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ANALYSIS OF HOSPITAL SERVICE AREAS IN ISTANBUL

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1. Introduction

Hospitals are costly institutions to establish and maintain, and health care is a costly item for most families in developing countries. It is to the advantage of all concerned, therefore, that investments in health care be made wisely and that hospitals be located so as to assure a viable operation while meeting the needs of the patient population (Morrill and Earickson (1969)). Medical care researchers have long been concerned with the affect of distance on the frequency with which services are used. Early work demonstrated empirical relationships between medical care utilization and distance, while later writing applied these findings to service area. Delineation (Bosanag, Parkinson and Hall(1976)).

The identification of the service area of existing health facilities is an important step in the evaluation of a health care facility system. Variations in the use of health services by the population of a geographic area have long been a concern of health planners and geographers. Service area studies can be used as a base to determine the needed capacity and characteristics of a hospital. The population within the area can be monitored as to demographic characteristics, incidence of

diseases, and hospital utilization. Hospitals would be to expand or contract certain services on the basis of population changes and could, on the basis of the accurate information provided by patients, coordinate activities with one another so that duplication of services and physical facilities would be avoided (Studnicki (1973)). Thus, there is potential for efficient organization of geographic markets for hospital care.

The service area concept is based on the assumption that people tend to use the nearest facility if there is no differences among the quality of services they provide. The behavioral assumption, which underlies this expectation, is that human beings tend to minimize the effort required to interact with the people and places around them. Consequently, numerous planning projects have been concerned with dividing a region into "study districts", "areas of major influence", "catchment areas", or "service areas". These geographical subdivisions are constructed on the often-unstated assumption that each hospital provides services to the residents of its service area, and that the residents of the service area obtain their hospital services at that hospital. Unfortunately, these service area delineation's are not consistent with the actual floes of patients to hospitals, specially in metropolitan areas. There are overlaps among the service areas of the hospitals (Studnicki (1973)).

In metropolitan areas, the large number of alternative hospitals, the relatively small distances between choices, and the large numbers of patients serviced confuse the affect of physical accessibility on the distribution of patients to hospitals. However, a few studies have attempted to analyze metropolitan geographical areas relating to the hospital-patient spatial relationship. These studies of patient origin have all demonstrated that hospital "trade areas" or "catchment areas" may be identified by collective patient travel patterns while the methods and techniques used in arriving at and analyzing these service areas differ widely, they all report one common conclusion. That is, while the physical relationship between a hospital and a patient's residence is undoubtedly an influence on the distribution of patients to hospitals metropolitan patients are not distributed in a way that minimize aggregate distance traveled or travel time occurred. Spatial research in a number of American metropolitan areas illustrated this trend, such as Drosnoss, Read and Lubin(1965) in California, Cherniak and Schneider (1967) in Cincinnati, Davise (1968) and Morrill and Earickson (1968) in Chicago. All of these studies identified "boundary jumping" behavior by 30 to 70 percent of the inpatient population studied. McGuirle and Porell (1984) give a comprehensive discussion of the role of travel costs in the use of health services.

Moreover, another complexity in the distribution of patients to hospitals in metropolitan areas is the heterogeneity of the interacting elements. Both hospitals and patients differ so much that it is extremely difficult to speak in absolute terms about the spatial behavior bringing them together. In fact, there has been some research aimed et establishing the characteristics of patients and hospital destinations that make them more or less attractive to one another (McLaughlin (1988); Wennberg and Gittelson (1973); Knickman and Foltz (1984)),

Therefore, it seems that metropolitan area present a special challenge in seeking to explain the spatial behavior of patients with respect to the distribution of hospitals. In addition, in developing countries the varying concepts of geographic space which are employed in health care policy have been comparatively under-researched in medical geography and health care policy studies have been neglected. If the service areas are very large, people and the communities to which they feel they belong find themselves out of reach, and their needs become obscured. The managers of the service can become remote and less sensitive to the particular needs of the different communities, The needs of the communities and the networks operating within them become equally obscured when nursing services are organized solely around general practices and the populations they serve. Therefore, the present study attempts to investigate the spatial behavior of in-patients with respect to throe different types of hospitals in Istanbul in order to provido background for hospital service area studies.

The organization of the paper is as follows. The distribution of beds and the characteristics of seven types of hospitals in Istanbul are described in section two. Section three analyzes the relationship between distance and frequency to seven types of hospitals. The final section is devoted to a conclusion and suggestion for further research.

2. The distribution of beds and characteristics of three hospitals in Istanbul

A majority of health care in Turkey is a public service and Istanbul has the largest concentration of health facilities. In 1996 there were 138 hospitals in Istanbul with a total of 30,975 beds. While the average number of beds per 10,000 is 37.8 in Istanbul, it drops to 20.2 for the country as a whole. Patients are free to decide to which hospital they want to go. At the public hospitals patients pay a modest fee where services are free for the poor patients.

Apart from the overwhelming center-periphery disparity, there are also gross disparities among the different districts of Istanbul; some of the old districts have a disproportionately high concentrating of health care facilities (Dokmeci, Dagoglu, Tantolac (1994)). This phenomenon is observed in other developing countries, as well (Akin, Griffin, Guilkey and Popkin (1984)), The district of Fatih -one of the oldest district- contains two university medical centers and has the highest number of beds per 10,000 (5,898). Other districts with relatively high numbers of beds include Beyoglu (815 beds), Uskudar (2083 beds), Kadikoy (2428 beds) and Sisli (2834 beds). Neighborhoods in the older, more centrally located parts of the city have relatively easy access to hospitals. The peripheral districts there are no hospitals at all, As a result, patients from the districts without hospitals tend to over-crowd the university medical enters, resulting in insufficient use of the health facility system and increased traffic congestion at the city center. In order to solve these problems, a redistribution of hospital beds with respect to the population is needed throughout Istanbul (Dokmeci, Dagoglu and Tanyolac (1994)). For this purpose, it is necessary to under- stand the spatial behavior of patients toward different types of hospitals.

In this study, the spatial behavior of patients is analyzed with respect to seven different types of hospitals in Istanbul

- (1) University hospitals,
- (2) General public hospitals,
- (3) Local public hospitals,
- (4) General private hospitals,
- (5) Local private hospitals;
- (6) Specialized hospitals,
- (7) Workers hospitals.

Capa University Hospital is investigated as a case study for university hospitals. This hospital is located in the historical core of the city. It has 1567 beds (1996), Since it is a teaching hospitals it has a large influence area: throughout the country: 16% of its patients come from other cities. Its large number of patients, staff and personnel exacerbate traffic congestion at the core of the city.

Haydarpasa hospital is taken as an example for the general public hospitals. It is located on the Anatolian side of the city and it attracts the Anatolian patients, which come to Istanbul to seek hospital care. It has 685 beds.

Two local public hospitals are taken into consideration: One of them is Bakirkoy Hospital, which serve a peripheral district with 1,300,000 people. The other one is Beykoz hospital, which serve a peripheral district with a population of 160,000 people, Bakirkoy public hospital has 164 beds which is far below the needs of the district. As a result, the number of private hospitals is rapidly increasing, Beykoz Hospital has 109 beds and together with other hospitals, it provides sufficient beds for this small district.

American and German Hospitals are taken as example for the general private hospitals. These hospitals provide top level of care with a very wide variety of specialties. American hospital has 126 beds and German Hospital has 189 beds. German hospital is located in the old CBD and the American hospital is located in the new CBD with wealthy community.

Eight local private hospitals are taken into consideration for the different districts of Istanbul, which are located in the first ring and the periphery. The number of beds changes from 30 to 70 which make difficult to run efficient hospitals, Kosuyolu Cardiovascular Disease hospital is investigated as a case study for specialized care hospitals. It is located in the Anatolian side of the city and it serves mostly poor and middle class patients. It has186 beds. It has a very high occupancy rate because of rapid increase in the number of cardiovascular disease patients in Istanbul and at the country level.

SSK Kartal, SSK Goztepe, SSK Pasabahce and SSK 8amatya are investigated as case studies for the workers hospitals, These hospitals serve health care only to patients which have workers insurance, So, they serve the areas where the workers are concentrated. SSK Kartal and SSK Pasabahce are located in the periphery of the city and the others are located in the first ring. SSK Kartal has 468, SSK Goztepe 1035, SSK Pasabahce 325 and SSK Samatya 804 beds, characteristics.

Thus, the characteristics of these hospitals illustrate that (except the small ones), they are able to attract patients not only from Istanbul but also from other cities irrespective of their private, public status and different bed prices, because of their high specialty care, which is lacking in many Anatolian cities. The effect of distance on the utilization of these different types of hospitals in Istanbul is explained in the next section.

3. Analysis of Spatial Behavior of Patients with respects to different types of Hospitals in Istanbul.

Patient origin data is used in this study to investigate the spatial behavior of patient's with respect to different types of hospitals.

With respect to Capa University Hospital, there is no relationships between the distance to hospital and frequency ($R^2 = 0.02$). Since this hospital provides a wide variety of hospital care at lower cost as a public hospital, it attracts patients from all over the city. Therefore, it has a large service area.

With respect to Haydarpasa General Public Hospital, the relationships between the distance to hospital and frequency is low, $R^2 = 0.26$ but it is higher than the University Hospital, So, University Hospital has wider impact spatially than the general public hospital because of the quality of care and variety of specialties.

The effect of distance on the frequency to local public hospitals is higher such as $R^2 = 0.41$ for Bakirkoy State Hospital and $R^2 = 0.42$ for Beykoz State Hospital. So, a small public hospital with fewer specialties than general hospitals serve as locally as it is expected.

With respect to general private hospitals, the effect of distance on the use of American and German Hospitals are investigated. For both of them, distance effect is very low and R^2 = 0.07 for German Hospital and R^2 = 0,13 for the American Hospital. Since these hospitals provide top level of care with high price, for the upper class of people distance does not have any effect of the frequency to these hospitals. The effect of distance on the use of local private hospitals is R^2 = 0,44. So, distance effect for these hospitals is more important than the general hospitals since their Capa patient's city and potential can only attract patients from their vicinity.

As an example for the specialty hospitals, Kosuyolu Cardiovascular Hospital is investigated. The impact of distance on the use of this hospital is low as the university hospitals $R^2 = 0.15$ since it attracts patients from all over the city due to the spacial care characteristics, which are offered.

With respect to workers hospitals if the hospital is near a large industrial area, $R^2=0.82$ the effect of distance is high as in SSK Pasabahce. If the hospital serve all over the city's patients which are worker, the distance effect is lower $R^2=0.22$ as in SSK Samatya or SSK Goztepe $R^2=0.32$, or SSK Training and Research $R^2=0.23$.

Beside distance, there are other factors, which effect the use of hospitals, The high socioeconomic level of the people living in the surrounding the hospital is another factor which effects their choice of hospital. The distribution of patients between the European and Asian side of the city is another factor which effect the use of hospitals.

4. CONCLUSION

This study investigates the utilization patterns of different types of hospitals in Istanbul, Investigation of the urban-space utilization pattern of social facilities can provide meaningful background of the morphology of the urban areas. The distribution of present facilities both medical and those associated with other activities provides important features of the urban development environment of today.

So population to be served result from many diverse influences of which simple physical accessibility is but a single one, Substantial travel may only reflect access to high technology or unique services, which are common for teaching hospitals. Patients referred from peripheral districts because they require the most sophisticated consultancy and therapeutic facilities of the teaching hospital. Projections if future demand for individual hospital facilities would do well to recognize the multiple causation of that demand. Distance complemented by socio-demographic data, identify and describe populations having differential geographic access to health resources. Such data can be of considerable utility to health planners, both in determining existing needs and assessing the impact of planning activities,

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