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Health, Poverty, and Well-Being

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Poster Session

Time: Friday, November 11, 2022 [6:00 PM - 7:00 PM]

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The paper focuses on the aspect of health and poverty in Tanzania. The majority of the low-income people in the country are not able to afford routine medical check-ups nor undergo all stages of treatment, such people opt for other alternative types of treatment that they can afford. Medical services are mainly dictated by the ability to pay and the magnitude of poverty varies depending on the geographical location of a person.

Although, the issue of health is nowadays given much attention in recent literature, still needs `intense research. In this paper, we use cross-sectional data from the National Panel Survey (NPS) collected by the National Bureau of Statistics to keep track of what type of treatment the households spend on health services.

 The NPS questionnaire collected information from all members of the household and those of age 12 years and above were personally interviewed at the time of the survey. Variables such as locality, main activity, gender, and age of respondents were also obtained in order to provide a snapshot of the well-being at the household level. Health is informative about living standards and can facilitate the reclassification of poor and non-poor households, and better measurements of health statistics provide a significant indicator of poverty.

Keywords: *Health spending patterns and Wellbeing*

Introduction

Household health expenditures are the expenditures incurred by households on health care and include out-of-pocket expenditures and prepayments. OOPE are the payments made directly by individuals at the point of service where the entire cost of the health good or service is not covered under any financial protection scheme. When an individual/household has to bear the expenditures for health care out of pocket, most of the time expenditures tend to be high in relation to their income thereby leading to low living standards (reduction in expenditure on basic necessities like food and clothing). OOPE becomes a burden for the poor especially when they have to spend huge amounts of their disposable income(Ministry of Health and Family Welfare. Govt. of India, 2016).

Healthcare financing is predominantly out-of-pocket (OOP) payments in many developing and low-income countries, these pockets may push households toward poverty(Garg et al., 2022). The affordability of health care is a common concern, although the term is rarely defined(J. Weiner, 2018). The issue of affordability of health services has receivedincreasing attention over the past two decades. Initially, the focuswas on what are termed 'cost of illness' studies(Cleary et al., 2013).

Fundamentally, affordability is a function of income, spending, and judgments about the value of goods and services for their price(J. Weiner, 2018).Health service accessibility is a function of how well thegeographic location, organization, acceptability, and price of available resources (supply) fit or interact with health needsand the ability of a broad range of potential users (demand) to seek, reach, and pay for care(Haggerty & Levesque, 2015). For most individuals and families, healthcare affordability concerns are not conceptual or normative; they are expressed as cost barriers to needed care, delayed or skipped care, or high levels of medical debt.(J. Weiner, 2018), health services differ from other essential goods in that spending is heavily skewed, and the demand or need varies dramatically from person to person, and over time, as health status changes(J. Weiner, 2018)

Determining spending pattern in relation to magnitude of poverty is crucial in medical policies as it helps unlocking and revealing medical needs in among low-income, medium and high-income people

The problem

The cost of a medical consultation is far more of burden for the poor, ample evidence suggest that when prices are raised through cost recovery schemes the poor are more likely than the non-poor to cut back on their use of health services (Dayton et al., 2000)

Research objective:

Characterization of the hospitalization rates and overnight staying at the traditional healer as per respondents in past four weeks from the day of interview.

DATA and VARIABLES

We use the dataset from National Panel Survey (NPS) that wasconducted by the National Bureau of Statistics; the panel is representative of the entire population. The analysis used five (5) auxiliary variables.

   i. Number of people spend on in the past 4 weeks for all illness and injuries including for the prescription medicine, tests, consultation and in patient fees
   ii. Number of people spend on the past 4 weeks for medical care not related to an illness including preventive health care, pre-natal visits, check ups
   iii. Number of people spend on in past 4 weeks for non-prescription medicine including Panadol, fansidar, cough syrup etc
   iv. In the last 12 months: Number of people had hospitalized or have an overnight stay in medical facility
   v. In the last 12 months: Number of people stay overnights at a traditionally healer's or faith healer's dwelling?

Methods

Three approached were used; Descriptive analysis, Bayes theorem approach and Multiple linear regression model.

i)   Descriptive analysis

Table 1: Medical treatment types in percentages

	people paid for illness and injuries	people…not related to illness	people with overnight stay	people with overnight at traditional healer	people with non-prescribed medical care
	P(A)	P (B)	P(C)	P(D)	P(E)
Wave 1	9.8	1.7	4.8	1.6	22.8
Wave 2	10.3	0.4	6.6	1.7	19.7
Wave 3	11.1	0.2	4.6	1.2	13.9

Hospitalization

The results shows that hospitalization rate in first, second and third wave were 4.8%, 6.6%, and 4.6% meaning that out of 100 individuals arrived at the hospital, 5 up to 7 individuals paid for overnight stay at the particular hospital in all waves (**Table 1**).

ii)   Bayes theorem approach

The Bayes approach provides the most natural analytic framework while avoiding the abuses of subjectivism. Bayes' theorem is the fundamental means to pass between conditional probabilities (FLEISS et al., 2004).

Bayes theorem for condition probabilities is used to analyze and characterize the nature of associations between people who paid for treatment of illness and injuries and overnight stay at the hospital, in contrast to people who paid for medical care not related to illness and injuries given overnight stay at the hospital. We will also analyze the association between overnight staying at the traditional healer and paying for treatment for illness and injuries at the hospital.

Conditions for overnight staying at the hospital were: treatment for illness and injuries and medical care not related to illness and injuries. Conditions for overnight staying at the traditional healer were: (1) treatment for illness and injuries at the hospital (A); (2) treatment for illness and injuries and medical care not related to illness and injuries (AnB); (3) treatment for illness and injuries and medical care not related to illness and injuries and overnight staying at the hospital (AnBnC).

Let P(A) denote the percentage of people who paid for illness and injuries, P(B) denotes the percentage of people who paid for service not related to illness and injuries, P(C) denotes the percentage of people who paid for overnight stay at the hospital, P(D), denote the percentage of people who paid for overnight stay at the traditional healer and P(E) percentage of people who paid for non prescribed medical care.

$$P(C|A) = \frac{P(CnA)}{P(A)} \ldots (i)$$

Similarly provided P(A)≠0,

$$P(C|B) = \frac{P(CnB)}{P(C)} \ldots (ii)$$

The Bayes theorem states that;

$$P(C|AnB) = \frac{P(AnB|C)P(C)}{P(AnB)} \ldots (iii)$$

$$P(D|AnB) = \frac{P(AnB|D)P(D)}{P(AnB)} \ldots (iv)$$

$$P(D|AnBnC) = \frac{P(AnBnC|D)P(D)}{P(AnBnC)} \ldots (v$$

FINDINGS

Table 2: Results from Calculated conditional probabilities and Bayes theorem

	P(AnB)	P(C|A)	P(C|B)	P(C|AnB)	P(D|AnB)	P(D|AnBnC)	P(E|AnBnC)
Wave 1	0.167%	4.8%	5%	4%	2%	0.230%	0.008%
Wave 2	0.041%	6.6%	7%	6%	4%	0.433%	0.003%
Wave 3	0.022%	4.6%	5%	4%	4%	0.213%	0.001%

Hospitalization given treatment of illness or injuries
The results show there is 4.8% probability that people paid for staying overnight at the hospital given they paid for treatment of illness or injuries in the first wave. Similar results are observed in the third wave however; slightly different results are seen in the second wave (**Table 2**).

Hospitalization given medical care not related to illness
It is also observed that there 5% probability that people who paid for staying overnight at the hospital given they paid for medical care not related illness. Similar results are seen in wave three though slightly different results shown in second wave (**Table 2**).

Hospitalization given treatment of illness or injuries and medical care not related to illness
It is observed that there 4% probability that peoplepaid for staying overnight at the hospital given they paid for both treatment of illness or injuries and medical care not related to illness. Similar results are seen in the third wave however different results are seen in the second wave where there is about 6% of probability (**Table 2**).

Equality of hospitalization rates
We use chi-squared test of homogeneity of m binomial proportions. When the Chi-square (χ^2) is large, we infer that two or more of the true proportions differ among the populations, subgroups, or units sampled (FLEISS et al., 2004). How we further interpret the data depends on whether we view the true proportions as constants or as random variables.

Testing for equality of hospitalization rate given illness and injuries and without illness and injuries conditions, by comparing P(C) and P(C|AnB) there is no significant difference since Chi-squared value= 0.14756, df = 2, p-value = 0.09289.

Conclusion

From the results it can be concluded that, hospitalization or overnight staying at the hospital given an individual paid for illness or injury has a higher probability than the probability of individual who paid for treatment for illness and injuries and medical care not related to illness and injuries and is higher than the probability of individuals who paid for overnight stay at the hospital given they paid for treatment for illness and injuries and medical care not related to illness and injuries and overnight staying at the hospital. It can also be concluded that the probability of an individual who paid for overnight stay at the traditional healer given he went to the hospital and receive medical care is lower comparing other probabilities. There is also significant difference in the probabilities in all three waves.

iii)   Multiple linear regression results on Health spending

We used a multiple linear regression model to analyze relationship between health spending and explanatory variables (age, sex, marital status) a Regression analysis is one of the most widely used techniques for analyzing multi-factor data. (Douglas C.Montgomery, Elizabeth A.Peck, n.d.)

Health_spending	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
sex	1084.41	589.337	1.84	.066	-70.845	2239.665	*
hhsize	49.407	80.237	0.62	.538	-107.879	206.694	
urb_rur	-1431.577	593.528	-2.41	.016	-2595.046	-268.107	**
age_	1574.134	572.234	2.75	.006	452.406	2695.862	***
educ_c	1400.07	732.994	1.91	.056	-36.789	2836.93	*
employ_status	-622.156	172.854	-3.60	0	-960.994	-283.317	***
poor	-14.226	2.962	-4.80	0	-20.033	-8.419	***
Constant	-3184.675	2393.255	-1.33	.183	-7876.08	1506.731	

Mean dependent var	3966.883	SD dependent var		35322.673
R-squared	0.005	Number of obs		7985
F-test	12.548	Prob > F		0.000
Akaike crit. (AIC)	188368.184	Bayesian crit. (BIC)		188424.067

*** p<.01, ** p<.05, * p<.1

Concluding remarks
The results show that there is significant causality relationship between health spending and independent variables (sex, location, age, education level, poverty and employment status). However the results show that there is no significant causality relationship between health spending and household size.

Females are spending more money in health than males (p-value<0.1). Moreover people who are living in rural areas spend more money in health than people living in urban areas (P-value<0.1).

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