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Catastrophic Health Expenditure and Impoverishment of Syrian Refugees in Egypt

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Abstract

The present study aims to measure the incidence and the concentration of catastrophic health expenditures, the impoverishment of Syrian refugees living in Egypt due to health expenditures, and the determinants leading to catastrophic expenditures. This study used quantitative data, collected through a household health access and utilization cross-sectional telephone survey on Syrian households registered with UNHCR Egypt. To estimate the incidence and intensity of catastrophic expenditures and impoverishment, the study used two methods and applied various thresholds to demonstrate the sensitivity of catastrophic measures. A logit model was estimated aimed at determining what factors influence the probability of catastrophic healthcare spending. 15.8% of the households spend > 30% of non-food expenditure in health care. Those spending more than 30% of non-food expenditure on health care spent 50.2% on average. The fourth and richest quintiles experience a higher incidence of catastrophic expenditures. After pay-ing for health care the poverty headcount increased 9.8 points, from 50 to 59.8%. The risk of incur-ring in catastrophic health expenditures increases with unemployment, urban residency, hospitali-sation, pregnant woman, disability presence and when the household head is female. One out of six refugee households experienced health expenditures in excess of 30% of non-food expenditures. Half of the Syrian Refugees in Egypt leave below the poverty line and an additional ten percent, around 12,000 individuals, are pushed below the estimated poverty line due to out-of-pocket health care payments.

Keywords:Catastrophic Health Expenditures, Impoverishment, Syrian, Syrian refugees.

Introduction

A refugee is someone who has been forced to flee his/her country because of persecution, war, or violence. United Nation High Commission for Refugees (UNHCR) identified 22.5 million refugees and 2.8 million asylum seekers by the end of 2016 [1].

Syria is the biggest humanitarian and refugee crisis of our time. Since the eruption of the Syrian conflict in 2011, Egypt has been host for a significant number of refugees. In August 2017, there were 123,000 asylum seekers and refugees from Syria registered with UNHCR in Egypt and a further 83,000 from other countries.

The global UNHCR urban policy advocates for the integration of refugees into the national health system as a sustainable strategy to guarantee access to health care. To obtain adequate healthcare, many households in Egypt rely on out-of-pocket payment (OOP) which increases the risk of becoming impoverished [2]. This burden of OOP could create barriers to health care access and use [3] for Egyptians and for refugees. One conception of fairness in payments for health care is that households ought not be required to spend more than a given fraction of their income on health care in any given period, and that spending in excess of this threshold can be labelled as "catastrophic"[4].

Catastrophic expenditure refers to the fact that falling ill may induce unpredictable shocks for household's living standards [5]. Many studies have measured the incidence and intensity of catastrophic OOP in low income countries, [6-7] showing that OOP leads to catastrophic spending and is a cause of impoverishment [8-9].

The present study aims to measure the incidence and intensity of catastrophic health expenditures (CHE), impoverishment and the determinants leading to CHE for Syrian refugees in Egypt. To our knowledge this is first study providing evidence of CHE for refugees.

Methods

Study Design and Setting

A quantitative design using a telephone survey was used for this study, where a representative random sample of Syrian households registered with UNHCR Egypt was contacted by phone.

The web-based Health Access and Utilization Survey (HAUS) questionnaire [10] was used for data collection. HAUS is a validated tool that has been developed by UNHCR Headquarter used by UNHCR in many countries to collect information on access and utilization of healthcare services. This study adapted the questionnaire to suit Egypt's context and translated it into Arabic.

The questionnaire included questions about household demographics, household health expenditures during the month preceding the survey, including spending on medicines, consultation, laboratory tests, diagnostic fees and hospitalization. It also included questions about household income from employment or from humanitarian assistance in the preceding four weeks.

Sample and Data Collection

Stratified systematic random sampling was used to select a representative sample of Syrian refugee households who are registered with UNHCR and have a phone number in UNHCR's database.

Stratification was based on Syrian refugees' geographical distribution in Egypt's governorates. The calculated sample size was 384 households. However, to account for the non-response that was experienced in previous surveys, 914 Syrian households were sampled using the aforementioned methodology. A total of 506 household's responses were finally obtained.

The survey was conducted by a private call centre between the 6th and 14th of September, 2017 after a training workshop for surveyors where role-playing technique was used. Following the training, the questionnaire was pilot tested on a sample of households and, based on feedback from interviewers, no final modifications were required.

Prior to data collection, information about the survey and its objectives was made available to the Syrian refugees' community on social media to ensure collaborative participation.

Following data collection, data was exported to Excel 2013, checked, cleaned and prepared for analysis by SPSS 24.0 and by ADePT.[1]

Expenditures were collected in Egyptian Pound (EGP) and converted into USD using the 2017 exchange rate. Exchange rate was 1USD = 17.6 EGP.

To ensure reliability, the preliminary expenditure data obtained from telephone interviews were triangulated with expenditure data obtained from Egypt Vulnerability Assessment undertaken by UNHCR through face-to-face interviews with Syrian refugee households.

[1] ADePT stands for Automated DEC poverty tables. ADePT is a product of the Development Research Group (DECRG).

Measuring CHE

CHE occurs if OOP payments for health care exceed a particular threshold of a household's resources: income, expenditure or consumption [8-9, 11]. Given the poor reliability and volatility of reported income of refugees, household expenditure is used as a proxy for effective household income [12]. We define CHE as a share of expenditure net of spending on basic necessities expressed as "nondiscretionary expenditure" following Wagstaff et al [11] and "capacity to pay" of Xu et al [9].

Measuring Incidence and Intensity of CHE

The incidence (H) of CHE can be expressed by head count. It is obtained by the proportion of households that incurred catastrophic payments and is estimated by the formula below [11]:

$$H = \frac{1}{N}\sum_{i=1}^{N} E_i$$

where N is the sample size. E is an indicator such that $E_i = 1$ if $\frac{T_i}{X_i} > Z$, and zero otherwise. Let T be OOP payments for health care, x be total household expenditure, and f(x) be nondiscretionary expenditure. Then, a household is said to have incurred in catastrophic payments if T/x, or T/[x-f(x)], exceeds a specified threshold budget share (z).

The catastrophic payments overshoot (O) denotes the average extent to which OOP exceed the chosen threshold for households that incurred in catastrophic expenditures. The household overshoot is estimated as follows:

$$O_i = E_i\left(\left(\frac{T_i}{X_i}\right) - z\right)$$

Then, average overshoot is simply written as:

$$O = \frac{1}{N}\sum_{i=1}^{N} O_i$$

H refers to the incidence of catastrophic payments, whereas O is the intensity of catastrophic payments. A concentration index (CI) was employed to measure the extent of socioeconomic inequality in CHE. It is defined as twice the area between the concentration curve and the line of equality [13-14]. The concentration index lies in [−1,1] [15], and its positive value indicates that a variable is more concentrated among the rich, and vice versa. The larger the absolute value of concentration index, the greater the inequality in CHE [16]. The concentration index (C) can be computed using the "convenient covariance" [17]: $\mathrm{C} = 2\,\mathrm{cov}(\mathrm{y_i}, \mathrm{R_i}) / \mu$, where C is concentration index, yi is CHE indicator, μ is the mean of CHE indicator and Ri is the fractional rank of household in the economic status distribution.

The weighted head count and overshoot measures were estimated as follows [8]: $H = H^w \cdot (1 - \mathrm{C}_e)$; $O^w = O \cdot (1 - \mathrm{C}_o)$. We used concentration indices, $\mathrm{C_e}$, and $\mathrm{C_o}$, for $\mathrm{E_i}$ and O_i, respectively, to measure the distribution of CHE in relation to household expenditures.

The weighted head count and overshoot measures show the impact of OOP when different weights are given to households depending on expenditure levels [14]. The households with the lowest expenditures are weighted by 2, and the households with the highest expenditures are weighted by 0, and the weight decreases with higher household expenditures. If the concentration index (Ce) is negative, the weighted head count (Hw) is greater than the head count (H) [15].

Measuring CHE and poverty line

Furthermore, we used the "Capacity to pay" to measure CHE adopting the World Health Organization (WHO) methodology [9]. We define catastrophic payments as OOP direct medical expenditure on health care in excess of a given share of capacity to pay, with measures of the total household (TEh) non-subsistence expenditure as a proxy of total income. Household capacity to pay (ctpayh) is then defined as household non-subsistence spending. Food expenditure may be lower than subsistence spending (SEh) for some households implying that the household's food expenditure (FEh) is under the estimated poverty line, In that case, non-food expenditure is used as non-subsistence spending.

Thus, $ctpay_h$ is computed as:

$$ctpay_h = \begin{cases} TE_h - SE_h \; if \; SE_h \leq FE_h \\ TE_h - FE_h \; if \; SE_h \leq FE_h \end{cases}$$

Considering scale economies in household consumption, the methodology uses adult equivalent household size rather than actual household size. The WHO has established the threshold at 40 % for developed countries but affirms that this percentage can change depending on the specific situation of the country [9]. We tested the threshold of 40% and 30%.

Considering that the poorer the household, the higher the share of total income or consumption devoted to food, calculations of subsistence expenditures and poverty line are based on the average food expenditure of households whose food expenditure share of total expenditures is in the 45-55 percentile range [18]. This gives the subsistence

expenditure per (equivalent) capita, which is also the poverty line (pl):

$$pl = \frac{\sum W_h * eqfood_h}{\sum W_h}$$

Where, $food45 < foodexp_h < food55$

The burden of health expenditures leading to CHE is defined as the OOP as a percentage of a household's capacity to pay.

Health Care Payments and Poverty

Impoverishment captures how far people are pushed below the poverty line as the result of health spending, and the possibility that health spending may push households who are already poor even further into poverty. Impoverishment effect of OOP payments for health care can be obtained by the difference between a poverty level with the gross of OOP payments (before health care payments) and a poverty level with the net of OOP payments (after health care payments).

First, we estimated the gross (of health payments) poverty ratio (HP^{gross}). This gives the percentage of the population living below the poverty line before health payments [11];

$$HP^{gross} = \frac{\sum_{i=1}^{N} S_i {P_i}^{gross}}{\sum_{i=1}^{N} S_i}$$

where ${P_i}^{gross}$ is equal to 1 if the per capita total expenditure of household (y_i) is less than the poverty line and 0 otherwise. si denotes the household size and N indicates the number of households in the sample. The gross (of health payments) individual-level poverty gap is estimated as:

$${g_i}^{gross} = {P_i}^{gross}(pl - y_i),$$

where pl refers the poverty line and the mean of poverty gap is simply found as:

$$G^{gross} = \frac{\sum_{i=1}^{N} S_i {g_i}^{gross}}{\sum_{i=1}^{N} S_i}$$

The net (of health payments) head count can be estimated by replacing ${P_i}^{gross}$ with ${P_i}^{net}$.

Where ${P_i}^{net}$ is equal to 1 if the per capita total expenditure of the household is less than the poverty line and the net of the health payments poverty gap is estimated as the replacement of ${g_i}^{gross}$ by ${g_i}^{net}$: ${g_i}^{net} = {P_i}^{net}(pl - y_i)$. A normalized poverty gap, which enables us to make international comparisons across countries with different poverty lines and currency units, is estimated as follows:

$$NG^{gross} = \frac{NG^{gross}}{pl}$$

A Logit Model of Determinants of CHE

A logistic regression analysis was used to identify the determinants of CHE. For the purposes of this study, a threshold of household spending higher than 30% of its capacity to pay (CTP) towards health care, was used as proxy for CHE in the model.

The basic functional form for the logistic regression is: $ln(\ y_i\ /(1-\ y_i) = \alpha + \Sigma\beta_i\ X_i$; where $ln(\cdot)$ is the natural logarithm, y is the dependent variable (the probability of a household facing CHE in the last month, α is the constant, X_i is each one of the independent or explanatory variables, β_i is the coefficient of independent variable X_i, and ε_i are the residuals or error terms.

The independent household variables are available socio-economic indicators such as age and gender of the head household, employment status, years of formal education, household size, living area (urban/rural), duration since arrival to Egypt, Governorates (region), number of children under 5 years, having a pregnant woman, facing hospitalization in the last year, presence of a person with disability, number of members with chronic illnesses, and income in the last month. The probability of CHE was calculated by Greene's logit equation [19] and the model goodness-of-fit was assessed by a Hosmer–Lemeshow test [20].

Results

Descriptive Results

Table 1 shows the summary statistics of the main household characteristics. The average household size was 3.7 members. Only 51.6% of the household heads reported being employed in the last month before the survey. Some 23% of the households reported having at least one pregnant woman in the last two years, and 27.5% reported having at least a child less than 5 years. More than half of the households (52.2%) reported having at least one member with chronic disease, and 10.9% having at least one member with disability.

The household average total monthly expenditure for the sample was 197.2USD, while the average reported income was lower than expenditure, 138.5USD, with 71 household heads (13.5%) reporting zero income. Household monthly capacity to pay or non-subsistence expenditure was 135USD.

The average OOP health spending per household over the four preceding weeks was 25.3USD, while

the average of OOP to household expenditure ratio was about 12.8%. Food was the most important component absorbing about 39.4% of total expenditure, followed by rent (26.5%). The bulk of OOP payments go towards purchasing drugs (37%), consultation (23%), laboratory and diagnostic tests (20.8%), and hospitalisation (17.5%).

Table 1 Description of Household Characteristics (n=506)

Variable	Variable Description	Mean (Standard Deviation) or number (%)
Household size	Average size of the Household	3.7 (1,88)
Income	Total Income of the Household in the last month in USD	138.5 (108.2)
Total Expenditure	Total Expenditure in USD	197.2 (134)
Out-Of-Pocket	Out of pocket health expenditure in USD	25.3 (67.1)
Non-food Expenditure	Capacity to Pay or non-subsistence expenditure	135 (116.4)
HH. Age	In years	40.2 (0.58)
HH. Gender	Male	81.8%
	Female	18.2%
HH. employed	Yes=1	51.6%
HH. Educational Level	No studies	5.1%
	Preparatory (6 years)	27.9%
	Primary (9 years)	50.6%
	Secondary (12 years)	10.5%
	Institute/technical degree/ University (> 12years)	5.7 %
Urban	Household residing in an urban area	90%
Having Pregnant Women	Household has at least one pregnant women in the last two years = 1 Otherwise = 0	23%
Having Child Under 5 years	Household has at least one child under 5 years	27.5%
Household with Members Chronic disease	Household has at least one member with chronic disease = 1 Otherwise = 0	52.2%
Household with Members with Disability	Household has at least one member with Disability = 1 Otherwise = 0	10.9%

Note: HH = household head. Table 2

Catastrophic Health Expenditures

Incidence and intensity results of CHE are shown in Tables 2 and 3. They are defined for health expenditures as a share of total household expenditure, non-food expenditure and capacity to pay using various threshold budget shares z.

Results show that as the threshold rises from 10 % to 15%, 30 % and 40% of total expenditures, the estimate of the incidence of CHE falls from 47.8 % to 29.9%, 7.4 % and 4.1%, respectively. For instance, 7.4% of the households spends in excess of 30% of total expenditures, and 15.8% spends in excess of 30% of non-food expenditures. At the 30 % of non-food expenditures threshold, incidence is very close to the incidence of capacity to pay (15.6%) at the same threshold. Then, as expected, incidence falls as the threshold increases.

CHE intensity is measured in Table 2 by the overshoot: OOP health payments in excess of a catastrophic payments budget share threshold of 30% represent 1.5% of total expenditure and 3.2% of non-food expenditure. The mean overshoot for total expenditure falls from 6.6 to 0.9% as the threshold rises from 10 to 40% and from 11.5 to 2.0% for non-food expenditure. Mean positive overshoot (MPO) in Table 2 indicates that those spending more than 15% of non-food expenditure on health care payments spent, on average, 34% (15+19%). And, those spending more than 30% of non-food expenditures on health care payments on average spent 50.2%. The mean positive overshoot (MPO) does not decline as the threshold is raised.

Table 2. Incidence and Intensity of CHE

Catastrophic payment measures	Threshold budget share z			
OOP as share of total expenditure	10%	15%	30%	40%
Headcount-H (%)	47.8	29.9	7.4	4.1
Overshoot-O (%)	6.6	4.7	1.5	0.9
Mean Positive Overshoot-MPO (%)	13.9	15.6	20.4	22.8
OOP as share of non-food expenditure				
Headcount (%)	58.3	47.0	15.8	9.8
Overshoot (%)	11.5	8.9	3.2	2.0
Mean Positive Overshoot (%)	19.7	19.0	20.2	20.1
OOP as share of capacity to pay				

Table 3, shows the incidence of CHE across quintiles. For all thresholds and measures, the fourth and richest quintiles experience a higher incidence. For instance, for 8.3% of households in the poorest quintile, OOP exceed 30% of non-food expenditure; but, this proportion rises to 17.6% of households in the fourth quintile and to 33.4 for households in the richest quintile.

Table 3: Adverse Selection in Health Insurance

	OOP expenditure as share of total expenditure			OOP expenditure as share of non-food expenditure			OOP as share of capacity to pay
Quintile	10%	15%	30%	10%	15%	30%	30%
Poorest	18,2	13,9	3,8	31,8	22,2	8,3	13.2%
Second	22,3	14,4	2,5	37,5	25,3	10,5	12.1%
Middle	23,3	13,4	1,1	46,8	35,0	9,0	12.1%
Fourth	36,6	20,1	8,9	55,8	45,2	17,6	13.8%
Richest	49,1	38,4	20,4	62,7	52,4	33,4	29.8%

Note: OOP = out of pocket health expenditures.

Distribution sensitive CHE measures are presented in Table 4. The concentration index for catastrophic payments and for the overshoot is positive for both measures, total expenditure and non-food expenditure, and increasing as the threshold rises, indicating that the better off are always more likely to exceed the chosen threshold and that they are more likely to exceed higher thresholds. Also, the rank-weighted head counts in Table 4 are smaller than the unweighted head ratio at all levels of thresholds (Table 3). It also indicates that the better-off are more likely to incur in CHE. Similarly, the rank-weighted overshoot was found smaller than the overshoot showing that the extent of excess health payments is smaller among the poor.

Table 4: Distribution-sensitive Catastrophic Payments Measures

	Distribution-sensitive Catastrophic Payments Measures					
	OOP expenditure as share of total expenditure			OOP expenditure as share of non-food expenditure		
	10%	15%	30%	10%	15%	30%
Concentration index, C_E	0.212	0.223	0.464	0.136	0.179	0.301
Rank-weighted headcount, H_w (%)	23.6	15.6	4.0	40.6	29.6	11.0
Concentration index, C_O	0.350	0.401	0.548	0.296	0.338	0.446
Rank-weighted overshoot, O_w (%)	3.0	2.1	0.7	6.3	4.5	1.8

Note: OOP = out of pocket health expenditures.

Household Impoverishment

The poverty line for a household composed of a single member equals 751EGP (42.6USD) per month, which is equivalent to $1.4 per day estimated. Household impoverishment was also estimated by calculating poverty levels using consumption expenditure before making health care payments

and after paying for health care. Both the poverty headcount and the poverty gap were calculated.

The results in Table 5 show that 50% of households were living below poverty line before paying for health care. After paying for health care, the poverty headcount increased by 9.8 points until 59.8%. This represents an estimate increase of 19.6% of population falling into poverty as a result of paying for health care.

The average shortfall from the poverty line (the poverty gap) was 6.7 USD before accounting for health care payments and 8.1 USD after accounting for health care payments. This represents an increase in poverty gap of 21.2 percent. The mean positive poverty gap does not change significantly before or after health payment. This suggests that the rise in the poverty gap is due to more households being brought into poverty and not because of a deepening of the poverty of the already poor.

Table 5: Poverty Headcount and Gap before and After OOP payments

			DIFFERENCE	
	Gross of health payments (1)	Net of health payments (2)	Difference Absolute (3) = (2) - 1)	Relative [(3)/(1)*100]
Poverty headcount (%)[1]	50.0	59,8	9.8	19.6
Poverty gap (USD) [2]	6.7$	8 .1	1.4	21.2%
Normalized poverty gap (% of poverty line)	15.7	19.0		
Normalized mean positive poverty gap (%) [3]	31.3	31.8		

Notes: Poverty line = 751 EGP =42.6$

1. *Percentage of population living below the poverty line.*
2. *Average deficit to reach the poverty line in the population*
3. *Average poverty gap of the poor divided by the poverty line*

Determinants of CHE

Table 6 presents the results of the multivariate logistic regression model for the determinants of CHE measures based on the capacity to pay. These estimates capture the values that maximise the log likelihood function of CHE. We found support for the hypothesis that the risk of incurring CHE increase with female headed household, unemployment, urban residency, hospitalisation, pregnant woman and disability presence.

Table 6: Determinants of CHE based on capacity to pay measures (n=506)

	Odds Ratio	**95% CI**
Constant	0.32***	
HH Age	1	0.97-1.02
HH Gender(Male)	2.03**	1.07-3.87
HH Unemployed	1.88**	1.02-3.46
HH years of formal education	0.99	0.93-1.06
Number of Household members	0,88	0,73-1,06
Urban	4.8**	1.19-19.21
Duration since arrival to Egypt	1.1*	0.99-1.23
Governorates (Cairo)		
Alexandria	0.6	0.21-1.74
6 October and Giza	0.32	0.97-1.1
Damietta	0.71	0.26-1.96
Qalyubia	-0.27**	-0.07-(-1)
Sharkia and others	0.18*	-0.04-(-0.76)
Income	1	
Hospitalisation	1.91**	1.01-.3.64
Num. of child<5 per household	1.1	0.64-1.91
Household with Pregnant woman	2.12**	0.99-4.5
Household with member having chronic illness	1.53	0.81-2.89
Household with member having disability	2.01**	0.98-4.14
Nagelkerke R Square = 0.166		
Hosmer and Lemeshow Test = 0.132		

*Notes: HH = household head. CI = confidence interval. The provided coefficients are the adjusted odds ratios. Robust 95% confidence intervals are presented in the third column. *** P <0.01; ** P < 0.05;*p<0.1*

The analysis showed that female-headed households are twice more unlikely to incur in CHE compared to male-headed household (OR=2.03; 95% CI= 1.07-3.87). Employment was protective factor against CHE. The odds of CHE are 1.88 (95% CI=1.02-3.46) higher among households whose head is not employed. The education level of the household heads was not a significant determinant of CHE in our study, and employment counts more than education in protecting households against CHE.

The results revealed that urban households are less protected against CHE than rural households. In particular, urban households are 4.8 times (95% CI: 1.19-19.21) more likely to incur in CHE compared to rural households. Also, regression results showed that the likelihood to face CHE varies across the Governorates: a rural governorate such as Qalyubia is more protected compared to Greater Cairo.

The cost of secondary health care services is very high in Egypt wherever in public or in private facilities. The analysis confirmed that households who had a member hospitalised in the last month had twice the likelihood to face CHE (OR = 1.91; 95% CI = 1.01-.3.64).

While households with young children (less than five years), or with a member having chronic disease were not statistically significantly affected by CHE, households having a member with disability is an important risk factor for CHE (OR = 2.01; 95% CI = 0.98-4.14). Also, households with a pregnant woman would increase twice the risk of CHE compared to household with no pregnant woman (OR = 2.12; 95% CI: 0.99-4.50).

Discussion

The incidence of CHE for Syrian refugees in Egypt is lower when OOP expenditures are expressed as a percent of total expenditure rather than as a percent of non-food expenditure or capacity to pay. This implies that food expenditure makes up a high proportion of total expenditure, as it is typical of low income countries [21]. Wagstaff et al [11] suggest that if health spending is income elastic, then non-food expenditure may be preferred for the denominator of the budget share to better detect catastrophic payments among the poor.

Our results show that the “richer” households of the sample (or households with a higher capacity to pay) are more likely to incur CHE. Similar results were reported for Mongolia as well as for other developing countries [22, 23]. This may be explained because patients in the richest group were more inclined to visit and/or have easily access to health care services. The low-income groups are substantially less likely to access specialized health care services at the higher referral levels due to both healthcare costs, and non-healthcare costs, such as transport and meals, indicating an unmet need of the poorest quintiles due to financial access barriers.

While financing is one of the most important elements of a health system, knowing the factors associated to CHE would help policy makers to better plan for the future. As expected, none of the households reported having any health insurance so this variable was not included in the analysis. The results of the logistic regression found support for the hypothesis that the risk of incurring in CHE increases with female and unemployed headed household. The duration of the stay in Egypt for Syrian refugees was only found significant at 10%, which may indicate that the longer they stay in Egypt the higher the chance for them to be exposed to CHE, which may be explained by the fact that refugees may have their savings exhausted or assets already sold. Income was not significant in our analysis, which is understandable considering that Syrian refugees have no legal access to the labour market, and income is associated to temporary informal labour or external humanitarian assistance.

The main limitations of this paper stem from the self-reported nature of the data and the use of a recall period of a month, which may be responsible for potential biases and measurement error in our sample. The analysis of CHE determinants has been limited due to the absence of more detailed information on perceived quality of life and previous types of illnesses. Also, we have only focused on the costs of medical care, but not on full income losses associated with illness.

Conclusion

The proportion of households facing CHE varies according to the CHE measure and threshold, but approximately one out of six refugee households experienced health expenditures in excess of 30% of non-food expenditures, which represented half of their non-food expenditures. Our study indicates that half of the Syrian Refugees in Egypt live below the poverty line and that an additional ten percent, around 12,000 Syrians in Egypt, are pushed below the estimated poverty line due to OOP. The design of appropriate intervention mechanisms in order to improve equity in access, insurance and payment for health care may protect vulnerable refugees against financial risk, and, subsequently, reduce the incidence of CHE and impoverishment.

A better knowledge of the determinants of CHE may be a useful tool to identify those refugees at a higher health risk and the need of extraordinary healthcare expenditures that can lead refugees to poverty.

Furthermore, UNHCR should continue to invest in the national health system and promote quality of care. This would not only increase access to public healthcare, address financial barriers of access to health systems and subsequently improve refugees' health and integration into society, but it also would protect households from financial risks arising from health expenditures.

Future research and policies should extend to alternative insurance and financing health care mechanisms, such as cash subsidies and community based health insurance, in order to improve household protection against CHE.

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Competing Interests

No competing interest.

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