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## EVALUATION OF AEDES AEGYPTI VECTOR CONTROL PROGRAM IN BUOL HEALTH DEPARTEMENT

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**Abstract:** - Buol district is a new developed area with high mobility population, so the environment is poorly maintained clean because the density of the population. This condition causes the potential for breeding of Aedes Aegypti vector and high incidence of dengue in Buol district, Central Sulawesi Province. Dengue cases in 2013 reach of 25 cases to 194 cases and in 2014 the number of cases increased by 676%. The purpose of this study was to evaluate the implementation of the Aedes Aegypti's vector control programs in the Buol Health Department. This observational research held in Health Department of Buol District and in three another health centers. Sampling technique was using purposive sampling by the sample size of 21 people. Measurements were performed by in-depth interview, observation and document analysis. The instruments used are guide interview and checklist sheet, and continue by Focus Group Discussion. The results showed that the fund is not sufficient, larvae survey tool was not complete yet, the implementation of activities (larvae survey, larvasidation, fogging) is only done as much as one cycle, the number of free larva in Buol only amounted to 35.3%, and the incidence of DHF which is still rising. The evaluation result showed that the implementation of Aedes Aegypti's vector control programs assessment in the health Department including good value scale, in Biau health center and Bokat health center have enough scale value. While in Lakea public health center including less value scale. So it needs to increase the efforts continuously, optimalitation and innovative way through empowerment communities or agencies in order to increase the Aedes Aegypti vector control programs.

**Keywords:** Evaluation, Aedes Aegypti vector control programs, the incidence of dengue fever cases.

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## INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is one of the infectious diseases that being a public health problem. Dengue is an infectious disease caused by the dengue virus. This is mainly transferred between humans by the *Aedes Aegypti* mosquito. The disease is widely distributed throughout the world's tropical and subtropical regions (Berntsen, 2009). Dengue fever is emerging arboviral diseases with worldwide impact. In order to develop interventions to slow or halt the further expansion of dengue cases should focus prevention efforts (Hayden and Waterman, 2005).

Proper control of DHF is breaking the chain of transmission is by controlling the vector. Some vector control methods such as by chemical use and larvasidation, insektisidation, Biology using natural enemy like predators, environmental management such as managing or eliminating mosquito habitat development which is famous for 3M plus or movement Mosquito Breeding Control (PSN), Determination of legislation and increase the role of as well as the community in vector control (MoH RI, 2013)

Buol regency, Central Sulawesi Province is a newly developed area, offering jobs higher than other areas, causing high population mobility as well. This causes the density of houses, many non-permanent rental terraced house frequently changing occupants so poorly maintained cleanliness, and the dirty environment.

Mobility of people and the environment are poorly maintained will potentially be a vector breeding places of *Aedes Aegypti* which cause high numbers of cases of dengue and mosquito-free for less than 95% in Buol, Central Sulawesi province. Based on the data of dengue cases in 2013 to 2014 a drastic increase in the amount of 25 cases to 194 cases with 676% trend.

The purpose of this study is to evaluate the Vector Control Program of *Aedes Aegypti* as a source of input (labor, funds, materials, facilities, and methods); process (implementation planning, surveying larva, larvasidation, fogging, counseling, and evaluation of activities); output (larva-free numbers); and the impact (the incidence of DHF) has been done in the health office. Buol, Central Sulawesi province.

## MATERIALS AND METHODS

This type of research is an observational study (no treatment need). This research is descriptive study. The draft evaluation been able to note the implementation of *Aedes Aegypti* vector

control programs in the Health Office Buol District, Central Sulawesi. Descriptive study aimed to describe a situation objectively and systematically of final result of the implementation of the *Aedes Aegypti* vector control program. Location of research carried out in health office of Buol regency and in three another health centers in the health service working area Buol. The research was conducted from March 2015 - in May 2015.

The subjects of this study amounted to 21 people consisting of 15 people at the Department of Health and six health workers from health centers. Subjects were taken by purposive sampling. Purposive sampling is not random sampling method and used for descriptive research.

This method of selecting cases with a specific goal in mind that there are researchers (Kuntoro, 2011). Data was collected by questionnaire (survey implementation larvae, larvasidation, fogging and counseling); perform document review (ABJ number and the incidence of DHF); make a field (funding, facilities larva surveys and fogging, fogging and larvasidation materials, methods, as well as the incidence of DHF) and in depth interview (quantity and quality of manpower, funds, facilities and surveys larva fogging, fogging materials and larvasidation, planning, and evaluation activities), followed by activities Focus Group Discussion (FGD).

The scale used for measuring the questionnaire in the study were Guttman scale with the provisions qualify (score 2) and are not eligible (score 1). Categories for determining assessments on each component are evaluated (input program, program activities, program outputs and impact of the program) is by using the form scale score 5 with the following conditions:

1. Very good, if the interval score was  $> 80\%$
2. Good, if the interval score was  $> 60\% - \leq 80\%$
3. Moderate, if the interval score was  $> 40\% - \leq 60\%$
4. Fewer, if the interval score was  $> 20\% - \leq 40\%$
5. less, if the interval the score Was  $\leq 20\%$

## RESULT AND DISCUSSION

Results of the analysis regarding the evaluation of *Aedes Aegypti* vector control programs in Health office of Buol district can be seen in the following table:

**Table 1. Evaluation of Performance Appraisal Vector Control *Aedes Aegypti* in the Health Service and in three health centers in the Work Area**

Health Service of Buol in 2014

No.	Variable	Instance (MS/TMS)			
		Public Health Center Office	Public Health Center Biau	Public Health Center Bokat	Public Health Center Lakea
1	Worker quantity	MS	MS	MS	MS
2	Worker quality	MS	MS	MS	MS
3	Fund	TMS	TMS	TMS	TMS
4	Larva Survei Means	TMS	TMS	TMS	TMS
5	Fogging Means	MS	TMS	TMS	TMS
6	Fogging Material	MS	MS	MS	MS
7	Larvasidation Material	MS	MS	MS	MS
8	Metods	MS	TMS	MS	TMS
9	Planning	MS	MS	TMS	TMS
10	Larva Survei	MS	MS	MS	TMS
11	Larvasidasi	MS	MS	MS	MS
12	Fogging	MS	MS	MS	MS
13	Counseling	MS	TMS	TMS	TMS
14	Evaluation of activities	MS	MS	TMS	TMS
15	ABJ Totaly	TMS	TMS	TMS	TMS
16	DHF Incident Value	TMS	TMS	TMS	TMS
<b>MS Total</b>		12	9	8	6
<b>MS Score(%)</b>		75%	56%	50%	38%
<b>Value Scale</b>		Good	moderate	moderate	Less

From Table 1 can be in the know the following information:

#### 1. Health Departement

Of the 16 variables studied, there were 12 eligible variable, the variable input (Worker quantity, Worker quality, fogging Means, fogging materials, larvasidation materials, methods); variable process (planning, survey larva, larvasidation, fogging, counseling, evaluation of activities) so as to obtain a score of 75% with good value scale category.

## 2. PHC Biau

From the 16 variables studied, there are 9 eligible variables that are input variables (worker quantity, worker quality, fogging materials, and larvasidation Materials); variable process (planning, larvae survey, larvasidation, fogging, evaluation of activities) so as to obtain a score of 56% with a sufficient value scale category.

## 3. PHC Bokat

from the 16 variables studied there are 8 eligible variables namely variable input (Worker quantity, Worker quality, Material Fogging, larvasidation materials, methods); process variables (larvae Survey, larvasidation, fogging) so as to obtain a score of 50% with a sufficient value scale category.

## 4. PHC Lakea

from the 16 variables studied, there are 6 variables that are eligible. They are input variables (worker quantity, Worker quality, fogging materials, larvasidation Materials); variables process (larvasidation, fogging) so as to obtain a score of 38% with less value scale category.

## DISCUSSION

### Input

Human resources (HR) are a key element in the organization. Therefore, HR must be managed well to enhance the effectiveness and efficiency of an organization (Hariandja, 2000) states that Health human resources qualified and in sufficient quantities and distributed has proven a positive effect on the smooth running of a program.

### 1) Quantity

Based on the results of interviews obtained information that the human resources in the Health Departement and in the three health centers that had already qualified more than one person, the amount of this energy is sufficient to represent a vector control program managers *Aedes Aegypti*. When viewed from the regulations Presidential Decree No. 72 Year 2012 on the National Health System that as implementing health measures, required adequate health human resources in the amounts, types, and distributed fairly and equitably according to the demands of health development needs.

Human health can be said is the "heart" of the National Health System. The number of health workers indirectly affects the degree of development of a nation. A growing number of health workers in a region will affect the quality of health services (Efendi et al, 2012).

## 2) Quality

While in quality, health workers involved in the implementation program of *Aedes Aegypti* vector control in the District Health Office. Buol already educated S1 health, especially in the section surveillance and environmental health and health promotion. Referring to the Presidential Decree No. 1116 of 2003 on guidelines for the implementation of surveillance systems, surveillance organizers resource that educated minimal S1, when viewed Permenkes No. 32 of 2013 on workers' organizer that power sanitarian minimal D3, while according Presidential Decree No. 1114 of 2005 on guidelines for the implementation of health promotion in the area of health promotion that education personnel minimal D3. Neither the competence of executive education programs at three health centers that minimum education diploma.

According Nuryati (2002) Improving the quality of human resources that are intimately associated with education, because education is at the main effort will be able to make the human resources of a high quality.

## Fund

Adequate health funding source, integrated, stable, and sustainable role vital for health service delivery in order to achieve the development goals of health (Purwanto, 2014). Sources of funds *Aedes Aegypti* vector control programs at health office Buol district I funded from budget funds (funds from the provincial government) and APBD II (funds from local government). APBD II is used for all activities *Aedes Aegypti* vector control program (larvae Survey, larvasidation, fogging, epidemiological investigation, and extension) of Rp. 41,185,000.00. While the budget funds I only used the survey activities larvae Rp. 2,800,000.00.

Financing sources *Aedes Aegypti* vector control programs in health centers working area *Health office of Buol district* in 2014 only from the Operational Support Health (OSH). No 2 of 3 health centers are not getting a good source of funds from the budget and the OSH, the health center which Bokat health centers, health centers Lakea. Besides just Public Health Centre Biau that gets funding from the OSH is Rp. 5,790,000.00. From the information submitted by the respondent that the funds are still not sufficient or appropriate to the needs of the implementation of the *Aedes Aegypti* vector control activities.

## Means

### 1) Larva Survei Means

Based on observations in the Department of Health and in the three health centers that larvae survey tool is still incomplete, most only use a dipper and a flashlight. This contrasts with the appropriate equipment with a book MoH RI on Dengue Control Module which includes larvae survey tool like bailer, pipette, a small bottle and a set tool of larval susceptibility testing (ovitrap). By looking at the book MoH RI on dengue control module in 2011 and Minister Regulation No. 374 on vector control in 2010, which means that, is used for survey activities larvae in Buol is still incomplete.

### 2) Fogging Means

In accordance with the statement of DHF program managing health office for fogging means in accordance with the technical guidelines in the book about the MoH RI Control Module DBD 2011. With fogging equipment which includes: 2 fogging machine, 1 piece 4-wheeled vehicles to transport personnel and equipment / materials fogging to the location, as well as personal protective equipment (PPE) such as field clothes, protective masks, field caps, and gloves. Whereas in 3 Public Health Centre working area Health Department still has not qualified for all of them yet have a fogging machines and 4-wheel vehicles.

Based Permenkes No. 374 on vector control in 2010, that the personal protection equipment to be used by officers/implementing vector control in accordance with the type of work and should refer to the criteria for the classification of pesticides by physical form, the entrance into the body and its toxic power.

## Material

The material used for insecticide fogging activities in 2014 was Acctelic (organophosphates), while the material used for larvasidation is temephos (organophosphate). The insecticide material was provided from the provincial government. This is in accordance with Permenkes No. 374 on vector control in 2010 and a book about the Ministry of Health RI Control Module DBD 2011.

## Method

Based on observations of the technical instructions and guidelines that the *Aedes Aegypti* vector control in the Department of Health has had 6 types of data technical instructions and

guidelines that Permenkes No. 374 in 2010, Presidential Decree No. 1116 In 2003, Presidential Decree No. 1479 In 2003, Guidelines for the control of dengue in 2013, dengue control module 2011 and the instructions of planning P2PL 2014, so still classified as eligible. Whereas in 3 health centers working area Health office of Buol district that there is only one health center is still quite qualify because it has four types of data that PHC Bokat, the rest are not eligible.

### Planning

Planning is the process of mobilizing information and resources from nature instinctive, spontaneous, and forecasting subjectively is deliberate, systematic, and objective. Planning is also the process to anticipate future events and determine the strategy to achieve the goal (Supriyanto and Damayanti 2007). From interviews with the respondents that no planning before implementation of the *Aedes Aegypti* vector control programs in Health office of Buol district, so that has been qualified. While the three health centers working area health office Biau only health center that makes planning, so as to qualify. While two community health centers that there is no planning, the health center is Bokat PHC, PHC Lakea, so it does not qualify, Flick survey and Larvasidation

Based on the results of the study showed that the overall value of the attitude of the survey larva in Health office of Buol district in 2014, including eligible. While the 3 Public Health Centre working area Buol District in Health Department and Health Center Lakea just yet eligible. The rest are two health centers are also included qualified health centers and health centers of Biau Bokat.

Based on the research results of larvasidation are good implementation of the health service and in 3 Public Health Centre working area Buol District Health Department in general has all been qualified. However, most respondents answered the survey larvae and larvasidation only done one time because of limited funds. If the view of the Ministry of Health RI 2011 book about the dengue control module and the Ministry of Health of Indonesia Year Book 2013 on Guidelines for control of Dengue Hemorrhagic Fever in Indonesia, that the survey should be in line larvasidation larvae and is 3 months.

### Fogging

Associated with the implementation of the fogging shows that the measurement results of the implementation of fogging in general, both in the health service and in 3 health centers working area Health Department of Buol District already qualified. But, the question items fogging at only 1 cycle because of limited funds. Meanwhile, if viewed from the Indonesian Ministry of

Health Book of 2011 on dengue control module and the Indonesian Ministry of Health Book of 2013 on Guidelines for control of Dengue Hemorrhagic Fever in Indonesia, that the implementation of the fogging should be carried out 2 cycles at intervals of one week, because if done one cycle has not been effective to kill mosquitoes.

### Counseling

Associated with the implementation of the extension can be seen that in general in the health service already qualified. In addition, to holding counseling, unisex distribution of leaflets to the public. Counseling is done by collecting societies or door to door. Whereas in 3 health centers working area Buol District Health Department for the implementation of counseling everything yet qualified, most do not distribute leaflets to the public.

Counseling will be more effective if accompanied by community development, fostering an atmosphere of social environment, as well as advocacy to the parties that can support the implementation of dengue control program. Through the third strategy, is expected to empower individuals, families, groups in the community to be able to perform activities of *Aedes Aegypti* vector control, build the atmosphere /environment conducive to the creation of a culture of clean and healthy lifestyle as well as the support of the decision makers. Policy makers and other stakeholders in the form of DHF control policy (MoH RI, 2011). According Pradani et al (2010) the results showed that the required extension integrally and continuously about the importance of PSN by raising public awareness. Empowerment is a health promotion strategy aimed at direct community with the aim of realizing the ability of communities to maintain and improve their own health.

### Evaluation Of Operations

The evaluation of *Aedes Aegypti* vector control activities in existing Health Department and conducted every end of the year, with the aim of routine tasks as well as to determine how much the success of the program has been implemented. While the three health centers and Health Department in working area of Buol District there are still 2 health centers that have not been carrying out evaluation activities, the health centers are community health centers Bokat Lakea. The rest just Public Health Centre Biau who has carried out the evaluation activities.

According Akdon (2007) of the evaluation function is used to determine the level of success and failure of a program and provide input in solving problems arising during the implementation of the program. The evaluation can be beneficial in improving the planning, strategy, policy

decision-making, wisdom in the control program, as well as input for improvement; process; and output.

### **The Total Of Larva Free Number**

Based on observations, it is known that the ABJ in Buol district still 35.5% or below the standard. It is associated also with ABJ at 3 health centers in the region of *Health office of Buol district*, which is still below to the standard. Figures Free Flick at PHC Biau 33.3%, 47.6% Bokat health centers, health centers Lakea as much as 40.0%. Whereas the standard value-free numbers larva is 95%. This is caused because the number jumantik are still very poor, causing performance is not optimal.

According Sungkar (2007) that it is causing *Aedes Aegypti* larvae being let loose on the examination is jumantik only check large water reservoirs such as bathtubs, buckets and drums. While a small container such as shelter AC droplets, flower vases, and shelter droplet dispenser is not in check. Meanwhile, according Kusumawati and Darnoto (2008), the vector of dengue eradication program focused on cleaning mosquito larvae, it requires the involvement of all levels of society in order to eradicate the mosquito can be longer and more sustainable.

### **Incidence Number of DHF**

Based on observations and data analysis can be seen that the number of dengue cases recorded in Health office of Buol district in 2014 increased from 2013, like from 25 cases to 194 cases with 676% trend. The number of cases associated of cases in each health center, which at Public Health Centre Biau increased from 18 cases to 84 cases, for PHC Bokat from nothing (0) cases increased to 50 cases, while in PHC Lakea of 2 cases increased to 9 cases, This suggests that the incidence of cases of dengue in Figures Buol in the category are not eligible.

Dengue control is right for today is breaking the chain of transmission is by controlling the vector. Various methods include chemical vector control with insecticides and larvicides, biology using natural enemies such as predators, environmental management such as managing or eliminating mosquito breeding habitats by 3M plus or PSN (Control of Mosquito Nest), the application of laws and regulations, improve community participation in control vector.

Integrated Vector Control (PVP) or Integrated Vector Management (IVM) is a vector control is done by using a combination of several methods of vector control is based on the consideration keanan, rationality and effectiveness of the implementation and sustainability. Excellence in Integrated Vector Control (PVT) can improving the effectiveness and efficiency of various

control methods, can improve control programs to more than one vector borne diseases, through cross-sector cooperation to achieve more optimal results and mutual (MoH RI, 2011).

## CONCLUSION

Based on the results and discussion above can be concluded that as a whole on the evaluation of *Aedes Aegypti* in the Department of Health has 12 qualified variables with a score of 75%, so that a good assessment category. At PHC Biau had 9 qualified variable with a score of 56%, thus including sufficient assessment category. For PHC Bokat has 8 variable qualified with a score of 50%, thus including sufficient assessment category. While PHC of Lakea has 6 variables qualified with a score of 38%, thus including the assessment categories less.

In *Aedes Aegypti* vector control programs in at Buol need to apply for an additional implementation needs tools such as fogging machines, machine Ultra Low Volume (ULV), and larvae survey equipment such as pipettes, small bottles and ovitrap. In addition, it is necessary to increase efforts on an ongoing basis activities, optimal (fogging implementation as much as 2 cycles and the implementation of larvae and larvasidation survey by 3 cycles) and innovative activities involving/empowering people or institutions concerned.

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