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**Original Article**

# Determinants of Catastrophic Health Expenditure in Iran

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**Abstract**

**Background:** This study will provide detailed specification of those variables and determinants of unpredictable health expenditure in Iran, and the requirements to reduce extensive effects of the factors affecting households' payments for health and other goods and services inappropriately.

**Method:** This study aims to identify measures of fair financing of health services and determinants of fair financing contribution, regarding the required share of households that prevents their catastrophic payments. In this regard, analysis of shares of households' expenditures on main groups of goods and services in urban and rural areas and in groups of deciles in the statistics from households' expenditure surveys was applied.

**Results:** The growth of spending in nominal values within the years 2002-2008 was considerably high and the rate for out-of-pocket payments is nearly the same or greater than the rate for total health expenditure. In 2008, urban and rural households in average pay 6.4% and 6.35% of their total expenditure on health services. Finally three categories of determinants of unfair and catastrophic payments by households were recognized in terms of households' socio-economic status, equality/inequality conditions of the distribution of risk of financing, and economic aspects of health expenditure distribution.

**Conclusion:** While extending the total share of government and prepayment sources of financing health services are considered as the simplest policy for limiting out-of-pocket payments, indicators and policies introduced in this study could also be considered important and useful for the development of health sector and easing access to health services, irrespective of health financing fairness.

**Keywords:** Catastrophic health expenditure, Out of pocket, Determinant, Iran

## Introduction

Different studies indicate on three major purposes distinguished for measurement of catastrophic health expenditure (1). First, in the absence of health insurance, high expenditures on health care can severely disrupt household living standards. Second, an implicit association between the state of poverty and health catastrophic expenditure has been suggested in many literatures (2-3). Catastrophic health care payments are also used to measure the performance of prevailing health insurance schemes. Considering all, serious concerns about the distribution of the financing burden in most countries have been increased and protecting the poor against catastrophic health expenditure is considered as one of their governments` priorities (4).

In countries at all income levels, direct payments are viewed as the most reliable financing scheme

to reduce the constraint impact on access to health care. But, at the same time, such a financing scheme could be viewed as a source of high and unfair share of households' payments in total health expenditure (5).In this regard, different evidences emphasized on a positive correlation between percentage of households caught in catastrophic payments and out-of-pocket payments (6).Further studies claimed that OOP payments prevent some people from seeking health care and result in financial catastrophe and impoverishment for some who obtain care. They estimated that more than 150 million people globally suffer financial catastrophe after accessing the care by out-of-pocket payments (2).

Considering that, the Iranian government approved a universal health insurance plan to provide affordable services to all urban and rural residents in 1994 and from 2005, the government approved another fully financial support of the insurance plan for rural residents, and partly financial support of insurance premium for the urban residents who remained uninsured till they need inpatient care (7).The plans left nobody without advantages of the universal health insurance coverage but, these plans were not successful enough to reduce out-of-pocket.

These evidences lead to a fact that achieving fairness in financing can be possible in the condition that specifying the characteristics and determinants of unpredictable nature of health expenditure and unfair expenses for households which drive them in irregular financing liabilities (8).

Different studies imply various factors affecting fair financial contribution mostly viewed as social, quality and socio-economic variables (9). This study will provide detailed specification of these groups of variables and determinants of unpredictable health expenditure in Iran, and the requirements to reduce extensive effects of the factors affecting households' payments for health.

## Materials and Methods

This analytical study has been followed with further investigation in the results of contribution changing policies, if existed, growth policies and households' health expenditure deflators within the last six years up to 2008. Then, the study pays close attention to the details of households' preferences in the distribution of their income among health and the other consuming items. This requires analysis of shares of households' expenditures on main groups of goods and services in urban and rural areas and in groups of deciles in the statistics from households' expenditure surveys. The analytical results clarify the patterns of choices of the households in payments for health and the other goods and services, and illuminate the need for improvement in access to public health services.

The concluding results are concerned with the determinants of health expenses in the households' total expenditure in terms of social determinants, socio-economic indicators, and health economic indicators. The first two indicators are known and classified in the earlier studies. The third group of indicators is introduced by this study, and is regarded as the result of positive analysis of the data and conceptual facts in the health economic study on total structure of health payment sources at macro, and then, household levels, and on financing framework along with the social insurance mechanism and other indicators concerning the uninsured groups.

## Results

The distribution of health expenditure extracted from the information of National Health Accounts runs as stated in Table 1.

**Table 1:** Iranian distribution of health expenditures in the selected years

| Distribution of health expenditures (%) | 2002 | 2005 | 2008 |
|---|---|---|---|
| General Government Budget | 23.4 | 28.4 | 24.9 |
| Prepayment Sources for Social Health Insurance | 21.8 | 17.2 | 20 |
| Out-of-pocket payments | 52.4 | 52 | 52.7 |
| Other private sources | 2.4 | 2.4 | 2.4 |
| Total | 100 | 100 | 100 |

Table 2 shows the share of health services from the two main groups of providers, the public and private sectors. This is in average between 10 percent of the scheduled fees for inpatient care and fixed amount of the fees, about 20-25%, for outpatient care services. But for ancillary services the shares from the scheduled fees rise to 40-50% and more, and mostly refer to the services from the private sector.

**Table 2:** The share of health services from public and private providers

| The share of health services (%) | 2002 | 2005 | 2008 |
|---|---|---|---|
| Public Sector Hospitals & Clinics | 29.95 | 30.75 | 32.24 |
| Non-profit Hospitals & Clinics | 0.71 | 0.7 | 0.7 |
| Profit Hospitals & Clinics | 66.26 | 63.08 | 62.66 |
| Administrative & Other Collective Expenditure | 3.79 | 6.19 | 6.10 |
| Total | 100 | 100 | 100 |

As Table 3 indicates, the growth of spending in nominal values within the years 2002-2008 was considerably high. This resulted in unpredictable effects of changes in the two important sources of general government health budget and prepayment funds for social health insurance mechanism.

**Table 3:** The growth rate of sources of health expenditure within six years

| | Growth rate from 2002 to 2005 (%) | Growth rate from 2005 to 2008 (%) |
|---|---|---|
| General Government Budget | 149.85 | 65.45 |
| Prepayment Sources for Social Health Insurance | 62.74 | 119.16 |
| Out-of-pocket payments | 104.75 | 91.4 |
| Other private sources | 109.21 | 87.23 |
| Total Sources | 105.9 | 84.4 |

The following table summarizes the share of urban and rural households' expenditures on main groups of goods and commodities in different years (Table 4).

**Table 4:** The share of households' expenditures on main groups of goods and commodities

| share of expenditures on main groups of goods and commodities | 2002 | | 2005 | | 2008 | |
|---|---|---|---|---|---|---|
| | Urban | Rural | Urban | Rural | Urban | Rural |
| Food | 25.58 | 37.27 | 24.06 | 37.83 | 22.39 | 41.03 |
| Apparel | 6.92 | 9.13 | 5.98 | 8.56 | 5.52 | 7.58 |
| Housing | 31.87 | 17.25 | 27.87 | 15.2 | 31.02 | 15.58 |
| Furniture & appliances | 6.07 | 7.87 | 5.6 | 7.84 | 5.12 | 7.17 |
| Health | 5.72 | 5.39 | 6.29 | 6.35 | 6.39 | 6.21 |
| Transportation | 10.62 | 7.16 | 15.37 | 12.01 | 14.65 | 12.98 |
| Entertainment, training & Education | 3.42 | 2.46 | 3.7 | 2.56 | 3.4 | 2.17 |
| Others | 9.8 | 9.71 | 11.13 | 9.65 | 11.51 | 10.84 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 |

Table (4) shows that in 2008, urban households in average pay 22.4% of their total expenditure on food, and 6.4% on health services. In this table in 2002-2008, the share of transportation is rising, and this along with the share of housing in total expenditure is considerably high. There have been little increasing changes in the share of health services in household's total expenditure in these years. This share is nearly equal to the out-of-pocket payments of the households in average, and while household's payment for prepaid health insurance services has been rising in these years, the share allocated to the out-of-pocket has raised, too.

Moreover this table shows that in 2008, rural households paid more than 41% of total expenditures on food, and then 15.6% on housing, 13 percent on transportation.

Table 5 demonstrates the determinants of unfair and catastrophic payments by households regarding households' payments and government expenditure policy rules.

**Table 5:** Determinants of unfair and catastrophic payments by households

| Indicators | Quality/Social Determinants | Socio-economic Indicators (in the Earlier Studies) | Health Economic/Expenditure Indicators | |
|---|---|---|---|---|
| | | | Measurement Indicators | Policy Rules |
| Employment situation of the Head of Family | + | | | |
| No/low/high Education of the Head | + | | | |
| Sex of the Head | + | | | |
| Age of the Head | + | | | |
| Number of the Members of Family | + | | | |
| Number of the Members over 60 | + | | | |
| Number of Kids below 12 | + | | | |
| Number of the Employed Persons in Family | + | | | |
| Having Health Insurance or Not | + | | | |
| Large/small Housing | + | | | |
| Out-of-pocket Share in Total Expenditure | | + | + | NHA |
| Horizontal & Vertical Inequality Indicators | | + | | |
| Health Financing Distribution Indicators of FFCI | | + | | |
| Out-of-pocket Changing Rules and Indicators | | | + | Public Policy for Extending Expenditure Control |
| Households' Willingness to Pay for Health Services | | | + | Health Balance Billing Monitoring and Justifying Policies |
| Sources of Growth in OOP and Prepayment Funds | | | + | Exploring & improving Long-term Financing Growth Rules |
| Contingent Valuing of Health Insurance Premium | | | + | Regular CVM Studies, and Consistent Premium Policies |
| Differences in Health Payments among Different Deciles in Urban and Rural Areas | | | + | Regular Studies of Households Health Expenditure and Justifying Action Policies |
| Links between Health & other Essential Payments among Different Deciles in Urban and Rural Areas | | | + | Regular Studies of Households' Health & Consuming Expenditures and Policy Effectiveness |
| Number of the Insured / Uninsured in the Informal Sector | | | + | Social Policy Covering the Uninsured |
| Needs for Special Programs in Government Budget to Support the Uninsured | | | + | Special Programs of Supporting & Empowering the Uninsured |
| Needs for Health Insurance Rules of Managed Care | | | + | Integrating Social Health Insurance Financing and Health Care |
| Needs for Health Insurance Contracts with Private Providers | | | + | Extending Social Health Insurance Contracts with Private Providers |

## Discussion

High level of out-of-pocket, about 40 percent of health expenditure and more, leaves households at the risk of unpredictable changes in his economic life that may cause catastrophe (10). According to this definition, the present results showed that households are the main sources of health expenditure in Iran. This has occurred despite the development of social health insurance in the last two decades, and despite the increment in the general government budget allocated to the public health sector in the same period, So health services in the public sector have been regarded as the main source of controlling OOP payments at the expected level determined by the scheduled fees.

Other results indicated that in 2008, the public and non-profit sectors totally have provided 33% of health services at the scheduled fees.The rest and more than 62% of services have been provided by the private sector with low/no control on the scheduled fees from the health authorities. This is an important reason for the high share of OOP payments, and low level of effectiveness of forma health tariffs in controlling/lowering user fees.

This study emphasized on some key factors as determinants of catastrophic health expenditures some is similar and others may have differences with those of other studies. For instance Fazaeli has shown that in addition to health and non-heath expenses of families, quality variables like employment situation of the head of family, no/low/high education of the head, sex and age of the head, number of family members, number of members over 60, number of kids below 12, number of employed persons in the family, having health insurance or not have been considered important in describing the condition of being involved in catastrophic situation (7).

Another study in a low income country emphasized on economic status, household health care utilization especially for medical care, illness episode in an adult household member and presence of a member with chronic illness as the most important determinants of CHE (11).

A Chinese study indicated that people spent more on healthcare with increasing age, especially over the age of 65 years, at the same time those who had chronic disease, earned higher incomes, settled in urban areas, lived in the middle or eastern regions of the country, or lived in a household with a head having a middle school or higher education paid more for their healthcare (12).These results are similarly repeated in two other Asian studies (13-14).

Other studies believed that those better-off households were at the risk of catastrophe because of their preference of using private facilities, at the same time, households with a greater proportion of elderly members, members with chronic illness or disability and members experienced hospitalizations had the highest risk for facing CHE (15).

In summary, the reasons for big share of OOP in the Iranian national health expenditure are:

- High inflation rates in the health sector and in the average for total consuming expenditure in the last two decades (annually 24.5% and 19.6%, for 2002 and 2008 respectively).
- Growing the numbers of physicians and other educated health workers more than 4 times.
- Increasing the number of insured people from less than 20 million urban residents to more than 80 % of total population, at least 60 million people.
- Most of the payment by the public in OOP source goes to services from private sector and for under the counter payment for services covered by the insurance organizations.
- Unsatisfaction by the public sector services or the health insurance support.
- Lack of preventing the private medical persons to work out of the regulated tariff rules or to ignore the insurance organization rules easily
- Inefficient social health insurance mechanism to reduce the direct payments from households

- Lack of well organized services by the public sector hospitals and clinics

The reasons, whatever they may be, drive the public to pay more than 52 percent of total health expenditure from their own pocket. It seems that one simple but not sufficient policy for limiting OOP payments and extending the formal tariffs, aiming at lowering OOP payments, is extending the total share of government and prepayment sources of financing health services, both at the scheduled fees. This requires taking the indicators that are relevant to policy instruments and aims. Many of the indicators and policies introduced here could also be considered important and useful for the development of health sector and easing access to health services, irrespective of health financing fairness.

## Ethical considerations

Ethical issues (Including plagiarism, Informed Consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc) have been completely observed by the authors.

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The authors declare that there is no conflict of interests.

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