



Inequalities in Willingness to Pay for Zambia's National Health Insurance Scheme

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ABSTRACT

This paper investigates socioeconomic inequalities in household willingness to pay for national health insurance. The paper used data from the nationally representative Zambia household health expenditure and utilization survey. Contingent valuation was used to elicit willingness to pay using a bidding game technique. A concentration curve and a concentration index were used to measure inequalities in willingness to pay, while Wagstaff, et al. decomposition was used to identify the factors that contribute to these inequalities. The concentration index for socioeconomic inequalities in willingness to pay was estimated at 0.161, indicating that willingness to pay was concentrated among affluent households. The Wagstaff, et al. decomposition results suggested that the ability to pay, proxied by per capita expenditure, contributed most to the inequalities in willingness to pay. Thus, policy makers should target programs that create employment and income generating activities that absorb everyone regardless of their socioeconomic status.

Keywords: Willingness to pay; Socio-economic inequality; Concentration index; Decomposition; Zambia

INTRODUCTION

Universal Health Coverage (UHC) is a global health policy agenda that has been adopted as one of the health targets of Sustainable Development Goal (SDG) number 3, which is to ensure healthy lives and promote wellbeing for all ages (World Health Organization, 2015). This target states that we should "achieve UHC, including financial protection, access to quality essential healthcare services and access to safe, effective, quality and affordable essential medicines and vaccines for all". Consequently, a predictable and sustainable

health financing mechanism is therefore pivotal to health system reform if UHC is to be attained.

To this effect, the government of Zambia is in the process of implementing a mandatory national health insurance scheme. This is to avoid high costs people incur when seeking health care. The purpose of the scheme is to ensure that everyone starts paying in advance for future health care expenditures instead of having to pay when they are sick. A national health insurance scheme will offer people health care when they need it and protect them from high health expenditures and risks of being impoverished due to ill health and emergency health expenditures. The scheme will also assist in ensuring

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sustainable, predictable and dedicated financing for the health sector whilst at the same time providing financial risk protection for its citizenry.

In Zambia, such financing mechanism could be an important way for improving health care utilization and improving health status. Some of the major problems facing the health sector in the country include limited funds for healthcare, elevated disease burden especially in this advent of HIV/AIDS and COVID-19, staff shortages, low and inequitable utilization and poor quality health services. These problems prevent health care from having a notable impact on health. The national health insurance scheme will provide additional funding to the Zambian health sector along with tax financing, private health insurance and community based insurance.

Only a single study on willingness to pay for health insurance explored inequalities in willingness to pay. Dong, et al., documented inequalities in willingness to pay for Community Based Insurance (CBI) by expenditure quintile using data collected from a household survey in Burkina Faso. A bidding game method of contingent evaluation was used to elicit willingness to pay. The results from study show that the poorer people were willing to pay less for CBI. Dong, et al., study further stated that, households might be a better unit of enrolment in terms of equity than the individual, since the distribution of willingness to pay by household was less unequal than the distribution of willingness to pay by individuals. Unlike Dong, et al., study this paper adds to literature by not only documenting socioeconomic inequalities in household willingness to pay for national health insurance in Zambia but also decomposing the factors that contribute to the socioeconomic inequalities. Doing so will help policy makers with the levers with which to address inequalities in willingness to pay for the scheme [1-7].

Theoretical Framework

The conceptual framework discusses the way the analysis is modeled and the reasons behind the choice of models, in line with the literature review. The model specification is based on the neoclassical theory of welfare economics that assumes that households are rational. Households aim to maximize their utility or satisfaction from consumption of any given good, subject to their budget constraint. However, unlike in the market for consumer goods, demand for health products is derived demand. Implying that health is demanded not just for its sake but to enable households to carry out certain rewarding activities. In line with welfare economic theory defined above, this study defines willingness to pay as the maximum amount that a Zambian household is willing to pay to participate in the national health insurance scheme (Figure 1).

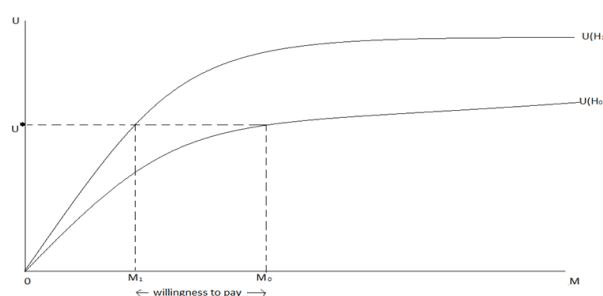


Figure 1: Willingness to pay for how much a household values health an improvement.

To illustrate household willingness to pay for the scheme as a health improvement strategy, assume that household utility $U(\cdot)$ depends on income M_i . Assume further that the introduction of national health insurance improves health status of a household from H_0 to H_1 . The willingness to pay for national health insurance is thus defined as:

$$U(M - Y, P, H_1) = U(M, P, H_0) \quad (1)$$

Where Y is willingness to pay and P is the price of non-health goods. Therefore, willingness to pay is the amount of money that if paid keeps the household at the initial level of utility. Figure 1 illustrates the concept of willingness to pay for national health insurance. The two curves U_0 and U_1 show how utility increases with income at two different health states H_0 and H_1 . To estimate a household's maximum willingness to pay for national health insurance, start with the initial level of health status H_0 and an income of M_0 and a utility level U^* . Next determine the lower income M_1 on an improved health status H_1 that results in the same utility level U^* as income M_0 in the original health state H_0 . Willingness to pay is the difference between M_0 and M_1 . Thus, willingness to pay is a measure of how much the household values a particular improvement in health [8-12].

MATERIALS AND METHODS

Data

This paper used secondary data from the 2014 Zambia Household Health Expenditure and Utilization Survey (ZHHEUS). The central statistical office with the support from the ministry of health and the university of Zambia conducted the survey to inform the national health accounts estimation and the development of the healthcare financing strategy. Using a two stage stratified sampling approach, it covered a total of 12000 households, including some 59,500 individuals, in all provinces and districts of the country.

Eliciting Willingness to Pay

Within the questionnaire, the bidding game version of contingent valuation was used to estimate willingness to pay for household head and other members of the family. Nine iterations were used in the bidding game and the starting bid was K3 000 per month, followed by the bids K2000, K1000, K500, K300, K100, K50, K20 and then K10. The final bid

question is a binary response question that indicates if the respondent is willing to pay less than K10 per month or not. This study mainly distinguished respondents who were willing to pay for the scheme from those that were not willing to pay at all.

Outcome Variable

The health outcome studied was willingness to pay, a binary variable. The English translation of the relevant survey question was: "Are you willing to pay for national health insurance scheme?"

Socioeconomic Rank

Per capita expenditure was used as the measure of socioeconomic status. Ekman explains that in situations with

reliable income statistics and a large section of the population in salaried work, socioeconomic status would be measured by the reported income from labour and capital. But in settings, such as those of most low-income countries, expenditure is taken as that measure. The use of per capita expenditure as a choice of socioeconomic status is necessitated by the relatively large sections of the population in unsalaried labour and the significant seasonal variations in household income (Table 1) [13-17].

Factors

The following factors were used in the decomposition analysis.

Table 1: Description of the factors.

Variable	Definition	Description
Age	Age of household head at last birthday	Continuous
Female	Indicate gender of household head, encoded as female=1, male=0	Dichotomous
Marital status	Indicate the marital status of household head: Never married=1, married=2, cohabiting=3, separated=4, divorced=5, widowed=6.	Categorical
Education	Highest attained level of formal education by household head: 0=none; 1=low; 2=middle and 3=high	Categorical
Employment status	Indicates employment type of the household head: Unemployed=1, informal employment=2 and formal employment=3	Categorical
Religion	Denomination of household head: 1=catholic, 2=protestant, 3=Jehovah's witness, 4=muslim, 5=traditionalist, 6=atheist and 7=others	Categorical
Household size	Number of people in a household	Continuous
Children	Number of children below the age of 5 years in a household	Continuous
Elderly	Number of persons above the age of 65 years in the household	Continuous
Urban	Location of household: 0=rural and 1=urban	Dichotomous
Visits	Total outpatient visits by household members in the last four weeks	Continuous
Days	Total number of inpatient days by household members	Continuous
Illnesses	Indicate whether any household member suffers from a chronic illness: 0=no, 1=yes	Dichotomous
Insurance	Health Insurance coverage of a household: 1=insured, 0=uninsured	Dichotomous
Per capita expenditure	Total per capita monthly household expenditure in Kwacha	Continuous

Note: All individual level characteristics refer to the characteristics of the respondent that answered the questions on household willingness to pay, namely the household head.

Concentration Curve and Concentration Index

Analyses on the extent of households' socioeconomic inequalities in willingness to pay were done in two stages. The first stage was to use a Concentration Curve (CC) to examine socioeconomic inequalities in willingness to pay for national health insurance. In the second stage, a Concentration Index (CI) was used. The standard concentration index is defined below:

$$CI = \frac{2}{\mu} Cov(h, r) \quad (2)$$

Where h is the willingness to pay for the scheme, r is the fractional rank of a household in the expenditure score distribution, Cov is covariance and μ represents the mean of the willingness to pay values. Since the outcome variable is binary, Erreyger's corrected concentration index was used. The index is desirable as it satisfies properties required for bounded variables. The equation for the Erreyger index is as follows:

$$CCI = 4\mu / (b-a) \times C \quad (3)$$

Where CCI is the corrected concentration index, μ is the mean of the willingness to pay, a and b are minimum and maximum values of willingness to pay, respectively, and C the standardized concentration index defined in equation (2). This study makes use of the coindex functionality in STATA to calculate concentration index and concentration curve.

The concentration index can either be positive or negative. The sign of the concentration index explains the relationship that exists between willingness to pay and position in the wealth score distribution. If the concentration index is zero, it means that there is no inequality in the distribution of willingness to pay by wealth and hence the concentration curves will coincide with the line of equality. A negative value of the concentration index is obtained if willingness to pay is disproportionately concentrated among the poorest households while a positive value of concentration index suggests willingness to pay is concentrated among the richest households. The value of the concentration index ranges between -1 and +1 and the concentration index provides information about the strength of the relationship. The closer the absolute values of the concentration index to one, the greater the level of inequality.

Decomposition Analysis

After estimating concentration index, the causes of the socioeconomic inequalities were determined. Decomposing socioeconomic inequalities helps to uncover specific factors that are potentially modifiable by policy decision makers. This was done using the Wagstaff, et al., decomposition method proposed by Wagstaff, et al.

Wagstaff, et al., Decomposition

Wagstaff, et al., proposed an approach that identifies factors that explain the socioeconomic inequalities in the willingness to pay for the national health insurance scheme. Following equation (4) below depicts the linear relationship between willingness to pay and its determinants:

$$y_i = \alpha + \sum_{k=1}^K \beta_k x_{ik} + \varepsilon_i \quad (4)$$

Where y is the binary outcome variable for willingness to pay, α is a constant, β measures the relationship between each explanatory factor (x) and the willingness to pay variable, and ε the error term. Like the concentration indices, the decomposition technique used for the standard Concentration Index (CI) was modified to suit the Corrected Concentration Index (CCI) as follows:

$$CCI(y) = 4 \left[\sum_{k=1}^K \beta_k \bar{x}_k CI(x_k) + GC_\varepsilon \right] \quad (5)$$

Where

$$\beta_k \bar{x}_k$$

Denotes the elasticity of willingness to pay to marginal changes in the k th factor. $CI(x_k)$ denotes the concentration index of the k th contribution factor, while GC_ε notes the generalized concentration index of the error term. The first term in equation as follows:

$$\left[\beta_k \bar{x}_k CI(x_k) \right]$$

Represents the contribution of factor k to socioeconomic inequality in willingness to pay. It constitutes the deterministic component of the willingness to pay concentration index. The second term (GC_ε) captures the unexplained component or the residual. The Generalised Linear Model (GLM) with binomial family and logit link was used to decompose the binary outcome variable. The use of GLM with binomial distributed outcome variable and specifying the identity link function is suitable choice in the decomposition analysis of the binary outcome, because it considers the structure of the distribution while preserving the link between the regressors and dependent variables. The contribution made by each factor is dependent on the sign and size of the calculated elasticity and concentration index for each factor.

$$\bar{x}_k \text{ (i.e. } CI(x_k) \text{)}$$

All things being equal, an increase (decrease) in inequality will increase (reduce) the degree of inequality in willingness to pay. This study also computed bootstrapped standard errors using 500 replications to determine whether the contribution of each factor to socioeconomic inequality in willingness to pay is statistically significant.

This study used the variables in **Table 1** as contributing factors in the decomposition. All categorical variables were converted to dummies in the Wagstaff, et al., decompositions. Data analyses were conducted in STATA software version 16.

RESULTS

Socioeconomic and Demographic Characteristics

Table 2 shows the socio-demographic characteristics of the households in the sample. The mean age for the household heads is 43.3 years and the mean number of children under 5 years old in a household is about one child per household. On average each household has 0.17 persons older than 65 years

of age. Most household heads are males (75.4%) and the majority of them are married (72.11%). The mean average household size is 4.97 and most of the household heads only reached a primary level of education (43%). Many of the household heads are protestants (67.96%). Employed household heads dominate the sample at about 78.81%, even though most of them work in the informal sector (88.5%). Many household heads reside in rural Zambia (58.11%) compared to 41.89% urban. More than ninety percent of the households (94.8%) do not have any insurance coverage. The majority of households had no members with chronic illnesses (60.31%), compared with those who had at least one member with chronic illness (39.69%). The mean total number of insured persons, the total number of outpatient visits, the total number of inpatient days and per capita household monthly expenditure (ZMK) are 1.25 persons, 67 visits, 1.25 days and K1,217.85 (\$190.29) respectively.

Table 2: Socio-demographic and other household characteristics.

Characteristics	Frequency	Percentage/Mean	Std. dev
Age in years	11,743	43.3	14.98
No. of children <5 years	11,944	0.89	0.96
No. of elderly >65 years	11,944	0.17	0.43
Gender			
Male	8,854	75.4	0.43
Female	2,891	24.6	0.43
Marital status			
Never married	706	6.02	1.51
Married	8,467	72.11	1.51
Cohabiting	37	0.32	1.51
Separated	275	2.34	1.51
Divorced	796	6.78	1.51
Widowed	1,460	12.44	1.51
Household size	11,944	4.97	2.55
Level of education			
None	1,183	10.18	0.83
Low	5,029	43.29	0.83
Middle	4,127	35.53	0.83
High	1,278	11	0.83
Religion			
Catholic	2,583	21.99	0.95

Protestant	7,982	67.96	0.95
Jehovah's witness	766	6.52	0.95
Muslim	56	0.48	0.95
Traditional	92	0.78	0.95
Atheist	109	0.93	0.95
Other	157	1.34	0.95
Employment status			
Unemployed	2,486	21.18	0.43
Formal	1,064	11.5	0.34
Informal	8,186	88.5	0.34
Place of residence			
Urban	4,921	41.89	0.5
Rural	6,824	58.11	0.5
Insurance			
Insured	624	5.2	0.24
Uninsured	11,320	94.8	0.24
Illness			
Yes	4,741	39.69	0.39
No	7,203	60.31	0.39
Total number of outpatient visits	11,944	0.67	1.03
Total number of inpatient days	11,944	0.16	0.48
Per capita monthly HH expenditure (ZMK)	11,944	1,217.85	2,599.26

Note: Individual socio-demographic characteristics represent those of the household head.

Willingness to Pay for National Health Insurance Scheme

The data showed that there is overwhelming support for the recently introduced national health insurance by the government of Zambia. About 90 percent of households in the sample rated the scheme as excellent, very good or good. Households in the rural areas were more positive about the scheme than urban households. Most households thought the scheme will make health care affordable and protect them against high health expenditures. The study found that, majority (80%) of Zambian households was willing to pay for the National Health Insurance scheme. The mean national health insurance contribution to be paid monthly was K90.76 (95% CI K84.29-K97.23) corresponding to 7.4% of average monthly household expenditure (K1,217.85). The median willingness to pay contribution was K10.00 implying that the 50th percentile of willingness to pay laid at K10.00. The number of households not willing to

pay for the scheme was 2,401 corresponding to 20% of all households. Of these households, about 77% indicated that they could not afford paying the contributions for the scheme. About 67% of households who stated that, they could not afford paying for the scheme were located in rural areas and their household heads were either unemployed or worked in the informal sector.

Concentration Curve and Concentration Index

Figure 2 below shows the concentration curve for willingness to pay for national health insurance scheme. The curve lies below the 45 degree line of equality, showing that willingness to pay is concentrated among the affluent households. The CI value of 0.161 is positive and highly significant at conventional levels. Thus, willingness to pay for national health insurance is concentrated among the non-poor segments of the population. The results from the CC and CI, therefore, indicate that willingness to pay for the scheme is

higher among non-poor households. In other words, poorer households are less willing to pay for national health insurance scheme in Zambia.

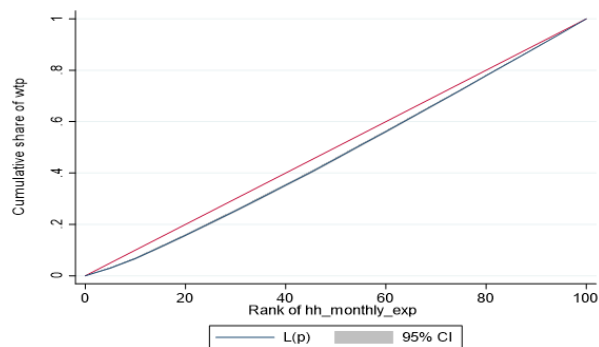


Figure 2: Concentration curve for willingness to pay for national health insurance.

Table 3: Decomposition of concentration index for willingness to pay.

Factor	Elasticity	CI	Absolute	S.E	%	Total (%)
Age	-0.067	-0.021	0.006***	0.001	3.6	3.6
Gender	-0.006	-0.045	0.001*	0.001	0.663	0.663
Marital status						
Unmarried	(base)	(base)	(base)	(base)	(base)	
Married	0.047	-0.025	-0.005***	0.001	-3.088	
Cohabiting	0	0.279	0	0	-0.032	
Separated	0.001	0.098	0.001	0	0.34	
Divorced	0.002	-0.032	0	0	-0.149	
Widowed	0.005	-0.067	-0.001	0.001	-0.883	
						-3.812
Religion						
Catholic	(base)	(base)	(base)	(base)	(base)	
Protestant	-0.019	-0.012	0.001**	0	0.584	
Jehovah's witness	-0.002	0.062	0	0	-0.259	
Muslim	0	0.22	0	0	0.233	
Traditionalist	-0.001	-0.36	0.001**	0		
Atheist	-0.001	-0.169	0.001**	0	0.469	
Other	-0.001	-0.048	0	0	0.125	
						1.759
Urban	-0.002	0.407	-0.003	0.007	-1.808	-1.808
Education						
None	(base)	(base)	(base)	(base)	(base)	

Socioeconomic Related Inequality in Willingness to Pay

Table 3 shows that the per capita expenditure factor makes the most statistically significant positive contribution to inequalities in willingness to pay of about 92.212%. Thus, reducing inequalities in households' ability to pay which is proxied by per capita expenditure reduces inequalities in willingness to pay by about 92%. Equally, household size makes the largest negative contribution to inequalities in willingness to pay (-10.822%). This implies that eliminating inequalities in household size will increase inequalities in willingness to pay by about 11%.

Low	0.012	-0.244	-0.010**	0.004	-6.445	
Middle	0.022	0.166	0.014***	0.003	8.625	
High	0.004	0.701	0.009	0.006	5.447	7.627
Insured	-0.004	0.658	-0.012***	0.003	-7.362	-7.362
Illness	0.01	0.005	0	0	0.119	0.119
Household size	0.064	-0.064	-0.017***	0.003	-10.822	-10.822
Children	0.003	-0.16	-0.0019	0.003	-0.999	-0.999
Employment status						
Unemployment	(base)	(base)	(base)	(base)	(base)	
Formal	0.004	0.571	0.008 ***	0.005	5.249	
Informal	0.028	-0.037	-0.004*	0.001	-2.578	2.671
Elderly	-0.008	-0.15	0.004***	0.001	2.698	2.698
Visits	0.001	-0.162	-0.001	0.002	-0.435	-0.435
Total inpatient days	0	-0.066	0	0	-0.06	-0.06
Per capita expenditure						
Quintile 1	(base)	(base)	(base)	(base)	(base)	
Quintile 2	0.016	-0.4	-0.025***	0.003	-15.765	
Quintile 3	0.025	0	0.001***	0.001	0.015	
Quintile 4	0.026	0.4	0.041***	0.004	25.667	
Quintile 5	0.04	0.8	0.133***	0.011	82.295	92.212
Explained					86.049	86.049
Residual			0.022**	0.009	13.951	13.951
Total			0.161		100	100

Note: CI: Erreygers concentration index; Absolute: Absolute contribution; SE: Bootstrapped standard errors for the absolute contributions obtained a bootstrapping method using 500 replications. *** p<0.01, ** p<0.05, * p<0.1

Other factors that made positive contributions to inequalities in willingness to pay include age (3.6%), gender (0.66%), religion (1.759%), education (7.627%), illness (0.119%), employment status (2.671%), and being elderly (2.698%). All positive contributions of variables show that reducing inequalities in these variables reduces the degree of inequalities in willingness to pay. Alternatively, eliminating inequalities in the positive contributing variables lowers inequalities in willingness to pay for Zambia's national health insurance scheme. The other factors that made negative contributions to inequalities in willingness to pay include

marital status (-3.812%), place of residence (-1.808%), insurance status (-7.362%), children (0.999), visits (-0.435) and total inpatient days (-0.06). Thus, all things being equal, all negative contributions of the variables imply that the elimination of inequality in these variables will increase the degree of inequality in willingness to pay for the national health insurance scheme.

The factors included in the paper explained about 86.049% of the overall inequality in willingness to pay. The remaining 13.951% are due to unexplained factors (residual). The

residuals are statistically not different from zero at the 1% level. **Figure 3** depicts the percentage of each contributing factor to overall inequality in willingness to pay. The largest contributor to the willingness to pay inequality is the ability to pay factor.

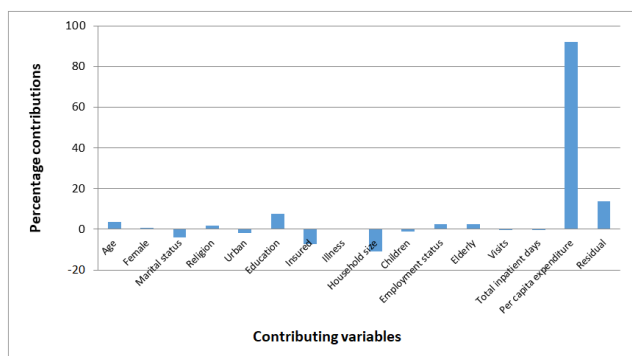


Figure 3: Percentage contribution of each factor to overall willingness to pay inequality.

DISCUSSION

This study examined the socioeconomic inequalities in household willingness to pay for national health insurance in Zambia. Given low health insurance coverage and substantial socioeconomic disparity in accessibility and affordability of health care among Zambians, this is the first study to undertake a comprehensive assessment of inequality in household willingness to pay for national health insurance scheme. Analyzing the population's willingness to contribute to financing the national health insurance scheme is likely to have a positive influence on the success of its implementation and its sustainability. This study finds that willingness to pay for the scheme is more concentrated among wealthy households in Zambia. Thus, affluent households are more willing to pay for national health insurance than poor households. Thus, policymakers should ensure that willingness to pay is evenly distributed among poor and affluent households. Furthermore, this study set out to determine the factors that contribute to socioeconomic inequalities in willingness to pay, using Wagstaff, et al., decomposition. Results from the Wagstaff, et al., decomposition of the binary outcome variable showed that the ability to pay proxied by per capita expenditure quintiles, which in Zambia's case remains indicative of socioeconomic status, explains most of the inequality in willingness to pay. Eliminating inequalities between non-poor and poor households in the ability to pay would reduce inequalities in willingness to pay for the national health insurance scheme. The results also showed that eliminating inequalities in educational attainment would reduce the inequalities in willingness to pay. Dispatch, et al., explains that the poor fail to access high school and college education in Zambia. Thus, the government should not only make basic education free but should also widen access to high schools and especially colleges and universities. If this problem is not addressed urgently, intergenerational inequalities will continue, and less educated households are unlikely to participate in health enhancing ventures

such as participation in health insurance schemes. Unemployment is another variable that is diverse in Zambia across age, gender and location. Thus, it is no surprise that employment status is among the variables that explain inequalities in willingness to pay. This means equalizing the distribution of employment status between non-poor and poor households will reduce the willingness to pay for national health insurance. Thus, the government should venture into employment creation activities to reduce inequalities in willingness to pay. The other factors that significantly explained inequalities in willingness to pay include age and having elderly members in the household. It is not surprising that variables such as age and having elderly household members showed an influence on inequalities in willingness to pay. Older people generally have poor health compared to young people. Ageing not only involves biological changes but also reflects accumulated effects of one's exposure to external risks, such as poor diet, and can be further influenced by social changes, such as isolation and loss of loved ones. Hence, it is difficult to separate willingness to pay for the scheme and age. Thus, in implementing national health insurance scheme, age related inequalities should take on greater urgency. The paper also alluded to the fact that the elimination of gender disparities would eliminate inequalities in the willingness to pay for the national health insurance scheme. Gender shapes all aspects of health and wellbeing, including the willingness to pay for the national health insurance. This is embedded in socially and culturally built restrictive gender norms that define roles and opportunities for all people, affecting determinants of health, risk behaviour and access to quality health services. As a result, women lose out on income-generating opportunities such as education and employment which may lead to them not being willing to participate in any health insurance scheme. Thus, gender equality should be an explicit goal for the Zambian government for sustainable implementation of the scheme.

CONCLUSION

The study examined socioeconomic inequalities in household willingness to pay for national health insurance scheme in Zambia. This study's results established that socioeconomic inequalities in willingness to pay are more concentrated among affluent households. In addition, differences in per capita expenditure accounted the most to socioeconomic inequalities in willingness to pay. The study suggested contributions adjusted for income and, use of exemptions or subsidies to help the poor. Thus, to attain greater equity in health, government should consider a policy of varying contributions according to income or exemptions and subsidies. In addition, policy makers should target policies that increase the health insurance coverage of the uninsured households to accelerate the global goals of financial protection and universal health coverage.

LIMITATIONS

This study has several limitations. The first limitation concerns the use of the bidding method of contingent valuation in eliciting willingness to pay which has a number of potential biases. Notable among them is the hypothetical bias. In this study, hypothetical bias is less likely because a simple scenario was provided to the respondents in the contingent valuation questionnaire. In addition, the hypothetical bias was reduced in that all the analyses were conducted only for the binary outcome variable which is less likely to suffer from the aforementioned bias.

The other limitation concerns the results of the decomposition analysis where it was stated that increases in willingness to pay inequalities is desirable for cross-subsidization to be possible. A problem arises in that it is difficult to establish the optimal increase in inequality for effective cross-subsidization. In other words, it is problematic to make any judgment on what the optimal level of inequality in willingness to pay for national health insurance should be. Furthermore, this study is an observational study and, therefore, does not imply causality of the findings. However, despite these limitations, this study is important in that it provides an understanding of the nature and drivers of socioeconomic inequalities in willingness to pay for national health insurance in Zambia.

RECOMMENDATIONS

The results of the paper confirmed that poor households are willing to pay less for national health insurance scheme. This reemphasizes the importance of households' ability to pay in designing good policies in the implementation of the scheme. Thus, to effectively implement the scheme, the government of Zambia needs to consider the economic status of households. Contributions for the scheme can be set on a sliding scale instead of flat rates. In addition, given that per capita expenditure is the main factor that explain inequalities in national health insurance, there is need to create employment and income generating activities that absorb everyone regardless of their economic status. Given that majority of household heads are in the informal sector where incomes are low, government should explore subsidization and variable mechanisms of contribution collection from the informal sector. These could include enrolment of microfinance loan recipients through a partnership between the bank and insurer, as piloted in Nigeria.

ETHICAL APPROVAL

The Zambia statistical agency formerly central statistical office under the provisions of the census and statistical act number 127 of the laws of Zambia granted ethical exemptions of this study. In addition, no identifying information of individuals was collected and only participants above the age of 16 years were interviewed after giving informed consent.

COMPETING INTERESTS

Authors declare that they have no competing interests.

AUTHORS' CONTRIBUTIONS

Both authors contributed to the design of the study, data analysis, and drafting of the manuscript. Both authors have reviewed and approved the final version of the manuscript.

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AVAILABILITY OF DATA AND MATERIALS

The dataset can be collected from the Zambia statistical agency offices.

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