

Annex 2

Annex 2.1: Estimation of the magnitude and intensity of catastrophic health expenditure (CHE)

The magnitude and intensity of CHE was estimated based on previously published methods as follows [1, 2]:

A household 'i' is said to have faced CHE if:

$$T_i/X_i > Z \dots\dots\dots (1)$$

Where T_i is the total out-of-pocket (OOP) payments for prevention and treatment of CVD household 'i' spent, X_i is the respective total household income and Z is the threshold chosen for CHE. In our analysis, the threshold for CHE is set at > 10% of household income.

The catastrophic headcount (H) for the sample, the proportion of households that faced CHE, is given by:

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

$$E_i = 1 \text{ if } T_i/X_i > Z \text{ and otherwise zero} \dots\dots (2),$$

where N is the sample size.

Households use various coping mechanisms other than current income to meet the OOP payments, we therefore deducted the amount of OOP payments financed through sources other than current income to estimate the adjusted CHE rate as recommended by others [3, 4].

The mean positive overshoot, the average amount by which households that suffered CHE exceeded the 10% household income threshold, was used to estimate the intensity of financial catastrophe households faced. We first assessed the catastrophic overshoot (*O*) defined as:

Overshoot (*O*) for household 'i' is given by:

$$O_i = E_i((T_i/X_i) - Z) \dots \dots \dots (3)$$

Overshoot for the sample:

$$O = 1/N \sum_{i=1}^N O_i \dots \dots \dots (4)$$

Mean Positive Overshoot (*MPO*) = *O*/*H*..... (2 & 4)

Annex 2.2: Household out-of-pocket expenditure

Table A.2.2.1. Annual out-of-pocket payment for prevention and treatment of cardiovascular disease in general and specialized hospitals in Addis Ababa, Ethiopia in 2015 US\$.

	OOP payment*	Mean	(SD)**	Median	(iqr)***	N
Public hospitals	total	96.6	(172.9)	45.4	(68.8)	306
	out-patient	70.5	(123.2)	41.0	(60.5)	294
	in-patient	246.1	(239.5)	195.1	(234.1)	40
Private hospitals	total	582.5	(600.4)	390.2	(514.4)	283
	out-patient	447.0	(448.1)	340.6	(371.0)	273
	in-patient	722.4	(577.5)	570.7	(535.7)	60
Ischemic heart disease	total	403.4	(519.2)	239.0	(452.4)	233
	out-patient	308.3	(366.9)	183.4	(355.6)	225
	in-patient	666.6	(502.0)	590.2	(402.0)	41
Stroke	total	451.0	(585.1)	243.9	(511.0)	83
	out-patient	229.9	(318.9)	78.0	(307.3)	71
	in-patient	511.8	(569.3)	378.0	(341.5)	39
Hypertension	total	229.4	(444.2)	60.6	(249.9)	235
	out-patient	203.4	(398.6)	58.5	(219.8)	233
	in-patient	367.5	(517.1)	243.9	(248.8)	18
Dyslipidemia	total	217.8	(337.5)	84.1	(244.4)	38
	out-patient	198.9	(311.3)	78.3	(178.5)	38
	in-patient	291.9	(59.9)	329.3	(85.4)	2
Reside in Addis	total	296.7	(478.8)	103.2	(339.0)	470
	out-patient	223.9	(351.8)	79.0	(281.0)	452
	in-patient	534.2	(546.0)	378.0	(494.3)	76
Reside outside Addis	total	464.6	(549.0)	271.0	(570.3)	119
	out-patient	363.8	(435.9)	219.5	(429.3)	115
	in-patient	580.2	(494.7)	465.9	(824.4)	24
Income quintiles ****	Q1	102.1	(170.7)	35.9	(91.2)	121
	Q2	219.5	(465.6)	59.1	(203.4)	157
	Q3	318.2	(403.2)	136.1	(405.9)	96
	Q4	464.1	(571.9)	293.2	(443.7)	128
	Q5	617.1	(606.9)	390.2	(584.1)	87

* out-of-pocket payment **standard deviation *** interquartile range **** total annual out-of-pocket payment both for out-patient and in-patient care disaggregated by income quintiles

Table A.2.2.2. Distribution of the study population by the type of hospital visited

	Public hospitals		Private hospitals	
	Percent (%)	[95 % CI]†	Percent	[95 % CI]†
Total	51.8	[47.5 56.1]	48.2	[43.9 52.5]
Q1	86.5	[78.0 93.0]	13.5	[7.0 20.0]
Q2	76.6	[69.4 93.8]	23.4	[16.1 30.6]
Q3	46.0	[35.3 56.6]	54.0	[43.4 64.7]
Q4	30.3	[21.6 38.9]	69.7	[61.1 78.4]
Q5	6.3	[0.3 12.3]	93.7	[87.7 99.7]

† 95% confidence interval for the mean

Table A.2.2.3 Time lost by patients due to illness related to cardiovascular disease or while seeking care for cardiovascular disease in Addis Ababa over one and twelve months period.

Time lost in number days			
Time lost over 1 month	Percent(%)	Time lost over 12 months	Percent(%)
<=1	73.7	<= 7	68.4
2 - 7	17.7	8 -14	11.9
> 7	8.6	> 14	19.7

REFERENCE

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4. Flores, G., et al., *Coping with health-care costs: implications for the measurement of catastrophic expenditures and poverty*. Health economics, 2008. **17**(12): p. 1393-1412.