ASSOCIATION RULE METHOD FOR INFORMATION SYSTEM EPIDEMIC DENGUE MAPPING BASED ASSOCIATION OF RISK FACTORS IN PALEMBANG

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ABSTRACT

Endemic diseases dangerous such as dengue fever must be handling seriously for the risk minimize by the disease. Dengue Hemorrhagic Fever (DHF) is disease has not been found vaccine or cure is powerful. It is necessary treatment to prevent the occurrence of dengue fever, especially when it came to the incidence of dengue fever endemic in certain areas by doing Epidemiologist dengue fever. Epidemiology is identification of risk factors for DHF to find level of area risk. Risk factors of hemorrhagic fever endemic must be identified to prevent the occurrence of dengue fever. Identifying risk factors and risk factors association can potential increase the occurrence of dengue fever. This study developed mapping information system Dengue epidemic through Association rule method of data mining. The information generated in the map of epidemic DHF level based association of potential risk factors that cause hemorrhagic fever endemic. Analysis with the Association Rule to determine level of DHF epidemic area based data reporting system.

KEY WORDS

information system mapping, data mining, Association Rule, endemic, Dengue Hemorrhagic Fever (DHF).

1. INTRODUCTION

1.1 Background

Endemic disease is serious problem faced by an area (region). Endemic diseases dangerous such as dengue fever must be handling seriously to minimize the risk disease. Dengue Hemorrhagic Fever (DHF) is disease which has not been found vaccine or cure is powerful. Endemic dengue is often found in Palembang city. Various articles have revealed that Dengue Hemorrhagic Fever (DHF) often occurred in Palembang.

Head of Health Office Palembang city, Anton Suwindro mention in the newspaper Sindo December 23, 2013 stated, cases of dengue in Palembang at 2012 recorded 725 cases and 2011 as many as 500 cases. Meanwhile, until the beginning of December 2013, the number of dengue cases already can be reduced to 450 cases. Therefore, prevention of dengue cases in Palembang continued.

Palembang consists of 14 sub-district with 103 villages including region endemic in the province of South Sumatra. Found 85 villages (83.5%) and 16 endemic villages (15.5%) are sporadic and only one area of the village belongs to the category of potential-free. (DHO Palembang, 2005, Prop South Sumatra Health Office, 2005).

By region by district / city in South Sumatra Province, dengue morbidity in Palembang is high (62.34

every 100,000 population), Prabumulih (49.93 every 100,000 population), Banyuasin (26.22) and Lubuk Linggau (15.66). (South Sumatra province health office 2008, Hamza Hashim, 2008). Of the 14 districts, Ilir Timur I was the District with the most dengue cases with 117 cases per 100,000 population with CFR 1%. Based on the case every year, the city of Palembang considered endemic region (Santoso, 2008) in (Hamzah, et al, 2009).

Therefore, it takes a work program to combat and control the spread of dengue fever in the city of Palembang. To prevent and control dengue endemic should be understood risk factors that can lead to endemic dengue. There are many risk factors that can lead to the incidence of dengue fever. Among other risk factors cause a lot of population, high population mobility, low areas, weather, population age, gender and densely populated. In accordance with the Minister's decision 581/1992 on efforts to combat dengue fever, the efforts to control the disease must be done by looking at three (3) important matters, namely: 1) human resources, such as counseling and education; 2) policy agents, such as government / cross-sectoral and community; 3) action, in the form of preventive and curative. (Kurniati, 2009).

2. Literature Review

2.1 Information System

2.1.1 The basic concept of information systems dengue fever

According Sutabri (2004), the system is group of elements that are closely related to one another, which function together to achieve certain goals. Furthermore Suyanto (2004) describes the information is data process into more useful form and better meaningful to humans.

Application of information systems within the organization to support information needed by all levels of management. It is known that the information is very important for the Management in decision making. The information system is system within organization that brings daily transaction processing needs to support operations function managerial organization with strategic activities of organization be able to provide certain outside parties with the necessary reports (Sutabri, 2004).

2.1.2 Components of the information system

According to Burch Grudniski (1986) said that the information system referred to as term building blocks , among others input block, model block, database block, technology block and control block . Six of the block is interact with each other unity form to achieve their goals.

2.1.3. Basic Concepts Database

Database is collection of computerized information with respect to certain topics (Suyanto, 2003). According to Kadir (2003) referenced in Ariansyah (2004), the database is system of organizing data with the help of computer that allows data to be accessed easily and quickly.

Database can organize the information interrelated and to be logical form for easy access (Suyanto, 2003).

2.2 Epidemiology Dengue Cases

Dengue is vector-borne disease, which could potentially cause Extraordinary Events. Proactive effort to prevent the occurrence of Extraordinary Events Dengue can be done by controlling risk factors, such as environmental risk factors physical (vector breeding sites), biological environment (vector), as well as the social environment (knowledge, attitudes and behaviors) that can be done through study Risk Factors DHF aims to identify environmental risk factors (physical and social) based on regional approach, measured variables of risk factors physical and social environment include the level of knowledge about dengue and the presence of larvae in the homes of respondents, with the parameters of House Index (HI). The existence of high HI indicates that in the

surveyed area has the potential for the occurrence of dengue transmission in the region because there are sources of infection (patients with DHF). Even in the absence of DHF patients was still chance for the occurrence of dengue transmission if the mosquitoes in the region has occurred Vertically transmission, i.e the transmission of Dengue viruses occur vertically from the mosquito Aedes aegypti larvae mature to derivatives so that when adults are infective without having to bite people with dengue , (Ludfi Santoso Eni Ratna Mintarsih, Hadi Suwasono, 1996, Enny Muchlastriningsih et al, 1997). Actually, the Indonesian people already know the signs and modes of transmission of DHF, because DHF entered Indonesia since 36 years ago. Prevention is simple and does not need high technology. To combat dengue clear and simple steps are needed to foster changes in attitudes and awareness of all parties and the community in keeping the environment clean. With large population, supposedly helping people and worked together to clean up the environment, just with simple steps mosquito nest eradication (PSN) conducted by 3M activity, the chain of transmission of the mosquito Aedes aegypti as the cause DHF can be cut, so as not to spread widely. (Rita Kusriastuti 2004, Wiku BB. Adisasmito M. Hasyimi, 1997) incidence of dengue cases has increased more years with different clinical manifestations. It is transboundary disease, which can actually be predicted and anticipated by the model-based integrated management of infectious diseases in the region comprehensive perspective. (Umar Fahmi Achmadi, 2005, Dep.Kes RI, 2002b, Gubler DJ, 1988, Santoso, 2008).

3. Results and Discussion

Results of this study is mapping information system Dengue epidemic DHF at Palembang city. The system developed based on the analysis and design of identify risk factors of dengue fever. This study enroll 6 risk factors to be studied there are: Age, Sex, Topography, rising temperatures, climate change and population density.

Results of research showed the age group most affected (data of patients by sex and age) 5- 9 years old and 9-14 years age group. While male gender that suffered most were. This may imply that risk factor age and risk factor gender had impact on the Dengue Fever endemic. These data indicate that the incidence of dengue fever affected by weather and climates which is a lot of rainfall will affect the high incidence of dengue fever. Conditions weather is risk factor that affects dengue too.

Risk factor of topographical areas many marshes relative incidence of dengue fever becomes more. It shows that Topography affects dengue epidemic.

Based upon risk factor that has been stated above, sought the association of each risk factor that can amplify the incidence of dengue fever. The results will be showcased in the mapping of areas prone to epidemics of Dengue Hemorrhagic Fever. To analyze the effect of concurrent risk factors that can lead to an epidemic of dengue fever, a technique used association rule. Occurrence of a particular set of items is determined by counting the frequent item sets.

Following simulations on systems that have been developed. Initially will be selected health centers of villages in the city of Palembang. Region predetermined point is the determination of the location of health centers to be sampled. As shown Figure 1. below:

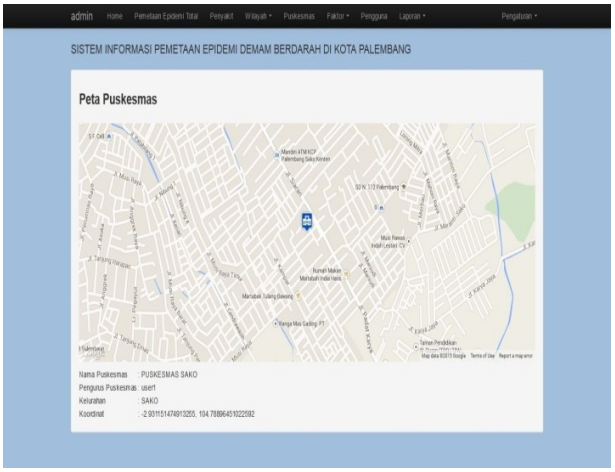

Figure 1. Location of health centers to be sample

Above is the result of data output by specifying the coordinates health centers sako

Once completed, determine the value of an epidemic of a new sample data that we have input. By selecting the menu Factors> Risk Factors

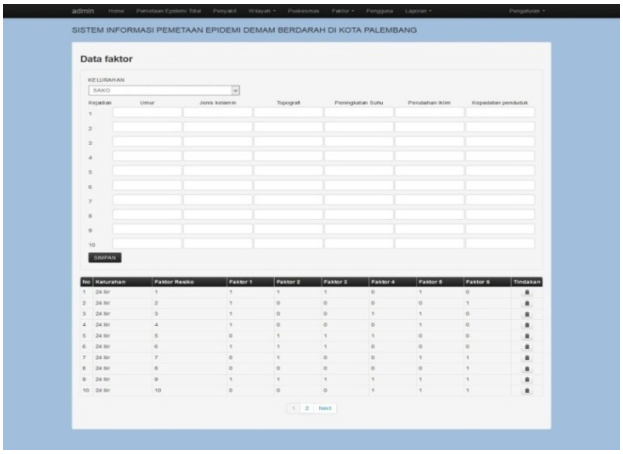

Figure 2. Risk Factor

Select the Village that will be made Assessment . And enter a value of 1 and 0 as Substitute and no. After successful entry into the next menu. Menu Factor> Factor Comparison Select the Village, then select comparison. After doing repeatedly throughout the existing comparator. So we get the data as follows

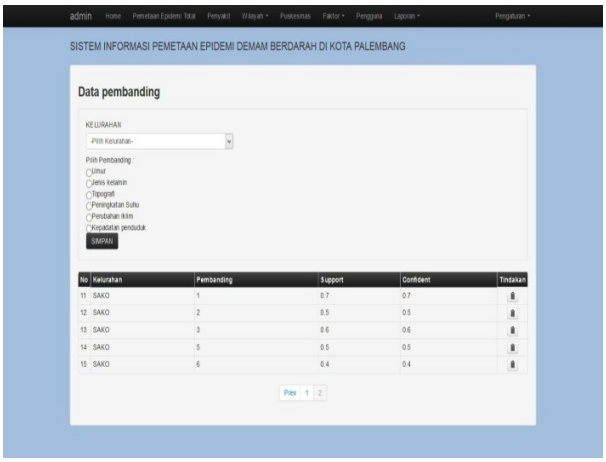

Figure. .3 The existing comparator

Once we get the value of the largest possible potential of an area. Then it will be displayed as shown below. Calculations using avg value of the existing potential.

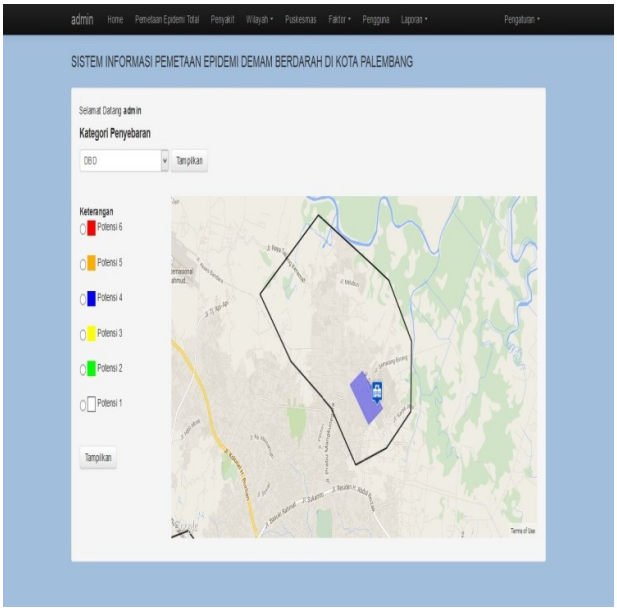

Figure 4. The value of the largest possible potential of area

Here is a picture on the home page, where the data is displayed in a manner that appears most frequently value. And on the following pages, the menu mapping Epidemic total. By looking for the maximum value

obtained from the calculation of the epidemic that we created earlier.

By using the calculation of the total value of the results of the comparison. And provide the possibility / biggest percentage that will happen.

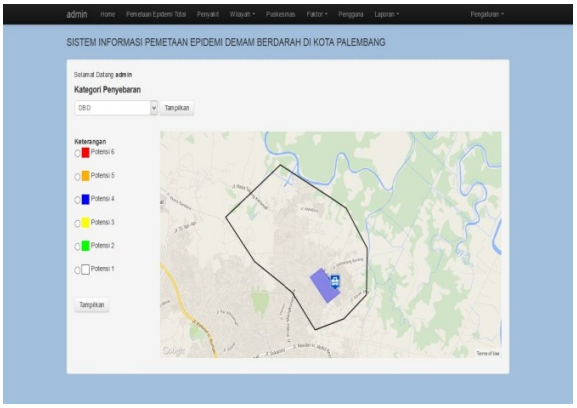

Figure 5. Result of calculation on map

And the calculated value epidemic in total, we can see, same potential value. So that the colors on the map did not under go changes.

Results of level dengue epidemic potential of associated risk factors. Dengue fever epidemic potential, according to calculations by Association Rule method. In Figure.5 above shows the blue color of the village shows that the potential is at level 4. This means that the association of some of these risk factors is high enough potential cause of the epidemic of Dengue Hemorrhagic Fever.

4. Conclusion

Based on the research that has been done and the results of discussions which have been described previously, it can be concluded that:

1. The risk factor is a factor that can give potential dengue trjadinya

2. Association of several risk factors can increase the potential of endemic dengue.

3. The system developed for mapping the dengue fever epidemic that is based on the association of risk factors, can identify areas that have some association with the risk factors that can lead to an epidemic of Dengue Hemorrhagic Fever.

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