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Environmental-Based Disease Prevention Model Based on Disease Vulnerability Index in Kepahiang Regency, Bengkulu Province, Indonesia

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Abstract

Environmental-based diseases in Kepahiang Regency tend to increase annually which will cause death if it is not handled quickly and appropriately. The incidence of the disease becomes the standard of measurement for the Community Health Development Index and Human Development Index. The purpose of this study was to determine the dimensions and indicators of environmental-based disease causes, calculate the disease susceptibility index and create a prevention model based on the disease susceptibility index obtained. The method used in this study is the modified Village Development Index (IPD) method. The environmental-based disease susceptibility index is structured into 7 dimensions, namely health services, health workers, environmental health, population, community behavior, disease control and governance which are arranged into 23 indicators. The highest disease susceptibility index in Kepahiang Regency is the pulmonary TB disease susceptibility index, which is 2.830. The DHF susceptibility index is 2.746 and the lowest is the susceptibility index to diarrhea at 2.456. The susceptibility index of the three diseases is included in the category of potentially vulnerable. If viewed from the index per dimension, the highest index is found in the community behavior dimension. The susceptibility index at the district level, it was found that Seberang Musi and Muara Kemumu districts had high susceptibility index.

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The strategy to increase the budget in improving health services, outreach to change people's behavior to be aware of health are potential steps to reduce the status of environmental-based disease vulnerability in Kepahiang Regency.

Keywords: Environment; susceptibility; Index.

I. Introduction

Environmental-based disease is one category of disease that has a role in determining public health degree. The types of diseases that are classified as environmental-based diseases are Acute Respiratory Infection (ARI), pulmonary TB, diarrhea, polio, measles, worms, avian flu, anthrax, dengue, malaria, filariasis and chikungunya. The high morbidity rate for some of these diseases can certainly reduce the public health degree [1].

Kepahiang Regency, the research location, is in the highlands of Bukit Barisan Mountains which is one of the regencies in Bengkulu Province. The area of Kepahiang Regency is approximately 66,500 hectares or 665 square kilometers. Landscape and climatic conditions in Kepahiang Regency also affect the incidence of existing environmental-based diseases. This is in accordance with the statement of Sukowati [13], that physical environment such as geography and climate influence disease transmission. The socio-cultural environment includes knowledge, attitudes, and behavior of the community in relation to vectors, besides that the biological and socio-cultural environment also plays an important role in the incidence of disease.

Several diseases that continue to increase both nationally and regionally are diarrhea, Dengue Hemorrhagic Fever (DHF) and Pulmonary Tuberculosis (pulmonary TB). WHO data stated that every year diarrhea is included in the top 10 causes of death in the world, 1.6 million deaths due to diarrhea of which more than 25% are children under 5 years of age [16]. The increase in diarrhea cases also occurred in Kepahiang Regency during the last 5 years. In 2014, 885 cases of diarrhea were handled then it increased to 1,635 cases in 2015 and 1,761 cases in 2016, while in 2017 this number fell to 1,544, then in 2018 it increased again to 1,992 cases. All ages of people can be infected by diarrhea and if not treated quickly it can cause death, especially toddlers [4]. In addition to diarrhea, a dangerous environmental-based disease is Dengue Hemorrhagic Fever (DHF) which is transmitted by *Aedes aegypti* mosquito which can cause death if not dealt quickly. DHF is still a public health problem that has not been fully resolved due to the difficulty to break the transmission chain and the absence of a vaccine to prevent it [9].

The next disease is Tuberculosis (pulmonary TB) which is caused by rod-shaped bacteria, namely *Mycobacterium tuberculosis*. The number of incidence of new cases of pulmonary TB in Kepahiang Regency decreased from 2014 to 2015, namely in 2014 there were 131 cases and in 2015 there were 85 cases. However, from 2015 to 2018 there was an increase of new cases, namely 87 cases in 2016 increasing to 112 cases in 2017 and 240 cases in 2018. Comprehensive prevention efforts are needed based on the susceptibility index, so this study aims to : 1) Identify the dimensions and indicators of 3 causes of environmental-based disease in Kepahiang Regency; 2) Designing an environmental-based disease prevention model in Kepahiang Regency (index-based); 3) Develop an environment-based disease prevention strategy based on the disease susceptibility

index in Kepahiang Regency and describe the role and influence of the stakeholders of each strategy [3].

II. Methods

2.1. Research Location and Time

This research has been conducted in 8 districts in the Kepahiang Regency from July to September 2020.

2.2. Types of Data and Data Collection Methods

The types of data used in this study are primary data and secondary data. Primary data were obtained by conducting in-depth interviews and questionnaires given to experts/resource persons consisting of 8 head of districts, 10 heads of public health centers (puskesmas), 1 head of the Health Service Office, 1 director of a hospital and 3 Regional People's Representative Assembly (DPRD) members. The secondary data collected is data from Central Bureau of Statistics (BPS), Kepahiang Regency Health Office Profile and public health centers annual report.

2.3 Data analysis method

The method used in this research is adjusted to the objectives to be achieved, namely:

2.3.1 Analysis of Dimensions and Indicators

The analysis of the dimensions and risk factors of environmental-based disease which is the first objective of this research is carried out through categorization, tabulation and scoring analysis as shown in Figure 1.

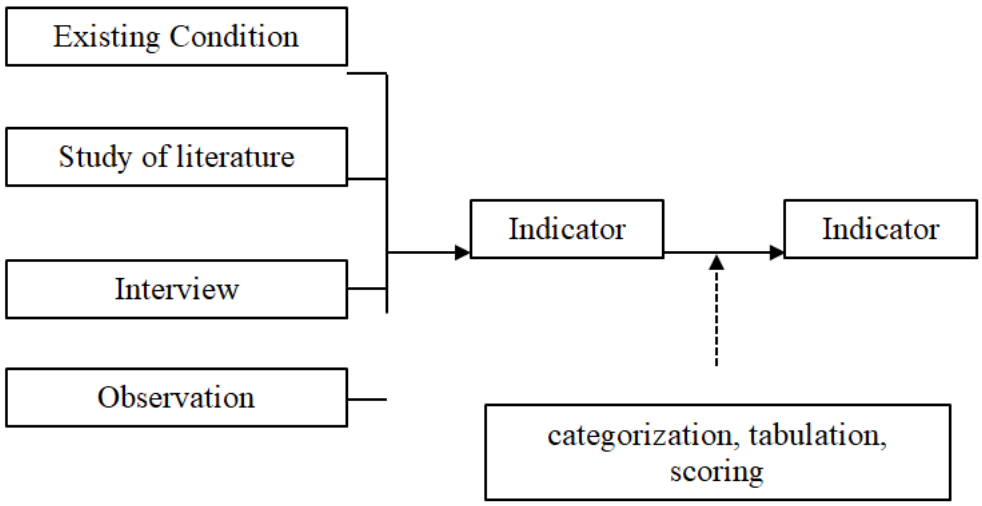

Figure 1: The chart of analysis of dimensions and risk factor analysis stage

2.3.2 Calculating Disease Susceptibility Index.

The environmental-based disease susceptibility index is determined according to the method used by Bappenas in determining the village development index [6] which is identifying the dimensions that affect the disease susceptibility index, then the dimensions will be reduced to indicators. After that, each indicator in all dimensions will be scored according to the existing literature. The Susceptibility Index will be calculated using the formula:

$$IK = \left(\sum_{1}^{n} BixVixKi \right)$$

Note:
IK : Indeks Kerawanan (susceptibility index)
Bi : weight of indicator i
Vi : Score of indicator i
Ki : constanta indicator i
n : the number of data n

In this study, the weights of the indicators are considered similar. The susceptibility index obtained is organized into 3 categories, namely:

Table 5

Value range of IK	Susceptibility Level
$0 \leq IK < 2,0$	Not vulnerable
$2,1 \leq IK < 3,5$	Potentially vulnerable
$3,6 \leq IK < 5,0$	Vulnerable

2.3.3 Developing Index-Based Prevention Model

Disease prevention model will be simulated based on the index obtained. The strategy of decreasing indicator scores per dimension will change the value of the vulnerability index in certain areas and certain dimensions. The decrease of score of the indicator will be described to determine the proper strategy for environmental-based disease prevention.

III. Results and discussion

3.1. Identification of Dimensions and Indicators that compose the Susceptibility Index of Environmental-based Disease

Based on literature studies, interviews and field observations, there are 7 dimensions and 23 indicators that influence the disease susceptibility index in Kepahiang Regency. The dimensions and indicators are presented in Table 1.

Table 1: Dimensions and Indicators for Compiling Disease Susceptibility Index

No	**Dimension**	**Indicator**	**Deskription**	**References**	Note
		Availability and access to Hospital	Availability and access to hospitals will have an influence on to what extend the disease can be treated immediately and not transmitted to others.	[6]	Diarrhea, DHF, Pulmonary TB
1	Health Service	Availability and access to public health center	Public health center as the first health facility for rural communities far from the hospital	[6]	Diarrhea, DHF, Pulmonary TB
		Availability and access to doctor's practice	The presence of a nearby doctor's practice will determine how quickly the disease can be treated so that transmission to the others can be prevented	[6]	Diarrhea, DHF, Pulmonary TB
		Availability and access to Pharmacies	People who want to directly buy medicine when they are sick will benefit greatly if the reach of the pharmacy is not too far	[6]	Diarrhea, DHF, Pulmonary TB
		Doctor Availability	The availability of doctors in health facilities will affect the quality of health services for the community	[2], [12]	Diarrhea, DHF, Pulmonary TB
2	Health workers	Availability of Nurse	The availability of nurses in health facilities will affect the quality of health services for the community	[2], [12]	Diarrhea, DHF, Pulmonary TB
		Availability of Midwife	The availability of midwives in health facilities will affect the quality of health services to the community.	[2], [12]	Diarrhea, DHF, Pulmonary TB
		Availability of Pharmacist	The availability of pharmacists in health facilities will affect the quality of health services for the community	[2]	Diarrhea, DHF, Pulmonary TB
		Availability of Laboratory assistants	The availability of laboratory assistants at health facilities will affect the correct diagnosis of the disease	[2]	Diarrhea, DHF, Pulmonary TB
		Percentage of clean water availability	The source of clean water used by the community will affect the health status	[18]	Diarrhea
		Food Management Place that meets health standards	Restaurants and public places that are in contact with food, if contaminated, will cause diarrhea	[18]	Diarrhea
		Availability of trash bin	Garbage which is a source of disease will determine disease susceptibility in an area	[18]	Diarrhea, DHF, Pulmonary TB
3	Environmental Health	Garbage Pick Up Schedule	If garbage is routinely transported, the negative impacts can be minimized	[18]	Diarrhea, DHF, Pulmonary TB
		Percentage of PSN program	Eradication of mosquito nests by the community together with health workers will help break	[15]	DHF

No	Dimension	Indicator	Deskription	References	Note
			the chain of spread of the dengue virus that causes DHF		
		Percentage of population who own a healthy house	A house that has good air circulation will kill germs that cause pulmonary TB more quickly	[8]	Pulmonary TB
		Percentage level of education	People who have a minimum education level of junior high school will tend to understand more about health	[12], [4], [5]	Diarrhea, DHF, Pulmonary TB
4	Population	Income Ratio	The income ratio of the population affects disease susceptibility because for those who have low income and do not have health insurance, it will be difficult to seek treatment when sick	[12], [4]	Diarrhea, DHF, Pulmonary TB
		Population Density Ratio	Population density affects the environmental-based disease transmission chain	[12], [4]	Diarrhea, DHF, Pulmonary TB
		Percentage of population using healthy latrines	Good sanitation will reduce the transmission of diarrhea	[18]	Diarrhea
		Percentage of villages Stop open defecation	Open defecation will pose a risk of diarrhea in the community	[17]	Diarrhea
		Ratio Habit of washing hands with soap	The habit of washing hands with soap reduces the risk of getting diarrhea in the community	[2], [5]	Diarrhea
		Ratio of population closing water reservoirs	If the water reservoir is not closed, it can become a breeding ground for mosquitoes carrying the virus that causes dengue fever	[9]	DHF
		Ratio habits to get treatment when the fever is high	High fever is one of the signs of dengue fever	[9]	DHF
5	Public Behavior	Ratio of people planting anti-mosquito plants	Anti-mosquito plants such as lemongrass and lavender can repel mosquitoes in the environment	[14]	DHF
		Ratio of people seeking treatment when there are symptoms of pulmonary TB	Pulmonary TB will be treated quickly if the bacterial infection that causes the desease is quickly detected	[8]	Pulmonary TB
		Ratio of people taking medicine completely	Pulmonary TB antibiotics must be taken regularly and until they run out	[10]	Pulmonary TB
		Ratio of the community to take alternative TB treatment	If TB is not handled properly, there will be a risk of transmitting the desease to other people around, especially to family member	[10]	Pulmonary TB
6	Disease Control	Percentage of incidence	The number of incidence in a certain period of time will determine the susceptibility index in an area	[12, [4]	Diarrhea, DHF, Pulmonary TB

No	Dimension	Indicator	Deskription	References	Note
		Percentage of treatment success	If the percentage of treatment success is high, it is a factor in preventing transmission to others	[12, [4]	Diarrhea, DHF, Pulmonary TB
		Percentage of budget for infectious disease prevention	The number of budget determines how much prevention programs can be carried out	[12, [4]	Diarrhea, DHF, Pulmonary TB
7	Governance	Ratio of Health education	Counseling serves to increase public knowledge about the disease	[12, [4]	Diarrhea, DHF, Pulmonary TB
		Ratio of education special for infectious diseases	The number of budget determines how much prevention programs can be carried out	[12, [4]	Diarrhea, DHF, Pulmonary TB

Based on Table 1, it can be explained that each of these dimensions and indicators will affect the environmental disease susceptibility index, especially Diarrhea, DHF and Pulmonary TB in Kepahiang Regency. These indicators differ according to the disease under study, particularly in the dimensions of environmental health, community behavior and disease control.

3.2. Disease Susceptibility Index

The disease susceptibility index is calculated using the Village Development Index (IPD) method that has been carried out by Bappenas which has been modified and it is assumed that the weight of each indicator is similar. The environmental-based disease susceptibility index is described in Table 2, Table 3 and Table 4. The index obtained is in the form of an index at public health centre, district and Regency levels as well as an index per dimension for each disease discussed.

Based on Table 2 above, it can be explained that the district index for diarrheal disease is 2.456 and it is included in the "potentially vulnerable" category. Meanwhile, the highest index per district is in Muara Kemumu district, which is 2.957, the lowest is in Kepahiang district, which is 1.870. Meanwhile, if viewed from the index per dimension, the highest index on the community behavior dimension is 3.214. Indicators on the dimensions of community behavior include the percentage of healthy latrine use, the percentage of villages that stop open defecation and the ratio of the habit of washing hands with soap. The strategy that can be done with this index-based model simulation is to increase the portion of budget for outreach to the community so that the percentage of using healthy latrines, stopping open defecation and washing hands with soap can increase. The increase in the percentage of people's behavior habits will presumably reduce the indicator score which causes the susceptibility index (IK) to diarrheal diseases. This is in accordance with [17] that there is a relationship between defecation behavior and the incidence of diarrhea. The same thing also applies to other indicators in each dimension as explained in WHO (2010) that one of the determinants of health status in the community is health services, the index of susceptibility to infectious diseases is also influenced by access to health care facilities [12] The DHF susceptibility index will be shown in Table 3

Table 2: Diarrhea Susceptibility Index

District		Dimension																						Index		
	Public health center	Health service				Health worker					Environmental Health			Population			Public behaviour			Desease control		Governance			Health center	District	Regency
		A	B	C	D	A	B	C	D	E	A	B	C	A	B	C	A	B	C	A	B	A	B	C			
Merigi	P1	3	2	0	3	4	2	3	0	3	0	5	2	0	3	5	0	3	3	3	0	3	3	3	2.304	2.304	
Ujan Mas	P1	3	0	0	3	4	4	0	0	0	0	0	2	0	0	5	3	3	3	0	0	3	3	3	1.696	2.239	
	P2	3	0	0	3	5	3	3	5	5	0	3	2	3	3	5	3	3	3	3	0	3	3	3	2.783		
Kepahiang	P1	0	0	0	0	4	1	2	0	0	0	3	1	0	0	5	3	5	3	3	0	3	3	3	1.696	1.870	2.456
	P2	0	0	0	0	3	2	2	5	0	0	3	1	3	3	5	0	3	3	0	5	3	3	3	2.043		
Kabawetan	P1	3	2	3	3	4	0	1	5	5	0	3	2	3	3	3	0	3	3	5	0	3	3	3	2.609	2.522	
	P2	3	2	3	3	0	2	2	5	0	0	3	2	0	3	3	3	3	5	5	0	3	3	3	2.435		
S. Musi	P1	4	2	3	3	5	2	2	5	5	0	5	3	5	3	0	0	5	3	0	0	3	3	3	2.783	2.783	
Tebat Karai	P1	3	1	3	3	0	3	3	0	3	0	3	3	0	3	0	0	5	3	0	0	3	3	3	1.957	2. 348	
	P2	3	1	3	4	0	4	1	5	5	0	5	3	3	3	0	3	5	3	3	0	3	3	3	2.739		
B. Ilir	P1	4	0	3	4	4	1	0	5	5	3	5	3	0	3	0	3	5	3	0	0	3	3	3	2.609	2.623	
	P2	4	0	4	4	0	2	2	5	0	3	5	3	3	3	0	5	5	5	3	0	3	3	3	2.826		
	P3	3	0	4	4	0	0	1	5	0	3	5	3	5	3	0	3	3	5	0	0	3	3	3	2.435		
M Kemumu	P1	4	3	4	4	0	2	3	5	0	3	5	5	5	3	0	3	5	5	0	0	3	3	3	2.957	2.957	
Index per indicator		2.857	0.929	2.143	2.929	2.357	2.000	1.786	3.571	2.214	0.857	3.786	2.500	2.143	2.571	2.214	2.071	4.000	3.571	1.786	0.357	3.000	3.000	3.000			
Index per dimension		2.214				2.386					2.381			2.310			3.214			1.071		3.000					

Table 3: DHF Disease Vulnerability Inde

District		Dimension																						Index		
	Public health center	Health service				Health worker					Environmental Health			Population			Public behaviour			Desease control		Governance			Health center	District	Regency
		A	B	C	D	A	B	C	D	E	A	B	C	A	B	C	A	B	C	A	B	A	B	C			
Merigi	P1	3	2	0	3	4	2	3	0	3	4	3	2	0	3	5	3	5	5	0	0	3	3	3	2.565	2.565	
Ujan Mas	P1	3	0	0	3	4	4	0	0	0	4	3	2	0	0	5	3	5	3	3	3	3	3	3	2.348		
	P2	3	0	0	3	5	3	3	5	5	4	3	2	3	3	5	3	5	3	0	0	3	3	3	2.913	2.630	2.746
Kepahi	P1	0	0	0	0	4	1	2	0	0	3	3	1	0	0	5	3	3	5	5	3	3	3	3			

ang																								2.043	2.326	
	P2	0	0	0	0	3	2	2	5	0	3	3	1	3	3	5	3	5	5	5	3	3	3	2.609		
Kabawetan	P1	3	2	3	3	4	0	1	5	5	4	3	2	3	3	3	5	3	5	0	0	3	3	2.870	2.674	
	P2	3	2	3	3	0	2	2	5	0	4	3	2	0	3	3	5	3	5	0	0	3	3	2.478		
S. Musi	P1	4	2	3	3	5	2	2	5	5	5	3	3	5	3	0	5	5	5	0	3	3	3	3.348	3.348	
Tebat Karai	P1	3	1	3	3	0	3	3	0	3	4	0	3	0	3	0	3	3	5	3	0	3	3	2.261	2.630	
	P2	3	1	3	4	0	4	1	5	5	4	3	3	3	3	0	5	5	5	3	0	3	3	3.000		
B. Ilir	P1	4	0	3	4	4	1	0	5	5	4	0	3	0	3	0	5	5	5	3	0	3	3	2.739	2.754	
	P2	4	0	4	4	0	2	2	5	0	4	3	3	3	3	0	5	5	5	3	0	3	3	2.783		
	P3	3	0	4	4	0	0	1	5	0	5	3	3	5	3	0	5	5	5	3	0	3	3	2.739		
M Kemumu	P1	4	3	4	4	0	2	3	5	0	5	3	5	5	3	0	5	5	5	0	0	3	3	3.043	3.043	
Index per indicator		2.857	0.929	2.143	2.929	2.357	2.000	1.786	3.571	2.214	4.071	2.571	2.500	2.143	2.571	2.214	4.143	4.429	4.714	2.000	0.857	3.000	3.000	3.000			
Index per dimension		2.214				2.386					3.048			2.310			4.429			1.429		3.000					

DHF susceptibility index at regency level is relatively higher than diarrhea, which is 2.746. If analyzed more deeply, there are several dimensions that affect the high DHF disease susceptibility index, including indicators on the dimensions of community behavior and environmental health. The dimensions of community behavior consist of 3 indicators, namely the ratio of people closing water reservoirs (A), the ratio of habits to get treatment when having a high fever (B) and the ratio of people planting anti-mosquito plants (C). In almost all districts scores on these three indicators are high. The strategy that can be done is to reduce the score of these indicators by providing socialization to the community about efforts to prevent dengue with 3M, educating the public about the characteristics of dengue fever to watch out for and socializing the importance of mosquito repellent plants to reduce dengue virus vectors, as stated by [14]. This socialization can be carried out of course if the program and budget are available.

Pulmonary TB is also an environment-based disease that needs to be prevented from spreading. The vulnerability index for pulmonary TB disease in Kepahiang Regency can be seen in Table 4 below.

Table 4: Disease Vulnerability Index for Pulmonary TB

District		Dimension																							Index		
	Public health center	Health service				Health worker					Environmental Health			Population			Public behaviour			Desease control		Governance			Health center	District	Regency
		A	B	C	D	A	B	C	D	E	A	B	C	A	B	C	A	B	C	A	B	A	B	C			
Merigi	P1	3	2	0	3	4	2	3	0	3	4	5	2	0	3	5	5	3	5	3	0	3	3	3	2.783	2.783	
Ujan Mas	P1	3	0	0	3	4	4	0	0	0	4	5	2	0	0	5	5	3	3	5	0	3	3	3	2.391		
	P2	3	0	0	3	5	3	3	5	5	4	5	2	3	3	5	3	3	5	5	0	3	3	3	3.130	2.761	2.830
Kepahiang	P1	0	0	0	0	4	1	2	0	0	3	3	1	0	0	5	3	3	5	5	0	3	3	3	1.913	2.152	
	P2	0	0	0	0	3	2	2	5	0	3	5	1	3	3	5	3	0	5	3	3	3	3	3	2.391		
Kabawetan	P1	3	2	3	3	4	0	1	5	5	4	0	2	3	3	3	3	3	5	5	5	3	3	3	3.087	2.826	
	P2	3	2	3	3	0	2	2	5	0	4	5	2	0	3	3	5	3	5	0	0	3	3	3	2.565		
S. Musi	P1	4	2	3	3	5	2	2	5	5	5	0	3	5	3	0	5	3	5	5	3	3	3	3	3.348	3.348	
Tebat Karai	P1	3	1	3	3	0	3	3	0	3	4	3	3	0	3	0	3	3	5	3	0	3	3	3	2.391	2.696	
	P2	3	1	3	4	0	4	1	5	5	4	5	3	3	3	0	5	3	5	0	3	3	3	3	3.000		
B. Ilir	P1	4	0	3	4	4	1	0	5	5	4	5	3	0	3	0	3	3	5	0	5	3	3	3	2.870	2.812	
	P2	4	0	4	4	0	2	2	5	0	4	5	3	3	3	0	5	0	5	3	3	3	3	3	2.783		
	P3	3	0	4	4	0	0	1	5	0	5	5	3	5	3	0	3	3	5	3	3	3	3	3	2.783		
M Kemumu	P1	4	3	4	4	0	2	3	5	0	5	5	5	5	3	0	5	3	5	5	0	3	3	3	3.261	3.261	
Index per indicator		2.857	0.929	2.143	2.929	2.357	2.000	1.786	3.571	2.214	4.071	4.000	2.500	2.143	2.571	2.214	4.000	2.571	4.857	3.071	1.786	3.000	3.000	3/000			
Index per dimension		2.214				2.386					3.048			2.310			4.429			1.429		3.000					

Similar to the two previous diseases, the pulmonary TB susceptibility index is included in the category of potential vulnerable in Kepahiang Regency. This situation should be downgraded. Because if preventive steps are not taken, the status can increase to vulnerable. The high index is determined by one of the dimensions of environmental health, namely an indicator of the percentage of the population owning a healthy home. As explained by [10] that the type of housing is a risk factor for the spread of pulmonary TB. A healthy house means that it has adequate ventilation so that air circulation and sunlight are good. The bacteria of *Mycobacterium tuberculosis* will die if there is an increase in room temperature because sunlight enters the house.

The indicator of the ratio of the community to take alternative pulmonary TB treatment (C) on the community behavior dimension has a maximum score in the entire working area of the public health center in Kepahiang Regency. The meaning is that almost 80% of TB patients and TB symptoms have had alternative treatment. This is not justified based on national and international treatment methods for pulmonary TB as explained by the Ministry of Health (2011) that the world guarantees cases of diagnosis and cessation of TB transmission.

If we look at the index value per district, the tendency for IK is high in Muara Kemumu and Seberang Musi districts. The index value in Muara Kemumu district is influenced by health service factors, unhealthy environmental conditions and community behavior. Geographically, Muara Kemumu district is the furthest district from the center of the Regency Capital, where there are still many villages located in the midst of community's plantations. Meanwhile, in Seberang Musi district, there is only 1 (one) public health center with a large working coverage area. This public health center is an inpatient public health center, but the existing facilities and human resources standards do not meet the standards as an inpatient one. An overview of the disease susceptibility index at the district level is shown in Figure 2 below.

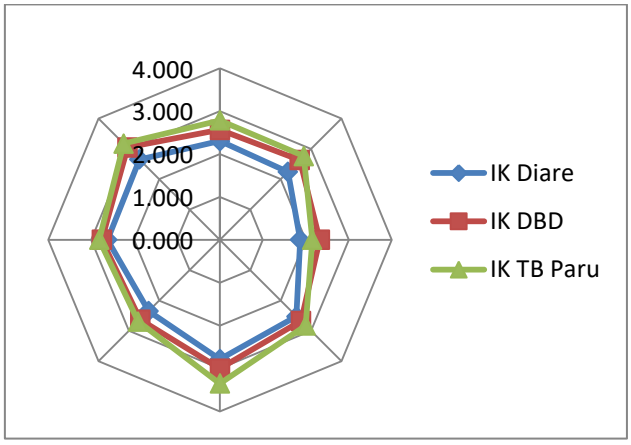

Figure 2: Disease Vulnerability Index by District

3.3. Index-Based Prevention Model

The model produced in this study is an index-based prevention model. To reduce the value and status of susceptibility of a disease in an area, it means having to reduce the score of the indicators that compose the index. For example, the diarrheal disease index at Muara Kemumu of 2.957 will be reduced through the strategy

of adding healthy latrines (Indicator A in the Community Behavior Dimension) and conducting socialization about stopping open defecation and socialization to improve the habit of washing hands with soap. So in the model simulation, if the scores of the three indicators are lowered, the diarrheal disease susceptibility index in Muara Kemumu District will decrease in value to 2.652. The application of the model in the effort to prevent this index based disease will simplifly the formulation of a strategy that will be carried out in the future by all relevant stakeholders. This is in accordance with the function of the model to simplify a system. A model is an abstraction of the real situation or a simplification of a real system to facilitate the study of a system [11], [7].

4. Conclusion

Based on the results of the research, it is found that: (1) The environmental-based disease susceptibility index is composed of 7 dimensions, namely health services, health workers, environmental health, population, community behavior, disease control and governance which are compiled into 23 indicators. (2) The highest disease susceptibility index in Kepahiang Regency is the pulmonary TB disease susceptibility index, which is 2.830; DHF IK is 2.746. The lowest IK is the diarrhea susceptibility index of 2.456 and the susceptibility index for the three diseases is included in the potentially vulnerable category (3) Based on the calculated per dimension index, the priority scale for environmental-based disease prevention in Kepahiang Regency is improving community behavior through socialization and real programs involving community in the context of environmental-based disease prevention

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