

Real Impact Of Forest And Land Fire On The Environment And The Cost Of Health Services In Artificial Disease In Payakumbuh West Sumatra

Linda Handayuni, Ali Amran, Abdul Razak, Eri Barlian

Abstract: *The smoke disaster caused by forest and land fires is a phenomenon occurring almost every year in Indonesia, especially in ten prone provinces including Riau Province. When the smoke haze occurred in the last three years that is always increasing. The objective of this research is to study the impact of KARHUTLA (Riau Forest and Land Fire) on Health Service Costs on ARI Disease in Payakumbuh City, West Sumatera. This research is an Ex Post Factor research to see the events that have happened. Respondents in this study are 100 people with respiratory infection located in health care work area Payakumbuh (Hospital, Clinic and other health services) and doctors and other health workers. Costs incurred in the provision of ARD services caused by KARHUTLA are the services of doctors, drugs and actions given to patients. The results showed that for one person ARI can be calculated with $Lsmog = d + o + t$ (required). The results of the cost can be determined after the ARD patient is treated.*

Index Terms: *Forest and land fire; Occurrence of ARI; Cost of health services*

I. INTRODUCTION

Forest fires are one of the more common forms of disturbance. [1] [2] explain the negative impacts of large fires include ecological damage, declining biodiversity, declining economic value of forests and soil productivity, global and global climate change, and the smoke disrupts public health and disrupts the transport of land, river, lake, sea and air.

Environmental pollution, especially air pollution in some provinces on Sumatra Island is quite high, especially when the dry season and forest fires are either intentional or unintentional, and fires are most common in Riau and Jambi provinces where the smoke spread includes neighbouring provinces[3] [4]. Smoke that covers the sky for several days has the potential for the spread of Acute Respiratory Infection(ARI). The high level of air pollution in the cause of ARI has the highest number of people suffered compared to other diseases that are about 20.55% [5].

The occurrence of smoke haze increase is very worrying because the smog is getting worse and thickened so as to make the visibility in Payakumbuh is getting smaller. Due to the direct impact of forest fires in Riau Province, among others, the emergence of ARD for the community. According to the air quality in Payakumbuh City is caused by forest and land fires, besides air pollution caused by forest fires can cause odour, visual disturbance and can cause acid rain damaging the environment [6].

Maler's Theory (1974) describes how much each individual pays for his health expenses related to air pollution. This model was formulated by [7] in the form of: $U = U(X, L, N; Z)$ where.

U = healthy needs

X: consumption of goods

L: leisure

N: Nature of illness

Z: The vector of individual characteristics (relative depending on the situation) in this study is ignored/not calculated.

The impact of forest fires has led to a decline in the level of public health, both directly and indirectly. The impact will be felt for children under five (under five years) and elderly (elderly). The direct impact of inhalation of forest fire smoke is an upper respiratory tract infection, whereas the indirect impact is the emergence of disease in the muscle and binding system if forest fire smoke closure lasts for a long period [8]. [9] adds increased ARI is indirectly stimulated by the inclusion of smoke particles containing harmful compounds such as SO₂, NO₂, CO and O₃ that interfere with respiratory function and can interfere with health, especially in the upper and lower respiratory tract, and cause pare infections such as bronchitis, edema of pare and pneumonia.

Based on data from the Health Office of West Sumatera province in 2015 [10] shows ISPA ranks the top of all diseases, with the number of sufferers as much as 287.145 people while caused by forest land fires amounted to 167,893 inhabitants.

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II. MATERIAL AND METHODS

implementation cost in ARI patient(table 1).

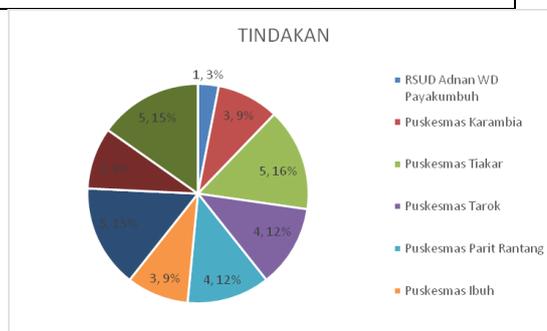
The type of research is quantitative research with correlation analysis to find out how big the relationship between independent variables with the dependent and the presence or absence of the relationship between variables. Independent variable is forest fire while the dependent is health

Table 1. Sample Research.

Regional General Hospital DR. Adnan WD Payakumbuh	ni = $372/21127 \times 100 = 1$ orang
hospital/clinic of Karambia	ni = $2.432/21127 \times 100 = 10$ people
hospital/clinic of Tiakar	ni = $2.648/21127 \times 100 = 11$ people
hospital/clinic of Tarok	ni = $5.188/21127 \times 100 = 22$ people
hospital/clinic of Parit Rantang	ni = $2.308/21127 \times 100 = 10$ people
hospital/clinic of Ibh	ni = $3.833/21127 \times 100 = 15$ people
hospital/clinic of Payolansek	ni = $3.903/21127 \times 100 = 16$ people
hospital/clinic of Lampasi	ni = $3.227/21127 \times 100 = 14$ people
hospital/clinic of Ait Tabik	ni = $2.909/21127 \times 100 = 11$ people

Total Sample All = 100 people.

In the cost of health services that are implemented in one hospital and eight health centres is the Services Doctors, Drugs and Action performed on patients. Where action does not have to exist if there is new count. The cost is calculated by the formula above formula which is modified to be simpler: $Lsmog = d + o + t$ (required). $Lsmog =$ Total cost of health services $d =$ Doctor Services $o =$ ARD of ARD $t =$ Cost of Action.



III. RESULT AND DISCUSSION

The results of the research of 100 respondents are shown in the following graphs:

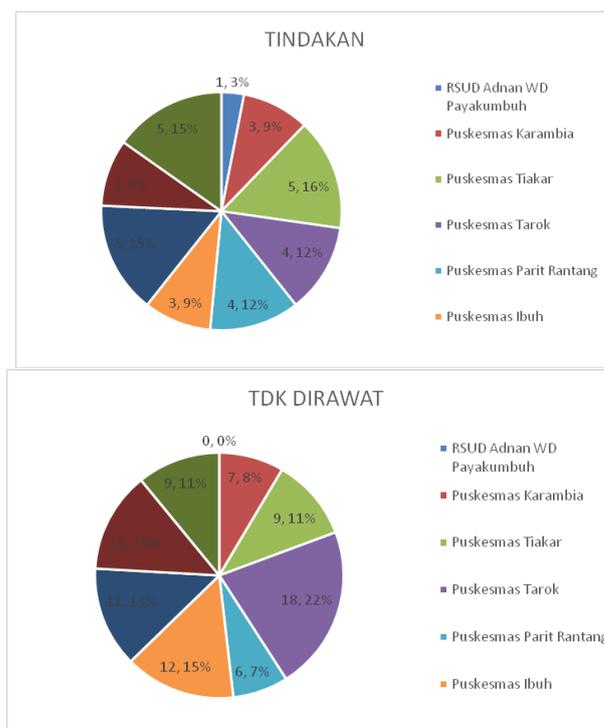
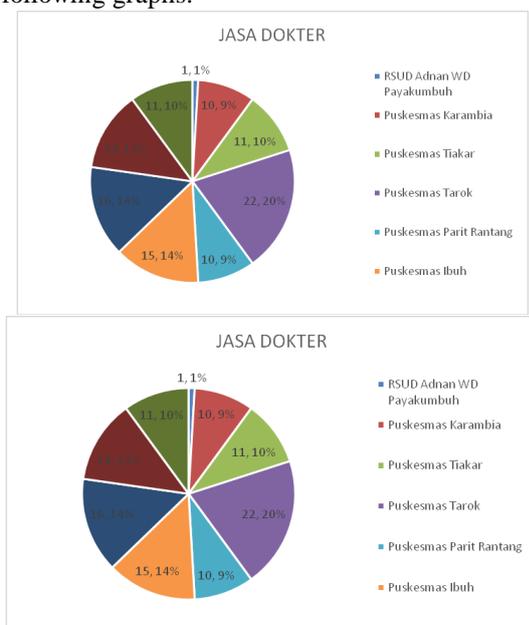


Figure 1. The graph of respondents

Data on the graph above with 100 respondents showed significant effect of smoke haze on health service cost whereas 1.1% hospitals services, hospital/clinic of Karambia 10.9%, hospital/clinic of Tiakar 11.1%, hospital/clinic of Tarok 22.20%, hospital/clinic of Parik Rantang 10.9% and hospital/clinic of Iuh 15.14%. Drug RSUD as much as 1.1%, hospital/clinic of Karambia 10.9%, hospital/clinic of Tiakar 11.1%, hospital/clinic of Tarok 22.20%, hospital/clinic of Parik Rantang 10.9% and hospital/clinic of Iuh 15.14%. The RSUD action was 1.3%, hospital/clinic of Karambia 3.9%, hospital/clinic of Tiakar 5.16%, hospital/clinic of Tarok 4.12%, hospital/clinic of Parik Rantang 4.12% and hospital/clinic of Iuh 3.9%. 1.3% of hospitals, 3.9%, hospital/clinic of Karambia, 5.25% of hospital/clinic of Tiakar Community Health Center, 4.12% Tarok hospital/clinic, 4.36% hospital/clinic of Health Center and 3.9% Iuh Community Health Center. Not hospitalized by 0,0%, hospital/clinic of Karambia 7,8%, health centre of Tiakar 9,11%, health centre of Tarok 18,22%, health centre of Parik Rantang 6,7% and health centre of Iuh 12,15%. This figure is a cost due to smog that causes ISPA is relatively mild. How to calculate this is evidence taken from the field.

These results indicate that forest and land fires affect the cost of health services, such as the most expensive cost of action and medication when the patient is treated and taken action. This can increase the budget Payakumbuh Government in the cost of health services specific ARI. For health expenses each year has been budgeted by the Payakumbuh government. This is in accordance with [17] Health costs are the amount of funds that must be provided to organize and/or utilize the various health efforts required by individuals, families, groups and communities.

At present, the cost and delivery of health services are fully borne by the government. The services are provided free of charge by the government so that very rarely the provision of health services is provided by private parties. In countries where the financial condition is not good, the system is difficult to implement because it requires huge funds. For example, funds from the central and provincial governments.

Forest and land fire incidents cause an increase in public health problems, especially at-risk groups, ie pregnant women, infants, children and the elderly who have low immunity. [19] [2] In fact, the event of forest and land fires not infrequently result in casualties.

Environmental factors greatly affect the incidence of ARI disease. Environmental factors can come from within and outside the home, one of them because of smoke forest fires [2]. This is in the opinion of [20] [21] which states that pollutants are materials that can change the conditions of a comfortable environment to be uncomfortable and not there, This disrupts the growth of certain species and breaks the food chain. The same thing was also revealed by [22] that the smoke causes irritation of the lid of the lining of the eyes, nose and throat so as to cause eye irritation, aqueous, aqueous and uncomfortable nose in the throat, nausea, headache and facilitate the emergence of ARI.

Furthermore, according to [22] one of the Ministry of Health's website on October 15, 2015, revealed that the smog

contains chemicals such as aldehydes, polycyclic, aromatic hydrocarbons, benzene, toluene, styrene, metal and dioxin. These chemical compounds are some such as benzene, toluene metal or heavy metals and very dioxins dangerous and can trigger cancer.

Furthermore, the losses from forest fires that produce smoke haze are very large, can be calculated using the formula $L_{smog} = d + o + t$ (required) [2]. The results of the cost can be determined after the ARD patient is treated.

The impact of other diseases is not counted because the dominant smoke haze effect is ARI. Infodatin published by the Ministry of Health in 2015 states that the dominant smoke fog found within 29 June-29 October 2015 in Riau province is ARI with 83.92% [22]. This is in accordance with the condition of the ISPA is low with minimal facilities. According to [23] the cost of ARI is dependent on the health facilities used and related to the severity of ARI experienced by individuals.

IV. CONCLUSION

Appropriate research results and discussion. It can be concluded that the impact of forest and land fires with the incidence of ARI disease is the rising cost of health services (Doctor Services, Drugs and Action). To calculate the losses incurred by KARHUTLA against ARI events are $L_{smog} = d + o + t$ (required). The results of the cost can be determined after the ARD patient is treated.

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Linda Handayuni, M.Sc as the head of research assigned in the main research design as well as contributing to the study of literature and research data.



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