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Accessibility and Utilization of Personal Health Service Facility at District Hospital in East Jakarta, Indonesia

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Abstract. The city growth and the increased number of population should be balanced with sufficient public facility, as well as health facility. The provision of health facility is an obligation of the government, including regional government. Since 2016, the provincial government of the Special Capital Region of Jakarta has opened District General Hospital, which is a class D hospital, as a 'bridge' between primary service facility (Public Health or *Puskesmas*) and City General Hospital in order to respond the increase of the community's need of secondary healthcare service more equally. In addition to increase the number of health facilities owned by the provincial government of the Special Capital Region of Jakarta, the establishment of District General Hospital brings change in the accessibility and utilization of health service facility in Jakarta. The aim of this research is to find out geographical accessibility and utilization of District General Hospital in East Jakarta, as well as to explain the relationship between the accessibility and utilization. This research uses analytical descriptive method, helped by GIS software, using secondary data of each hospital. Based on the research, it can be seen that the establishment of 3 District General Hospitals in East Jakarta geographically has been able to reach almost all areas in East Jakarta, except for a few areas on the northeast side of East Jakarta. It indicates that the provincial government of the Special Capital Region of Jakarta has successfully eased the geographical access of the East Jakarta residents to the health service facility.

1. Introduction

Urbanization as a phenomenon of internal migration or the growth of the city, occurred in all parts of the world. The wisdom of the Government on the construction of urban infrastructure, in particular, contribute to the development of urbanization, given city life strongly determined by the capacity of the infrastructure. The increase in population and changes in the city's way of life encourages physical development of the city and facilities supporting community needs, considering the number of inhabitants will correlate positively with urban infrastructure needs. High number of the population requires food, availability of land for housing and public facilities are basic. Satisfy the basic facilities that can be used optimally by the community is a measure of its performance against a good city because the organizers of the country was able to meet the needs.

One of the basic urban facilities that must be provide by the Government is the health care facilities because it is a basic need of every human being. In 2016, Jakarta Provincial Government manages 7 Regional general hospitals, 44 subdistrict health centers and 301 primary health care in six areas of the city administration [1]. In the year 2016 they open a new health facility District Hospital Class D at Sub district level, in order to respond to the increasing needs of the community's response to access



secondary health services is more evenly distributed, with a concrete task of carrying out individual health services such as curative, rehabilitative efforts, health promotion and implement efforts reference. The increasing number of choices of health service facilities owned by DKI Jakarta Provincial Government has an influence on the utilization and coverage of health care facilities within them

This study aims to describe the link between accessibility and utilization of District Hospital in East Jakarta, by explaining geographical accessibility to the utilization of health care facilities in District Hospitals in East Jakarta. Quantitatively, the presence of the District Hospital increases the number of health facilities owned by DKI Jakarta Provincial Government, which certainly brings changes in accessibility and utilization of health care facilities in Jakarta. The establishment of the District Hospital which is closer to the neighborhood is expected to bring changes to the goal of medical treatment for the Jakarta population so that they no longer accumulate in large hospitals. This certainly affects the pattern of health service coverage, including accessibility before and after the establishment of District Hospital. To find out whether the birth of the District Hospital has been able to expand the accessibility of the population to reach the hospital, it is necessary to measure accessibility because ideally the addition of new health facilities means opening wider accessibility and range of services for the community.

2. Materials

Accessibility to health services is influenced by many things that are very multidimensional. Peters [2] states that access to health services can be seen through four dimensions, namely (1) geographical accessibility, (2) availability (3) financial accessibility, (4) acceptability (level of acceptance), which shows how responsive health care providers can meet the expectations / expectations of users of their services. There are five interrelated dimensions in defining the concept of 'access', namely wide availability, accessibility, accommodation, affordability and acceptance [3].

Measuring accessibility is basically measuring the relationship between obstacles that arise between the location of health facilities (travel time, costs, distance) and the capacity of potential health service users to overcome these obstacles [4]. Accessibility measurement by considering geographical factors can be done using GIS.

GIS in the health sector is used for information transformation related to health, social, demographic, morbidity into spatial scope, so stakeholders can know the capacity and accessibility of their health resources [4]. A number of studies have been conducted to explain the impact of the location of health facilities to their use. The best way to measure accessibility of health facilities is to use distance and demand (demand) variables for health facilities [5]. Accessibility of health services can be measured using geographic and demographic data of the population [6]. Accessibility to health services measured by Ray & Ebener is guided by 4 accessibility dimensions previously expressed by Peters (2008), but focuses more on geographical accessibility.

3. Methods

This study uses a method of AccessMod, a GIS-based open source that can be used to measure physical accessibility and geographical coverage of health facilities by considering location, demographic and geographical factors [6]. Through this instrument it is possible to be able to measure physical accessibility to health facilities and estimate geographical coverage (a combination of availability and accessibility range) from existing health facilities networks.

This study uses the variables used by Ray & Ebener [6][7] namely independent variables in the form of health facility locations, population distribution, road networks, travel scenarios and land use, with the dependent variable in the form of geographical accessibility to health service facilities.

The study was located in 3 District Hospitals in East Jakarta as shown in figure 1, namely Ciracas Hospital, Kramat Jati Hospital and Matraman Hospital on East Jakarta Administrative City, which was originally is a sub-district health center development. The three sub-district hospitals are based on the

spatial detail plan and zoning regulations of each sub-district, have been in the public and social service zones.

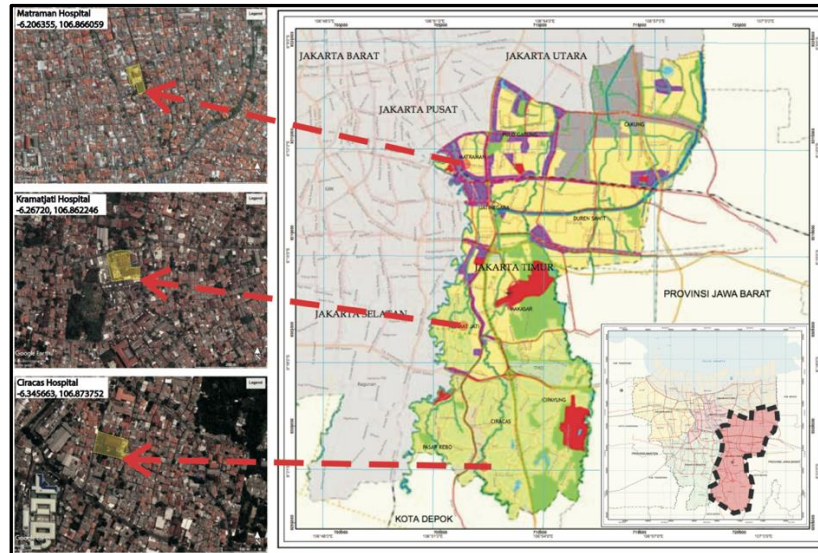


Figure 1. Research location

Source: DKI Jakarta RTRW 2010-2030, google earth, processed.

4. Result and Discussion

Accessibility measurement results or travel time distribution resulting from the calculation by AccessMod is shown in figure 2, which explain that measurement result from the research found that the majority of East Jakarta residents need around 30 minutes to reach the nearest District Hospital, except the area on the east and northeast side of East Jakarta which takes more than 30 minutes. The results of calculating the accessibility of the travel time to get to the nearest District Hospitals are mapped in the picture below.

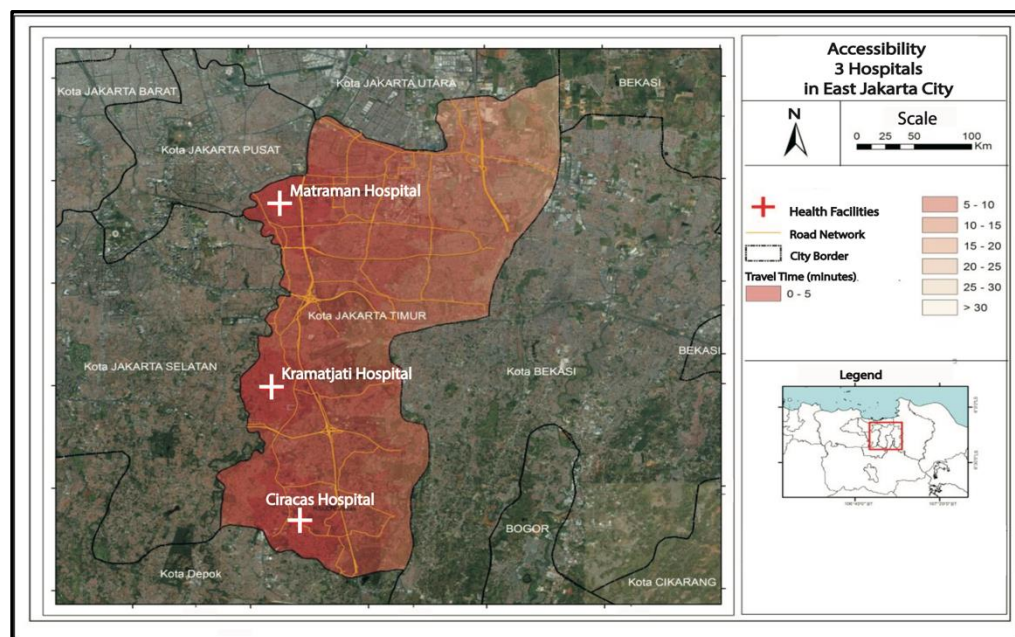


Figure 2. Results of accessibility analysis study in the form of travel time throughout the East Jakarta area to reach District Hospital in East Jakarta

Based on the results of measurement by AccessMod 5.0 instrument that was carried out to find out the travel time needed to reach the District General Hospital in East Jakarta, as presented in Figure 2, it was obtained that an average of less than 30 minutes was needed. The brightest color gradation is seen in East Jakarta on the northeast side, which means that the area takes more than 30 minutes to reach the nearest District Hospital, namely Matraman Regional General Hospital.

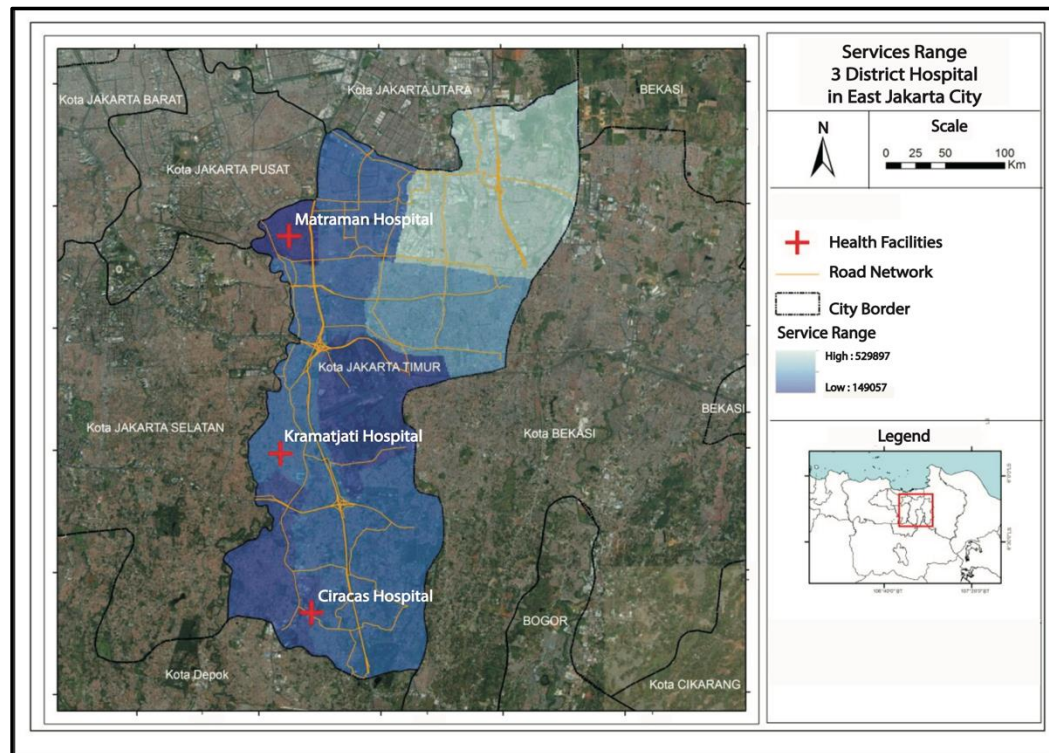


Figure 3. Results of geographic coverage analysis research in the form of travel time throughout the East Jakarta area to reach District Hospital in East Jakarta

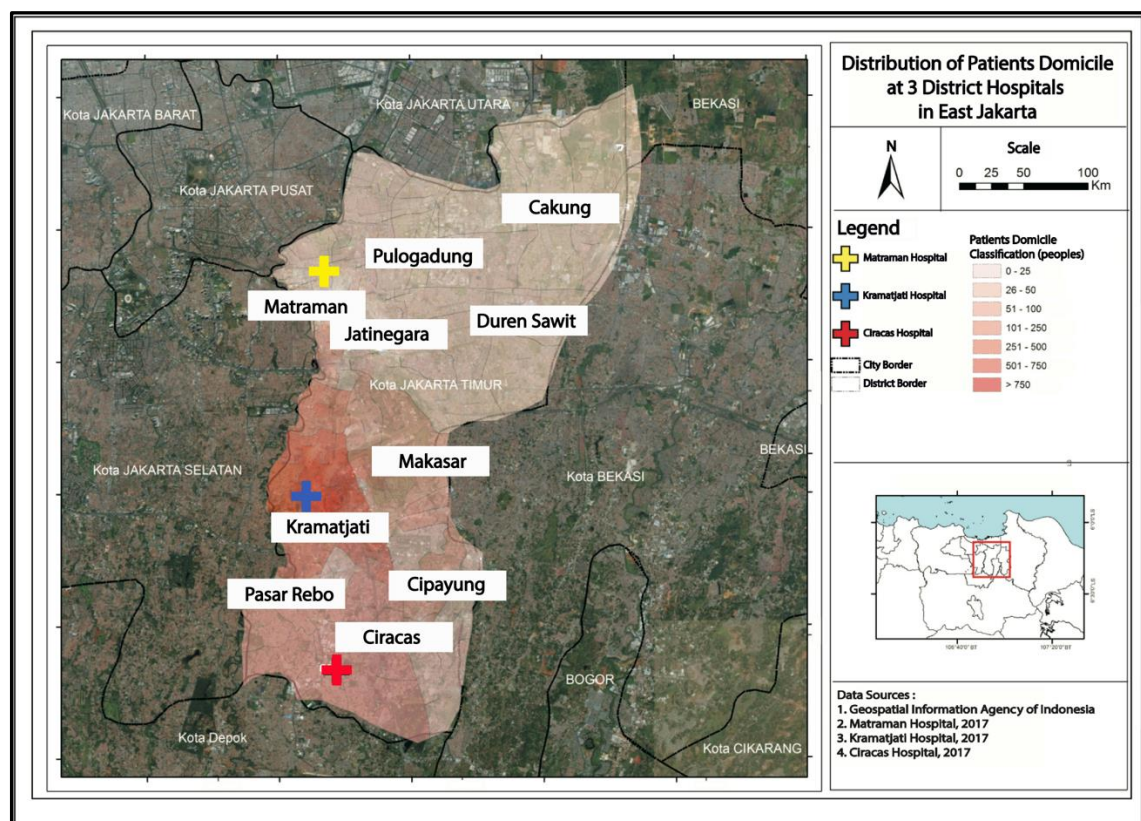
Meanwhile, the results of the calculation and mapping of the service coverage area of the three District Hospitals are presented in Figure 3. The darkest color gradation shows the area that is close to the District Hospital, while the brightest color gradation shows the sub-district which is far from the service area. Based on the mapping results presented in Figure 3, it can be seen that the sub-district area in which there is a RSUD has a close range of hospital services, as well as the surrounding area. Contradictory things can be seen in the East Jakarta region on the east and northeast which have the brightest color gradation, which shows the area with the furthest outreach from the third service of District Hospital in East Jakarta. The region with the brightest gradation of color is the area of Cakung District, Pulogadung and part of the Duren Sawit region.

Hospital utilization is an illustration of the utilization of health care facilities, both for outpatient care, hospitalization and emergencies. To focus on the results to be obtained in this study, namely geographical accessibility, the researcher will only discuss the driving factors related to geography, namely mapping the origin of the patients who had visited each District Hospital through a medical information system. The step of processing the data from the domicile of the visitors of the third patient of the District Hospital is done by classifying the visitors based on the village, subdistrict and city of domicile by using the pull of the medical records of the District Hospital. This data is the data contained in the visitor registration sheet when they first come and register at the registration counter. Processed products from the domicile of visitors in the three hospitals are shown in Table 1 below.

Table 1. Results of grouping 3 visitor domiciles District Hospital in East Jakarta in 2017

DOMICILE	CIRACAS HOSPITAL		KRAMAT JATI HOSPITAL		MATRAMAN HOSPITAL	
	CITY	CITY (%)	CITY	CITY (%)	CITY	CITY (%)
A JAKARTA						
1 CENTRAL JAKARTA	44	0.23%	117	0.28%	81	2.20%
2 NORTH JAKARTA	27	0.14%	61	0.14%	26	0.71%
3 WEST JAKARTA	16	0.08%	73	0.17%	7	0.19%
4 SOUTH JAKARTA	112	0.57%	743	1.76%	55	1.50%
5 EAST JAKARTA	17,856	91.50%	40,429	95.83%	3,401	92.57%
6 SERIBU ISLAND	-	0.00%	11	0.03%	-	0.00%
B OTHER CITIES						
7 BEKASI REGENCY	12	0.06%	12	0.03%	6	0.16%
8 BEKASI CITY	120	0.61%	286	0.68%	25	0.68%
9 BOGOR REGENCY	84	0.43%	94	0.22%	10	0.27%
10 BOGOR CITY	3	0.02%	3	0.01%	1	0.03%
11 DEPOK CITY	1,177	6.03%	291	0.69%	15	0.41%
12 TANGERANG REGENCY	1	0.01%	11	0.03%	5	0.14%
13 TANGERANG CITY	2	0.01%	10	0.02%	3	0.08%
14 SOUTH TANGERANG CITY	9	0.05%	21	0.05%	3	0.08%
15 OTHERS	51	0.26%	28	0.07%	36	0.98%
TOTAL	19,514	100.00%	42,190	100.00%	3,674	100.00%

The results of the grouping of the third visitor's domicile in District Hospital in East Jakarta were then mapped so that information was obtained about the distribution of the origin of the visitor's domicile as shown in the following Figure 4.

**Figure 4.** Distribution of visitor domicile 3 District Hospital in East Jakarta originating from within the city of East Jakarta

Based on the plotting data of the origin of the patient's domicile of each existing hospital as shown in figure 4, it is known that health service consumers not only come from the city of East Jakarta, but also spread throughout almost Jakarta and surrounding cities. Health care needs are unique in nature, their utilization cannot be predicted can occur at any time, anytime and anywhere. Regional administration factors can no longer be used as a limit for the utilization of health services. The

maintenance of other supporting infrastructure such as roads also supports increased access to utilization of health facilities.

The geographical accessibility measurement of District Hospital which is done using GIS instruments is a calculation that takes into account several landscape variables such as land height, land use, speed and type of transportation mode chosen and the location of the hospital. From the results of this calculation it is known that not all of East Jakarta is affordable by the third service of the District Hospital. The contractual contract occurs when viewed from the side of its utilization, that users of health services at District Hospitals in East Jakarta come from almost all areas of DKI Jakarta and several cities and regencies around DKI Jakarta. This is consistent with the research of Retnaningsih [8] that health services have uncertainty characteristics, because everyone has the risk of being sick anytime and anywhere, causing uncertainty when needing health services, what kind of health services are needed and where to get these services. Therefore, geographical boundaries related to territories ultimately no longer have an effect on the utilization of health services, considering that each person has their own reasons and preferences in utilizing health care facilities.

Seeing the distribution of domicile users of health services in each District Hospital in East Jakarta, one of the factors that influence the third utilization of District Hospital is distance.

5. Conclusion

Based on the results of the analysis and discussion, this study concludes that the accessibility of District Hospitals in East Jakarta geographically can reach almost all regions in East Jakarta, except for a few areas on the northeast side of East Jakarta. This shows that DKI Jakarta Provincial Government has successfully equalized access to health facilities in DKI Jakarta. The proximity of the location of the health facility in a distance to the residence of the population influences the service coverage that can be provided. The existence of 3 District Hospitals in East Jakarta has now been able to reach almost the entire area of East Jakarta. Therefore the addition of a new District Hospital in East Jakarta has not been urged to be done in the near term. However, if the DKI Jakarta Provincial Government decides to increase the number of new District Hospitals in East Jakarta, the alternative locations that can be selected are in 2 sub-districts with the furthest and longest travel time to the three existing hospitals, namely in the Districts of Cakung and Duren Sawit. .

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