Measuring equity in household's health care payments (Tehran-Iran 2013): technical points for health policy decision makers

Aziz Rezapour[1], Farbod Ebadifard Azar[2], Saber Azami Aghdash[3]
Asghar Tanoomand[4], Seyed Morteza Hosseini Shokouh[5], NegarYousefzadeh[6]
Pezhman Atefi Manesh[7], Ali Sarabi Asiabar*[8]

Abstract

Background: Households' financial protection against health payments and expenditures and equity in utilization of health care services are of the most important tasks of governments. This study aims to measuring equity in household's health care payments according to fairness in financial contribution (FFC) and Kakwani indices in Tehran-Iran, 2013.

Methods: This cross-sectional study was conducted in 2014.The study sample size was estimated to be 2200 households. Households were selected using stratified-cluster sampling including typical families who reside in the city of Tehran. The data were analyzed through Excel and Stata v.11software. Recall period for the inpatient care was 1 year and for outpatient1 month.

Results: The indicator of FFC for households in health financing was estimated to be 0.68 and the trend of the indicator was ascending by the rise in the ranking of households' financial level. The Kakwani index was estimated to be a negative number (-0.00125) which indicated the descending trend of health financing system. By redistribution of incomes or the exempt of the poorest quintiles from health payments, Kakwani index was estimated to be a positive number (0.090555) which indicated the ascending trend of health financing system.

Conclusion: According to this study, the equity indices in health care financing denote injustice and a descending trend in the health care financing system. This finding clearly shows that deliberate policy making in health financing by national health authorities and protecting low-income households against health expenditures are required to improve the equity in health.

Keywords: Equity, Health care financing, Equity indices, Fairness in financial contribution (FFC), Kakwani index.

Introduction

After the Islamic Republic of Iran's revolution, a fair pattern of socio-economic development has been followed and comprehensive reforms in all areas of administrative and executive policies were pushed through. Meanwhile, in Iran there was a hope that equity in health will ultimately

[1]. PhD, Department of Health Economics, School of Health Management and information Sciences& Health management and Economics Research Center &Center of Excellence in Health Management and Economics, Iran University of Medical Sciences. Tehran, Iran. rezapour_a57@yahoo.com
[2]. PhD, Department of Health Education and promotion, School of Health &Health Management and Economics Research Center, Iran University of Medical Sciences, Tehran, Iran. dr.febadi@yahoo.com
[3]. PhD Candidate in Health Policy, School of Health Management and Information Sciences, Iran University of Medical Sciences, Tehran, Iran. saberazami@yahoo.com
[4]. PhD, Department of Microbiology, Faculty of Medical Sciences, Maragheh University of Medical Sciences, Maragheh, Iran. tanomanda@yahoo.com
[5]. PhD Candidate in Health Economics, Department of Health Management and Economics, School of Health, Tehran University of Medical Sciences. Tehran, Iran. hosainysh.morteza@gmail.com
[6]. Msc in Health Management, School of Health, Tehran University of Medical Sciences. Tehran, Iran. yousefzadeh.negar@gmail.com
[7]. MSc in Clinical Psychology, Head of Outsourcing Group, Health Management and Economics Research Center, Iran university of Medical Sciences, Tehran, Iran. pezhman_ata@yahoo.com
[8]. (**Corresponding author**) Msc in Public Administration, Health Management and Economics Research Center, Iran university of Medical Sciences, Tehran, Iran. sarabi.a@iums.ac.ir

ensure sustainable and equitable development. Since that revolution, many actions and efforts were made to improve the health equity based on Islamic principles; such as establishment of health care networks, adoption of executive policies for equitable distribution of resources, social welfare and the alleviation of poverty and development in line with social justice in the country (1).

National health system of Iran is organized into three levels: country level, provincial and city levels. Ministry of Health and Medical Education (MHME) at the top country level, medical universities at the provincial level and executive health departments and health networks at the city level provide health care services (2).

Justice in health financing is of particular importance in order to achieve equity in health care and fair access to health services. Injustice in health care financing not only imposes burden of disease but also may cause impoverishment and catastrophic health costs. In some cases, despite the need to primary health care services, households deprive themselves due to lack of capacity to payfor health costs. Lack of financial protection against unexpected and unwanted health expenditures can even exacerbate poverty in poor households (3).

An effective assessment and a comprehensive study are required to identify social and economic factors affecting the health status and interactions between those factors, and to find about the impact of the government policies and programs on inequities in health care and the steps toward improving the socio-economic conditions affecting the health of the population (4).

The results of the measurement of inequity and its effects on service delivery can be considered as valuable data in the decision making process for the allocation of resources in the health sector. From the legal point of view, inequity measurements and total access to healthcare services and the level of accessibility are the necessary data for decision-making in the health sector (5).

In recent years, there have been a variety of reliable indices utilized for measuring equity in financing health systems. For a global research in2000, the World Health Organization (WHO) used the fairness of financial contribution (FFC)index in range of values between 0-1. The closer the number is to 1, it indicates a more favorable situation of equity and 0 indicates the worst situation of equity in health financing (6).

One of the most important indices used in this context is Kakwani index. This indexmeasures the extent to which health care financing system digresses from the equity (7).

In recent years, a number of studies in the field of health economics have used these indicators to assess the equity in the health care system of Iran (8-10).Despite the efforts to improve health system equity indices in Iran, current studies revealed the existing inequity in access to primary healthcare and challenging issues in regard to health care financing. Hence this study aimed to measure equity in health care payments among households of metropolitan Tehran. This study was designed and conducted using FFC for health care financing and Kakwani index.

Methods
Study design
This is a descriptive cross-sectional study conducted in Tehran in 2014. The research population consisted of typical families living in Tehran between 2013 and 2014. A stratified-cluster sampling was used to select samples from typical urban family members who have lived in Tehran for at least one year prior to data gathering. Sample size was estimated 2200 households. Tehran metropolitan has twenty-two municipality regions. Also we used quota sampling for each of municipality regions. Thus, 100 questionnaires were considered for each region considering the fact that each region has a number of districts and each district is composed of several neighborhoods. Through cluster sampling method, one district from each region and a neighborhood from every district

werechosen randomly. Block sampling was performed in three phases:

First phase: Determining the characteristics and specifications of the

The second stage: Selection of samples, and

The third phase: Completing questionnaires.

Determining the characteristics and specifications of the sampling includes determining the starting point of each block, the sequential order and determining the sampled households. Data were collected using households' budget and health care utilization questionnaire. To ensure the questionnaire's face validity, comments from some supervisors, consultants and specialists in health economics were used. To ensure content validity, variables of the universal health survey questionnaire which measures the performance of the health systems (11), questionnaire of households budget in the Statistical Center of Iran (12), and external studies related to equity in the field of financing, accessibility and utilization of health services were used (11, 13-32).The questionnaire consists of 8 dimensions as follow.

The first part of the questionnaire included household socioeconomic information. In the second part food costs and nonfood costs and pre payments for health care were asked. The third part belonged to the households' income. Since, some of the households refused to declare their income or offered misinformation; the gross costs of households were considered as their income by assuming zero/no savings, as applied in many other studies (33-35). In the fourth part, households were asked whether they had members with disabilities or individuals requiring long-term care. The fifth part consisted of the household demographic characteristics, including age, sex, height, weight, general health status, healthy behaviors status, marital status, type of insurance, employment status, etc.

In the sixth part, households were questioned about their needs to different types of inpatient and outpatient healthcare ser-

vices based on self-report. In the seventh part, accessibility status, utilization of outpatient care services, and direct and indirect costs based on the type of service and reference location for each member of the households; and in the eighth part, accessibility status and utilization of inpatient care services and formal and informal costs based on the type of service and location for each household member were asked. In line with previous studies, recall period for the inpatient care was 1 year and for outpatient1 month.

Study procedure

The data were collected using face-to-face interview by the researchers with the head of the households or those over the age of 18 who were aware of the information required by the research and also in some cases, when the family was not aware of some needed information, data gathered through observation of documents. The information was recorded in the questionnaires by the interviewers. If length of stay of a specific household in Tehran was less than one year, that family was excluded and another household from the right side replaced. If during the home visits the family was not present at home or the head of the household or an informed person were not available, after 5 days for the second time the interviewer referred to that family to gather and record information. If data collection for the second time was not successful and also if the households were not convinced to give information after the first or second time, another family from the right side was replaced. This method can almost picture the objective nature of the study.

To measure FFC of households in the health financing two indices were used: FFC and Kakwani. The FFC index was determined through following formula:

(Fairness in Financial Contribution) FFC=

$$\left[1-4\frac{\sum_{i=1}^{n}\left|HFC_i-\overline{HFC}\right|^{3}}{0.125n}\right]$$

The purpose of this work is giving greater weight to households who spend a larger proportion of their income on health. These indices would reflect the inequity in financial contribution of the households. In this formula, HFC_i is equal to financial contribution of a particular household and HFC the average of financial contributions among households. The FFC value ranges between 0 and 1, where 1indicates extreme equity and zero indicates the extreme inequity among households (36).

The following three steps were taken to calculate Kakwani index (7):

• *Step one:* determining the income inequality using concentration index or the Gini coefficient, through the following formula:

$$Gini =1-\sum_{i=1}^{n}(x_{i+1}+x_i)(y_{i-1}+y_i)$$

where X_i represents cumulative percentage of income and the Y_i represents the cumulative percentage of the population based on income deciles (36).

• *Step two:* Measuring the inequity in health care payments. In this step X_i represents the cumulative percentage of the population based on the income deciles and Y_i represents the cumulative percentage of payments for health care services.

• *Step three:* Measuring Kakwani index:

size of this index is twice the area enclosed between the Lorenz curve and the curve of concentration in payment. The index value is calculated by the following formula:

K = CI-Iy

The range of the index values is between 1 and -2 and it is valid when -2≤K≤+1.

Positive values greater than 0 indicate progressive or ascending mode of financing and negative values less than 0indicatethe regressive or descending mode of financing. If k=-2, then all payments for health care services is paid by the poorest person of the population and all income is earned by the richest person. If k=1, then all payments for health care services are paid by the richest person of the population and the income distribution is equitable. If k=0, the corresponding state is established, Gini coefficient and the concentration index are both zero; in other words the distribution of income is equitable, and health care payments are also appropriate.

In this study, in order to comply with research ethics, the households' participation in the study was completely voluntary, and also they were assured of the confidentiality of their information.

Results

The FFC index for the whole studied households was 0.68 and for those who used health care services estimated 0.6, indicating injustice and inequity in health care financing.

According to results of the study, among households with better financial situation, there was an uptrend in the FFC index for

Table 1. FFC index for health care financing among all the studied households based on quintiles

Quintiles FFC indices	The poorest	2	3	4	The richest
FFC	0.62	0.64	0.89	0.35	0.99

Table 2. Average of health expenditure indicators among all studied households according to quintiles (in percent).

Health Expenditure indices quintiles	The poorest	2	3	4	The richest
Proportion of out-of-pocket payments from capacity to pay	9.31	8.1	6.36	7.25	1.4
Proportion of out-of-pocket payments from households' gross costs	4.84	4.9	4.84	5.8	1.2
Proportion of non-health costs from total gross costs	95.52	95.52	95.52	94.2	98.8
Out-of-pocket payments per capita (in dollars)	21.48	33.39	55.29	105.04	30.61

health care financing based on the quintiles, although the situation was different for the fourth economic quintile (Table 1).

The results of the research showed that proportion of out-of-pocket payments of households' capacity to pay in the poorest economic quintile is more than other quintiles (Table 2).

Gini coefficient (0.287886) and the Lorenz curve indicate the presence of inequity in income distribution in favor of the rich people. Although the concentration curve in health payments and the size of the concentration index in out-of-pocket payments for health (0.286637) confirm the existence of inequity to the detriment of the rich people.

However, the value of the Kakwani index is a negative number (-0.00125) and indicates that the health care financing system in the under studied community is regressive (Fig. 1).

The effects of the redistribution of income through out-of-pocket health payments on income inequity and Kakwani index showed that even by redistribution of income, Gini coefficient (0.288579) and the Lorenz curve indicate the presence of inequity in income distribution in favor of the rich people; although the concentration curve in health payments and the value of the concentration index in out-of-pocket payments for health (0.379136) confirm the
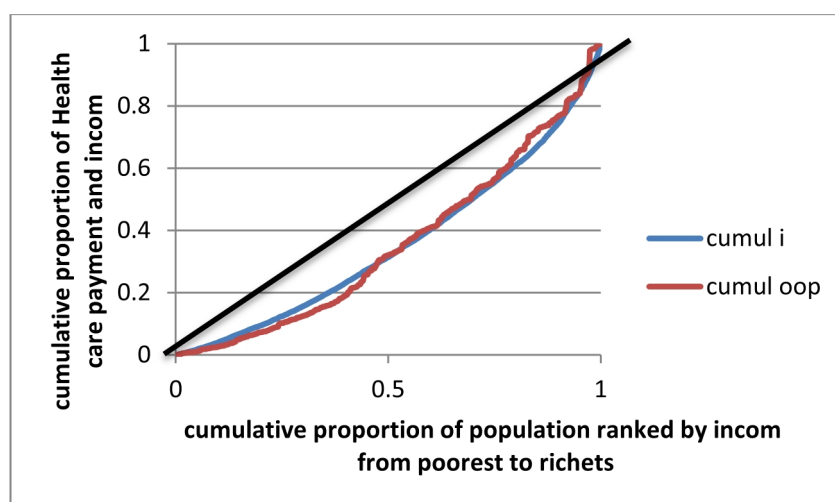

Fig. 1. Inequity in income and out-of-pocket payments for health care services in the studied households
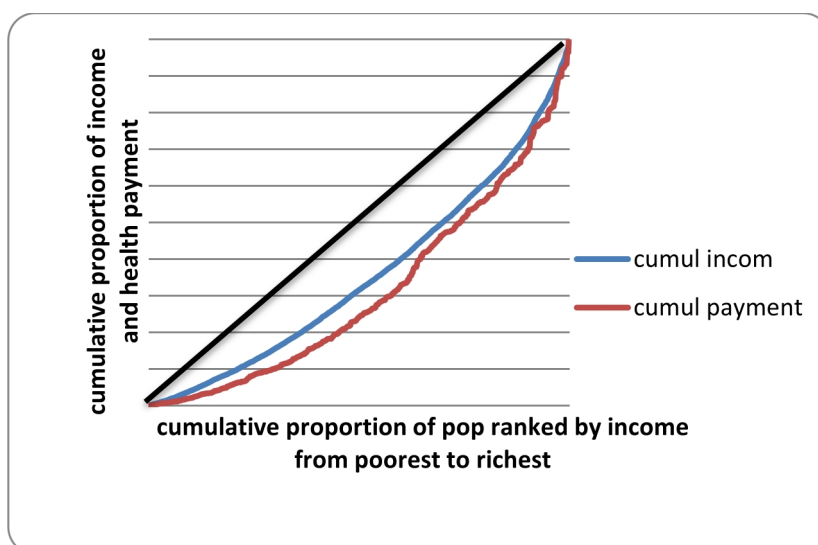

Fig. 1. Inequity in income and out-of-pocket payments for health care services in studied households after the redistribution of incomes

existence of inequity to the detriment of the rich people. However, the value of the Kakwani index is a positive number (0.090555) that shows by redistribution of income, health financing system in the studied community will become progressive (Fig. 2).

The results indicates that by redistribution of income, the income inequity (less in favor of the wealthy people) and payments for health care services (too much to the detriment of the rich people) increase compared to the state before the redistribution, and in whole, the degree of upward of health financing of households enhances.

Discussion

Precise measurement of equity in accordance with the financial indices of the health care system can only be accurately recorded when health care services for the poor have been used. In regard to financial considerations and many other reasons, many poor households do not receive health care services, and as long as the disease is not serious, abstain from seeking health care services. Therefore presented statistics should not mask this fact. Also provided measurements may underestimate the true incidence of impoverishment among the poor population, and health inaccessibility is a serious matter. Therefore the implications of this matter are not computable in the measurement and estimation of indicators of health care financing. This issue can affect the equity indices in the health financing. Information on the costs and utilization of health care services are usually susceptible to be biased. For reducing this limitation in this study, recall period for outpatients was considered 4 weeks, and it is not able that this issue leads to underestimation of annual outpatient expenditures of households and on the other hand, this factor should be considered as one of the limitations of this study.

According to the results of this study, the FFC index for studied households in health care financing was estimated to be 0.6832. The results of the study by Danesh Kohan and colleagues (2011) in Kermanshah reported the FFC value as 0.57(37). Results of the study of Gatsadz et al (2009) in Georgia showed the FFC index improved by converting from 0.68 in 2004 to 0.82 in 2007; this indicates that the health financing system is relatively fair and equitable in that country (10).

Also a study by Wagstaff et al in Vietnam (2003) demonstrated that FFC index changed from 0.95 in 1993 to 0.96 in 1998 (35). The study of Fazaeli published in 2008 showed that FFC reached a significant improvement in urban areas and rose from 0.84 to 0.85 during the period of study, but this indicator had a descending trend in the rural areas and decreased from 0.829 to 0.825. However, the index size improved from 0.833 to 0.835 (38). The results of the study of Razavi et al (2006) showed descending trend of FFC and equity in financing (39). World Health Report (2000) estimated the average FFC to be about 0.57 for all countries (36). According to the WHO in 2000, Colombia, Luxembourg, Denmark and Djibouti had the best place in terms of the FFC in the health care financing, among the 190 countries worldwide. Iran ranked 112 in the world. This ranking indicates an inappropriate status of Iran compared to other countries in the region (36).

Accordingly, some differences were found between the present with other studies' results, in regard to various socio-economic structures and different health systems of the countries, which is not unexpected. In Iran, the FFC_i quickly found a special place among various national equity-oriented programs due to its unique specifications for a detailed assessment of the justice-oriented goals. For instance according to the Article 90 of the Fourth Development Plan, the FFC as an indicator of fair financial contribution of households in health care financing is specified above 0.9, to promote equity in health access and financing (40). However, according to the results of our study, FFC value in the studied population was much less than 1. It should be noticed that number 1 represents

the extreme equity and it is also noteworthy that the value of this index in the studied population was less than the amount stipulated in the national development plans (0.9); depicting a considerable degree of inequity in households' financial contribution in health care financing. The year 2010 has been set as a deadline for accomplishment of the Fourth Development Plan; however, the level of achieving equity in the health care financing system has not been assessed and reported continuously in the country.

In our study, concentration curve and reported indices for the households' capacity to pay and share of out-of-pocket health payment from capacity to pay and households' gross expenditures showed disparities in favor of the rich people among studied households. Among studied households, concentration in income or the Gini coefficient and Lorenz curve indicate inequity in income distribution in favor of the rich, although the concentration curve in health payments and the value of concentration index in the out-of-pocket health payments confirmed an inequity to the detriment of the rich. However, the value of Kakwani index is estimated to be a negative number (-0.00125) and showed that health financing system in the study population has a regressive or descending state throughout-of-pocket health payments. Inequities in the capacity to pay and also households' income indicate inequity in income and economic power distribution in favor of the rich while the Kakwani index is negative and the concentration index of health care expenditures suggests that the poor spend a higher proportion of their income for health care services than the rich and therefore they are more immersed in poverty and catastrophic costs.

In a study by Hajizadeh (2003), Kakwani index for health care payments had a progressive mode during the study period for both rural and urban households. In the whole, average of Kakwani index for pre-payments during the period of the study represented a descending trend for both of

the rural and urban households and this regressive mode was more severe in urban households than rural (8).

In the study of Smith (2010), the Kakwani index for out-of-pocket payments for health expenses had a descending trend in each year. In the entire study period, the index value reflected a higher descending trend. In this case, concentration curve of out-of-pocket payments for health expenses was above the Lorenz curve, which represents a regressive state. However, in case of lower incomes, this curve became closer to the Lorenz curve. The results of this study showed that there was no significant difference between the shares of the lower deciles in the total out-of-pocket payments for health expenses and share of their income.

Households in the lowest income deciles just pay under 3 percent of their out-of-pocket health payments. This is despite the fact that their share of total income is equal to 2.4% (41).

Results of the study by Yu et al (2006) in the Malaysia revealed that according to the proportion approach for assessment, out-of-pocket payments has a huge financial burden for the poorer deciles. As a matter of fact the poorest deciles had paid the highest share of their income (27.3%) as out-of-pocket payments, while the total average of the studied households was 37.1 (42).

According to the results of various research in most countries, and in parallel with the results of the present study, there is a descending trend in out-of-pocket for accessing health care services (43-48). In other words, as present study showed, in the most countries, poor people directly pay a greater proportion of their income as out-of-pocket payments for health care financing than the rich. In accordance with the results of the present study, study of Yardim et al (2010) revealed that concentration curves for the capacity to pay reflects inequity in the capacity to pay and income while the rich reaps the benefit of this matter. In contrast, unlike the results of this study, concentration curve for out-of-pocket payments for health care services in

their study was under the Lorenz curve and showed that out-of-pocket payments for health care services along with an exponential increase in income or capacity to pay would have a progressive or ascending trend (17).

Study of Vork et al (2009) showed that health care financing system in Estonia generally has an exponentially progressive or ascending mode. For them, the Kakwani index in 2007 was estimated to be 0.09. It was stated in this study that the main reason for progressive mode of Kakwani index in health care financing was relevant to the social taxes as a major source of health financing. This Study indicated that out-of-pocket payments for health expenditures lead to a regressive or descending mode as we demonstrated in our study. In other words, in general, households with higher gross costs spend more for health care expenditures. Their study revealed that out-of-pocket payments for health has played a growing role in financing of health care system in the period of 2000 to 2007 (49).

Results of this study showed that redistribution of income through the out-of-pocket health payments reduces the concentration index in households' capacity to pay and moderates inequity in favor of the poor. The results also indicate that in all studied households, amount of income inequity (in favor of the wealthy people to the lower amounts) and payments for health care services (to the detriment of the rich in larger amounts) becomes more by redistribution of income through health payments in comparison with the state before the redistribution; thus health financing system has grown exponentially through out-of pocket payments, in the these households.

By redistribution of income through health payments, level of inequity in income and payments for health care services increases slightly in comparison with the state before the redistribution of income and ascending degree of health financing through out-of-pocket payments increases in this category of households. In the study by Hajizadeh (2003) it was shown that ef-

fects of redistribution of health expenditures was negative on the Gini coefficient and inequity in income reduced in the urban and rural households. He also showed that the concentration index in the non-food costs or capacity to pay reduced and status of equity improved as a result of the redistribution of health care expenditures (8).

Conclusion

Results of the present study revealed an unfavorable significant difference between the existing status of equity in health care financing system and what is expressly stipulated in the Fourth and Fifth Development Plans as the anticipated national development programs in the field of equity in health. On the other hand, the recent study indicated that if redistribution of income for the poor occurs in terms of health expenditures or in other words if provision of health services for the poor people becomes free, significant improvements in the capacity to pay and a progressive trend in the financing of health care system will be achieved.

This obviously indicates the necessity of deliberate policy making in the field of health care financing by health authorities and protection of the poor households with low capacity to pay and to improve the equity in health.

Acknowledgments

References

1. Achievements, challenges and prospects facing the health system of Iran. tehran: ministry of health, 2010.

2. Asefzade S, Rezapoor A. Health care management. Qazvin: Hadise Emrooz; 2012.

3. Knaul FM, Arreola-Ornelas H, Méndez-Carniado O, Bryson-Cahn C, Barofsky J, Maguire R, et al. Evidence is good for your health system: policy reform to remedy catastrophic and impoverishing health spending in Mexico. The Lancet 2006;368(9549):1828-41.

4. Marmot M, Friel S, Bell R, Houweling TAJ, Taylor S. Closing the gap in a generation: health equity through action on the social determinants of health. The Lancet 2008;372(9650):1661-9.

5. Makinen M, Waters H, Rauch M, Almagambetova N, Bitran R, Gilson L, et al. Inequalities in health care use and expenditures: empirical data from eight developing countries and countries in transition. Bulletin of the World Health Organization 2000;78(1):55-65.

6. The world health report, Health systems: Improving Performance, World Health Organization, 2000.

7. Ebadifard Azar F, Rezapoor A. Health care economics. 1 ed. Tehran: Ebadifar; 2010.

8. Hajizade M. Justice in Iran's health system financing through household budget and Kakvani tehran: Iran University of Medical Sciences; 2002.

9. Karami M, Najafi F, Karami B. Catastrophic Health Expenditures in Kermanshah, West of Iran: Magnitude and Distribution. Resarch of Health Sciences 2009;9(2):36-40.

10. Kavoosi Z, Rashidian A, Pourreza A. Inequality in household catastrophic health care expenditure in a low-income society of Iran. Health Policy and Planning 2012:1-11.

11. Üstün TB, Chatterji S, Mechbal A, Murray CJL. The world health surveys. Health systems performance assessment: debates, methods and empiricism Geneva, World Health Organization 2003;797.

12. Households Budjet Questionaire. 2009; Available from: http://salnameh.sci.org.ir.

13. Culyer AJ. The dictionary of health economics: Edward Elgar Publishing; 2008.

14. Bredenkamp C, Mendola M, Gragnolati M. Catastrophic and impoverishing effects of health expenditure: new evidence from the Western Balkans. Health policy and planning 2011; 26(4):349-56.

15. Salti N, Chaaban J, Raad F. Research Health equity in Lebanon: a microeconomic analysis. 2010.

16. López-Cevallos DF, Chi C. Health care utilization in Ecuador: a multilevel analysis of socio-economic determinants and inequality issues. Health policy and planning 2010;25(3):209-18.

17. Yardim MS, Cilingiroglu N, Yardim N. Catastrophic health expenditure and impoverishment in Turkey. Health policy 2010; 94(1):26-33.

18. Gotsadze G, Zoidze A, Rukhadze N. Household catastrophic health expenditure: evidence from Georgia and its policy implications. BMC health services research 2009;9(1):69.

19. Angel-Urdinola D, Cortez R, Tanabe K. Equity, access to health care services and expenditures on Health in Nicaragua: World Bank; 2008.

20. Morris S, Sutton M, Gravelle H. Inequity and inequality in the use of health care in England: an empirical investigation. Social Science & Medicine 2005;60(6):1251-66.

21. Regidor E, Martínez D, Calle ME, Astasio P, Ortega P, Domínguez V. Socioeconomic patterns in the use of public and private health services and equity in health care. BMC health services research 2008;8(1):183.

22. Yu CP, Whynes DK, Sach TH. International Journal for Equity in Health. International Journal for Equity in Health 2008;7:15.

23. Mendoza-Sassi R, Béria JU, Barros AJD. Outpatient health service utilization and associated factors: a population-based study. Revista de saúde pública 2003;37(3):372-8.

24. Dunlop S, Coyte PC, McIsaac W. Socio-economic status and the utilisation of physicians' services: results from the Canadian National Population Health Survey. Social Science & Medicine 2000;51(1):123-33.

25. Sibley LM, Weiner JP. An evaluation of access to health care services along the rural-urban continuum in Canada. BMC health services research 2011;11(1):20.

26. De La Hoz KF, Leon DA. Self-perceived health status and inequalities in use of health services in Spain. International Journal of Epidemiology 1996;25(3):593-603.

27. Van Doorslaer E, Koolman X, Puffer F. Equity in the use of physician visits in OECD countries: has equal treatment for equal need been achieved. Measuring up: improving health systems performance in OECD countries 2002:225-48.

28. Szwarcwald CL, Souza-Júnior PRB, Damacena GN. Socioeconomic inequalities in the use of outpatient services in Brazil according to health care need: evidence from the World Health Survey. BMC health services research 2010; 10(1):217.

29. Maziak W, Ward KD, Mzayek F, Rastam S, Bachir ME, Fouad MF, et al. Mapping the health and environmental situation in informal zones in Aleppo, Syria: report from the Aleppo household survey. International archives of occupational and environmental health 2005;78(7):547-58.

30. Hotchkiss DR, Hutchinson PL, Malaj A, Berruti AA. Out-of-pocket payments and utilization of health care services in Albania: Evidence from three districts. Health policy 2005;75(1):18-39.

31. Bago d'Uva T, Jones AM, Van Doorslaer E. Measurement of horizontal inequity in health care utilisation using European panel data. Journal of health economics 2009;28(2):280-9.

32. Mangano A. An analysis of the regional differences in health care utilization in Italy. Health & Place 2010;16(2):301-8.

33. Hjortsberg C. Why do the sick not utilise health care? The case of Zambia. Health Economics 2003;12(9):755-70.

34. Rous JJ, Hotchkiss DR. Estimation of the determinants of household health care expenditures

in Nepal with controls for endogenous illness and provider choice. Health Economics 2003;12(6):431-51.

35. Wagstaff A, Doorslaer Ev. Catastrophe and impoverishment in paying for health care: with applications to Vietnam 1993–1998. Health Economics 2003;12(11):921-33.

36. Reinhardt UE, Cheng Tm. The world health report 2000-Health systems: improving performance. Bulletin of the World Health Organization 2000;78(8):1064-.

37. Daneshkohan A, Karami M, Najafi F, Matin BK. Household catastrophic health expenditure. Iranian journal of public health 2011;40(1).

38. Fazaeli AA. Measuring Equity in health care financing in Iran(2003-2006). tehran: health deputy of ministry of health,Applied research center, 2007.

39. Razavi SM, Hassanzadeh A, Bassmanji K. Equity in Financing Contribution in health system. Tehran; Andishmand Publisher, 2005.

40. Fourth Five-Year Development Plan set. tehran: presidence, d.f.S.P.a.M.o., 2005.

41. Smith S. Equity in Irish health care financing: measurement issues. Health Economics, Policy and Law 2010;5(2):149.

42. Yu CP, Whynes DK, Sach TH. Assessing progressivity of out-of-pocket payment: with illustration to Malaysia. The International journal of health planning and management 2006;21(3):193-210.

43. Wagstaff A, Van Doorslaer E, Van der Burg H, Calonge S, Christiansen T, Citoni G, et al. Equity in the finance of health care: some further international comparisons. Journal of health economics 1999;18(3):263-90.

44. Mastilica M, Bozikov J. Out-of-pocket payments for health care in Croatia: implications for equity. Croatian Medical Journal 1999;40:152-9.

45. Lairson DR, Hindson P, Hauquitz A. Equity of health care in Australia. Social Science & Medicine 1995;41(4):475-82.

46. De Graeve D, Van Ourti T. The distributional impact of health financing in Europe: A review. The World Economy 2003;26(10):1459-79.

47. O'Donnell O, Van Doorslaer E, Rannan-Eliya RP, Somanathan A, Adhikari SR, Akkazieva B, et al. Who pays for health care in Asia? Journal of health economics 2008;27(2):460-75.

48. Equity in financing and delivery of health Services in Bangladesh, Nepal and Sri Lanka. sri lanka: Institute of Policy Studies, 2003.

49. Võrk A, Saluse J, Habicht J. Income-related inequality in health care financing and utilization in Estonia 2000-2007. 2009.