Shiraz E-Med J. 2023 January; 24(1):e121263. https://doi.org/10.5812/semj-121263.

Published online 2023 January 8. **Research Article**

Role of Health Insurance in Facing Health Expenditures Among Urban Female-headed Households in Iran

Simin Ghaderi [1, *]

[1]Department of Economics, Faculty of Management and Human Sciences, Chabahar Maritime University, Chabahar, Iran

[*] *Corresponding author*: Assistant Professor of Economics, Department of Economics, Faculty of Management and Human Sciences, Chabahar Maritime University, Chabahar, Iran. Email: siminghaderi@yahoo.com

Received 2021 November 30; **Revised** 2022 September 03; **Accepted** 2022 November 29.

Abstract

Background: Health insurance is one of the important parts of financing in the health system to reduce inequality in household health expenditures.
Objectives: This study aimed to investigate the role of health insurance in facing health expenditures among urban female-headed households in Iran.
Methods: This descriptive-analytical applied study was performed cross-sectionally using the double-sample selection econometrics method in Stata software (version 16) in 2021. The sample included 2645 female-headed households, and the data were prepared by the Statistics Center of Iran using a questionnaire.
Results: The results showed that social security insurance, private insurance, and insurance of special organizations led to an increase in the health expenditures of female-headed households by 159896, 334137, and 18332 Rials, respectively. Increasing household size, having children, having an elderly person, increasing per capita income, and per capita tobacco expenditures led to an increase in the health expenditures of female-headed households by 875260, 1545153, 2441094, 0.32, and 1.65 Rials, respectively.
Conclusions: Private insurance, social security insurance, and insurance of special organizations had the greatest impact on increasing the health expenditures of female-headed households, respectively. Therefore, it is necessary to create an integrated health insurance system that reduces insurance organizations and funds and provides the same level of coverage for health goods and services. It is also suggested to adopt policies to increase the educational level of female-headed households to reduce health expenditures.

Keywords: Health Expenditures, Insurance, Selection Bias, Family Characteristics

1. Background

In addition to dealing with problems for family financing and supervision, female-headed households are involved in various economic, social, and cultural discrimination that has made them very vulnerable (1, 2). The vulnerability of female-headed households includes their mental and physical health (2-4), where a large part of physical health results from paying attention to health and medical care (5, 6), and female-headed households due to the high volume of activities, compared to other women, have paid less attention to their health and medical care (5). Therefore, paying attention to health care and its related expenditures in female-headed households and how it is financed is essential and necessary, especially regarding the feminization of aging and the feminization of the head of the household (7).

The health insurance system is one of the essential parts of financing in the health system to justify household health expenditures. Health insurance, with its independent nature, provides the necessary financial resources through the participation of healthy individuals and the needs of these individuals during illness and is an important factor in the development and establishment of social justice (8, 9). There are many parallel organizations in Iran that all or part of their activities is health insurance (8, 10). Insurance organizations such as the Health Insurance Organization of Iran, the Social Security Organization, the Armed Forces Medical Services Insurance Organization, and the Imam Khomeini Relief Committee conduct the most important insurance activities in Iran (10). According to principle 29 of the Constitution, access to social security, health care, and medical care in the form of insurance is a public right, and the government is obliged by law to provide the aforementioned services and financial support to everyone in the country. Due to the mul-

tiplicity of organizations and insurance funds in Iran, the need to study the role of each health insurance in facing health expenditures among households, especially female-headed households, is more important.

Recent studies by Shahraki and Ghaderi for urban households and Savojpouri et al. for all urban and rural households in Iran showed that households with health insurance had higher health expenditures than other households (5, 11). Yoosefi Lebni et al. investigated the challenges and opportunities confronting female-headed households in Kermanshah, Iran, and stated that their health would be achieved by increasing education and improving their socioeconomic status (2). Burstrom et al. found that lone mothers had significantly worse health than other mothers in Italy, Sweden, and Britain and were more likely to suffer material damage (6). Oraro et al. in Cameroon showed income, wealth, and the number of children as the main factors in mothers' decision to buy health insurance (12). Ahmadi and Taheri also, using the ordered probit model for Iranian households, stated that households with rural insurance, social security, supplement, and medical services had the lowest health expenditures, respectively (13). Furthermore, Ghaderi stated that households in Iran with health insurance, social security, and special organizations had the highest health expenditures among households, respectively (10). Zareie and Mohammadi (14) also confirmed the high share of the Health Insurance Organization in reducing personal payments of patients in public hospitals of Ilam, Iran.

2. Objectives

Considering the increase in female-headed households, the feminization of aging, the vulnerability of the physical health of these households, and the role of health insurance as one of the most important parts of financing in the health system to reduce inequality in health expenditures, investigating the role of insurances and their impact on the health expenditures of female-headed households is essential. Therefore, the main purpose of this study was to assess the role of various health insurance types in facing health expenditures among urban female-headed households in Iran and seek to answer the questions "whether health insurance increases the health expenditures of female-headed households," "what effect does each of health insurance types have on the health expenditures of female-headed households," and "which of the health insurance types has the highest impact on the health expenditures of female-headed households?"

3. Methods

The present descriptive-analytical applied study was performed cross-sectionally using the double-sample selection econometrics method in 2021. The statistical population of the study was the total number of female-headed urban households in Iran in 2019. The sample size consisted of 2645 female-headed households that were randomly selected by the Statistics Center of Iran based on a three-stage sampling method (i.e., city, block, and household selection) (15).

3.1. Data Collection

The data were collected by the Statistics Center of Iran using the Household Income and Expenditure Survey (HIES) questionnaire through the direct meeting of the statisticians with the sample household and in the presence of the head of the household. The information required for this study was extracted from the raw data of different parts of the questionnaire in 2019 and processed in Excel software (version 2019). The estimation of the coefficients of the study models was performed in Stata software (version 16) using the double-sample selection econometrics method.

3.2. Models' Specification

The double-sample selection model was previously applied by numerous studies (10, 16-19). The model used in this study was introduced in the first part of this research by Shahraki and Ghaderi (5), and the second selection equation was added to this model. The general model for double-sample selections is as follows (20):

The first selection equation:

$$y_{1i}^{*} = \beta'_1 x_{1i} + u_{1i} \quad (1)$$

The second selection equation:

$$y_{2i}^{*} = \beta'_2 x_{2i} + u_{2i} \quad (2)$$

The decision equation:

$$y_{3i}^{*} = \beta'_3 x_{3i} + u_{3i} \quad (3)$$

By defining two variables of two values, y_{1i} and y_{2i}, to determine the output of the two selected equations, the individuals within the original sample can be categorized as follows:

$$y_{1i} = \begin{cases} 1 \, if \, y_{1i}^{*} > 0 \\ 0 \, if \, y_{1i}^{*} \leq 0 \end{cases} \quad (4)$$

$$y_{2i} = \begin{cases} 1\, if\ y_{2i}^{*} > 0 \\ 0\, if\ y_{2i}^{*} \geq 0 \end{cases} \quad (5)$$

It can be said that the values of y_{3i} are observed if and only if $y_{2i} = 1$, which in turn is obtained when $y^{*}_{1i} > 0$ and $y^{*}_{2i} > 0$. According to the above-mentioned classification, the decision regression equation for the observations $y_{2i} = 1$ is as follows:

$$\begin{aligned} E\ (y_{3i}|y_{2i} = 1) = \ & \beta'_3 x_{3i} \\ + \ & \sigma_3 E\ (u_{3i}|y_{2i} = 1) = \beta'_3 x_3 \\ + \ & \sigma_3 E\ (u_{3i}|y_{1i}^{*} > 0,\ y_{2i}^{*} > 0) \end{aligned} \quad (6)$$

in which $E\,(y_{3i}|y_{2i} = 1)$ indicates the common output of two selection equations if $E\,(u_{3i}|y^{*}_{1i} > 0, y^{*}_{2i} > 0) \neq 0$, linear regression of y_{3i} on x_{3i} leads to the inconsistent estimation of the parameters of the decision equation. Therefore, if the two selection equations are independent, Equation 6 for the random state will be as follows:

$$y_{3i} = \beta'_3 x_{3i} + \sigma_3 \rho_{13} \lambda_1 + \sigma_3 \rho_{23} \lambda_2 + w_3 i \quad (7)$$

in which w_{3i} is the residuals and the lambda coefficients (inverse of Mills ratio), which are determined as follows:

$$\lambda_1 = \phi \frac{\beta'_1 x_{1i}}{1 - \Phi\ (\beta'_1 x_{1i})} \quad (8)$$

$$\lambda_2 = \phi \frac{\beta'_2 x_{2i}}{1 - \Phi\,(\beta'_2 x_{2i})} \quad (9)$$

in which $\varphi(.)$ and $\Phi(.)$ are the symbols of the density function of a standardized normal distribution and the cumulative distribution function, respectively (20). According to this structure, in the present study, for investigating the role of health insurance types in household health expenditures, a double-sample selection model with the following selection and decision equations was used:

The first selection equation (purchasing from the health market):

$$y_{1i} = \beta'_1 x_{1i} + u_{1i} \quad (10)$$

The second selection equation (health insurance purchasing):

$$y_{2i} = \beta'_2 x_{2i} + u_{2i} \quad (11)$$

The decision equation (health expenditures):

$$y_{3i} = \beta'_3 x_{3i} + \sigma_3 \rho_{13} \lambda_1 + \sigma_3 \rho_{23} \lambda_2 + w_{3i} \quad (12)$$

y_{1i} is the dependent variable of the first selection equation. If the household has health expenditures $y^{*}_{1i} > 0$, it means that it has bought from the health market. In this case, we have $y_{1i} = 0$; otherwise, y_{2i} is the dependent variable of the second election equation if the household has paid for the health insurance ($y^{*}_{2i} > 0$); therefore, we have $y_{2i} = 1$; otherwise, we have $y_{2i} = 0$. These two selection equations were estimated by the bivariate probit method, and the lambda variables were estimated according to equations 9 and 8; then, the decision equation, as described in Equation 12 was estimated by the ordinary least squares method. y_{3i} is the dependent variable of the decision equation and represents the level of household health expenditures. Moreover, x_{1i}, x_{2i}, and x_{3i} indicate the explanatory variables of the first and second selection equations and the equation of decision, respectively. The model-independent variables were selected based on theoretical foundations and empirical studies in this field (10, 11, 21).

4. Results

The total sample included 2645 households, 32.14%, of which, equivalent to 850 households, had no health expenditures at all, and 67.86% of them, equivalent to 1795 households, had health expenditures. Health expenditures included the expenditures of sections 6 and 13 (outpatient and hospital expenditures and insurance premiums paid by the household) according to the HIES questionnaire. Of the total sample households, 21%, equivalent to 552 households, had no health insurance, and the remaining 79% had an average monthly health expenditure of 1143830 Rials. The average household health expenditure of the sample was 3213452 ± 1095736 Rials (monthly). Table 1 shows the mean of health expenditures of sample households according to the types of insurance. It is notable that different types of insurance were included in the paper, according to the questionnaire of the Statistics Center of Iran. The results showed that the highest mean of health expenditures was related to households with private insurance, medical treatment insurance, social security insurance, insurance of special organizations, and health insurance for villagers and nomads, respectively.

As stated in the method, the first selection equation is related to the probability of purchasing a female-headed household from the health market, and the second selection equation is related to the probability of purchasing health insurance, the results of which were presented using the bivariate probit method in Table 2. The chi-square statistic was 259, which showed that the total variables of the models are statistically significant differences from 0 and are significant. Given that the estimation of the selection equations was conducted based on the bivariate probit method, the coefficients obtained in these two equations are only suitable for examining the direction of effects (22, 23). The marginal effects were used to examine the

Table 1. Mean of Households' Health Expenditures According to the Types of Insurance (Monthly, Rials) [a]

Types of Insurance	Mean	No. (%)
Medical treatment insurance	1.7×10^6	361 (0.14)
Social security insurance	1.5×10^6	921 (0.37)
Private insurance	2.2×10^6	211 (0.08)
Insurance of special organizations	1.1×10^6	117 (0.05)
Health insurance for villagers and nomads	553918	888 (0.36)
Households with insurance	1143830	2093 (0.79)
Households without insurance	913380.1	552 (0.21)

[a] Source: Author's findings

effect of each of the independent variables on the probability of health insurance purchasing and purchasing from the health market, the results of which were presented in the sixth column of Table 2.

The results of the selection equations in Table 2 showed that the education of the head of the household had a negative effect on the probability of the female-headed household facing health expenditures and led to a reduction in the probability of purchasing health insurance. Having a higher educational level in the household, having children and an elderly person, increasing per capita income, and per capita expenditures on tobacco increased the probability of facing health expenditures among households. The results of the second selection equation, which indicated the probability of purchasing health insurance by the female-headed household, showed that literacy head, household size, and educational level of the household members, having a private house, and having a child increased the probability of purchasing health insurance by female-headed households. Additionally, the increase in per capita income and per capita expenditure on tobacco also led to an increase in the probability of purchasing health insurance by female-headed households.

The results of the marginal effects of the probability of purchasing from the health market and purchasing health insurance in the sixth column of Table 2 showed that literacy of the head of the household, increasing household size, increasing the educational level of household members, having a private house, and having an elderly person increased the probability of purchasing health insurance and from the health market by households by 4.9, 4.7, 2.06, 2.2, and 7.3, respectively. Increasing per capita household income also increased the probability of purchasing from the health market and purchasing health insurance. After estimating the coefficients of the bivariate probit equations, the lambda variables for each of the selection equations were estimated as described in equations 8 and 9. Then, the decision equation (Equation 12) was estimated by the presence of these variables and other explanatory variables using the ordinary least squares method, and the results were reported in Table 3.

The value of R^2 was equal to 0.52, and the value of F statistic was equal to 8.68, which with a probability of less than 0.001, showed that all coefficients of independent variables of the model had a significant difference of 0. In addition, the results of the Breusch-Pagan test showed that there was no heteroskedasticity in the model. The results of the decision equation in Table 3 showed that increasing the age and literacy of the head of the household led to an increase in monthly household health expenditures by 41972 and 1152605 Rials, respectively. Increasing the educational level of the head of the household led to a decrease in health expenditures by 106706 Rials. Increasing the household size, increasing the educational level of household members, having children, and having an elderly person led to an increase in the health expenditures of the female-headed households by 875260, 519130, 1545153, and 2441094 Rials, respectively. Furthermore, the increase in per capita income and increase in per capita expenditures on tobacco led to an increase in household health expenditures by 0.32 and 1.65, respectively. Among the types of health insurance, having medical treatment insurance and health insurance for villagers and nomads did not have a statistically significant effect on household health expenditures; however, social security health insurance, private insurance, and insurance of special organizations led to an increase in household health expenditures by 159896, 334137, and 18332 Rials, respectively.

5. Discussion

Health insurance is considered one of the important parts of financing in the health system to reduce inequality in household health expenditures. Therefore, this study aimed to investigate the role of various types of health insurance in facing health expenditures among urban female-headed households. The result showed that with the increase in the educational level of female-headed households, household health expenditures decreased. Savojipour et al. and Shahraki and Ghaderi for Iranian urban households positively assessed the association between the educational level of the head of the household and health expenditures (5, 11). It seems that female-headed households with lower educational levels are more prone to diseases and the use of medical interventions; therefore, their health expenditures are higher. On the other hand, it is possible that female-headed households with a higher educational level have a higher level of health literacy and have used appropriate health services

Table 2. Results of Selection Equations and and Bivariate Probit [a]

Variables	The First Selection Equation		The Second Selection Equation		Marginal Effects	Probability
	Purchasing From the Health Market	Probability	Health Insurance Purchasing	Probability		
Head age	0.004764	0.139	-0.00328	0.359	0.000764	0.504
Head education	-0.06963	0.005	-0.13277	< 0.001	-0.04388	< 0.001
Head literacy	0.061484	0.415	0.178696	0.038	0.04982	0.064
Household size	0.041135	0.195	0.198402	< 0.001	0.047639	< 0.001
Highest household education	0.036229	0.034	0.056765	0.005	0.020603	0.001
Private home	-0.04295	0.476	0.181066	0.005	0.022269	0.293
Households with child	0.247588	0.066	0.43413	0.002	0.03587	0.453
Household with an elderly person	0.183938	0.03	0.118455	0.227	0.073973	0.015
Per capita income	1.78 E -08	< 0.001	2.68 E -08	< 0.001	9.93 E -09	< 0.001
Tobacco expenditures	4.79 E -08	0.756	3.25 E -07	0.037	7.24 E -08	0.174
Number of employed individuals in a household	0.026846	0.571	-0.10046	0.062	-0.01053	0.533
Head without husband	0.0605	0.509	0.453747	< 0.001	0.078954	0.014
Head never married	0.18979	0.231	0.765351	< 0.001	0.029791	0.611
Cons	-0.15904	0.441	-0.24248	0.286		

[a] Source: Author's findings

and care when needed; therefore, they are less faced with diseases and expensive health services. The educational level is expected to be directly related to health expenditures in the short term (24), and since these short-term expenditures preclude the use of therapeutic interventions and the development of specific and incurable diseases at high costs in the long term, the health costs of educated individuals are likely to be lower than those of other individuals in the long term (5, 10).

Increasing the income of female-headed households led to an increase in the probability of buying from the health market and purchasing health insurance and an increase in household health expenditures, which is consistent with the results of studies by Shahraki and Ghaderi (5), Oraro et al. (12), Osmani and Okunade (25), and Savojipour et al. (11). Income is the most important factor influencing health expenditures by developing the ability to pay (25). Previous studies have also shown that female-headed households have a higher share of poverty (6) and lower health expenditures than other households due to lower income (13, 26, 27); therefore, it is proposed to adopt policies to increase the income of female-headed households and create employment.

The results also showed that having health insurance increased the health expenditures of female-headed households, which is in line with the results of studies by Shahraki and Ghaderi (5), Ahmadi and Taheri (13), and Savojipour et al. (11). The positive relationship between having insurance and health expenditures can be due to several reasons. Firstly, the family with health insurance pays more attention to their health (13); as a result, they use more prevention and treatment services (9). Secondly, insurance types do not provide sufficient financial support to patients for medical expenditures, and health expenditures increase despite insurance. Inadequate coverage of basic health insurance services and the government's inability to cover the cost of treatment can lead individuals to choose supplementary health insurance (28, 29). Thirdly, households are encouraged to use more health services due to having insurance and being aware of the reduction in the cost of services and health care (10).

Estimating the effect of different types of health insurance on the exposure of female-headed households to health expenditures showed that private insurance, social security insurance, and insurance of special organizations had the greatest impact on increasing the health expen-

Table 3. Effects of Health Insurance on Health Expenditures of Female-headed Households [a]

Decision Equation		
Variables	**Coefficient**	**Probability**
Head age	41971.59	0.026
Head education	-106706	0.019
Head literacy	1152605	0.018
Household size	875259.2	0.032
Highest household education	519129.7	0.022
Households with child	1545153	0.049
Household with an elderly person	2441094	0.011
Per capita income	0.320202	0.005
Tobacco expenditures	1.65709	0.011
Number of employed individuals in a household	-149486.3	0.219
Head without husband	574167.9	0.055
Insurance expenditures	0.132332	0.502
Medical treatment insurance	-22218.2	0.925
Social security insurance	159896.7	0.034
Private insurance	334137.5	0.103
Insurance of special organizations	18332.11	0.095
Health insurance for villagers and nomads	-213304.5	0.164
Lambda1	-1.38E+07	0.023
Lambda2	-3644552	0.011
Cons	1.17E+07	0.015

[a] Source: Author's findings

ditures of female-headed households, respectively. The effects of medical treatment insurance and health insurance for villagers and nomads were not statistically significant. The results of descriptive statistics also showed that the highest mean of health expenditures was related to households with private insurance, medical treatment insurance, social security insurance, insurance of special organizations, and health insurance for villagers and nomads, respectively. Households with insurance from special organizations had lower health costs than households with social security and private insurance. This result can also be in line with the actions of these organizations and institutions for the covered individuals to reduce personal payments. One of these actions is the establishment and designation of special medical centers that reduce the patient's share of medical services.

Increasing the age of female-headed households has increased the likelihood of exposure to health expenditures and increasing household health expenditures. These households are likely to face higher health costs than other households for several reasons. Firstly, they need more health care due to the feminization of aging and the treatment of diseases they might have in middle age. Secondly, the income of this household is lower than other households. Having a child under the age of 7 years and an elderly person over the age of 60 years also increased the likelihood of female-headed households facing health expenditures and having higher health expenditures, which is consistent with the results of previous studies (10, 11, 30, 31). Su et al. and Xu et al. also stated that individuals over 60 years and children under 3 years are more exposed to increasing health costs (30, 31). Female-headed households with an elderly member over 60 years had higher health costs than households with a child under the age of 7 years; consequently, more support for these kinds of households is necessary in order to reduce health expenditures. In addition, households with older individuals, due to disability or lower pension earnings, usually have lower incomes than other households, which leads to a lack of health care (5, 10).

5.1. Limitations

Medical treatment insurance and health insurance for villagers and nomads were not statistically significant in the model; therefore, they could not be compared to other insurance types. Also, since the sample of this study was selected from the sample of the Statistics Center of Iran; therefore, it was impossible to increase the sample size.

5.2. Conclusions

This study was conducted to investigate the role of various types of health insurance in the exposure of female-headed urban households to health expenditures in Iran. The results showed that health insurance increased the health expenditures of female-headed households. Moreover, private insurance, social security insurance, and insurance of special organizations had the greatest impact on increasing household health expenditures, respectively. Having a higher educational level in the household, having children and the elderly, increasing per capita income, and per capita spending on tobacco led to an increased probability of households faced with health expenditures. Given that female-headed households with different health insurances had different health expenditures, it is essential to establish an integrated health insurance system that, while reducing insurance organizations and funds, provides the same level of coverage for health goods and services. Additionally, further insurance coverage for female-headed households is recommended due to the feminization of aging and the reduction of their

income level. Due to the lower income level of female-headed households than other households, it is recommended to adopt policies to increase the income of female-headed households by increasing employment, government grants, and health subsidies. Moreover, it is suggested to increase the educational level of the heads of households and their health literacy.

Acknowledgments

The author would like to express gratitude to all those who contributed to this study.

Footnotes

Conflict of Interests: The authors declare that they have no competing interests.

Data Reproducibility: The data presented in this study are openly available in one of the repositories or will be available on request from the corresponding author by this journal representative at any time during submission or after publication. Otherwise, all the consequences of possible withdrawal or future retraction will be with the corresponding author.

Funding/Support: This study was not funded.

References

1. Pieters J. Education and Household Inequality Change: A Decomposition Analysis for India. *J Dev Stud*. 2011;**47**(12):1909–24. https://doi.org/10.1080/00220388.2011.561323.
2. Yoosefi Lebni J, Mohammadi Gharehghani MA, Soofizad G, Khosravi B, Ziapour A, Irandoost SF. Challenges and opportunities confronting female-headed households in Iran: a qualitative study. *BMC Womens Health*. 2020;**20**(1):183. [PubMed ID: 32807144]. [PubMed Central ID: PMC7433139]. https://doi.org/10.1186/s12905-020-01046-x.
3. Aghajanian A, Thompson V. Female Headed Households in Iran (1976–2006). *Marriage Fam Rev*. 2013;**49**(2):115–34. https://doi.org/10.1080/01494929.2012.728558.
4. Kwon M, Kim H. Psychological Well-Being of Female-Headed Households Based on Age Stratification: A Nationwide Cross-Sectional Study in South Korea. *Int J Environ Res Public Health*. 2020;**17**(18). [PubMed ID: 32899644]. [PubMed Central ID: PMC7559352]. https://doi.org/10.3390/ijerph17186445.
5. Shahraki M, Ghaderi S. Determinants of health expenditures of female-headed households in urban areas of Iran. *Iran J Health Educ Health Promot*. 2021;**9**(2):133–44. https://doi.org/10.52547/ijhehp.9.2.133.
6. Burstrom B, Whitehead M, Clayton S, Fritzell S, Vannoni F, Costa G. Health inequalities between lone and couple mothers and policy under different welfare regimes - the example of Italy, Sweden and Britain. *Soc Sci Med*. 2010;**70**(6):912–20. [PubMed ID: 20060633]. https://doi.org/10.1016/j.socscimed.2009.11.014.
7. Fotros MH, Ghodsi S. [Comparing Multidimensional Poverty of Female and Men Headed Households in Urban and Rural areas in Iran by Alkire-Foster Method]. *Social Welfare*. 2018;**18**(69):227–185. Persian. https://doi.org/10.29252/refahj.18.69.227.
8. Moghaddasi H, Hosseini A, Asadi F, Esmaeili M. [Problems of health insurance systems and the need for implementation of a reform approach]. *Journal of Health Administration (JHA)*. 2011;**14**(44). Persian.
9. Thuong NTT, Huy TQ, Tai DA, Kien TN. Impact of Health Insurance on Health Care Utilisation and Out-of-Pocket Health Expenditure in Vietnam. *Biomed Res Int*. 2020;**2020**:9065287. [PubMed ID: 32908923]. [PubMed Central ID: PMC7471796]. https://doi.org/10.1155/2020/9065287.
10. Ghaderi S. [The Impact of medical Insurances on out-of-pocket payments among urban households in Iran: A Double-Sample selection Model]. *Journal of Health Administration*. 2019;**22**(2):41–54. Persian.
11. Savojipour S, Assari Arani A, Agheli L, Hassanzadeh A. [The determinants of urban families' health expenditure]. *The Journal of Economic Policy*. 2018;**10**(19):25–52. Persian. https://doi.org/10.29252/JEP.10.18.25.
12. Oraro T, Ngube N, Atohmbom GY, Srivastava S, Wyss K. The influence of gender and household headship on voluntary health insurance: the case of North-West Cameroon. *Health Policy Plan*. 2018;**33**(2):163–70. [PubMed ID: 29145600]. https://doi.org/10.1093/heapol/czx152.
13. Ahmadi A, Taheri E. [Factors affecting health expenditures of households in Iran: application of Ordered Probit model]. *Journal of Health Administration (JHA)*. 2017;**20**(67). Persian.
14. Zareie G, Mohammadi E. [Investigating the Effect of Health Care Improvement Plan on the Payment of the Insured in Iranian Health Insurance Organization (Case Study: Hospitalized Patients in Collegiate Hospitals of Ilam City in December 2013 and 2014)]. *Journal Of Ilam University Of Medical Sciences*. 2017;**24**(6):178–88. Persian. https://doi.org/10.18869/acadpub.sjimu.24.6.178.
15. Statistical Center of Iran. *Statistical Center of Iran*. Tehran, Iran: Statistical Center of Iran; 2019. Available from: https://www.amar.org.ir/english.
16. Zhang R, Inder BA, Zhang X. Bayesian estimation of a discrete response model with double rules of sample selection. *Comput Stat Data Anal*. 2015;**86**:81–96. https://doi.org/10.1016/j.csda.2014.12.012.
17. Bousmah MA, Boyer S, Lalou R, Ventelou B. Reassessing the demand for community-based health insurance in rural Senegal: Geographic distance and awareness. *SSM Popul Health*. 2021;**16**:100974. [PubMed ID: 34849390]. [PubMed Central ID: PMC8608590]. https://doi.org/10.1016/j.ssmph.2021.100974.
18. Ham JC. Estimation of a Labour Supply Model with Censoring Due to Unemployment and Underemployment. *Rev Econ Stud*. 1982;**49**(3). https://doi.org/10.2307/2297360.
19. Jung H, Lee J. Estimating the effectiveness of national health insurance in covering catastrophic health expenditure: Evidence from South Korea. *PLoS One*. 2021;**16**(8). e0255677. [PubMed ID: 34411126]. [PubMed Central ID: PMC8376031]. https://doi.org/10.1371/journal.pone.0255677.
20. Keshavarz Haddad G. *[Microeconometric data analysis and policy assessment]*. Tehran, Iran: Ney Publications; 2015. Persian.
21. Mekonen AM, Gebregziabher MG, Teferra AS. The effect of community based health insurance on catastrophic health expenditure in Northeast Ethiopia: A cross sectional study. *PLoS One*. 2018;**13**(10). e0205972. [PubMed ID: 30335838]. [PubMed Central ID: PMC6193712]. https://doi.org/10.1371/journal.pone.0205972.
22. Shahraki M, Agheli L, Assari Arani A, Sadeqi H, Ghaderi S. The relationship between mother's socioeconomic status and child health. *J Research Health*. 2018;**8**(2):143–51. https://doi.org/10.29252/jrh.8.2.143.
23. Abdel-Rahman S, Shoaeb F, Fattah MNA, Abonazel MR. Predictors of catastrophic out-of-pocket health expenditure in rural Egypt: application of the heteroskedastic probit model. *J Egypt Public Health Assoc*. 2021;**96**(1):23. [PubMed ID: 34342779]. [PubMed Central ID: PMC8333171]. https://doi.org/10.1186/s42506-021-00086-x.
24. Yao W, Gao D, Sheng P. The impact of education on healthcare expenditure in China: quantity or quality. *Appl Econ Lett*. 2018;**26**(14):1192–5. https://doi.org/10.1080/13504851.2018.1542118.

25. Osmani AR, Okunade A. A Double-Hurdle Model of Healthcare Expenditures across Income Quintiles and Family Size: New Insights from a Household Survey. *J Risk Financial Manag*. 2021;**14**(6). https://doi.org/10.3390/jrfm14060246.
26. Ghiasvand H, Abolghasem Gorji H, Maleki M, Hadian M. Catastrophic Health Expenditure Among Iranian Rural and Urban Households, 2013 - 2014. *Iran Red Crescent Med J*. 2015;**17**(9). e30974. [PubMed ID: 26473081]. [PubMed Central ID: PMC4601211]. https://doi.org/10.5812/ircmj.30974.
27. da Silva MT, Barros AJ, Bertoldi AD, de Andrade Jacinto P, Matijasevich A, Santos IS, et al. Determinants of out-of-pocket health expenditure on children: an analysis of the 2004 Pelotas Birth Cohort. *Int J Equity Health*. 2015;**14**:53. [PubMed ID: 26051372]. [PubMed Central ID: PMC4467315]. https://doi.org/10.1186/s12939-015-0180-0.
28. Boone J. Basic versus supplementary health insurance: Access to care and the role of cost effectiveness. *J Health Econ*. 2018;**60**:53–74. [PubMed ID: 29913308]. https://doi.org/10.1016/j.jhealeco.2018.05.002.
29. Stabile M, Townsend M. Supplementary Private Health Insurance in National Health Insurance Systems. In: Culyer AJ, editor. *Encyclopedia of Health Economics*. Amsterdam, The Netherlands: Elsevier; 2014. p. 362–5. https://doi.org/10.1016/b978-0-12-375678-7.00924-x.
30. Xu K, Evans DB, Kadama P, Nabyonga J, Ogwal PO, Nabukhonzo P, et al. Understanding the impact of eliminating user fees: utilization and catastrophic health expenditures in Uganda. *Soc Sci Med*. 2006;**62**(4):866–76. [PubMed ID: 16139936]. https://doi.org/10.1016/j.socscimed.2005.07.004.
31. Su TT, Kouyate B, Flessa S. Catastrophic household expenditure for health care in a low-income society: a study from Nouna District, Burkina Faso. *Bull World Health Organ*. 2006;**84**(1):21–7. [PubMed ID: 16501711]. [PubMed Central ID: PMC2626518]. https://doi.org/10.2471/blt.05.023739.