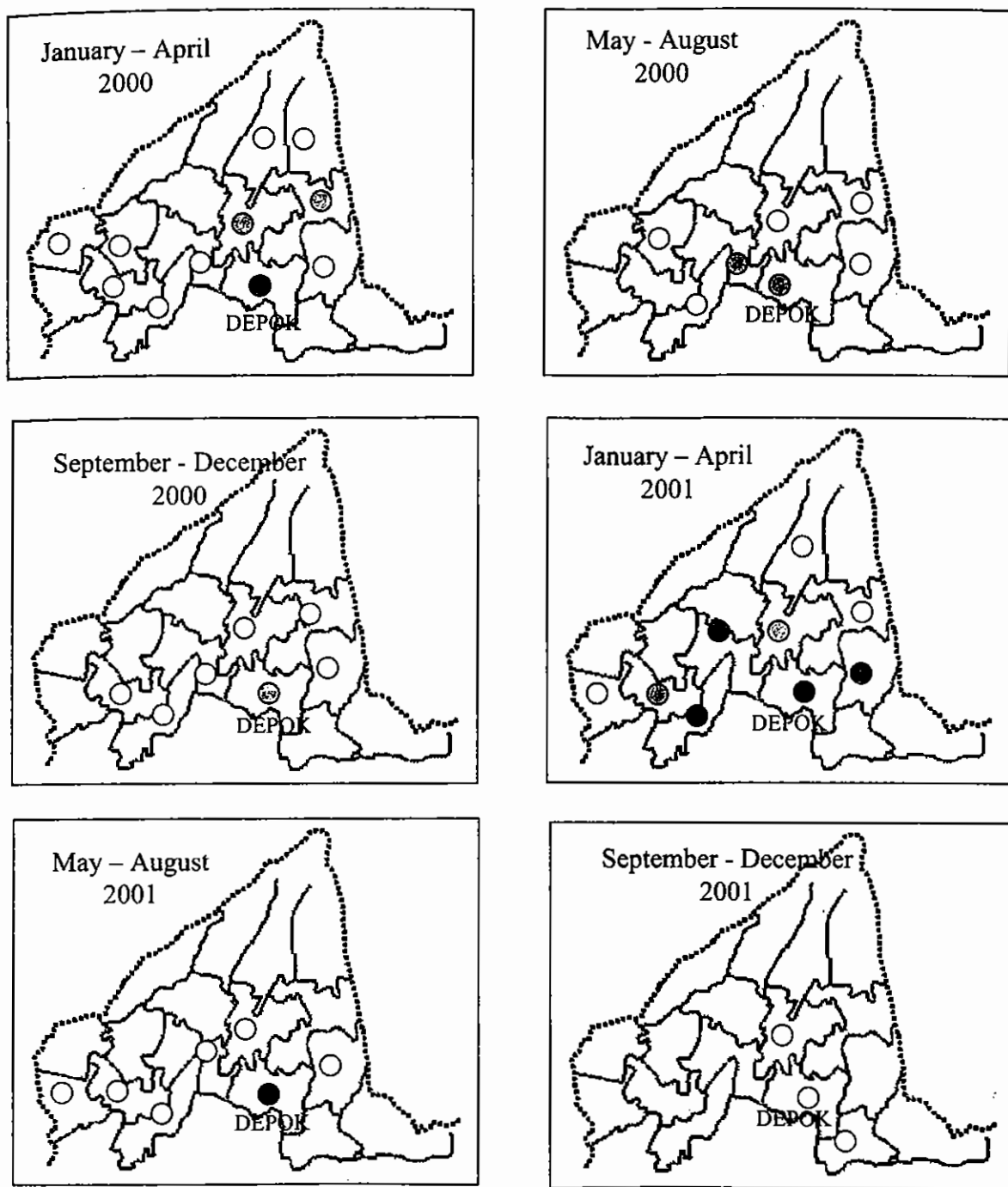
Figure 2. Frequency of DHF cases who lived in Sleman district and discharged from Dr. Sardjito Hospital from 1995 to 2001

Community participation for larvae surveillance in Depok is less successful compared to that in Kraton. The health center hires a surveyor to keep track of larvae in the houses. The data collected by the surveyor (remunerated Rp5.000,00 per 30 houses) are considered more reliable compared to the data generated by the community or health cadres. The problem is the lack of funding to pay the surveyor to do regular vector surveys.

CONCLUSION

Community participation is an important means for creating community awareness about the danger of DHF and how to prevent DHF transmission in their neighborhood. However,

the data generated by community reporting of DHF cases and vector surveys are not always dependable and usually out of date for the effective control of DHF incidence in the community. Hospital reporting of cases, diagnosed as DHF, should provide a more timely and comprehensive picture of DHF time-space distribution, since most DHF cases are treated in the hospital. Hospitals should disseminate DHF cases time-space distribution to health centers and district health offices. Partnerships between health centers and health offices and the community may enhance the information system and knowledge generation about how to keep DHF case to zero incidence.



Number of cases representation:

○ = 1-2 cases; ⊙ = 3-4 cases ● = 5-9 cases ● = 10-19 cases ● = 20 cases or more

Figure 3. Distribution of DHF cases in Sleman District, from 2000 to 2001

REFERENCES

1. Halstead,S.B., Epidemiology of dengue and dengue hemorrhagic fever in DJ Gubler and G Kuno (ed). Dengue and dengue hemorrhagic fever, CAB International, Willing ford, United Kingdom.1997.
2. Carme,B., Sobesky,M., Biard, M.H., Cotellon,P, Aznar,C., Fontanella,J.M., Non-specific alert system for dengue epidemic outbreaks in areas of endemic malaria. A hospital-based evaluation in Cayenne (French Guiana), *Epidol Infect.* 2003;30(1):93-100.
3. Winch,P.J., Leontsini,E., Rigau-Perez,J.G., Ruiz-Perez,M., Clark,G.G., Gubler, D.J., Community-based dengue prevention programs in Puerto-Rico:impact on knowledge, behavior, and residential mosquito infestation, *Am J Trop Med Hyg.* 2002;67(4):363-370.
4. Teixeira Mda G., Barreto,M.L., Costa Mda,C., Ferreira,L.D., Vasoncelos,P.F., Cairncross,S., Dynamics of dengue virus circulation: a silent epidemic in a complex urban area, *Trop Med Int Health.* 2002; 7(9):757-62.