Identifying the users of public health services within Greater Cairo as a part of achieving social justice

Mustafa M. Abdel Hafeez [*], **Ashraf A. El Mokadem** [*], **Marwa M. Ahmed**[*], **Heba A. Ahmed**[*]

[*] Architecture and Urban Planning Department, Faculty of Engineering, Port-Said University

Abstract- This study aims to identify the real users of public health services within Greater Cairo. This can help in reducing service delivery to non-beneficiaries, thus, prevent resources' abuse and promotes economic efficiency. Moreover, it makes the needy -who are deprived of the service and cannot afford private surgery and private medical treatment- feel justice. In this study, identifying the users of public health services depends on: defining the basis on which services will be provided and the factors affecting it, identifying the validity of these factors and how to measure them, constructing factors' index and testing it.

Index Terms- Social justice, Public health services, and Greater Cairo.

I. INTRODUCTION

Social justice is one of the most important moral, legal, political and social concepts that has been defined differently by different groups and changed from time to time depending upon the prevailing conditions of an era. It can be identified as "*the mutual obligations -rights and duties- flowing between the individual and society*" [1]. These obligations with regard to public services are:

- Society's duty is to ensure the right of access of different types of individuals to different services that provide protection, maintenance, care, and well-being.
- Individuals' duty is to utilize and maintain these services.

It is notable that, in order to make a service well utilized, it is important to define service's users at first, then make these users properly accessed to the service. Based on this, the literature suggests that there are five-justice conceptions that may be used to allocate public service units. These conceptions include [2]:

Equality
Equality seeks the equal distribution of services. William and Kenneth recognized several dimensions of services' equal distribution; the most prominent are: 1) units of analysis: for services that are supplied directly to households/ neighborhoods/ districts, etc. This means that households in one neighborhood/ neighborhoods in one district/ districts in one city receive services equal to those in other neighborhoods/ districts/ cities, 2) range of permissible variation: for services that have a defined catchment area. This means that those reside beyond the maximum distance are said to be victims of unequal service distribution. The most observed shortcomings of this concept is that it neglects the differences among different analysis units. In other words, it requires that everyone starts from the same place and needs the same things.

Need
Services distribution based on need assumes that some people have a greater need for specific services than do other people. According to William and Kenneth, need refers to characteristics of people (i.e. income level) or conditions in society (i.e. buildings materials). They explained that low-income persons are considered as having a greater need for public services than the high-income ones because they have less potential for obtaining those services with private resources. Similarly, houses built with flammable materials and are close together are considered as having a higher need for fire protection services than those built with bricks; as the probability of fire occurrence, fire spread and loss of life is greater.

Demand
William and Kenneth argued that demands that people make for services should influence services distribution. These demands can be measured by two methods: 1) directly, through requests/ complaints transmitted by phone, letters, etc. 2) indirectly, through calculating usage rates; since the more the users are, the need to establish a new service increases. It is worth mentioning that many researchers criticized using the previous methods in measuring demands. Some argued that some groups and individuals –especially the rich– are more likely than others to contact government officials about service related problems, others argued that many –especially the low-income– may decide not to use a service at all because of its remoteness; thus, services' budget in both cases will mostly be oriented to the wealthier areas.

Preference
People may feel like requesting or complaining without doing so because of lack of money, fear for their safety, etc.; therefore, consulting them about the services they prefer is necessary. Distribution of services based on preferences has many problems. The most important are consumer tastes may vary widely and their preferences for particular services may be erratic and subject to change. Moreover, the cost of responding to such variances and changes is very high.

Willingness-to-pay
Willingness-to-pay is related to ability-to-pay; therefore, income levels influence who gets what. This means that the subsequent pattern of service distribution will be skewed in the direction of wealthier areas.

As this study is concerned with identifying the real users of public health services within Greater Cairo, it is important to define the basis on which services will be provided. On one hand, many researchers argued that, amongst the previously mentioned conceptions, "need" is the main determinant of

equitable health services distribution. They referred that health-seeking behavior is governed primarily by need rather than by how much it would cost. The proof of this is based on the fact that if the amount of services that meet medical needs exceeds the amount that consumers actually choose, health service units will be under-utilized. Alternatively, if consumers need more health services than would be provided, demand will exceed the available units. Thus, the distribution of service units should be proportional to "need".

On the other hand, other researchers argued that, health services should be distributed equally among inhabitants, and should be increased to the needy. According to GOPP (2014), this agrees with the Egyptian standards. However, due to the high international costs of health services, the low level of spending on public health services, and deficiencies in the numbers and levels of nursing and technical staff, the provision of public health services was limited to the needy who cannot afford private surgery and private medical treatment. Thus, "need" will be adopted in this study.

II. Factors affecting need to public health services

Pursuant to the foregoing, one of the main dimensions influencing the need for public services -in general- and health services -in particular- is the income level. Other dimensions include [3] [4] [5] [6] [7]:

-Individual characteristics

Gender
Women tend to have a greater need for health services than men; due to their reproductive health care needs at the younger ages and the greater incidence of chronic conditions among them at the older ages.

Age
Some age-gender groups have a greater need for health services than others. It is argued that areas with a greater percentage of older people and small children will see more demands on health services than those with more younger age groups.

Genetics
Inheritance plays a part in determining healthiness, lifespan, and the likelihood of developing certain illnesses.

-Individual lifestyle
Balanced eating, keeping active, drinking, smoking, and how we deal with life's stresses affect health.

-Social factors

Population density
High population density corresponds to the greater number of contacts among individuals. These contacts are essential parameters in the transimission of infectious disease. Therefore, areas with high population densities are more vulnerable to disease spread.

Family size
Previous researchers focused on how family size affects a mother's health. They argued that the more children a woman has, the fewer family resources that could be allocated to her, and the more likely that she has bad health conditions. Others found that family size and the number of siblings can affect children's health and well-being, since children in large families receive fewer financial/ practical investments than do children in small families.

Educational condition
Illiterate individuals are more likely to work under hazardous conditions or be exposed to environmental toxins, therefore, they are more vulnerable to disease. Moreover, they are more often misuse medication whether because they have trouble reading and understanding the relevant information (warnings, dosage, contraindications, etc.), or their mistrust of the healthcare system and reluctance to use healthcare services, therefore, they could be exposed to more health problems.

Women work
Researchers argued that women work makes them too busy to shop for, prepare and cook healthy meals at home; which can cause obesity in children. Overweight and obese children are likely to stay obese into adulthood and more likely to develop noncommunicable diseases diabetes and cardiovascular diseases at a younger age.

-Physical factors

The characteristics and quality of housing:
Adequate housing is a broad concept that includes a range of issues, but in terms of health the key housing issues are:
▪ Location: far from pollutants and risks (e.g. stormwater drains).
▪ Stability: withstands tough conditions.
▪ Infrastructure: connected to water and sanitation networks.
▪ Design: allows the entry of sunlight and fresh air.
▪ Area: suitable for the number of occupants.

Table 1: The health risks of housing defects

Housing defect	Health risk
Inadequate heating	Bronchitis, pneumonia, stroke, heart disease, hypothermia
Inadequate ventilation	Respiratory complaints, CO poisoning
Lack of hygiene facilities	Infections
Structural instability	Injury or death
Hazardous materials	Respiratory diseases, cancer
Overcrowding	Infections, stress
Inadequate means of escape	Injury or death by fire

Accessibility to the benefits of urban life:
Increasing travel time to work, social and recreational facilities or spaces takes over time and energy that could be spent on physical activity to stimulate mental and physical health Moreover, it can reduce the number of trips to those activities, thus, reducing social interactions. Researchers found that people with lower levels of social interactions have a higher risk of cognitive decline and risk of dementia in old age.

Access to food environment
Researchers found that higher food costs make households – especially the low-income– don't get enough food; these higher costs can occur due to increasing the time and effort required in getting to green groceries, supermarkets, and other food stores from an urban planning perspective, making them suffer from severe undernutrition or marasmus.

Facilitating physical activity:

Areas with wide streets, long blocks, few sidewalks and a lack of mixed land use leave children and young people with "nowhere to go" and contribute to the increase in passive indoor recreational activities; therefore, reducing physical activity. Physical inactivity has been identified as the fourth leading risk factor for global mortality. Moreover, it is estimated to be the main cause for approximately 25% -30% of cases of breast and colon cancers, diabetes and ischaemic heart disease.

Providing a safe living environment:

From a health perspective, safety is concerned with injuries and the extent to which the physical environment contributes to or prevents them. These injuries can be unintentional injuries (e.g. motor vehicles crash, buildings collapse) or intentional injuries (e.g. violence against oneself or others and homicides).

-Natural environment

A healthy natural environment contributes to public health. The aspects of natural environment that have a substantial impact on public health include:

Quality of air

Good air quality is essential for human health. Air pollutants can reduce the capacity to resist infection, and increase incidence of stroke, heart disease, and lung cancer. Therefore, the World Health Organization (WHO) offered a global guidance on thresholds and limits for key air pollutants that pose health risks; including, Suspended particles (PM10), Lead (PB), Carbon Monoxide (CO), Nitrogen Dioxide (NO2), Sulphur Dioxide (SO2), and Ozone (O3).

Quality of water

Good water quality is substantial for the health and well-being of humans and ecosystems. Drinking contaminated water, in medical term, may cause diarrhea, bacterial dysentery, cholera and many other contagious illnesses.

Acoustic comfort

Excessive noise seriously harms human health and can cause hearing loss, high blood pressure, and sleep loss; these effects depend on acoustical characteristics of the noise (e.g., loudness, time, pattern).

Thermal comfort

Cities retain much of its heat in roads, buildings, and other structures; causing of higher temperatures. Higher temperatures can affect human health and lead to additional deaths; particularly among elderly people. It can also raise the levels of ozone and other pollutants in the air that exacerbate cardiovascular and respiratory disease.

Green areas

Green areas are the 'lungs of the city'. They help in mitigating the effects of urbanization and provide residents with a choice of recreational opportunities; which ordinarily entail some form of physical activity, at least walking. Therefore, green areas contribute positively to health and general wellbeing.

III. IDENTIFYING THE VALIDITY OF THE FACTORS AFFECTING NEED TO PUBLIC HEALTH SERVICES

In order to identify the validity of the previous factors; regarding the Egyptian environment, a questionnaire was conducted over 1200 participants within different economic level areas. The questionnaire was divided into three parts. The first part (P1) concentrates on the factors affecting health; including: individual characteristics, socio-economic and physical factors. By answering this part, health status of the respondents can be predicted (I1). The second part of the questionnaire asks about the respondents' health status (P2). If the respondents' answers match the predicted health status (P2=I1), factors affecting health are considered valid and can be used to identify those in need to health services. Furthermore, respondents' answers can be considered as an indicator of need to public sector's health services (I2).

As for the third part, it identifies the users of public sector's health service and asks about the reasons that push them to use it (P3). If the respondents' answers match the indicator of need to public sector's health service (P3=I2), factors affecting health are considered valid and can be used to identify those in need to public sector's health service units. Figure 1 illustrates the purpose of each part of the questionnaire.
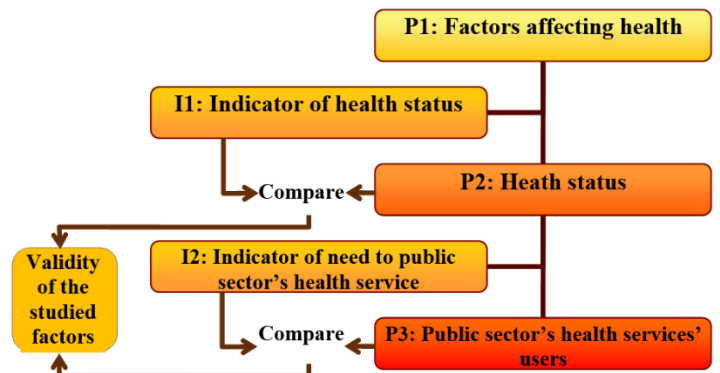

Figure 1: The different parts of the questionnaire and their purposes

The questionnaire was conducted in a number of different areas; including: Madinet Nasr, Al-Maadi, Al-Dokki, Shubra Al-Khima, Manshyet Nasser, Al-Mataria, Al-Bsateen, and Boulaq Dakrour. The respondents were classified based on the following table to include: high income respondents, upper middle income respondents, lower middle income and low-income respondents. The results of the questionnaire showed that:

-Low income respondents

Part 1: Factors affecting health

Most of low income inhabitants live in rooms (61.4%) with rate scramble exceeds than 5 persons/room (55.3%), they are not connected to water/sewage networks (67.7%) as most of these areas are informal. However, they are connected -to some extent- to green groceries (47.5%), markets (31.1%) and recreational areas (54.6%). They are surrounded by landfills (58.4%), workshops (37.2%), factories (23.2%) and high-voltage transmission lines (21.1%). So they are predicted to have a lot of health problems, especially respiratory, heart and intestinal diseases.

Part 2: Health status

Respondents' answers showed that 82.3% of low-income inhabitants have respiratory diseases, 73.1% suffer from intestinal diseases, 59.1% suffer from undernutrition and 55.9% have heart diseases, while only 24.2% have neurological diseases. This agrees -considerably- with the predicted health status. It is worth mentioning that all suffering from intestinal diseases are not connected to water networks, while most have respiratory and neurological diseases live close to factories and workshops (85.7%) and do not exceed 30 years old. Due to the high percentage of patients among the low-income inhabitants; in addition to their economic level, most of them are predicted to use public sector's health services; especially they are of low cost.

Part 3: Health services users

Most of the respondents prefer to use public sector' health services, even if they are distant (88.3%). All of them agreed that this is because medical consultations and drugs are low in cost. They also agreed that; for outpatient services, they prefer GHs more than FHCs. According to them, the variety of specialties (i.e. rheumatology, renal, oncology, and allergy) is the main reason. This also was applied to educational/ university hospitals and the GHs. However, they see that most service units need to be developed and equipped to function better. Moreover, new units need to be established to accommodate the increasing numbers of patients.

-Lower Middle income respondents
Part 1: Factors affecting health

All of lower middle income inhabitants live in apartments with rate scramble 2 persons/room (67.6%). All of them are connected to water/sewage networks, however, some of them are connected to green groceries (56.2%), markets (60.3%), recreational (76.2%) and commercial areas (20.6%). A few are surrounded by workshops (28.6%), and high-voltage lines (18.1%), while many live close to factories (43.5%) and streets with high traffic density (66.7%). So they are predicted to have some health problems, such as respiratory and neurological diseases.

Part 2: Health status

Respondents' answers showed that 44.2% of mid-income inhabitants have neurological diseases, 49.5% have respiratory diseases, and 36.9% have heart diseases. This agrees with the predicted health status. It is worth mentioning that most have respiratory, neurological and heart diseases live close to factories, workshops and streets with high traffic density (79.3%) and do not exceed 30 years old. Due to the percentage of patients among the lower middle income inhabitants; in addition to their economic level, some of them are predicted to use public sector's health services; especially those suffering from chronic disease, while the others are predicted to use private sector's health services.

Part 3: Health services' users

For outpatient services, 33.2% of respondents use public sector's health services, as they are close to them, while the others (66.8%) use private health services. As for inpatient services, the percentage of users increases to reach 58.3%. They agreed that they prefer Educational hospitals more than GHs. Those use private services agreed that they do not use

the public ones because of the weakness of the provided service.

-Upper Middle income respondents
Part 1: Factors affecting health

All of upper middle income inhabitants live in apartments with rate scramble 2 persons/room (76.3%). All of them are connected to water/sewage networks, however, most of them are connected to green groceries (77.2%), markets (81.3%), recreational (82.7%) and commercial areas (64.6%). A few are surrounded by workshops (6.3%), and high-voltage lines (10.1%), and live close to streets with high traffic density (32.6%). So they are predicted to have few health problems, such as respiratory and neurological diseases.

Part 2: Health status

Respondents' answers showed that 21.5% of upper middle income inhabitants have neurological diseases, 19.2% have respiratory diseases, and 9.1% have heart diseases. This agrees with the predicted health status. Due to the low percentage of patients among the upper middle income inhabitants; in addition to their economic level, a few are predicted to use public sector's health services, while the others are predicted to use private sector's health services.

Part 3: Health services' users

For outpatient services, 7.3% of respondents use public sector's health services, while the others (92.7%) use private health services. As for inpatient services, the percentage of users increases to reach 18.2%. They agreed that they prefer university and specialized hospitals. Those use private services agreed that they do not use the public ones because their conviction that this type of services established basically to serve the low income.

-High-income respondents
Part 1: Factors affecting health

All of high-income inhabitants live in apartments and villas with rate scramble 2 persons/room (36.8%) or less (63.2%). About all of them are connected to water/sewage networks (100%), green groceries (83.5%), markets (91.9%), recreational (98.2%) and commercial areas (87.8%). A few are surrounded by high-voltage lines (9.7%). Thus, only the elderly are predicted to have some health problems.

Part 2: Health status

Respondents' answers showed that 20.1% of high-income inhabitants have heart diseases, 6.9% have neurological diseases, and 3.5% have respiratory diseases; most of them are above 60 years old (72.9%). This agrees with the predicted health status. Due to the low percentage of patients among the high-income inhabitants; in addition to their economic level, they are predicted to use private sector's health services.

Part 3: Health services' users

All the respondents use private health services; even if the public ones are close to them. They all agreed that this is because of their conviction that this type of services established basically to serve the poor.

Based on the previous results, it is obvious that factors affecting need to public health service are compatible with the responses of the interviewee within the study area. Therefore, they can be used to identify the users of public sector's health service.

IV. MEASURING THE VALID FACTORS

As need is the main determinant of equitable health services distribution (according to literature review) and the factors affecting it can be used to identify the users of service's type (based on the questionnaire), key indicators have been identified for the previous factors to be measured. It is worth mentioning that some indicators are difficult to be measured; such as genetics and individual lifestyle. Therefore, they were excluded from the study. Table 2 shows need to public health services indicators. These indicators were calculated for each shyakha (neighborhood).

Table 2: Need to public health services indicators

Dimensions	Sub-dimension	Indicators	Unit
Individual characteristics	GENDER	No. of Females	Persons
	AGE	No. of children (-5)	Persons
		No. of the elderly (+60)	Persons
Socio-economic factors	Population Density	No. of persons per area	Persons
	Family size		Persons
	Educational condition	Illiteracy rate	Persons
	Economic condition	Unemployment rate	Persons
	Women's work	No. of working women	Persons
Built environment	Access to the benefits of urban life	No. of residents not connected to transportation network	Persons
	Access to adequate housing	No. of residents within the unplanned areas	Persons
		No. of residents not connected to clean water network	Persons
		No. of residents not connected to sewage network	Persons
		Rate scramble	Persons/room
	Providing safe living environment	No. of residents within the unsafe areas	Persons
		No. of residents at risk of crimes	Persons
		No. of residents at risk of traffic accidents	
	Food security and healthy nutrition	Access to markets and green groceries	Meters
	Facilitating physical activity	Block width	Meters
		Access to recreational and commercial areas	Meters
Natural environment	Quality of Air	PB	MicroGrams/m1
		PM10	MicroGrams/m2
		SO2	MicroGrams/m3
		NO2	MicroGrams/m4
	Thermal Comfort	Land Surface Temperature	˚ c
	Natural Landscapes	Area of green spaces	m2

V. CONSTRUCTING THE NEED TO HEALTH SERVICES INDEX (NHSI)

Construction of NHSI implemented the principle component factor analysis on the different calculated indicators using "STATA" program. Varimax rotation with Kaiser Normalization was done to simplify and minimize these factors to achieve meaningful construction. The result of this analysis was a principal component with the largest amount of information common to all of the factors with a factor loading for each shyakha (neighborhood). Loadings range between -4.4 and 34.06. The total explained variance for the first component was 20.81%.

VI. TESTING THE (NHSI)

In order to test the NHSI, it is important to evaluate its performance in differentiating between the different types of cells. A 4-means cluster analysis was conducted using the index score as the clustering dimension.

For the purpose of distinction, these categories were named as:
- Low need to health services.
- Lower middle need to health services.
- Upper middle need to health services.
- High need to health services.

The average score for the low need cluster was -2.574654 with a range from -1.92466 to -4.45104, while the high need cluster had an average of 3.480551 and ranges between 1.16 and 34.07. Figure 2 shows these clusters according to the corresponding shyakha. It is obvious that high need shyakhat (neighborhoods) concentrate in Manshyet Nasser, El-Basatin, Dar El-Salam, Ain Shams, El-Zawya El-Hamra, Warraq El-Arab, Saft El-Laban, Boulaq El-Dakrour, El-Maasara, Helwan, Begam and Bahtim. As for the low need shyakhat (neighborhoods), they concentrate in Madinet Nasr, Misr El-Gadida, El-Dokki, El-Agouza, and El-Maadi. It is obvious that, all the "high need to health services" areas are characterized by high population density, high percentages of illiteracy and unemployment, lack of green areas, markets, commercial and recreational areas, in addition to, intense presence of environment pollutant sources, manifested in large numbers of workshops and factories, while the "low need to health services" areas are characterized by low population density, low percentages of illiteracy and unemployment, presence of green areas, markets, commercial and recreational areas (see Table 3. Accordingly, the NHSI is effective in identifying the real users of public health services within Greater Cairo.

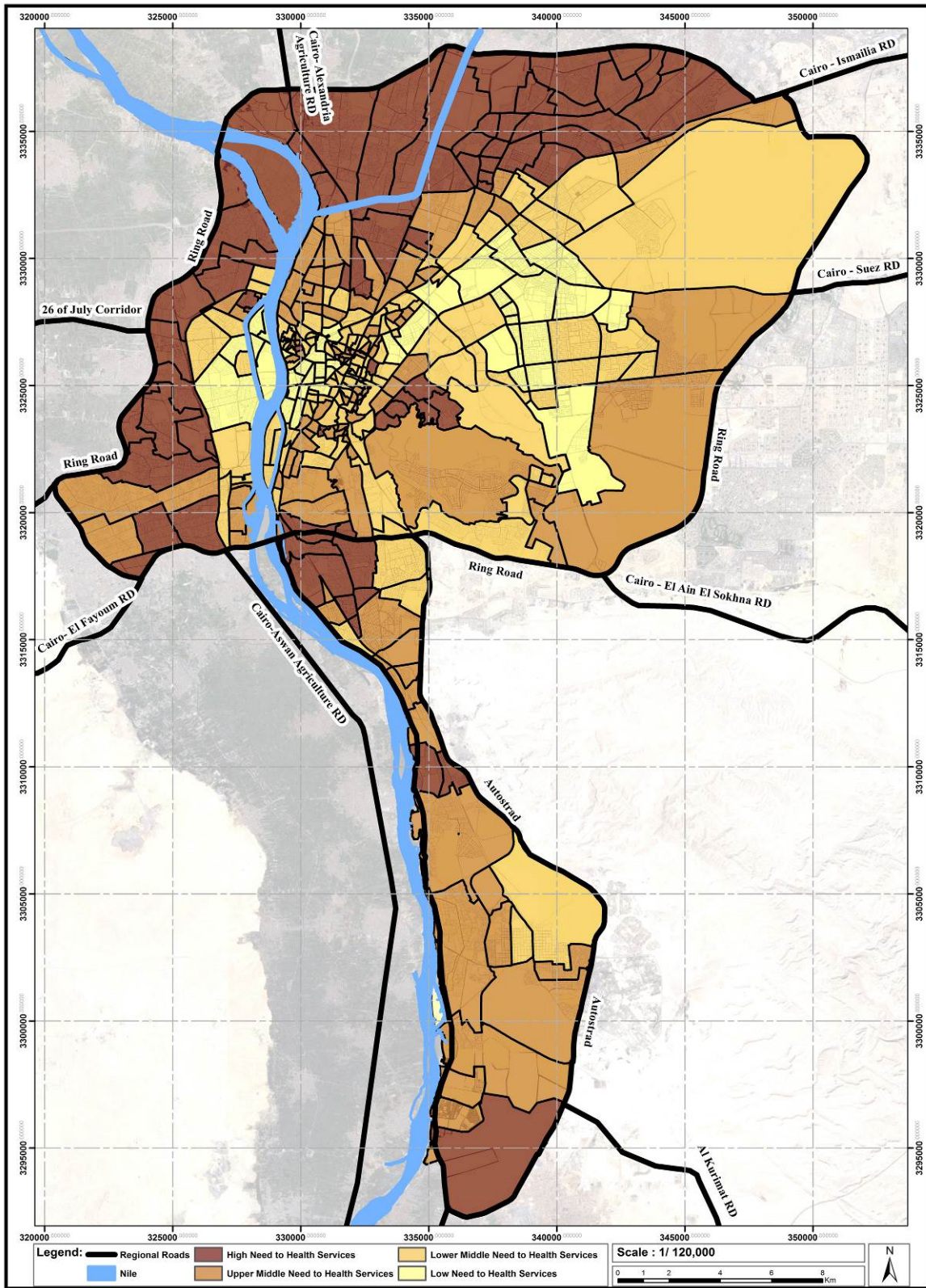Figure 2: Clusters according to the corresponding shyakha (neighborhood)

Table 3: Results of cluster analysis

	High need to Health services			Upper middle need to Health services			Lower middle need to Health services			Low need to Health services		
	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max

	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max
No. of Females	2.3	185.6	3274.0	2.3	91.2	252.6	0.7	56.1	122.3	0.0	23.2	103.2
No. of Children	0.5	47.2	964.9	0.4	15.8	37.2	0.1	8.5	22.8	0.0	2.8	11.0
No. of the Elderly	0.2	22.5	270.4	0.4	22.3	73.4	0.1	16.2	41.8	0.0	8.1	21.4
Family Size	3.2	3.9	4.4	2.4	3.6	4.4	2.8	3.5	4.2	0.0	3.0	4.0
Population Density	4.7	279.8	337.0	4.5	182.7	298.5	1.5	111.3	142.5	0.0	45.7	109.6
Illiteracy Rate	0.7	76.8	1506.6	0.2	37.4	98.7	0.1	17.0	66.9	0.0	3.3	11.9
Unemployment Rate	0.2	13.1	200.4	0.1	5.9	18.0	0.1	3.1	12.0	0.0	1.4	7.7
No. of Residents not Connected to Clean Water network	0.0	1.7	42.4	0.0	0.7	14.1	0.0	0.3	4.4	0.0	0.0	0.3
No. of Residents not Connected to Sewage Networks	0.7	19.1	147.6	0.0	4.1	66.2	0.0	2.0	26.9	0.0	0.5	4.9
No. of Residents within Unplanned Areas	0.0	135.3	920.1	0.0	32.9	326.5	0.0	3.8	97.1	0.0	0.2	5.4
Scramble Rate	0.9	1.2	1.6	0.8	1.2	1.8	0.7	1.1	2.0	0.0	0.8	1.1
Distance to Markets	365.9	2083.5	7891.0	261.3	1244.5	8270.4	283.2	711.6	2362.1	240.7	655.5	1395.9
Distance to Green Groceries	308.8	1191.6	5538.7	137.5	708.0	2657.1	165.1	506.3	1629.4	191.5	441.5	1075.2
Street Width	3.5	4.7	7.0	3.1	4.6	7.3	3.1	5.0	7.6	3.6	6.4	8.3
Sidewalks Width	0.6	0.9	1.2	0.5	0.8	1.2	0.6	0.9	1.2	0.7	1.1	1.4
Block Size	57.9	137.5	281.9	63.4	124.4	209.1	57.5	130.5	274.1	70.3	145.2	231.4
Distance to recreational Areas	308.9	1094.7	4364.5	61.6	565.4	1673.9	130.2	463.1	1096.0	87.7	277.6	570.1
Distance to Commercial Areas	177.8	795.5	2488.1	73.4	424.0	1751.4	81.1	323.8	1017.2	82.9	280.5	726.6
No. of Residents within Unsafe Areas	0.0	21.5	259.9	0.0	3.2	143.5	0.0	1.0	53.8	0.0	0.1	1.8
No. of Residents at Risk of Crime	186.8	2465.9	7511.8	168.1	2193.6	4596.0	119.4	1648.1	3475.0	363.9	962.5	1927.3
No. of Residents at Risk of Traffic Accidents	0.0	2493.4	14737.2	0.0	1862.0	5933.1	0.0	1479.1	4101.0	199.1	1123.1	2881.3
PB	0.3	0.5	0.7	0.3	0.4	0.6	0.3	0.5	0.5	0.4	0.5	0.5
PM10	165.9	202.8	336.7	164.3	194.5	334.1	162.5	188.5	266.5	166.7	183.0	202.4
So2	10.6	20.7	26.2	12.2	21.9	27.3	15.1	22.4	27.1	15.7	22.1	27.7
No2	28.0	44.8	56.7	27.7	43.9	57.4	31.3	46.1	60.4	38.9	50.4	62.6
LST (Summer)	34.9	43.8	54.1	34.3	44.9	56.9	32.6	45.0	55.5	33.8	43.6	51.7
LST (Winter)	12.6	26.1	32.6	14.1	27.9	32.6	16.7	27.9	32.0	19.7	27.5	32.0
Area of Green Areas	0.0	234803.2	3567840.0	0.0	56969.3	762974.2	0.0	30513.5	302659.1	0.0	35894.8	167474.5

VII. CONCLUSION

This study tried to identify the real users of public health services within Greater Cairo through defining the basis on which services are provided. The study showed that need is the main determinant in using public health services. Based on this, factors affecting this need were extracted, then, the validity of these factors was identified through a questionnaire conducted over 1200 participants within different economic level areas. Respondents answers showed that the extracted factors are compatible with the Egyptian environment. Therefore, they can be used to identify the users of public sector's health service.

Accordingly, indicators have been identified for the previous factors to be measured. These factors were minimized; using the principle component factor analysis, and clustered into 4 categories; representing the levels of need to public health services. Analysis showed that all the "high need to health services" areas are characterized by high population density, high percentages of illiteracy and unemployment, lack of green areas, markets, commercial and recreational areas, in addition to, intense presence of environment pollutant sources, manifested in large numbers of workshops and factories, while the "low need to health services" areas are characterized by low population density, low percentages of illiteracy and unemployment, presence of green areas, markets, commercial and recreational areas. Thus, this method is effective in identifying the real users of public health services within Greater Cairo.

REFERENCES

[1] Almgren, G., "Health Care Politics, Policy, and Services: A Social Justice Analysis", New York: Springer Publishing Company, 2013.

[2] Lucy, W., Gilbert, D., and Birkhead, G., "Equity in Local Service Distribution", Public Administration Review, 1977, Vol. 37, pp. 687- 697.

[3] Wu. X. and Li, L., "Family size and maternal health: evidence from the One-Child policy in China", Journal of Population Economics, 2012, Vol. 25, pp.1341-1364.

[4] GRNUHE, "Improving urban health equity through action on the social and environmental determinants of health", London: Global Research Network on Improving Health Equity, 2010.

[5] Khadr, Z., "Monitoring Socioeconomic Inequity in Maternal Health Indicators in Egypt: 1995 -2005", International Journal for Equity in Health, 2009, Vol. 38.

[6] Galea, S., "Macrosocial Determinants of Population Health", New York: Springer, 2007.

[7] Eyles, J., "A needs-based methodology for allocating health care resources in Ontario, Canada: development and an application", Social Science & Medicine, 1991, Vol. 33, pp.489-500.

AUTHORS

First Author – Mustafa M. Abdel Hafeez, Architecture and Urban Planning Department, Faculty of Engineering, Port-Said University, Port Said, Egypt.

Second Author – Ashraf A. El Mokadem, Architecture and Urban Planning Department, Faculty of Engineering, Port-Said University, Port Said, Egypt.

Third Author – Marwa M. Ahmed, Architecture and Urban Planning Department, Faculty of Engineering, Port-Said University, Port Said, Egypt.

Fourth Author – Heba A. Ahmed, Architecture and Urban Planning Department, Faculty of Engineering, Port-Said University, Port Said, Egypt.