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Horizontal Inequity in Access to Outpatient Services among Shiraz City Residents, Iran

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ABSTRACT

Background: lack of access to health services has been mentioned as one of the main causes of health inequity in the health system. The aim of this study was to measure horizontal inequity in access to outpatient services in Shiraz.

Methods: This household survey was conducted among 1608 participants above 18 years in Shiraz in 2012. Four-stage sampling was used. According to the high amount of zero-valued of outpatient services utilization, zero inflated regression model was established. We computed concentration index (CI) for determining actual (CI_M) and indirect standardized utilization (CI_{IS}) of outpatient services in order to compute a horizontal inequity index (HII). The results were analyzed using Stata software, version 8.

Results: The CI_M was not statistically significant (-0.016, 95% CI: -0.097, 0.066). But the CI_{IS} was statistically significant and favored the rich (0.06, 95% CI: 0.010 to 0.001). The horizontal inequity index was -0.076.

Conclusions: There was no inequality in actual amount of outpatient utilization, maybe High subsidization to health care by government in public sector, high insurance coverage, low prices of health services in the public sector, quality of services and opportunity cost of high income groups were the reasons for our results.

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Introduction

Equity is the one of the main aspects of the health systems assessment, so according to the World Health Report 2000, to achieve health systems goals (health promotion, accountability and financial contributions), two dimensions of the best achievable average (good) and lowest possible differences between individuals and groups (fairness) should be met¹.

Despite the emphasis on equity in health and its role in theory, all health systems are faced with inequity, even in wealthy countries there are differences in health outcomes between different socioeconomic levels and sometimes their consequences decrease as poor countries². In addition, effective access to health services is in the core of the debate on how to achieve the goals related to health and equality and lack of access to health care is referred to as a major factor in health inequalities^{3,4}. However, the ambiguity in this definition is surprising⁵. Although a clear definition for access has not been proposed, the literature emphasizes that

access is the equal access opportunity to health services⁶. Factors related to supply and demand sides determine this opportunity⁷.

Maybe the concept of equity in access is equal with horizontal equity in access to services⁵. Some factors affect utilization of services, such as income, gender, health status and etc. Some of these factors (gender and health status) are considered as need variable and others are as non-need variables. There is Horizontal equity when utility of services is related to need variable⁸. The health system will be fair when need-variables have a strong positive correlation with utilization of health services⁹.

Moreover, inequity occurs when the socioeconomic variables are determinants of access and utilization⁹. Because health is precious and the resources in the health system are limited, it is essential that health care becomes available according to the individuals' needs, not socioeconomic status³.

Many studies have been done related to equity in access to health care and utilization and these are important in health policy making, health service equity indicators; their analysis can show how the civil rights of person is provided in equality in access to health care⁹.

Evaluating equity in utilization can compare different regions in health care utilization after being adjusted according to the needs and this show how policies have been successful in social equity development. It is appropriate to allocate resources with the goal of equity development in policies and programs¹⁰.

Moreover, it is important to gather more evidence related to people health and health inequity. Policymaking can use from these evidence in order to illustration of health equity and utilization¹⁰.

Outpatient care in health services is in the primary level and includes several services which can affect the use of other services. Knowledge of equity in access to outpatient leads to recognize current situation, programs evaluation and policy makings, identification of vulnerable groups, and planning to reduce the obstacles to access of health services and health system performance. Therefore, determine the equity in access to outpatient services in Shiraz, southern Iran was the aim of this study.

Methods

This study was a cross-sectional household survey carried out in Shiraz in 2012. The population included all the people above 18 years living in Shiraz. The sample size using formula was determined 784. Where $d=0.14$, $\sigma = 2$ and 95% confidence interval. Since the cluster sampling was used in the second step of the sampling, the sample size was determined $2 \times 784 = 1568$. Assuming that about 2.5% of the non-response or incomplete responses have final sample was increased to 1608.

Sampling was done in four stages. First the municipality areas were considered as nine strata and the sample size was determined in proportion with each stratified population. Due to technical issues of the study, in the second step, of each area ten residential blocks were randomly selected.

Thirdly, in each block, the households were selected by systematic random sampling in the manner of every other household and finally the individuals were selected using Kish method¹¹.

Upon seeing the first one, he or she was asked to put his/her finger on a Latin letter in order to select a code at random. Then after determining the people above 18 yrs. in the household, the selected one could be determined from the table (Table1).

Example: if the person select letter D and the number of the people above 18 years in the household are 4, then number 3 will be achieved based on the crossing of the row related to number 4 and the column related to D. Number 3 is a representative of the third young people who is above 18 years in the household.

The first column: The numbers of this column show the people above 18 yrs., being listed in order of age (from young to old).

The first row: Shows the respondent determining code¹¹.

Table 1: Kish table for selecting the people in each household

Number ^a	A	B ¹	B ²	C	D	E ¹	E ²	D
1	1	1	1	1	1	1	1	1
2	1	1	1	1	2	2	2	2
3	1	1	1	2	2	3	3	3
4	1	1	2	2	3	3	4	4
5	1	2	2	2	4	4	5	5
≥6	1	2	2	2	4	5	5	6

^a The number of household members above 18 years of age

The data were collected by two questionnaires. Based on the first questionnaire information, people's use of the outpatient services was measured. The questionnaire reliability was assessed and tested by the internal consistency statistical analysis and its content validity was approved by experts. This questionnaire included the following information: demographic information, health insurance, income, employment status, residential area, marital status, and level of education and their utilization of the outpatient services during the 1 month prior to the interview. In the interviews, for each of the outpatient services (General physician, specialists, pharmacy, consulting, midwife, rehabilitation, emergency and Para- clinics), the following questions were asked i.e. in the previous month, how many did you use from general physician?

SF₃₆ Questionnaire was used to measure life quality as the proxy of the people's health status. It has been adapted culturally by Montazeri et al. In their study the questionnaire reliability was assessed and tested by the internal consistency statistical analysis and its content validity was approved by experts according to CVR and CVI indexes¹².

Horizontal equity was assessed by Horizontal Inequity Index (HII). HII was computed by the difference between two components: The inequality in actual and needed utilization of outpatient services. For both of them inequality was measured by concentration index. Concentration index for actual utilization of outpatient services was expressed by CI_M and need-standardized utilization of outpatient services by CI_{IS} . The degree of income-related inequality in the distribution of actual utilization of outpatient services was measured using CI_M . CI_{IS} is computed based on the predicted value (need-standardized amount of outpatient services the person would have received) that every individual receive if he/she treated like others with the same need features.

The statistical process was done in three steps. First, we calculated Concentration Index for actual amount of outpatient utilization (CI_M). Second, Concentration Index was calculated for standardized utilization of outpatient services (CI_{IS}). Finally, once the concentration indices for actual utilization of outpatient services (CI_M) and standardized utilization of outpatient services (CI_{IS}) were calculated, the Horizontal Inequity Index (HII) was calculated as follows:

$$HII = CI_M - CI_{IS}$$

In order to calculate the Concentration index we used individual data and the following formula:

$$C = \frac{2}{N\mu} \sum_{i=1}^n h_i r_i - \frac{1}{N}$$

N implied sample size, h_i indicated outpatient utilization for individual i , μ denoted the mean of outpatient services utilization and r_i indicated the individuals' rank in the income

distribution. In other words $ri = i/N$ is the fractional rank of individual i in the income distribution, with $i = 1$ for the poorest and $i = N$ for the richest.

According to high amount of non-use of outpatient services, standard utilization was determined with zero-inflated regression. Age, gender and health statuses were considered as need factors similar to World Bank guideline¹³. Other variables were non-need factors. Indirect standardization method was used to describe outpatient utilization by need factors (health status, age and gender).

In order to indirect standardization first, we estimated the following regression:

$$Y_i = G(\alpha + \sum_j \beta_{ji} x_{ji} + \sum_k \gamma_k Z_{ki}) + U_i$$

Y_i : utilization of outpatient services

x_{ji} : need variables

Z_{ki} : non-need variables

Estimated parameters of zero-inflated regression (α , β , γ), the need variables for each of the individuals (x_{ji} that j was indicated j th need variable and i was showed i th individual), and sample mean of the non-need variables (Z_{ki} that k was indicated k th non-need variable and i was showed i th individual) were used. To obtain the predicted of outpatient utilization.

Finally, difference between actual amount of utilization and estimated amount of Y_i (expected utilization), plus the overall sample mean was given indirect standardized utilization of outpatient services.

Stata version 8 was used for data analyzing and $p < 0.005$ was considered as the statistical significance.

The Ethics Committee of Shiraz University of Medical Sciences approved the study (Project No: 91-6374).

Results

The response rate was 97.5%. It was shown that the mean of outpatient utilization was 2.66 monthly (± 3.07) and annual rate was 31.92. Among surveyed outpatient services, pharmacy had highest mean (1.40, ± 1.66) and the least one was related to emergency (0.01, ± 0.08). Other descriptive results are shown in Table 2.

Table 2: Description of studied outpatient services

Variables	Mean	SD	Min	Max
General physician	0.45	0.83	0	10
Specialist	0.37	0.74	0	7
Emergency	0.01	0.08	0	1
Midwife	0.13	0.50	0	7
Consultation	0.08	0.42	0	10
Para clinic	0.18	0.65	0	10
Pharmacy	1.40	1.66	0	15
Rehabilitation	0.10	0.98	0	23

Concentration index for actual outpatient utilization (CI_M) was calculated negative; however, it wasn't significant (-0.016, 95% CI: -0.097 to 0.066). The results showed concentration index for standardized outpatient utilization (CI_S) was 0.06 and significant (0.06, 95% CI: 0.010 to 0.001). Horizontal inequity index was -0.076 (Table 3). Outpatient utilization in income groups before and after standardizing is shown in Table 4. While, the second and

third income quintile had the more need (respectively 2.50 and 2.85) the actual utilization were less than their need (respectively 2.30 and 2.10). On the other hand, the lowest income quintile utilized more than their need from outpatient services.

Table 3: Income-related inequity in the utilization of outpatient services

Variables	Concentration Index	SD	Lower	Upper
Concentration index for actual outpatient utilization (CI_M)	-0.016	0.041	-0.097	0.066
Concentration index for standardized outpatient utilization (CI_S)	0.060	0.002	0.010	0.001

$$\text{Horizontal Inequity Index (HII)} = CI_M - CI_S = -0.016 - 0.06 = -0.076$$

Table 4: Distribution of outpatient utilization (by income quintiles)

Quintile	Number	Minimum	Maximum	Mean	SD
Very high					
Actual	312	0.00	27.00	2.90	3.40
Standard	311	-2.80	27.20	2.70	3.40
High					
Actual	314	0.00	23.00	2.30	3.20
Standard	311	-1.70	21.30	2.50	3.04
Middle					
Actual	314	0.00	23.00	2.10	3.11
Standard	309	-2.50	22.10	2.85	2.10
Poor					
Actual	314	0.00	21.00	2.50	3.10
Standard	311	-1.71	21.40	2.60	2.10
Very poor					
Actual	314	0.00	22.00	2.40	2.40
Standard	311	-1.40	20.10	2.50	3.30

Discussion

Annual rate of outpatient utilization was 31.92. The national study in Iran showed different results. The annual rate of utilization in their study was 8.7¹⁴. In another study, mean utilization of outpatient services in the past 12 months was 0.299¹⁵. Comparison of the results of our study with those found from these studies indicated that outpatient utilization in our study setting is more than of them. The difference could be attributed to the study period, study location, the study population as well as the difference in demographic characteristics of the population studied.

Among various services, pharmacy had the highest mean of utilization. It seems that the accessibility to pharmacy services and the great numbers of OTC (Over-the-counter) prescriptions as well as the high number of self-treatment, confirmed in the previous research on self-treatment behavior in Iran could account for the increase in the number of people going to pharmacies^{16, 17}.

The literature reveals that income is a main factor in health services utilization inequality. Clarifying the equity situation in outpatient utilization through estimation horizontal inequity index was the aim of this study.

In our study, CI_M was negative (-0.016). In fact, the effect of income is to shift the utilization of outpatient services in a pro-poor direction. However, this wasn't statistically significant and shows all of the individuals regardless of their incomes have equal access to outpatient services. Maybe, high subsidization to health care by government in public sector, high insurance coverage and

low prices of health services in the public sector were the main reasons for our findings. In other words, policy relevant factors caused pro-poor direction in outpatient utilization. Also, Esmailnasab et al (2014) showed utilization prevalence of public health services was more than private health services¹⁸. On the other hand, perhaps financial problems in access to upper level services such as hospital were the reason for more outpatient services.

Similar to our finding, another study calculated negative value for CI_M ¹⁹. Shin et al (2011) investigated horizontal equity in ambulatory care use between rural and non-rural areas. Their result showed CI_M was -0.058 for rural, -0.020 for non-rural, and -0.037 for overall. According to our result, inequity in outpatient utilization in USA at overall level is twofold that of Shiraz. Other studies found the opposite results (a positive value)^{14, 20, 21}. Naghavi et al (2002) in a study in Iran calculated 0.042 to 0.78 for concentration index¹⁴. Another study at Markazi province, Mohammadbeigi et al (2013), calculated a positive value for CI_M . In their study, CI_M was 0.053 for overall; however, for health workers it was, -0.065; this is the same as our finding. They showed extension of health insurance coverage (rural insurance) improved access to health care (family physician) and provided urban hospital insurance, causing increased access to health care in Iran. On the other hand, these programs affected low and middle income groups that are exposed to access barriers²⁰.

However, our study showed that regardless of income, the individuals could utilize outpatient services. It seems that Iran policies and programs regarding outpatient services are successful in reaching equity.

After adjusting for need factors (health status, gender and age), Concentration Index for need standardized utilization (CI_{IS}) was calculated positive and statically significant. In general, this shows rich individuals after being standardized based on need factor must utilize more than poor individuals must. One of the probable reasons for positive CI_{IS} in our study could be that the rich individuals don't utilize health services because they want high quality services. As Mohammadinia et al (2014) showed inpatient services were more satisfactory than outpatient ones with treatment services, quality and other surveyed services²¹.

Perhaps, another reason was high opportunity cost of high income groups. As another study in Iran reported, the employed people in public and private sectors and the self-employed people were less likely to look for outpatient care than others were. In other words, flexible daily schedules and get away from work permit individuals seeking their outpatient needs²². This issue calls for specific attention as studies have reported unmet health care needs due to high health expenditure in Iran²³.

Schneider et al (2006) compared horizontal equity in Micro Health Insurance (MHI) and user fees. In two groups, adjusted C index was zero (0.042 and 0.008 respectively). In other words, regardless of their income, expected need-adjusted visit distributed among all groups equally. Whoever they used (self-assessed severity) SAS as need indicator while it doesn't represent general health status and is related to a specific illness period²⁴. Another study showed different result and, calculated a negative value¹⁹.

Finally, HII from subtraction of CI_M and CI_{IS} was obtained negative (-0.076). This shows poor individuals utilized outpatient services more than their need. This result is in the same line with the Indonesia study. In Indonesia, Hidayat et al (2004), in a different insurance scenario, found a positive value for HII. Income-related inequity in access to OPC (pro- rich for private provider and pro-poor for public facilities) was seen in Indonesia²⁵. However, another study in Iran showed that being poor is associated with less usage of all type of care²⁶.

Other studies in USA and Rwanda showed different evidence. In these studies, HII was positive^{19, 24}. Schneider et al (2006), in a different insurance scenario, found different values for HII. MHI members faced a zero value while user-fee individuals experienced a positive value. The barrier to access related to lack of MHI seems to be the cause of this inequity in low income groups. Standardization based on need didn't affect the expected mean of utilization. Therefore other variables such as financial and non-need factors seem to influence the utilization of uninsured individuals²⁴.

Several factors may influence negative HII in our study: (a) low price in public facilities related to high subsidization of medical care by government that cause more outpatient utilization among the poor; (b) expansion of health insurance coverage; (c) financial barriers related to upper level access.

Conclusions

As a consequence, actual amount of outpatient services distributed among all groups equally. While utilization of standard amount of these services based on need factor was skewed towards the rich. Finally HII was calculated negative. This means that low income groups utilized outpatient services more than their need. It seems that policies such as expanding health insurance and providing subsidy for health sector in order to decrease financial barriers were successful. From a policy perspective, in order to continue this trend, Iranian health system needs to address poor and underprivileged individuals through expanding health insurance and financial policy (subsidy for health sector specially disadvantage individuals). However, a pro-rich inequality in standardized utilization of outpatient services is significant. We might expect unobserved factors (inequity factor) to have an impact on use of outpatient services. Therefore, decomposition and identifying them are necessary.

There were some limitations in our study. First income was used as a measurement of economic status, and there was potential form of understatement bias. Second in order to identify the relevant inequity factors, decomposition was not conducted and finally, there is no information on quality of health services provided. On the other hand, there was some strength in the present study. First in order to measure inequity, HII was used. Second, SF₃₆ was used for health status assessment.

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Conflict of interest statement

The authors declare that they have no competing interests.

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