

# Catastrophic Health Expenditures in Kermanshah, West of Iran: Magnitude and Distribution

\*Karami M. MSc, \*Najafi F. MD, PhD, \*\*Karami Matin B. PhD

\*Kermanshah Health Research Center (KHRC), Kermanshah University of Medical Sciences, Iran

\*\* Health Care Management, Kermanshah Health Research Center (KHRC), Kermanshah University of Medical Sciences, Iran

(Received 19 Apr 2009; accepted 29 Aug 2009)

## Abstract

**Background:** Health policy makers are concerned about protecting people from catastrophic health expenditures and subsequent impoverishment. This study aimed to describe the magnitude and distribution of catastrophic health expenditures in Kermanshah western Iran.

**Methods:** In this descriptive study, during May 2008, 189 households were chosen by “Systematic Random sampling” among the community of Maskan in Maskan Center for Population. After getting the informed consent forms signed, data were collected using a questionnaire by interviewing the head of the families. The cut-off point for catastrophic expenditure was defined as health expenditures over 40% of household’s capacity to pay.

**Results:** From a total of 189 households, 22.2% (42) households (95% CI 16.3%- 28.1%) incurred catastrophic health expenditures. Out of 42 households, for 11.9%, the head of family was female. 40.5 % had one member younger than 12 years old, 26.2% had one member older than sixty years old, and 9.5% were households with at least one member with chronic condition. In addition, 19% were uninsured. In addition, because of financial burden of health expenditures 21.4% of the households sold their jewels, 16.7% used up their savings and 47.6% were in debt.

**Conclusion:** Compared to 2% of general population facing catastrophic health expenditure, 22.2% was a high proportion. Our study revealed the importance of protecting households against the cost of ill-health.

**Keywords:** *Catastrophic health expenditures, Households financing contribution, Iran*

## Introduction

Health systems have three fundamental objectives: improving the health of the population; meeting people’s expectations and providing financial protections against the costs of ill-health (1). The fairness of health financing as a subset of the three main goals of health systems is based on the notion that every household should pay a fair share (1). Catastrophic health expenditures occur when households need to spend an important fraction of their net income on health care; some of them being pushed into poverty and others refuse to continue to get the care needed (1).

According to World Health Organization (WHO) definition, “households with catastrophic expenditures were defined as those with health expenditures over than 40% of household's capacity to pay. The health financing contribution of a household ( $HFC_h$ ) is defined as the ratio of total household spending (HS) on health and its total capacity to pay. Capacity to pay was defined as total non-food expenditure.  $HFC_h$  can be summarized in the following formula:

$$HFC_h = \frac{\text{Total health spending}_h}{\text{Capacity to pay}_h} = \frac{HS_h}{(Exp + aTax + Food)_h}$$

(Please note that the subscript h denotes household level data)

The numerator corresponds to total household health expenditure ( $HS_h$ ) which is the sum of prepayment and out-of-pocket (oop) payment to the health system. It can be simplified into the following formula:

$$HS_h = \text{Prepay}_h + \text{oop}_h$$

The denominator is a measure of the household's permanent above subsistence income estimated for a household's total expenditure ( $EXP_h$ ) incremented by adjusted tax payments used on health not already included in total expenditure such as income tax and property tax ( $aTax_h$ ) and net of food expenditure ( $Food_h$ )<sup>(2)</sup>.

The impact of catastrophic payments on people may lead to cut down on necessities such as food and clothing, or are unable to pay for their children's education. WHO has proposed that health expenditure is viewed as catastrophic whenever it is greater than or equal to 40% of a household's non-subsistence income, i.e. income available after basic needs have been met. However, countries may use a different cut-off more consistent with their national health policies (3).

Every year, approximately 44 million households, or more than 150 million individuals, throughout the world face catastrophic expenditure, and about 25 million households or more than 100 million individuals are pushed into poverty, mainly because of high expenditure for health care needed (3). Costs of health care services might be a direct cost such as those for medicines or laboratory tests or an indirect one such as transport and food. WHO reported that 2% of the Iranian households incurred catastrophic health expenditures and at least 1% of those suffer from impoverishment (1).

This study aimed to describe the magnitude and distribution of catastrophic health expenditures in Kermanshah, western Iran.

## **Materials and Methods**

We conducted a descriptive study during May 2008 and entered 189 households who were

chosen by "Systematic Random sampling" among residents of Maskan's population-based research center (Maskan Center) in Kermanshah, Iran. This center has a population larger than 18000 people with a diverse socioeconomic status making our sample representative of Kermanshah's population. After completing informed consent form, data were collected using a questionnaire by interviewing the head of the family. A catastrophic expenditure was defined as health expenditures over 40% of household's capacity to pay.

To estimate the catastrophic health expenditure, we used WHO methodology for estimating Household Financing Contribution (HFC) (2). The HFC is defined as the ratio of total Household Spending (HS) on health to the total capacity of household to pay. The numerator (HS) included all payments towards the financing of the health system through social security contribution, private insurance, and out-of-pocket payments. The total capacity to pay defined as total of non food expenditures. Using SPSS software (version 12.00) data were analyzed.

## **Results**

From a total of 189, females accounted for 12.7% of the family heads. The mean age  $\pm$  standard deviation of head of the families was  $48.96 \pm 12.86$  yr and 75.1% of the families were covered by at least one type of insurance. A total of 22.2% (95% CI 16.3%-28.1%) of the households (42 households) faced catastrophic health expenditures.

From those faced with catastrophic expenditure, the female family head came out at 11.9%. Around 40.5% had one member younger than 12 yr old, 26.2% had at least one member older than 60 yr old, 9.5% of households had at least one member with chronic condition and 19% were uninsured. Because of financial burden of health expenditures, 21.4% of the households sold their jewelries, 16.7%

used up their savings, 47.6% borrowed money from someone other than a friend or family and 19% were supported by extended family members or friends from outside the house-

hold. Table 1 shows the distribution of demographic variables and other baseline characteristics in details among households who either incurred or did not faced catastrophic payments.

**Table1:** Distribution of baseline characteristics among households according to the status of health care payments\*

Variables	Households with catastrophic payments	Households without catastrophic payments	All households (n= 189)
	(n= 42) n (%)	(n= 147) n (%)	n (%)
Age (mean ± SD)	49.74± 11.68	48.73± 13.20	48.96± 12.86
Sex (Female %)	5 (11.9)	19 (12.9)	24 (12.7)
One family member younger than 12 yr old	17 (40.5)	57 (38.8)	74 (39.2)
One family member older than 60 yr old	11 (26.2)	33 (22.4)	44 (23.3)
one family member with chronic condition	4 (9.5)	6 (4.1)	10 (5.3)
Insurance coverage	34 (81)	108 (73.5)	142 (75.1)
Complementary insurance coverage	8 (19)	29 (19.7)	37 (19.6)
Households sold their jewels	9 (21.4)	32 (21.8)	41 (21.7)
households who used up their savings	7 (16.7)	23 (15.6)	30 (15.9)
Households borrowed money from someone other than a friend or family	20 (47.6)	73 (49.7)	93 (49.2)
Households who supported by family member/friends from outside the household	8 (19)	21 (14.3)	29 (15.3)
<b>Household size (mean± SD)</b>	4.45± 1.74	4.22± 1.61	4.27± 1.64

\*All *P* values for comparison between households with or without catastrophic health expenditure were > 0.05

Although no statistically significant, household with catastrophic health expenditure were more likely to have either a family member younger than 12 yr old or older than 60 yr old (Table 1). In addition, such families were more likely to have a member suffering from chronic condition and use their saving.

### Discussion

Our results showed that 22.2% of the households incurred catastrophic health expenditures which were relatively high compared to similar studies (4-7). For example, in Burkina Faso it is estimated that 6-15% of the households incurred catastrophic payments (8). In a multi-center study among 59 coun-

tries, proportion of households facing catastrophic payments varied from less than 0.01% in Czech Republic and Slovakia to 10.5% in Vietnam. Two groups of countries had relatively high rates of catastrophic health expenditure: countries in transition, e.g., Azerbaijan, Ukraine, Vietnam, Cambodia and Latin American countries, e.g., Argentina, Brazil, Colombia, Paraguay, Peru (3).

However, there are several issues regarding the comparison between our estimation with reports from elsewhere. First, this proportion might have been estimated even higher if we had not used a conservative cut-off for catastrophic expenditure (> 40% of their available income). Second, information bias toward overestimating the total health spending and/or un-

derestimating the total available income are errors that might make the comparison across different countries invalid. Finally, one study (2) used conservative definition of catastrophic payments, i.e. it used a higher threshold than earlier studies, it is worth mentioning that the health income and expenditure surveys do not typically seek information on the indirect costs of seeking care, such as those associated with transport, food, and accommodation, or lost earnings associated with illness. Accordingly, the estimates from such studies (including ours) might even provide an underestimation of the financial consequences of out-of pocket payments. These three factors and differences in methodology e.g. choosing different cut-off points might describe the observed variability in reported the proportion of households with out-of pocket payment for health care (4, 9, 10). Whether our estimation might be an underestimation or overestimation of real burden of health expenditure, it is considerably different from WHO estimation for Iranian nation (2%) and other countries with similar economical status. For example, Sesma-Vázquez S et al. (4) defined catastrophic payments as those with health expenditures over 30% of their ability to pay and they reported that 3.8% of the households in Mexico incurred catastrophic health expenditures. Table 2 shows the proportion of households with catastrophic payments among some Asian countries with 80% CI (3).

**Table 2:** Proportion of households with catastrophic payments among some Asian countries

Country	Point estimate	80% Confidence Interval
Azerbaijan	7.15	6.43- 7.86
Bangladesh	1.21	1.01- 1.41
Kyrgyz	0.62	0.38- 0.86
Morocco	0.17	0.10- 0.25
Republic of Korea	1.73	1.65- 1.80
Thailand	0.80	0.70- 0.89
Yemen	1.66	1.46- 1.86
Present study (West of Iran)	22.2	18.31- 26.57

Although factors such as the availability of health services requiring out-of-pocket payments, low household capacity to pay and lack of prepayment mechanisms for risk pooling are most influential factors, most of the observed variations in catastrophic health expenditure among countries are attributed to other determinants (2). The fact that the families are headed with old people, females and those with disabilities might increase the risk of facing catastrophic health expenditure. For example, in two US studies, (11, 12) households headed by older people, people with disabilities, the unemployed or poor people, and those with reduced access to health insurance were more likely to be affected than other households. In Georgia, the results of a survey undertaken after the transition to a decentralized, market-driven system showed that 19% of households seeking care had to borrow money or sell personal items to pay, and that 16% were unable to afford the medications prescribed (3). Our estimation in showing similar differences (although non-statistically significant) between families with or without catastrophic health expenditure is similar to the reports from elsewhere (3, 9, 5).

The real burden of catastrophic health expenditure need to be further investigated (13, 14). In fact, many poor households will choose to not seek care rather than become impoverished. In addition, some people may cut down on other necessities such as food, clothing, or their children's education. The findings of this report need to be further examined by doing similar studies in other deprived provinces. In addition further analytical studies help to understand about contribution of determinant of out-of pocket payments.

### Acknowledgements

We would like to thank all of subjects enrolled in this research for their collaborations. Support was provided by Kermanshah University of Medical Sciences. The authors declare that they have no conflicts of interest.

## References

1. WHO, World Health Report 2000. *Health systems improving performance*. WHO, 2000.
2. Murray CJL and Frenk Julio. *A WHO Framework for Health System Performance Assessment*. WHO, Geneva, 1999.
3. Xu K, Evans DB, Kawabata K, Zeramardini R, Klavus J, Murry CJL. Household catastrophic health expenditure: a multicountry analysis. *Lancet*. 2003; **362**: 111–17.
4. Sesma-Vázquez S, Perez-Rico R, Sosa-Manzano CL, Gomez-Dantes O. Catastrophic health expenditures in Mexico: magnitude, distribution and determinants. *Salud Publica Mex*. 2005; **47**: 37-46.
5. Rocha-García A, Hernández-Peña P, Ruiz-Velazco S, Avila-Burgos L, Marín-Palomares T, Lazcano-Ponce E. Out-of-pocket expenditures during hospitalization of young leukemia patients with state medical insurance in two Mexican hospitals. *Salud Publica Mex*. 2003; **45**: 285-92.
6. Knaul FM, Arreola-Ornelas H, Méndez O, Financial protection in health: Mexico, 1992 to 2004. *Salud Publica Mex*. 2005; **47**: 430-39.
7. Fabricant S, Kamara C, Mills A. Why the poor pay more: household curative expenditures in rural Sierra Leone. *International Journal of Health Planning and Management*, 1999; **14**: 179-99.
8. Tin T S, Kouyate B, Flessa S. Catastrophic health expenditures for health care in low income society: a study from Nouna District, Burkina Faso. *Bulletin of WHO*. 2006; **84**: 21-27.
9. Waters HR, Anderson GF, Mays J. Measuring financial protection in health in the United States. *Health Policy*. 2004; **69**:339-49.
10. Pérez-Rico R, Sesma-Vázquez S, Puentes-Rosas E. Catastrophic health expenditures in Mexico: comparative study by social exclusion level. *Salud Publica Mex*. 2005; **47**: 47-53.
11. Merlis M. Family out-of-pocket spending for health services: a continuing source of financial insecurity. Available from: [http://www.cmwf.org/programs/insurance/merlis\\_oopspending\\_509.pdf](http://www.cmwf.org/programs/insurance/merlis_oopspending_509.pdf)
12. Wyszewianski L. Families with catastrophic health care expenditures. *Health Serv Res*.1986; **21**: 617–34.
13. Creese A, Kuznets J. Lessons from cost recovery in health: forum on health sector reform. *WHO/SHS/NHP/95.5*. Geneva: World Health Organization, 1997.
14. Gilson L. The lessons of user fee experience in Africa. *Health Policy Plan*. 1997; **12**: 273-85.