What has been the progress in addressing financial risk in Uganda? Analysis of catastrophe and impoverishment due to health payments

Authors:

Brendan Kwesiga[1*], Tom Aliti[2], Pamela Nabukhonzo Kakande[3], Peter Byawaka[3,] Susan Najuko[2], Justine Hsu [4] , John E Ataguba[5], Grace Kabaniha[6]

*Corresponding author

Institutional Affiliation:

1. World Health Organization, Health Systems Cluster, Nairobi, Kenya, kwesigab@who.int
2. Ministry of Health, Planning Department, Kampala, Uganda aliti68@yahoo.com
3. Uganda Bureau of Statistics, Kampala, Uganda
4. World Health Organization, Economic Analysis Cluster, Geneva, Switzerland
5. Health Economics Unit, School of Public Health and Family Medicine, University of Cape Town, Cape Town, South Africa, john.ataguba@uct.ac.za
6. World Health Organization, Health Systems Cluster India Country Office, kabanihag@who.int

Abstract

Background: Monitoring progress towards Universal Health Coverage (UHC) requires an assessment of progress in coverage of health services and protection of households from the impact of direct out-of-pocket payments (i.e. financial risk protection). Although Uganda has expressed aspirations for attaining UHC, out-of-pocket payments remain a major contributor to total health expenditure. This study aims to monitor progress in financial risk protection in Uganda.

Methods: This study uses data from the Uganda National Household Surveys for 2005/06, 2009/10, 2012/13 and 2016/17. We measure financial risk protection using catastrophic health care payments and impoverishment indicators. Health care payments are catastrophic if they exceed a set threshold (i.e. 10% and 25%) of the total household consumption expenditure. Health payments are impoverishing if they push the household below the poverty line (the US$1.90/day and Uganda's national poverty lines). A logistic regression model is used to assess the factors associated with household financial risk.

Results: The results show that while progress has been made in reducing financial risk, this progress remains minimal, and there is still a risk of a reversal of this trend. We find that although catastrophic health payments at the 10% threshold decreased from 22.4% in 2005/06 to 13.8% in 2012/13, it increased to 14.2% in 2016/17. The percentage of Ugandans pushed below the poverty line (US$1.90/day) has decreased from 5.2% in 2005/06 to 2.7% in 2016/17. The distribution of both catastrophic health payments and impoverishment varies across socio-economic status, location and residence. In addition, certain household characteristics (poverty, having a child below 5 years and an adult above 60 years) are more associated with the lack of financial risk protection.

Conclusion: There is a need for targeted interventions to reduce OOP payments, especially among those most affected to increase financial risk protection. In the short-term, it is important to ensure that public health services are funded adequately to enable effective coverage with quality health care. In the medium-term, mandatory prepayment through health insurance will be needed to reduce the burden of OOP health spending further.

Key words: Financial protection, Uganda, Universal Health Coverage, health financing, health, trends, impoverishment, catastrophic health payments

Background

Uganda has expressed aspirations to attain Universal Health Coverage (UHC) [1]—a key component of the Sustainable Development Goals (SDGs) agenda. UHC is about ensuring that the population has access to needed health services that are of adequate quality to be effective, without facing any financial risk that results from paying out-of-pocket (OOP) for health services [2-4]. Many countries, including Uganda, still face challenges to achieving UHC [5]. For example, in Uganda, OOP payments for health services are still dominant, contributing up to 40% of Uganda's total health expenditure [6], even though user fees/cost-sharing in government facilities have been abolished since 2001. This phenomenon presents a paradox [7].

Safeguarding households from incurring financial risks and minimising the risk of falling into poverty, through ensuring that households' consumption of other basic needs such as food and shelter are not compromised due to direct OOP payments is critical [3]. This is even more important for a country like Uganda, where more than a quarter of the population (about 10 million Ugandans) in absolute poverty of the [8] and more than 40% remains vulnerable to economic shocks [9]. This situation raises an urgent need to implement health financing strategies that address the burden of OOP payments.

Financial resources to Uganda's health sector remain very inadequate. Government per capita health expenditure averaged US$9 in the past ten years [10]. This is grossly below the US$84 recommended to provide a minimum health care package [11] or the US$271 per capita estimated for achieving UHC by 2030 [12]. Furthermore, the proportion of the health budget allocated to the health sector (an indication of the level of prioritisation of the sector) declined to an average of about 7% in the period between 2015-2019 from about 9% in 2010-2015 [10]. Low levels of public health financing led to the health sector, increasingly relying on OOP health spending and external resources [6].

It is not surprising that Uganda's Health Financing Strategy 2015-2025 identifies the need to address the current burden of OOP payments [13]. In designing such strategies to address financial risk in the context of moving towards UHC, there is a need for up-to-date country-specific evidence on the extent and distribution of the burden of OOP health spending across the population.

Adequately monitoring of UHC at both the global and country levels is required to harness the benefits of efforts towards UHC. To achieve this goal, the World Bank Group

together with the World Health Organization (WB/WHO) have developed a framework for monitoring and evaluation of progress towards UHC [14]. This framework identifies two major indicators for monitoring financial risk protection—catastrophic health payments and impoverishing health expenditures. The catastrophic health payments indicator looks at the extent to which the share of OOP health payments in total household consumption expenditure does not compromise consumption of other household basic needs while the impoverishment indicator looks at the extent to which OOP payments increase both the incidence and intensity of poverty [14]. This framework also emphasizes the need to use several equity dimensions to monitor progress towards UHC.

Previous studies have analyzed financial risk protection in Uganda's health system [15, 16] using dated datasets. However, they have yet to show the trend in financial risk protection in Uganda using recent datasets, which is critical for monitoring progress towards the UHC goals. The objective of this paper is to present an updated assessment of financial risk protection in health using indicators from the WB/WHO framework. The paper also presents the trend from 2005/6 to 2016/17 to track Uganda's progress towards UHC. This study provides baseline information on the extent of financial risk protection in health as Uganda plans to roll out a National Health Insurance Scheme to decrease the reliance on OOP payments for health services and ensure financial risk protection for all.

Methods

Data

The Uganda integrated household survey, known as the Uganda National Household Survey (UNHS) is the main data for the analysis in this paper. The UNHS is undertaken every two or three years by the Uganda Bureau of Statistics (UBOS) and collects individual and household level data about socioeconomic characteristics, health status, health-seeking behaviour, and household expenditures including health expenditure. This paper uses the UNHS data for the years 2005/6, 2009/10, 2012/13 and 2016/17 containing data on 7400, 6887, 7500, and 17320 households, respectively. Stata version 13.1 [17] is used for data analysis.

Measurement of socio-economic status

137 Household consumption expenditure is used as the measure of socio-economic status as
138 opposed to household income because the former is recommended as a more reliable
139 measure of socioeconomic status in low-income countries like Uganda [18]. The
140 construction of Uganda's consumption expenditure aggregate is detailed elsewhere [19].
141 Adult equivalent household consumption expenditure is obtained by dividing total
142 household consumption by an adjusted household size (equivalence scale). This
143 approach for estimating the adjusted household size has been used elsewhere to assess
144 the impoverishing impact of OOP health spending [16]. The consumption for household
145 members below 18 years weighs less than that for adults in adjusting household
146 expenditures. The equivalence scale for Uganda is based on estimated calorie
147 requirements for different age groups [19].

148

Measurement of catastrophic health payments

150 Two thresholds are used to assess financial catastrophe from OOP health spending in this
151 paper. A household's OOP spending on health services is defined as catastrophic if it
152 exceeds 10% or 25% of total household expenditure (or consumption) [20]. Indicators of
153 the incidence (headcount) and intensity (the mean positive gap) are considered.
154 Catastrophic health payments headcount represents the percentage of household whose
155 OOP payments for health exceed 10% or 25% of total household expenditure. On the
156 other hand, the mean positive gap indicates by how much the households exceed the
157 chosen threshold for those that exceed.
158

Household characteristics associated with catastrophic health payments

160 The factors that are associated with incurring catastrophic health expenditures are
161 assessed using a logistic regression model.

$$\text{cata} = \alpha + \beta X + \varepsilon$$

163 where "cata" is the incidence of catastrophic health expenditures, cata = 1 for a
164 household with catastrophic expenditures, and 0 otherwise. The vector of explanatory
165 variables (X) includes equalised household size, the level of education, sex, employment
166 status and marital status of the household head, location of household (rural or urban),
167 presence of a child below 5 years and an adult above 60 years, and region of residence.
168 The explanatory variables and expected signs are shown in Table 1.

169 <<Table 1>>

Measurement of impoverishment due to OOP health spending

Impoverishment from OOP spending on health services captures the extent by which OOP payment affects both the incidence and the depth/intensity of poverty across the population [20, 21]. Unlike the assessment of financial catastrophe, impoverishment headcount from paying OOP for health services estimates the difference between the percentage of the population below a defined poverty line before and after adjusting for the effect of OOP health payments [20]. The impoverishment gap from OOP spending is the difference in impoverishment gap (i.e. the extent to which an individual falls below the poverty line) before and after OOP health spending. The normalised impoverishment gap is computed by dividing the impoverishment gap by the poverty line—this is the impoverishment gap as a proportion of the poverty line.

Two poverty lines are used to assess impoverishment from OOP health spending. The first is the international poverty line (i.e. $1.90/per day based on 2011 Purchasing Power Parity (PPP)[i]. The second is Uganda's national poverty line, which is region and location (urban/rural) specific. The average national poverty line is Shs. 29,505 but varies from Shs. 32106 per month in the central region (urban) to Shs. 28165 per month in the western region (rural). Uganda's national poverty line is constructed based on the calorie requirement of household members and then adjusted for household non-food expenditures ([19]).

Results

Catastrophic health payments

Table 2 indicates the trend of the catastrophic headcount and the mean positive gap for two thresholds (10% and 25%). For both thresholds, there has been a decreasing pattern in terms of the catastrophic health payments headcount between 2005/06 and 2012/13. However, there was an increase between 2012/13 and 2016/17, irrespective of the thresholds. Concerning the mean positive gap, there has been a decreasing pattern for both thresholds, decreasing from 2005/06 to 2016/17.

<<Table 2>>

Table 3 shows catastrophic payments disaggregated by social-economic status, urban/rural location, and region of residence. The incidence of catastrophic health expenditure was higher among the richer quintiles when compared to the poorest quintile in the first three years. The reverse was true in 2016/17, where the poorer

quintiles experienced a higher incidence of catastrophic payments. The incidence of catastrophic costs was much higher in the rural areas than in the urban areas in 2005/06 and 2009/10 with the pattern changing in 2012/13 and 2016/17. With regards to the regions, catastrophic health payments are highest in the Western and Central regions between 2005 and 2017.

There are some household characteristics associated with an increased likelihood of catastrophic health payments. As shown in Table 4, the factors which are significantly associated (5% level of significance) with an increased likelihood of catastrophic health expenditures are having a child, and an elderly member in the household.

<<Table 3>>

<<Table 4>>

Impoverishment

The results in Table 5 show that OOP payments are impoverishing in Uganda as they increase the incidence and depth/intensity of poverty among the poor across all the time period. The pattern is similar for all the poverty lines considered. A decrease in the impoverishment headcount was observed from 2005/06 through to 2016/17, although the decline in the impoverishment headcount between 2012/13 and 2016/17 is minimal.

<<Table 5>>

<<Table 6>>

Table 7 shows the disaggregation of impoverishment effect by socio-economic status, residence and region. The results show that the impoverishment effect is mainly concentrated in the middle and second richest quintiles of socio-economic status. It is also largely concentrated in the Central and Western regions. The distribution of impoverishment by residence is less clear-cut, showing a mixed pattern over the different years considered.

<<Table 7>>

Discussion

This study set out to assess the trends in the status of financial protection in Uganda with a view of informing strategies for strengthening financial risk protection. The findings show that Ugandans still lack financial risk protection, and there has been a reversal of the trend in catastrophic expenditure and impoverishment rates. This pattern threatens Uganda's ability to attain UHC. This pattern is not surprising especially in the context of the country's dependence on OOP payments, which requires urgent attention. The main strength of this study is that unlike all the previous studies which showed a snapshot analysis of the situation of financial risk protection at a point in time, this study was able to show a trend over time. This paper also shows equity aspects by disaggregating the financial risk protection indicators using various equity dimensions. It also shows factors that are associated with households facing financial risk due to direct OOP payments.

The results from this study are consistent with previous assessments of financial risk protection in Uganda and other low-income countries that depend heavily on direct OOP payments [15, 16, 22]. However, when we compare the results of Uganda to similar studies in Kenya [23, 24], Rwanda, Zambia, South Africa, Tanzania and Ghana [25-27], Uganda's estimated levels of catastrophic payments and impoverishment are higher in magnitude than all these countries. However, the results are consistent with literature as countries, where the contribution of OOP payments in total health expenditure is higher, are more likely to have higher levels of financial catastrophe or impoverishment from OOP spending. The main difference between Uganda and the other countries is that it has a much higher level of OOP payments (at 40%) but also most these countries have significant prepayment for health by establishing additional prepayment schemes in addition to general tax contributions from government budgets.

The results of this study provide important implications for policymakers in Uganda. The fact that there could be a reversal in the gains observed in the reduction of financial risk highlights the importance of continuous monitoring. It also implies that there is a need to move away from the business as usual approach in Uganda. Although Uganda established free care policy for primary health care services by abolishing user fees, the allocation of resources to the health sector from the national budget has not matched the need. Establishing a well-intentioned policy mandate without adequately funding it may produce reverse results as is being experienced in Uganda where OOP payments have continued to increase even in the context of no user fees [7]. To highlight the extent of underfunding, whereas, consumer price index published by the UBOS shows that the

price of consumables/utilities has increased by over 20% in the previous decade; the allocation to purchase of these has been stagnant (reduced in real terms when adjusted for inflation and exchange rate depreciation) [28]. This results in the lack of critical inputs required to provide quality health care in the public sector, leading to the private sector providing the majority of services [29]. This has led to inequitable access to services, as only those who can pay access services [30]. However, even for the non-poor who can pay for services within the private sector, this approach is not sustainable in the long-term as they may be impoverished. Increasing public financing would enable reduced exposure to financial risk, especially among the poor who pay OOP because of the limited availability of services in the public sector. Furthermore, one of the ways Uganda can reduce reliance on OOP payments is through moving towards mandatory health insurance. Uganda should fast track its plans for establishing a single pool mandatory national health insurance scheme so as to enable strategic purchasing of health care services and reduce direct OOP health spending. However, this should be done concurrently with quality improvement interventions. It has also been shown in other countries that well-designed supply interventions aimed at improving quality of care are protective against OOP payments and have operational simplicity and greater provider accountability [31].

This study is not without any limitations. The main limitation is the absence of information on access/utilization of services across the population for how financial risk was measured. The goal of UHC is to enable access to all who need care while minimizing the extent to financial risk. By not being able to show the extent to access, this paper did not show whether the lack of financial risk protection was influenced by the level of (or the lack of) access. Some additional limitations arise from the data used. Although the UNHS has critical data useful for this analysis, it has some major gaps that if addressed, would enable the survey to provide more useful information for decision-makers. For instance, one dimension that could be useful is to identify the type of service (i.e. inpatient or outpatient) used and rate of utilization to identify the drivers of OOP payments for policy targeting.

Conclusion

In this study, we present empirical evidence on the extent of financial risk protection in health in Uganda. The financial burden due to OOP payments remains high and there is a risk of a reversal of previous gains in reducing this burden. We show that some households are more vulnerable to incurring the burden of OOP health payments. The

310 study shows that Uganda needs to reconsider its strategies to decrease the burden of OOP
311 payments. In particular, there is a need to fast-track the design and implementation of
312 the mechanisms for protecting the population from financial catastrophe and
313 impoverishment, especially the planned mandatory health insurance scheme. This
314 should be done together with interventions aimed at improving effective coverage of
315 quality health care in the public sector facilities. Lastly, monitoring financial risk
316 protection should be institutionalised as part of monitoring the implementation of health
317 financing reforms in Uganda.
318

Abbreviations

320 DFID Department for International Development of United Kingdom

321 OOP   Out of Pocket Payments

322 PPP   Purchasing Power Parity

323 SDGs Sustainable Development Goals

324 UBOS Uganda Bureau of Statistics

325 UHC   Universal Health Coverage

326 UNHS Uganda National Household Survey

327 WB   World Bank

328 WHO World Health Organisation

329

Declarations

Ethics approval and consent to participate

332 The study did not involve or use human subjects or identifiable personal data, human
333 tissue, or animals and thus did not require ethical approval. The study was implemented
334 with the permission of and in collaboration with the Uganda Bureau of Statistics (UBOS)
335 that implement the Uganda National Household Survey (UNHS).

336

Consent for publication

338 The article is original, has not been published in a journal before, and is not currently
339 under consideration by another journal. All authors of the manuscript have read and

340 agreed to its content and are accountable for all aspects of the accuracy and integrity of
341 the manuscript.

342

Availability of data and material

344 The datasets analyzed in the current study are available from the Uganda Bureau of
345 Statistics. UNHS data is available on the UBOS website
346 (http://www.ubos.org/unda/index.php/catalog/51). Data analysis files and other
347 materials can be obtained from the corresponding author.

348

Competing interests

350 All authors declare no competing interests

351

Funding

355

Authors' contributions

357 Conceived and designed the study: BK, TA, PNK, SN, PB, JH and AEJ. Data cleaning and
358 analysis: BK, TA, PNK, PB, AEJ, JH and GK. Drafted manuscript: BK, GK, TA and AEJ.
359 Reviewed the manuscript: BK, TA, PNK, SN, PB and AEJ. All the listed authors have read
360 and approved the final manuscript submitted for publication.

361

Acknowledgements

367

368

References

1. Ministry of Finance, Planning and Economic Development,: **National Development Plan 2015-2020**. Kampala, Uganda: Ministry of Finance, Planning and Economic Development; 2015.
2. World Health Organization: **The World Health Report 2013: Research for universal coverage**. Geneva: World Health Organization; 2013.
3. World Health Organization: **The World Health Report 2010 - Health systems financing: the path to universal coverage**. Geneva: World Health Organization; 2010.
4. Ataguba JE, Ingabire M-G: **Universal Health Coverage: Assessing Service Coverage and Financial Protection for All**. *American Journal of Public Health* 2016, **106**(10):1780-1781.
5. McIntyre D, Obse AG, Barasa EW, Ataguba JE: **Challenges in financing universal health coverage in sub-Saharan Africa**. *Oxford Research Encyclopedia of Economics and Finance* 2018, **2018**(5):1-80.
6. Ministry of Health: **National Health Accounts 2012/13 and 2013/14**. In. Kampala, Uganda: Ministry of Health; 2016.
7. Nabyonga Orem J, Mugisha F, Kirunga C, Macq J, Criel B: **Abolition of user fees: the Uganda paradox**. *Health policy and planning* 2011, **26**(suppl_2):ii41-ii51.
8. Uganda Bureau of Statistics: **Uganda National Household Survey 2016/17**. In. Kampala, Uganda: Uganda Bureau of Statistics; 2017.
9. World Bank: **The Uganda Poverty Assessment Report 2016 Farms, cities and good fortune: assessing poverty reduction in Uganda from 2006 to 2013**. Kampala, Uganda: The World Bank; 2016.
10. Ministry of Health: **Annual Health Sector Performance Report**. In. Kampala, Uganda: Ministry of Health; 2017.
11. McIntyre D, Meheus F: **Fiscal Space for Health and Other Social Services.** . In. London: Chatam House; 2014.
12. Stenberg K, Hanssen O, Edejer TT-T, Bertram M, Brindley C, Meshreky A, Rosen JE, Stover J, Verboom P, Sanders RJTLGH: **Financing transformative health systems towards achievement of the health Sustainable Development Goals: a model for projected resource needs in 67 low-income and middle-income countries**. *The Lancet Global Health* 2017, **5**(9):e875-e887.
13. Ministry of Health: **Health Financing Strategy 2015-2025**. In. Kampala, Uganda: Ministry of Health, Uganda; 2016.
14. Boerma T, Eozenou P, Evans D, Evans T, Kieny M-P, Wagstaff A: **Monitoring progress towards universal health coverage at country and global levels**. *PLoS medicine* 2014, **11**(9):e1001731.
15. Xu K, Evans DB, Kadama P, Nabyonga J, Ogwal PO, Nabukhonzo P, Aguilar AM: **Understanding the impact of eliminating user fees: utilization and catastrophic health expenditures in Uganda**. *Social science & medicine* 2006, **62**(4):866-876.
16. Kwesiga B, Zikusooka CM, Ataguba JE: **Assessing catastrophic and impoverishing effects of health care payments in Uganda**. *BMC health services research* 2015, **15**(1):30.
17. StataCorp: **Stata: release 13 - Statistical software**. College Station, Texas: StataCorp LP; 2013.
18. Deaton A, Zaidi S: **Guidelines for constructing consumption aggregates for welfare analysis**, vol. 135: World Bank Publications; 2002.
19. Appleton S: **Poverty in Uganda, 1999/2000: Preliminary estimates from the UNHS**. *Nottingham, UK: University of Nottingham* 2001.
20. Wagstaff A, Doorslaer Ev: **Catastrophe and impoverishment in paying for health care: with applications to Vietnam 1993–1998**. *Health economics* 2003, **12**(11):921-933.
21. Foster J, Greer J, Thorbecke E: **The Foster–Greer–Thorbecke (FGT) poverty measures: 25 years later**. *Journal of Economic Inequality* 2010, **8**(4):491-524.

416 22. Ruhweza M, Baine S, Onama V, Basaza V, Pariyo G: **Financial risks associated with healthcare**
417 **consumption in Jinja, Uganda**. *African health sciences* 2009, **9**(2).
418 23. Barasa EW, Maina T, Ravishankar N: **Assessing the impoverishing effects, and factors associated**
419 **with the incidence of catastrophic health care payments in Kenya**. *International journal for*
420 *equity in health* 2017, **16**(1):31.
421 24. Chuma J, Maina T: **Catastrophic health care spending and impoverishment in Kenya**. *BMC health*
422 *services research* 2012, **12**(1):413.
423 25. Akazili J, Ataguba JE-O, Kanmiki EW, Gyapong J, Sankoh O, Oduro A, McIntyre D: **Assessing the**
424 **impoverishment effects of out-of-pocket healthcare payments prior to the uptake of the**
425 **national health insurance scheme in Ghana**. *BMC international health and human rights* 2017,
426 **17**(1):13.
427 26. Mills A, Ataguba JE, Akazili J, Borghi J, Garshong B, Makawia S, Mtei G, Harris B, Macha J, Meheus
428 F: **Equity in financing and use of health care in Ghana, South Africa, and Tanzania: implications**
429 **for paths to universal coverage**. *The Lancet* 2012, **380**(9837):126-133.
430 27. Nguyen HT, Rajkotia Y, Wang H: **The financial protection effect of Ghana National Health**
431 **Insurance Scheme: evidence from a study in two rural districts**. *International journal for equity*
432 *in health* 2011, **10**(1):4.
433 28. Ministry of Health: **Ministerial Policy Statement for FY 2018/19**. In. Edited by Health Mo.
434 Kampala, Uganda; 2018.
435 29. Konde-Lule J, Gitta SN, Lindfors A, Okuonzi S, Onama VO, BC. F: **Private and public health care in**
436 **rural areas of Uganda.** *BMC international health and human rights* 2010, **10**(1):29.
437 30. Kwesiga B, Ataguba JE, Abewe C, Kizza P, Zikusooka CM: **Who pays for and who benefits from**
438 **health care services in Uganda?** *BMC health services research* 2015, **15**(1):44.
439 31. Wagner N, Quimbo S, Shimkhada R, Peabody J. **Does health insurance coverage or improved quality**
440 **protect better against out-of-pocket payments?** Experimental evidence from the Philippines. *Soc*
441 *Sci Med*. 2018. doi:10.1016/j.socscimed.2018.03.024
442

List of Tables

Table 1: Explanatory variables for the logistic regression

Variables	Expected sign
Poverty (poor=1, non-poor=0)	+
Residence (urban=1, rural=0)	-
Region (reference=central)	+/-
Sex of household head (male=1, female=0)	+/-
Number of people in the household	+
Children below 5 years in the household (yes =1, no=0)	+
Adults above 60 years in the household (yes= 1, no=0)	+
Education of household head (reference: no formal education)	-
Employment (reference: formal employment)	-
Marital status (married=1, not married=0)	+/-

+: Positive, -: Negative, +/-: Indeterminate

Table 2: Household catastrophic health payments

Year	10%		25%	
	Headcount (%)	Mean positive gap (%)	Headcount (%)	Mean positive gap (%)
2005/06	22.4	11.5	5.9	13.1
2009/10	21.4	11.0	5.4	12.2
2012/13	13.8	8.9	2.6	10.9
2016/17	14.2	8.8	2.7	8.2

Source: Authors' computation based on the UNHS 2005-2017 data

Table 3: Disaggregation of catastrophic health expenditure (10% of total household expenditure)

Disaggregation variable	2005/06	2009/10	2012/13	2016/17
Total	22.4	21.4	13.8	17.1
Socio-economic status quintiles				
Poorest	18.9	17.2	9.6	17.6
Second poorest	20.4	18.9	10.0	18.8
Middle	24.2	21.5	12.6	16.9
Second richest	26.5	24.2	18.1	17.6
Richest	22.0	25.0	18.7	14.7
Poverty Status				
Non-poor	23.7	22.6	14.8	16.7
Poor	19.5	17.2	9.8	18.3
Residence				
Rural	23.5	21.7	13.5	17.3
Urban	16.2	19.5	14.9	16.5
Region				
Central	20.3	21.9	19.8	19.1
Eastern	21.1	21.6	9.1	15.9
Northern	20.2	18.3	13.1	14.9
Western	27.8	23.1	13.8	18.2

Source: Authors' computation based on the UNHS 2005-2017 data

Table 4: Determinants of catastrophic health expenditure, 2016/17

Catastrophic health expenditure (10% of household expenditure)						
Independent Variables	Odds-ratio (OR)	SE.	z	P>z	[95% CI]	
Poverty (poor=1, non-poor=0)	0.4	0.0	-8.2	0.0	0.3	0.5
Residence (urban=1, rural =0)	0.8	0.1	-1.9	0.1	0.7	1.0
Region (R=central)						
Eastern	0.8	0.1	-1.5	0.1	0.7	1.1
Northern	0.9	0.1	-0.6	0.6	0.8	1.2
Western	0.8	0.1	-1.6	0.1	0.7	1.0
Household size	1.1	0.0	2.7	0.0	1.0	1.1
Sex of household head (male=1, female=0)	0.9	0.1	-1.0	0.3	0.7	1.2
Employment (R=formal)						
Casual/Subsistence	1.1	0.1	0.5	0.6	0.9	1.3
Unemployed	1.3	0.2	1.9	0.1	1.0	1.6
Children below 5 (yes =1, no=0)	1.3	0.1	3.1	0.0	1.1	1.5
Adults above 60 (yes= 1, no=0)	1.4	0.2	3.3	0.0	1.2	1.7
Education (R= no formal education)						
Primary level	1.1	0.1	0.7	0.5	0.9	1.4
Secondary level	1.0	0.1	-0.2	0.9	0.7	1.3
Tertiary	0.7	0.2	-1.7	0.1	0.5	1.1
Marital status (married=1, not married=0)	1.3	0.2	2.0	0.0	1.0	1.7
_cons	0.1	0.0	-13.5	0.0	0.1	0.2

Log pseudo likelihood   = -14632786
Number of obs   =   15,349
Wald chi2(15)   =   135.0
Prob > chi2   =   0.000
Pseudo R2   =   0.013

R= Reference category

Source: Authors' computation based on the UNHS 2016/17 data

Table 5: Impoverishment indicators using the international poverty line

	Pre-payment poverty (%) (A)	Post-payment poverty (%) (B)	Absolute difference (%) (B-A)
2005/06 (PPP=513.9492)			
Poverty headcount	51.8	57.0	5.2
Normalised mean positive poverty gap	35.2	37.0	
2009/10 (PPP=741.3262)			
Poverty headcount	46.3	50.8	4.5
Normalised mean positive poverty gap	33.4	34.9	
2012/13 (PPP=1043.083)			
Poverty headcount	64.0	67.2	3.2
Normalised mean positive poverty gap	39.4	40.2	
2016/17 (PPP=1161.989)	51.8	57.0	5.2
Poverty headcount	35.2	37.0	
Normalised mean positive poverty gap			

Source: Authors' computation based on the UNHS 2016/17 data

Table 6: Impoverishment indicators using Uganda's national poverty line

	Pre-payment poverty (%) (A)	Post-payment poverty (%) (B)	Absolute difference (%) (B-A)
2005/06			
Poverty headcount	31.1	35.6	4.6
Normalised mean positive poverty gap	35.2	37.0	
2009/10			
Poverty headcount	23.2	27.2	4.0
Normalised mean positive poverty gap	27.6	28.3	
2012/13			
Poverty headcount	19.7	21.7	2.0
Normalised mean positive poverty gap	26.4	26.7	
2016/17			
Poverty headcount	21.5	24.1	2.5
Normalised mean positive poverty gap	5.3	6.0	

Source: Authors' computation based on the UNHS 2016/17 data

Table 7: Disaggregation of impoverishment headcount

Disaggregation variable	2005/06	2009/10	2012/13	2016/17
Total	5.2	4.5	3.2	2.7
Socio-economic status quintiles				
Poorest	0.0	0.0	0.0	0.0
Second poorest	0.0	0.0	0.0	0.0
Middle	16.7	18.6	0.0	11.0
Second richest	8.3	2.5	14.9	2.5
Richest	1.0	1.5	1.2	0.0
Residence				
Rural	5.6	4.9	2.9	3.1
Urban	2.9	2.2	4.1	1.6
Region				
Central	5.4	3.4	4.8	2.5
Eastern	5.2	5.3	2.0	2.5
Northern	2.7	4.4	2.7	3.0
Western	6.9	4.9	3.4%	3.0

Source: Authors' computation based on the UNHS 2005-2017 data

---

[i] The PPP conversion rate for the different years surveys are; 2005/06 (PPP=513.9492) , 2009/10 (PPP=741.3262), 2012/13 (PPP=1043.083) and 2016/17 (PPP=1161.989)