

Thematic Map Making of the Distribution of Medical Record and Health Information Professional Based on Geographic Information System (GIS) in Riau Province Health Facilities in 2017.

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Abstract

The thematic map making with the assistance of geographic information system for the distribution of Medical Records and Health Information (PMIK) is the most effective and efficient way in analyzing and visualizing the data and information in order to make it easier for the local government to present more interesting and informative information. This is because the data presented is in the form of map, thus making it easier to be read and understood by the local government in taking decision for fulfilling the lack of PMIK in each health service facility in the district or city of Riau Province. The purpose of this study is to present informative and interactive health information which is in accordance with the data obtained by the assistance of geographic information system. The research method used in descriptive with 197 PMIK of Riau Province as the sample. The data analysis used in this research is spatial classification analysis (reclassify). From the research result, it was known that the distribution of Medical Records and Health Information Professional (PMIK) based on the working area location of 12 districts/cities of Riau Province is as many as 294 people distributed uneven since most of the Medical Records and Health Information Professional (PMIK) is in Pekanbaru City which is 176 people. Meanwhile, the least distribution of Medical Records and Health Information Professional (PMIK) in Meranti Island District which is 0 person. This is because Meranti Island does not belong to Riau Province but Riau Islands. The distribution of medical record and health information professionals in health facilities based on district/city service Institutions is 294 of Medical Record and health information professionals with Pekanbaru City has the highest distribution of 176 people working in both private and public health centers/hospitals in Pekanbaru. Meanwhile, the lowest distribution of the service Institutions is in Siak District, Rokan Hilir District which is 4 people. The distribution of Medical Record and Health Information Professional in Riau Province health facilities based on data from PORMIKI DPD membership in Riau Province is 338 people distributed throughout Riau Province and Riau Islands. The distribution of Medical record and health information according to STR management, which is a permit for a health professional to be able to apply for a job according to the number of Riau PORMIKI membership management is 338 people.

Keywords: *Thematic Map Making, Medical Record and Health Information Based on Geographic Information System*

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INTRODUCTION

The implementation of health efforts must be supported by health workers who are responsible, have high ethics and morals, expertise, and authority that must continuously be improved through continuous education and training, certification, registration, licensing and guidance, supervision, as well as monitoring so that the implementation of health efforts fulfills a sense of justice and humanity as well as in accordance with the development of health science and technology (Republic of Indonesia Law No. 36 of 2014 on Health Workers).

The fact that there are currently many regions which have minimal health workers who are unevenly distributed, making the improvement of even health needs health technology in the forms of tools and/or methods intended to help establish diagnosis, prevention and treatment of human health problems. Pan (2016) mentions that one of the technologies that can be used in the health sector is the Geographic Information System (GIS), where information can be presented in an informative and interactive form. GIS utilizes locations on the earth, the location of its objects and their information on the earth (attribute).

Through the combination of the geographic information, it can produce more complex health information related to the process of collection, analysis, planning and supervision which is sometimes useful for making decisions so that the expected health goals are achieved.

One of the health workers described in the Republic of Indonesia Law No. 36 of 2014 is the Medical Record and Health Information (PMIK) technician. According to the Minister of Health of Republic of Indonesia Regulation No. 55 of 2013 on the Implementation of Medical Recorder Work states that the Medical Recorder is someone who has passed the medical record and health information education in accordance with the laws and regulations.

Based on PORMIKI Seminar in 2015, it was said that Indonesia only has 8000 medical record technicians and still lacks 83,000 medical record technician. Meanwhile, Riau Province still lacks sufficient medical record technicians in which from 60 hospitals, there are only 90 medical record technicians worked. As a whole, Riau requires 600 medical record technicians. It is supported by the membership data of the Regional Board of Association of Indonesian Medical Record and Health Information Professional (PORMIKI). The number of PMIK



distributed in the government and private health care facilities, health offices and educational institutions in the districts or cities of Riau Province is 224 people. The number of public and private health care facilities based on the data from the profile of the Riau Provincial Health Office in 2016 shows that Riau Province has 67 public and private hospitals and as well as 212 public health centers. At present, the number of PMIK has spread widely across the health care facilities throughout Indonesia both at hospital and health center, one of which is the distribution of PMIK in the districts/ cities of Riau Province.

The thematic map making of the distribution of PMIK professional is one of the most effective and efficient ways to analyze and visualize data and information. It will be easier for DPD PORMIKI Riau and the regional government to present more interesting and informative information. Because the data is displayed in the form of a map, it is very easy to be read and understood by the local government in making a decision in fulfilling PMIK deficiencies in every health service facility in the district/ city of Riau Province.

In Riau Province, particularly in the use of GIS in presenting data in the form of maps is still very rare, especially the distribution of PMIK professional which has never been made. Through the information of the distribution of PMIK professionals in the form of thematic maps, it will have an impact on the ease of reading all data about the distribution of PMIK and directly seeing the conditions very clearly when it is compared to the presentation in table form. According to the explanation above, the researcher is interested in conducting a research entitled "*Thematic Map Making of the Distribution of Medical Record and Health Information Professional Based on Geographic Information System (GIS) in Riau Province Health Facilities in 2017*"

LITERATURE REVIEW

Thematic Map

A map is a description of a part or the whole earth located above or below the surface and is presented in a flat plane at a specific scale and projection systematically. Since it is limited by scale and projection, the map will never be as complete and as detailed as the earth. Therefore, it is necessary to simplify and select the elements to be displayed on the map (GIS Aceh Nias Consortium, 2007).

The role of map in GIS is considered important because other than as the data sources, map is also a medium to help people understand the area to be worked on. In a map, there must be a scale. The scale is a comparison between the distance in the map and the actual distance, so that we can know the conditions on the actual field. Thematic map is map which illustrates the geographical concept, such as population, density, climate, transfer of goods and others. In order to form a thematic map on ArcView, legend can be used. Forms of gradual colors and gradual symbols present the levels or ranking of the numerical data. Gradual color legends can be used for data areas, while the gradual symbols can be used for point and line data.

GIS

Data to be handled in GIS (geographic information system) is spatial data, which is a geographically oriented data, has a specific coordinate system as its reference base and has two important parts which make it different from other data. Geographic Information System (GIS) is a computer-based information system used to process and store geographic data or information (GIS of Aceh Nias Consortium, 2007). In general, GIS (Geographic Information System) is a component consisting of hardware, software, geographic data and human resources which work together effectively to enter, store, repair, update, manage, manipulate, integrate, analyze and display data in a geographical information. GIS has the ability to connect various data at a certain point on earth, combine them, analyze and finally map the results.

GIS can be described in several sub-systems, those are; (1) Input, which is the stage of preparation and collection of the spatial data and attributes from various sources. In this stage, conversion of analog data to the appropriate digital format is also carried out. (2) Manipulation,

which is the adjustment of the data entered for further processing, for example: scale equations, changing the projection system, generalizations, etc. (3) Data Management, which is using the Database Management System (DBMS), to help store, organize, and process the data (4) Query, which is searching the data using more than one layer, aims to provide information for the analysis, and obtain the desired data (5) Analysis, is the ability to analyze the spatial data in order to obtain new information by making a "What if" scenario model. One analytical facility which is widely used is overlay analysis, and (6) Visualization, which is the presentation of results in the form of new information or existing databases in the form of softcopy or hardcopy in the form of: map, table, graph, and etc.

Map Making by Arcview

Stages in map-making using Arcview application are:

1. Open the Arcview 3.3 application
2. Click views, select as a blank project
3. On views, click new
4. Then, select the file menu, click extensions, in available extensions select JPEG (Image Support Legend Tools) to open the file with type of JPEG, click ok.
5. In the view menu, select properties, scale the map on map units and distance units, replaced with the centimeters scale, then click ok. The view appearance has been completed
6. Select add theme, in the source types data, change the image format of the data source, then open the image file for the basis of making a map
7. In the view menu, select new theme, in the feature types, select polygons to create a map pattern and divide the area based on the map.
8. Next, draw a map pattern with vertex tools according to the base of the map image point from point to form a map pattern.
9. After the map pattern is finished, click view properties, change the background color into transparent.
10. Click attributes on the map, give a new column for naming the map area.
11. Select the theme menu, click auto-label. Thus, the name of the region that has been written will appear based on the region
12. Make a path on the map, click new theme, select line, click ok
13. Same as the region name, giving the road name has been made by clicking attributes in line, give a new column for naming the map road, do not forget to create a road pattern with draw line tools.
14. Select the menu theme, click auto-label, then the inputted street name will appear based on the path
15. Make a color comparison to find out its amount and its distribution in each region, select Legend Editor Properties, in Legend Type select graduated color, click Apply, then a histogram prosentase of the population will appear, so that it can conclude the height of the map and in the legend editor, select point, therefore, its distribution with its points illustration will appear on the map. Thus, it can be concluded that more points means that the distribution on the map is higher

METHODOLOGY

Descriptive research method. The sample of this study is medical record and health information technicians in the health service Institutions in Riau Province in 2017. The stages of research was collecting the data first, then the data is grouped according to the research criteria. After grouping, the data was then made into a thematic map design by carrying out the process of assigning data objects using longitude coordinate points obtained from Google maps. Numbers of coordinates were inputted to each point to place the objects according to their position in the map and produce thematic maps of the information on the distribution of medical record and health information professional in Riau Province health facilities in 2017. Data which has been interpreted into a map was analyzed by the users so that the map can support the decisions to be made.



a. The distribution of medical record and health information professional (PMIK) with thematic map in the districts/ cities of Riau Province



Figure 1. Map of The distribution of PMIK based on the Work Area in Riau Province in 2017

Based on the thematic map of the distribution of Medical Record and Health Information Professional (PMIK) based on the work area, it can be seen that from 10 Districts (Bengkalis District, Indragiri Hilir District, Indragiri Hulu District, Kampar District, Meranti Islands District, Kuantan Singingi District, Rokan Hilir District, Rokan District, Rokan Hulu District, Siak District, and Pelalawan District) and 2 Cities (Pekanbaru and Dumai), the working area of Pekanbaru city which has the highest distribution of medical record and health information professional (PMIK) is 176 people marked by pink symbols.

With the new paradigm, the role of the medical record profession (in the traditional context) changes. This change gives birth to the concept of global reference regarding the seven roles of new strategies and at the same time as a powerful driver for the MIK profession improvement.

The researchers' assumption is that to carry out good services, it is necessary to distribute the recorders evenly, both in hospital or public health center and as a reference for the local government as a basis for making decision to meet the shortcomings of medical recorders.

b. The Distribution of Medical Record and Health Information Professional (PMIK) in Health Facilities with Information Thematic Map Based on Districts/ Cities Health Service Institutions in Riau Province

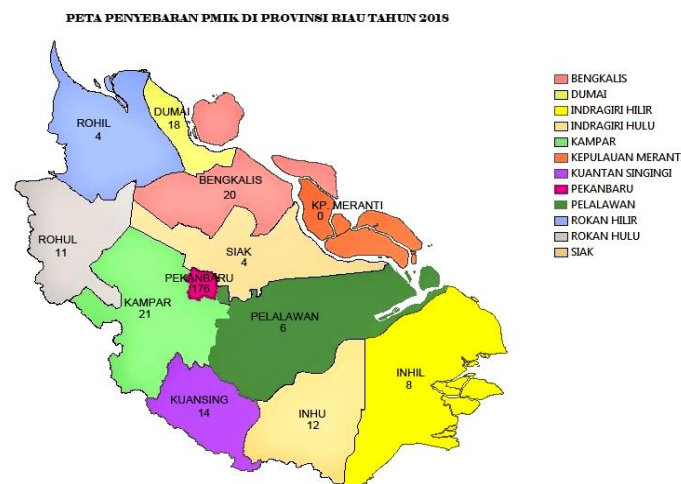


Figure 2. The Distribution of the Medical Record and Health Information Professional (PMIK) in Health Facilities Based on Health Service Institutions of the Districts/ Cities in Riau Province

Based on the mapping result of Figure 2, it is known that from the distribution of Medical Record and Health Information Professional in Districts/ Cities health facilities in Riau Province, the difference of the distribution of health facilities per district / city in Riau Province seems to be very clear. Pekanbaru is the highest city for the distribution of Medical Record and Information Health Professional which is marked by pink symbol of 176 people as a very high distribution area. Pekanbaru City is the capital city of Riau Province, which is the center of the urban development, and many health facilities are distributed in Pekanbaru, both government and private owned. Pekanbaru City has 30 health centers as well as 38 private and government hospitals.

The researcher assumes that the medical record and health information professionals in each health facility is not evenly distributed. There are still many inequalities in medical record and health information in hospitals or health centers.

c. The distribution of medical record and health information professional (PMIK) with thematic map based on Riau Province PORMIKI membership in 2017.

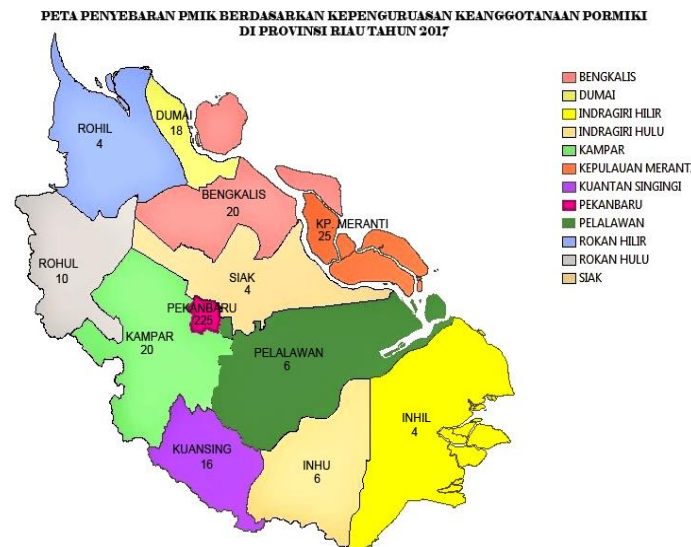


Figure 3. The distribution of medical record and health information professional (PMIK) based on Riau Province PORMIKI membership in 2017

Based on Figure 3, it can be seen that many regions have become the members of Riau PORMIKI, of which 225 people found in Pekanbaru city. Then, for the regions that have become the members of Riau PORMIKI with 4 people are Rohil, Siak, and Inhil Regions.

Currently, PMIK has distributed widely in health care facilities throughout Indonesia both in hospital and health center. One of them is the distribution of PMIK in districts/ cities in Riau Province based on the membership data from the Regional Leadership Council of the Professional Association of Indonesian Medical Record and Health Information (PORMIKI) Province.

The researcher assumes that PMIK must joins PORMIKI membership. Even though each province has a PORMIKI, however it would be good for PMIK to work in Riau province and to join the Riau PORMIKI membership.

d. Distribution of Medical Record and Health Information Professional (PMIK) based on STR (Registration Certificate) of Riau Province with Thematic Map of 2017.





Figure 4. The Distribution of Medical Record and Health Information Professional Based on STR Management in Riau Province in 2017

Based on the thematic map of figure 4, the information of the distribution of Medical Record and Health Information Professional based on STR Management in Riau Province, Pekanbaru has the highest distribution in terms of STR management which are 260 people marked with pink symbol. It is followed by Meranti Island District with 25 people, 20 people from Bengkalis and 20 people from Kampar. For the lowest distribution in STR management, there are 4 people in Indra Giri Hilir District.

Registration Certificate (STR) is valid for five years and can be extended every five years. In accordance with Regulation of the Minister of Health (Permenkes) 1796 of 2011, STR which has expired can be extended through the participation of health workers in education and/ or training activities, other scientific activities in accordance with their profession, and community service activities.

The researcher assumes that STR is a requirement of a health worker to apply for a job because it requires more participation and communication that is established by becoming a member of PORMIKI, for PMIK who already have the STR it is necessary to see whether the STR is still valid or needs an extension.

CONCLUSION

The Distribution of Medical Record and Health Information Professional (PMIK) based on the location of the work area of 12 districts/ cities in Riau Province which are 294 people are distributed unevenly where the highest distribution of the Medical Record and Health Information Professional (PMIK) is located in Pekanbaru, which is 176 people. Meanwhile, the Distribution of Medical Record and Health Information Professional (PMIK) located in Meranti Island District is 0 person since Meranti islands are not included in the province but the Riau Islands.

The distribution of medical record and health information professionals in health facilities based on district/ cities service Institutions of 294 people, the number of medical record and health information professional for Pekanbaru has the highest distribution which is 176 people working in public and private health centers/ hospitals. Meanwhile, the distribution of Medical Record and Health Information Professional in health facilities based on the lowest service institutions is found in Siak district, Rokan Hilir District which are 4 people.

The distribution of Medical Record and Health Information Professional in Riau Province health facilities based on data from the PORMIKI DPD membership in Riau Province is 338 people distributed throughout the Riau Province and Riau Islands regions.

The distribution of Medical Record and Health Information Professional according to the management of STR which is a

permission letter of a health professional to be able to apply for a job where of the 388 Medical Record and Health Information Professional is in accordance with the number of Riau PORMIKI membership management.

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