

Effect of Wealth on Health Care Seeking Behavior And Out of Pocket Health Expenditure
in Malawi

Alero Agberen

A thesis
submitted in partial fulfillment of the
requirements for the degree of

Master of Public Health

University of Washington
2016

Committee:

Joseph B. Babigumira

Alisa M. Jenny

Program Authorized to Offer Degree:

Global Health

©Copyright 2016

Alero Agberen

Abstract

Background: Under-five mortality continues to be a source of concern globally, particularly in Sub-Saharan Africa. Exploring the association between wealth, health seeking behavior and out-of-pocket expenditure is necessary in order to pinpoint the areas to which resources should be channeled so as to make maximum impact in reduction of under-five mortality.

Methods: This study aims to highlight the disparity in seeking for healthcare and personal spending for healthcare across the different socioeconomic levels in Malawi. We performed a cross sectional population-based household survey in 2015. The survey contained data for children 2-59 months with a reported history of symptoms of non-severe pneumonia, malaria and diarrhea in the two weeks prior to the survey. A principal component analysis (PCA) was used to construct a wealth index (the predictor of interest) into quintiles. We carried out a bivariate and multivariate logistic regression of the predictor of interest, wealth index, and the outcome variables, health seeking behavior and out-of-pocket expenditure (OOP).

Results: The sample included 1,150 children between the ages of 2-59 months whose parents reported cough, diarrhea or fever in the past two weeks. In the unadjusted bivariate analysis and multivariate analysis adjusting for education, age of caregiver, area of residence and number of people in the household, there was no observed trend in seeking for treatment across the wealth quintiles. In the unadjusted bivariate analysis, the odds of seeking for care in government facilities among participants in the lowest wealth quintile was 26% less when compared to those in the highest wealth quintile (OR = 0.74, 95% CI: 0.39, 1.39). There were no observed trends when comparing the odds of incurring OOP expenditure among participants across the different wealth quintiles. Comparing dollar amount spent among participants who incurred OOP, participants in the highest wealth quintile were likely to spend

2.28 times more money when compared to those in the lowest wealth quintile, with statistical significance.

Conclusion: In a population with marginal differences in socioeconomic status, the concept of wealth may be inconsequential to their health seeking behavior or out-of-pocket expenditure. Ensuring a constant supply of medications and enforcing the non-payment of service fees in government health facilities may be a solution to improving health seeking behavior and reducing under-five mortality in Malawi.

Effect of Wealth on Health Care Seeking Behavior And Out of Pocket Health Expenditure
in Malawi

Alero 'M. Agberen

Chair of the Supervisory Committee:
Joseph B. Babigumira MBChB, MS, PhD
Department of Global Health

EFFECT OF WEALTH ON HEALTH CARE SEEKING BEHAVIOR AND OUT OF POCKET HEALTH EXPENDITURE IN MALAWI

BACKGROUND AND SIGNIFICANCE

The high rate of under-five mortality globally has been a source of concern for several years, earning the issue a spot in the eight-point millennium development goals (MDG)¹. Although the rate of under-five mortality declined by about 53% between 1990 and 2015 globally², the estimated 2015 rate of 16,000 deaths per day is still a divergence from the United Nation's projection for the year 2015, which was to reduce under-five mortality globally by two-thirds. The African continent, specifically Sub-Saharan Africa is responsible for the highest rate of under-five mortality globally^{3,4,5}. The odds of a child in Sub-Saharan Africa dying before the age of five years is 14 times more than that of a child of similar age in a developed or high-income country⁴. Neonatal mortality accounts for a large proportion of the total under five mortality. Statistics show that about 45% of the total under-five mortality globally, occurs in the first month of life⁴. In older children under-five, that is, children between the ages of 2-59 months, the top three causes of mortality globally are malaria, pneumonia and diarrhea^{4,5,6}.

The situation in Malawi is no different. With an under-five mortality rate of 64 per 1,000 live births⁷, pneumonia, malaria and diarrhea are the major causes of under-five mortality, accounting for about 40% of the total under-five deaths in Malawi⁸. Studies show that factors which drive these high rates of under-five mortality include poverty, poor access to health care, rural dwelling, malnutrition, and uneducated mothers^{4,6-9}. Several of these factors are at play in Malawi. Malawi is the poorest and one of the least developed countries in the world, with about 80% of the population dwelling in rural areas¹⁰. Although there have been some improvements in the health sector in Malawi in recent times, several bottlenecks still exist in the delivery of optimal health care in the country. Some of these include poor infrastructure, lack of equipment, lack of qualified and inadequate human resources, weak management and weak supply chain management systems¹¹⁻¹³.

Health seeking behavior for childhood diseases also has an impact on under-five mortality¹⁴. Health seeking behavior refers to the steps an individual takes in order to restore health¹⁵. In the context of this study, it is the willingness of an individual to seek treatment or advice for an ailment, outside the home. Several factors such as cost of treatment and the health care system in place, affect health seeking behavior^{16,17}. High cost of treatment beyond the affordability of the populace, as well as poor health systems, act as deterrents to health seeking behavior. Studies show that health seeking behavior can be predicted by the type and severity of the illness, socioeconomic status, and mother's education¹⁸⁻²⁰

Out of pocket cost is the amount of money an individual pays for health care (not covered by insurance of any sort). The Malawi government provides free health care in all its government-run public health facilities. Therefore, citizens who patronize government health facilities should ideally receive care at no cost to themselves. Socioeconomic status appears to be a recurrent feature in the factors leading to high under-five mortality, health seeking behavior and out-of-pocket expenditure. Individuals in the lowest socioeconomic level typically display the factors that affect under-five mortality and yet this same group of individuals as several studies have shown, are the least likely to seek care for a sick child. Due to the interplay of all of these factors, it is possible to hypothesize that a link exists between wealth and health

seeking behavior. But without any evidence-based findings from studies in the Malawian population, we are unable to categorically state that a relationship exists, hence the need for this study.

AIMS

This study aims to highlight the disparity in seeking for care and personal spending for healthcare across the different socioeconomic levels in Malawi. Studies in developing countries have shown that an association exists between an individual's level of wealth and their utilization of health services, care seeking behavior and spending out of pocket^{21,22}. But we were unable to find studies carried out in Malawi to explore these relationships. Furthermore, in lieu of Malawi's peculiarity in terms of poverty level and proportion of the population who are rural dwellers, we were curious to know whether our findings will be confirmatory of the other studies in similarly low-income countries.

Objectives:

1. To evaluate the association between wealth and health care seeking behavior for children 2 - 59 months of age in Malawi with non-severe malaria, pneumonia and diarrhea.

We hypothesize that people in the higher wealth quintiles exhibit a higher rate of health care seeking for any type of illness affecting their children under the age of five years.

2. To assess the association between wealth and out-of-pocket expenditure for health care for children between 2 - 59 months in Malawi.

We hypothesize that people in the higher wealth quintiles pay more out-of-pocket for healthcare than people in the lower wealth quintiles.

METHODOLOGY

Study design and data source

This is secondary data analysis of a cross sectional population-based household survey. This survey was a component of a quasi-experimental study¹³. Surveys were carried out in March 2014, 2015 and 2016 with the aim of assessing the impact of pharmacy assistants training and deployment on medication availability and improved pharmacy services in rural health centers in Malawi. This study uses the 2015 household survey data.

Study setting, site and sampling

Malawi has 28 districts spread across its north, central and south regions¹². For administrative purposes, these districts are further divided into traditional authorities which comprise of villages. The three tiers of health care facilities: the primary, secondary and tertiary health facilities operate at the different administrative levels; primary health facilities such as health centers in the villages, secondary health facilities such as district hospitals at the district level and the tertiary health facilities such as the specialist central hospitals which are referral hospitals^{11,13,23}

Four districts matched on region, geographic features, socioeconomic status of residents, risk level of malaria, pneumonia and diarrhea, access to social amenities were purposefully selected. One health center in each of the four districts was chosen, and the household survey conducted in the villages around the chosen health centers. The health centers are Dolo in Chikwawa district, Lobi in Dedza district, Ntaja in Machinga district and Khuwi in Ntchisi district.

Sampling was a two-stage cluster design. In the first stage, all enumeration areas (EAs) within each of the four selected districts were identified, based on the data available from the Malawi National Statistics Office. Clusters of the 30 EAs closest to the health centers were selected, from which we sampled. In the second stage of sampling, a central point such as a school was identified, a direction randomly selected, one house in that direction chosen at the start point and every tenth household in that direction selected to be screened¹³. The survey questionnaire was administered to households with eligible participants who met the inclusion criteria. The criteria for inclusion in the study include consent for participation by the representative of the household, one or more children between 2-59 months with a reported history of cough or difficulty breathing or rapid respiratory rate, fever and loose watery stools (symptoms of non-severe pneumonia, malaria and diarrhea respectively) in the 2 weeks prior to the survey.

Ethical considerations

Our study required no ethical clearance from any review boards as the data received was de-identified data. The original study from which we sourced our data was approved by the University of Washington Institutional Review Board and Malawi National Health Sciences Research Committee.

Data Analysis

The questionnaire was designed to collect information on household assets, illness type, health seeking behavior, out-of-pocket expenditure and medication use. This study uses the data on household assets, health seeking behavior and out-of-pocket expenditure. The total sample size was 1,150.

The analysis was done using Stata 14. With a principal component analysis (PCA), a wealth index which is our predictor of interest, was constructed from data collected in the household survey. Input for the PCA was a total of 38 variables which ranged from household assets (such as television, radio, cellular phone, and refrigerator), housing characteristics (such as type of roofing and flooring materials), housing facilities (such as electricity and water source), toilet facilities and ownership of land and livestock. A wealth index of 5 quintiles was created, the 1st quintile being the poorest and the 5th quintile the least poor.

The first outcome variable, health seeking behavior, was evaluated by 3 variables: 1) sought treatment vs. did not seek treatment, 2) sought treatment in one place vs. sought treatment in more than one place and, 3) sought treatment in a government facility vs. sought treatment in non-government facility. The second outcome variable, out-of-pocket expenditure (OOP) was evaluated by 2 variables: 1) incurred out-of-pocket expenditure vs. did not incur out-of-pocket expenditure and 2) expended less than USD 1 vs. expended greater than USD 1. The covariates considered in the analysis were: gender of child, age of the child, gender of caregiver, age of caregiver, education level of the caregiver, area of residence, number of persons in household, and type of illness.

Descriptive statistics summarize the demographic characteristics and clinical symptoms of the participants, using percentage distributions for categorical variables, means and standard deviations for continuous variables. A bivariate logistic regression of the predictor of interest; wealth index and the outcome variables, health seeking behavior and OOP. A multivariate logistic regression model was used to analyze the association between wealth and health seeking behavior and OOP, adjusting for education of caregiver, age of caregiver, area of residence and number of people in the household. Wealth index was transformed into 4 dummy variables with the 5th quintile being the reference category.

RESULTS

Participants' demographics and clinical characteristics

The analysis included 1,150 children between the ages of 2-59 months whose parents reported they had a cough, diarrhea or fever in the past two weeks. Over half of the participating children (50.8 %) were female 48.1% were male. Nineteen percent of the children were less than 12 months of age, 27.3% between 13 – 23 months and 53.6% between 24- 59 months. The majority of the care-givers (94.7 %) were female. The mean age of caregivers was 27.9 years, (SD 8.5). About three-quarters of the caregivers (74.4%) reported having a primary-level education, 8.3% reported having a secondary school-level education or higher and 12.5% had no formal education.

The distribution of participants across the four districts surveyed was almost even, with the highest proportion of 30.3% from Ntchisi district and the lowest proportion of 22.5% from Dedza district. The mean number of persons in each household was 5.2 (SD 1.7)

Over three-quarters (78.8%) of participants had fever, 23.5% had cough and 45.5% had diarrhea, in the two weeks prior to the survey. Some participants had more than one of the three illnesses.

Outcome variables

87.5% of the participants sought treatment for their ailments, of these 92.6% sought treatment in only one place and the remaining 7.4% sought treatment in two or more places. 97.3 % of those who sought treatment in more than one place received meds. Which suggests that one reason why participants seek treatment in more than one place is due to stock outs of medication in the first place of treatment visited. Only about 30% of those who sought treatment incurred OOP cost, with a mean amount of USD 1.30, SD 2.75

Table 1 Demographic and clinical characteristics of study participants

| Characteristic | Total | |
|--|--------------|----------|
| | N | % |
| Total | 1150 | |
| Gender of child | | |
| Male | 553 | 48.1 |
| Female | 584 | 50.8 |
| Missing | 13 | 1.1 |
| Age of child | | |
| < 12 months | 220 | 19.1 |
| 12 - 23 | 314 | 27.3 |
| 24 - 59 | 616 | 53.6 |
| Gender of caregiver | | |
| Male | 28 | 2.4 |
| Female caregiver | 1089 | 94.7 |
| Missing | 33 | 2.9 |
| Age of caregiver, mean (SD) | 27.9 (8.5) | |
| Education | | |
| None | 144 | 12.5 |
| Primary | 856 | 74.4 |
| Secondary or higher | 95 | 8.3 |
| Missing | 55 | 4.8 |
| Area of residence | | |
| Ntchisi (Khuwi) | 348 | 30.3 |
| Machinga (Ntaja) | 267 | 23.2 |
| Dedza (Lobi) | 259 | 22.5 |
| Chikhwawa (Dolo) | 293 | 25.5 |
| # of persons in household, mean(SD) | 5.2 (1.7) | |
| Type of illness | | |
| Cough | 270 | 23.5 |
| Fever | 906 | 78.8 |
| Diarrhea | 523 | 45.5 |

Table 2 Care seeking, type of provider visited, number of providers visited, and places received medications and OOP incurred

| Outcome variables | N | Total | % |
|---|----------|--------------|----------|
| Total | | 1150 | 100 |
| Sought treatment | | | |
| Yes | | 1006 | 87.5 |
| No | | 144 | 12.5 |
| Sought treatment at 1 place only | | | |
| | | 932 | 92.6 |
| Place of treatment | | | |
| Government facilities | | 796 | 85.4 |
| Other | | 136 | 14.6 |
| Sought treatment in more than one place | | | |
| | | 74 | 7.4 |
| First place of treatment if > 1 place | | | |
| Government facilities | | 72 | 97.3 |
| Other | | 2 | 2.7 |
| Sought treatment in > 1 place and received meds | | | |
| Yes | | 72 | 97.3 |
| No | | 2 | 2.7 |
| Meds received by people who sought treatment in > 1 place | | | |
| | | 117 | |
| Place where meds were received | | | |
| Government facilities | | 40 | 34.2 |
| Other | | 77 | 65.8 |
| Incurred OOP cost | | | |
| Yes | | 281 | 30.2 |
| No | | 725 | 77.8 |
| Among those who incurred OOP cost | | | |
| | | Kwacha | USD |
| mean | | 1012.7 | 1.30 |
| sd | | 2141.8 | 2.75 |
| q1 | | 45 | 0.06 |
| q2 | | 100.0 | 0.13 |
| q3 | | 1200.0 | 1.54 |
| skewdness | | 4.42 | 4.42 |

Logistic regression models of health seeking behavior

About 87% of participants sought care for their illnesses (malaria, pneumonia and diarrhea), with the percentages varying slightly across the wealth quintiles. In the unadjusted bivariate analysis and multivariate analysis adjusting for covariates, there was no observed trend in seeking for treatment across the wealth quintiles. In the unadjusted bivariate analysis, the odds for seeking for treatment among participants in the second poorest wealth quintile was 1.00 (95% CI: 0.57, 1.76), exactly the same as the odds in the least poor or highest wealth quintile which was the reference category. In the

adjusted multivariate analysis, the odds changed slightly, still with no observable trend. None of our findings was statistically significant. (Table 3)

Among participants that sought care, 92.6% sought care in one place and the rest 7.4% sought for care in two or more places. In the unadjusted bivariate analysis, the odds of seeking care in more than one place varied across the wealth quintiles, with no observable trend. In the multivariate analysis after adjusting for confounding covariates, the odds varied slightly, still with no trend. In all of the analyses, the least poor quintile was our reference category. (Table 4)

Table 3 Logistic regression model of probability of seeking care

| Characteristics | Sought treatment | | | | | | | | | | | |
|-----------------|------------------|---------|-----|------|------|-----------|-----------------------|-----------|----------------------|--------|--------|--|
| | Total | | No | | Yes | | Unadjusted Odds Ratio | | Adjusted Odds Ratio* | | | |
| | N | % | N | % | N | % | OR | 95% CI | OR | 95% CI | 95% CI | |
| Wealth Index | | | | | | | | | | | | |
| 1 st | 280 | 40 14.3 | 240 | 85.7 | 0.97 | 0.56 1.68 | 0.96 | 0.51 1.79 | | | | |
| 2 nd | 252 | 35 13.9 | 217 | 86.1 | 1.00 | 0.57 1.76 | 1.21 | 0.62 2.36 | | | | |
| 3 rd | 225 | 21 9.3 | 204 | 90.7 | 1.56 | 0.83 2.93 | 1.43 | 0.72 2.86 | | | | |
| 4 th | 227 | 25 11.0 | 202 | 89.0 | 1.30 | 0.71 2.38 | 1.58 | 0.81 3.07 | | | | |
| 5 th | 166 | 23 13.9 | 143 | 86.1 | 1.00 | | 1.00 | | | | | |

* Adjusted for education, age of caregiver, area of residence, and number of people in the household

Table 4 Logistic regression model of probability of seeking care in more than one place, among those who sought for care

| Characteristics | Sought treatment in more than one place | | | | | | | | | | | |
|-----------------|---|----------|----|------|------|-----------|-----------------------|-----------|----------------------|--------|--------|--|
| | Total | | No | | Yes | | Unadjusted Odds Ratio | | Adjusted Odds Ratio* | | | |
| | N | % | N | % | N | % | OR | 95% CI | OR | 95% CI | 95% CI | |
| Wealth Index | | | | | | | | | | | | |
| 1 st | 240 | 227 94.6 | 13 | 5.4 | 0.97 | 0.39 2.39 | 1.07 | 0.38 3.00 | | | | |
| 2 nd | 217 | 193 88.9 | 24 | 11.1 | 2.10 | 0.92 4.81 | 2.04 | 0.79 5.30 | | | | |
| 3 rd | 204 | 192 94.1 | 12 | 5.9 | 1.05 | 0.42 2.65 | 1.11 | 0.40 3.07 | | | | |
| 4 th | 202 | 185 91.6 | 17 | 8.4 | 1.55 | 0.65 3.70 | 1.41 | 0.56 3.57 | | | | |
| 5 th | 143 | 135 94.4 | 8 | 5.6 | 1.00 | | 1.00 | | | | | |

* Adjusted for education, age of caregiver, area of residence and number of people in the household

Of the participants who sought care, the odds of seeking care in a government hospital compared to other health facilities was highest among participants in the least poor wealth quintile. In the unadjusted bivariate analysis, the odds of seeking for care among participants in the lowest wealth quintile was 26% less when compared to those in the wealthiest quintile (OR = 0.74, (95% CI: 0.39, 1.39)). The odds and confidence interval remained the same in the adjusted multivariate analysis. Participants in the 4th and 5th wealth quintiles had a higher odds of seeking care in government hospitals. (Table 5)

Table 5 Logistic regression model of probability of seeking care in government hospitals, among those who sought for care

| Characteristics | Sought treatment in Government Hospital | | | | | | | | | |
|-----------------|---|---|----|-------|-----|-------|-----------------------|-----------|----------------------|-----------|
| | Total | | No | | Yes | | Unadjusted Odds Ratio | | Adjusted Odds Ratio* | |
| | N | % | N | % | N | % | OR | 95% CI | OR | 95% CI |
| Wealth Index | | | | | | | | | | |
| 1 st | 240 | | 35 | 14.58 | 205 | 85.42 | 0.74 | 0.39 1.39 | 0.74 | 0.39 1.39 |
| 2 nd | 217 | | 33 | 15.21 | 184 | 84.79 | 0.70 | 0.37 1.33 | 0.70 | 0.37 1.33 |
| 3 rd | 204 | | 30 | 14.71 | 174 | 85.29 | 0.73 | 0.38 1.40 | 0.73 | 0.38 1.40 |
| 4 th | 202 | | 24 | 11.88 | 178 | 88.12 | 0.93 | 0.48 1.83 | 0.93 | 0.48 1.83 |
| 5 th | 143 | | 16 | 11.19 | 127 | 88.81 | 1.00 | | 1.00 | |

* Adjusted for education, age of caregiver, area of residence and number of people in the household

Logistic regression models of OOP

Less than one-third (30%) of the participants who sought care had OOP expenditure for health care. The distribution is similar across the wealth quintiles with little variations. There are no observed trends when comparing the odds of incurring OOP expenditure among participants across the different wealth quintiles both in the unadjusted bivariate and adjusted multivariate analyses. (Table 6)

Table 6 Logistic regression model of probability of incurring OOP, among those who sought for care

| Characteristics | Incurred Out of Pocket Expenditure | | | | | | | | | |
|-----------------|------------------------------------|---|-----|-------|-----|-------|-----------------------|-----------|----------------------|-----------|
| | Total | | No | | Yes | | Unadjusted Odds Ratio | | Adjusted Odds Ratio* | |
| | N | % | N | % | N | % | OR | 95% CI | OR | 95% CI |
| Wealth Index | | | | | | | | | | |
| 1 st | 240 | | 175 | 72.92 | 65 | 27.08 | 1.29 | 0.79 2.09 | 0.96 | 0.59 1.58 |
| 2 nd | 217 | | 147 | 67.74 | 70 | 32.26 | 1.65 | 1.02 2.68 | 1.14 | 0.69 1.88 |
| 3 rd | 204 | | 148 | 72.55 | 56 | 27.45 | 1.31 | 0.80 2.16 | 1.04 | 0.62 1.75 |
| 4 th | 202 | | 144 | 71.29 | 58 | 28.71 | 1.40 | 0.85 2.30 | 1.28 | 0.77 2.12 |
| 5 th | 143 | | 111 | 77.62 | 32 | 22.38 | 1.00 | | 1.00 | |

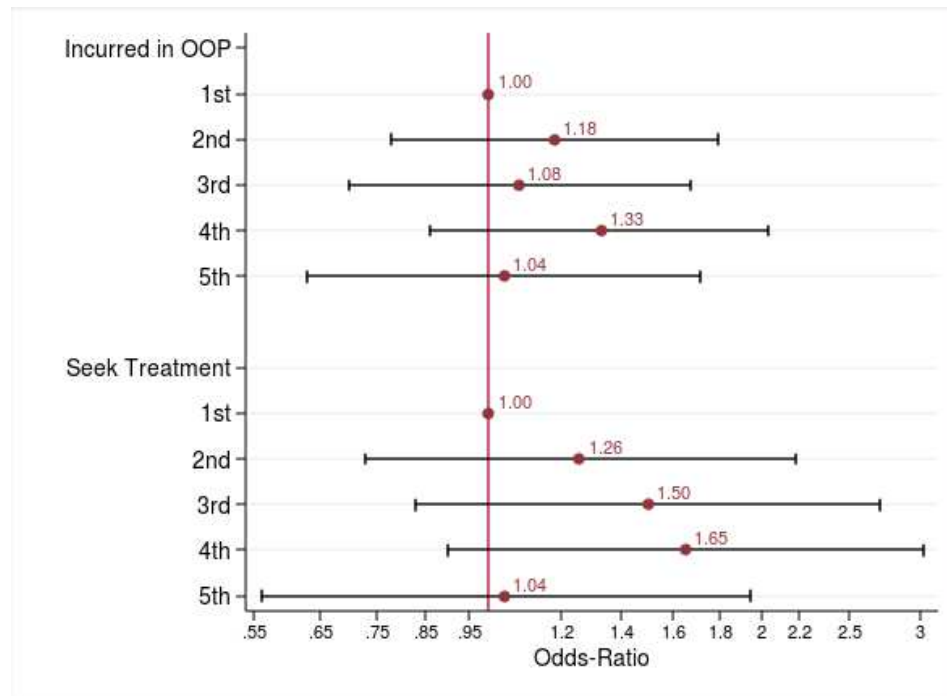
* Adjusted for education, age of caregiver, area of residence and number of people in the household

Table 7 Logit model of probability of incurring greater than 1 USD OOP, among those who incurred OOP

| Characteristics | Dollar amount Incurred | | | | | | | | | |
|-----------------|------------------------|------------|-------|------------|-------|-----------------------|-----------|----------------------|-----------|--|
| | Total | < 1 dollar | | > 1 dollar | | Unadjusted Odds Ratio | | Adjusted Odds Ratio* | | |
| | N | N | % | N | % | OR | 95% CI | OR | 95% CI | |
| Wealth Index | | | | | | | | | | |
| 1 st | 65 | 47 | 72.31 | 18 | 27.69 | 0.34 | 0.14 0.81 | 0.75 | 0.26 2.11 | |
| 2 nd | 71 | 52 | 73.24 | 19 | 26.76 | 0.32 | 0.14 0.76 | 0.60 | 0.22 1.65 | |
| 3 rd | 56 | 35 | 62.50 | 21 | 37.50 | 0.53 | 0.22 1.27 | 0.71 | 0.24 2.12 | |
| 4 th | 60 | 35 | 58.33 | 25 | 41.67 | 0.63 | 0.27 1.48 | 1.17 | 0.41 3.33 | |
| 5 th | 34 | 16 | 47.06 | 18 | 52.94 | 1.00 | | 1.00 | | |

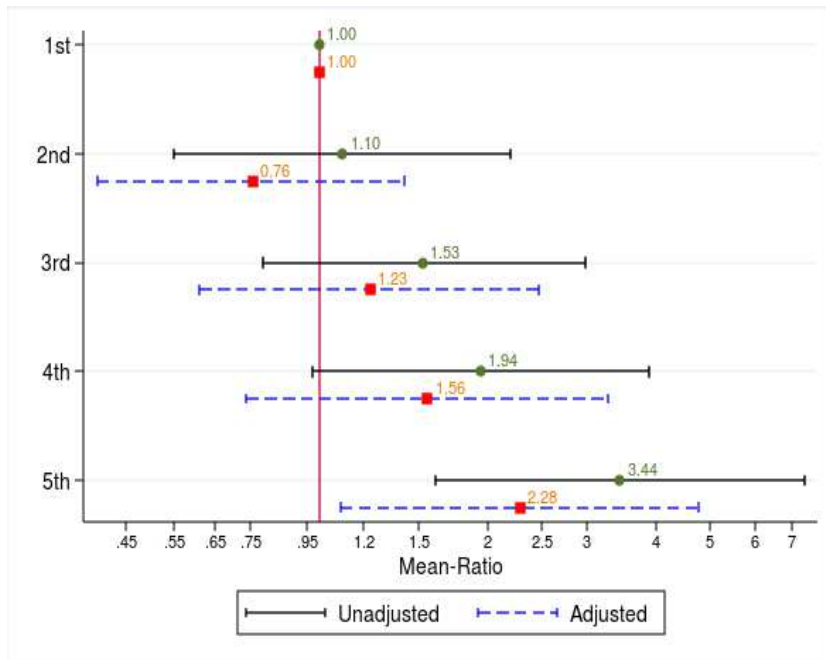
* Adjusted for education, age of caregiver, area of residence and number of people in the household

Figure 1 Plot showing odds of seeking treatment and incurring OOP by wealth index



The mean amount in USD expended by participants who had OOP expenditure was 1.30 (SD 2.75). The odds of expending greater than 1USD OOP among participants in the lowest wealth quintile was 0.34 (95% CI: 0.14, 0.81) times the odds in the highest quintile in the unadjusted bivariate model. There is an observable trend of increasing odds with increasing wealth quintiles. However, on adjusting for covariates, the trend is lost, though the odds remain higher among participants in the two highest wealth quintile (Table 7). Using a Poisson regression with robust standard errors to compare dollar amounts spent among participants who incurred OOP, participants in the highest wealth quintile were likely to spend 2.28 times more money when compared to those in the lowest wealth quintile, after adjusting for other covariates. This trend was statistically significant (Fig. 2).

Figure 2 Plot showing the ratio of dollar amount spent among those who incurred OOP



DISCUSSION

Most of the study participants sought care outside their homes, with the majority of them seeking care in only one place. Government facilities were favored above others by most participants, regardless of their wealth quintiles. Less than one-third of our study participants incurred out OOP. Among participants who incurred OOP, there was a noticeable trend in the dollar amount spent, where participants in the highest wealth quintile spent up to 2.3 times more than those in the lowest wealth quintile. While the analysis showed no significant associations, the findings show that service fees are still paid in some government hospitals and that medication stock-outs affect health seeking behavior and may be the reason participants incurred OOP.

The gender distribution of the children who participated in our study was almost equal, in keeping with the gender distribution of the Malawian population¹⁰. The majority of care givers in the study had at least a primary level-education, only about 12.5% had no formal education. The rate of basic education among the study participants is rather high (82.7%), especially in a country like Malawi with such a high rate of poverty and low level of development and this figure contrasts with the literacy rate of 65.8%¹⁰. The mean number of persons in the households was 5.2, with some variations across quintiles, the highest quintiles having more people. This finding corroborates those of other previous research that shows that wealthier people in developed nations have fewer household members and vice versa for developing nations^{24,25}.

Our analysis showed a high rate of health seeking behavior among the participants of the study. This finding is consistent with those studies from other low income countries although we expected slightly lower rates, considering the level of poverty and the low GDP of Malawi. This high rate of health seeking behavior may be explained by the high rate of basic education among the study participants, as studies show an association between education and health seeking behavior²⁶. Bivariate analysis of health seeking behavior by quintiles, showed a deviation from the norm. Ours was a mixed picture where participants in the third wealth quintile had the highest treatment seeking behavior (90.7%), as opposed to participants in the highest wealth quintile (86.1%). Other studies have shown an increasing trend in health seeking behavior with increasing wealth quintiles, with differing degrees of variation based on the levels of inequalities in the country²⁷. Only 7.4% of the study participants who sought care did so in more than one place. Across the wealth quintiles, we fail to observe any trends that show wealthier participants were more likely to seek care in more than one place. Seeking care in more than one place could be due to any of several reasons such as dissatisfaction with the level of care received, medication stock-outs, unbearably prolonged waiting time, inability to pay for services in the first port of call, among other reasons.

Over 97% of participants who sought treatment in more than one place had government hospitals as their first treatment place. Also, 97.3% of participants who sought treatment in more than one place received medications. This suggests that medication stock-outs in the government hospitals may have been a reason for seeking care in a second and third place. This is not surprising as stock-outs is one of the problems facing the Malawian government hospitals^{12,13}.

A greater proportion of the participants sought for treatment in government hospitals, which is expected of a rural population. Counterintuitive however, was the finding that the odds of seeking treatment in a government hospital was higher among the least poor participants, who have been shown by previous research to prefer to seek care from private providers. This could be explained by fact that shops and traditional practitioners fall into the other category and people in the lower wealth quintiles are known to patronize those as they have a chance of getting treatment and medications on credit. In this analysis, government hospital or health center, mobile clinic and health surveillance assistant (HSA) were categorized as government facilities while mission hospital or health center, private hospital or clinic, pharmacy, shop and traditional practitioners categorized as other. The 'other' category therefore, does not strictly refer to private hospitals rather to every other place that is not government or public funded.

We found that almost one-third of those who sought care (majority of whom, from government hospitals) incurred OOP, yet health care in government hospitals in Malawi is free. This suggests that some form of fee for service is required in government hospitals still. Although the mean amount spent OOP was relatively small (USD 1.3 or 1,102 Malawian Kwacha), that could be significant for a family in such a poor community. OOP increases the strain on citizens and further worsens the economic state of these citizens who are already in a dire economic situation. Participants in the higher wealth quintiles were more likely to spend higher amounts OOP which should be logical as the least poor participants have the ability to pay for services OOP. But our analysis showed that people in the highest wealth quintiles patronize government facilities more. This further stokes our suspicions that fee for service continues to be demanded at government hospitals.

Limitations

Our study had some level of bias due to residual confounding. The original study from which the data was sourced was not designed to answer the research questions of this study. Therefore, information on a few other variables such as number of children under-five years in the household, which may have confounded our study were unavailable and thus could not be adjusted for during the analysis. Secondly, all participants of the study were sampled from four different rural areas with similar socioeconomic profiles, hence we had very little variability in socioeconomic status across the wealth quintiles, which probably limited our ability to notice and appreciate any effect of wealth. Thirdly, the participants of our study were sampled from rural areas only, which is not representative of the entire country. We therefore lack the ability to generalize our findings to the entire country of Malawi, least of all, Sub-Saharan Africa

Conclusion

In a population with marginal differences in socioeconomic status, the concept of wealth may be inconsequential to their health seeking behavior or out-of-pocket expenditure. A more detailed analysis, with a more varied population in terms of socioeconomic status and geographic location (rural or urban would be beneficial) in order to understand the role that wealth plays in health seeking behavior and out-of-pocket expenditure in Malawi. Ensuring a constant supply of medications and enforcing the non-payment of service fees in government health facilities may be a solution to improving health seeking behavior and reducing under-five mortality in Malawi.

REFERENCES

1. United Nations. Millennium Development Goals. UN Millennium Project. <http://www.unmillenniumproject.org/goals/>. Published 2006. Accessed June 21, 2016.
2. Global Health Observatory data. WHO | Under-five mortality. WHO.
3. WHO. Global Health Observatory (GHO) data | Under-five mortality. WHO.
4. WORLD HEALTH ORGANIZATION. WHO | Children: reducing mortality. World Health Organization. doi:Factsheet no 178 (2014).
5. Liu L, Johnson HL, Cousens S, et al. Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000. *Lancet*. 2012;379(9832):2151-2161. doi:10.1016/S0140-6736(12)60560-1.
6. WHO | Child mortality. WHO.
7. The World Bank. The World Bank Data- Mortality Rate, under-5 (per 1,000). World Development Indicators. <http://data.worldbank.org/indicator/SH.DYN.MORT>. Accessed May 20, 2016.
8. WHO. Malawi Analytic Summary. http://www.aho.afro.who.int/profiles_information/index.php/Malawi:Analytical_summary_-_Health_Status_and_Trends. Accessed May 15, 2016.
9. Kayode GA, Adekanmbi VT, Uthman OA. Risk factors and a predictive model for under-five mortality in Nigeria: evidence from Nigeria demographic and health survey. *BMC Pregnancy Childbirth*. 2012;12:10. doi:10.1186/1471-2393-12-10.
10. CIA. The World Factbook. The World Factbook2. <https://www.cia.gov/library/publications/the-world-factbook/geos/xx.html>. Published 2015.
11. World Health Organization. Malawi Analytic Summary- Service delivery. http://www.aho.afro.who.int/profiles_information/index.php/Malawi:Analytical_summary_-_Service_delivery. Accessed May 21, 2016.
12. VillageReach - Supply Chain Strengthening in Malawi. 2008.
13. S.J. L, A.M. J, E. L-C, et al. Impact of pharmacy worker training and deployment on access to essential medicines and health outcomes in Malawi: protocol for a cluster quasi-experimental evaluation. *Implement Sci*. 2014;9:156. doi:10.1186/s13012-014-0156-2.
14. Amarasiri de Silva MW, Wijekoon A, Hornik R, Martines J. Care seeking in Sri Lanka: One possible explanation for low childhood mortality. *Soc Sci Med*. 2001;53(10):1363-1372. doi:10.1016/S0277-9536(00)00425-1.
15. Cornally N, McCarthy G. Help-seeking behaviour: A concept analysis. *Int J Nurs Pract*. 2011;17(3):280-288. doi:10.1111/j.1440-172X.2011.01936.x.
16. Malik EM, Hanafi K, Ali SH, Ahmed ES, Mohamed KA. Treatment-seeking behaviour for malaria in children under five years of age: implication for home management in rural areas with high seasonal transmission in Sudan. *Malar J*. 2006;5:60. doi:10.1186/1475-2875-5-60.
17. Andersen RM (University of C at LA. Revisiting the Behavioral Model and Access to Medical Care : Does it Matter ? Author (s): Ronald M . Andersen Source : Journal of Health and Social Behavior , Vol . 36 , No . 1 (Mar . , 1995) , pp . 1-10 Published by : American Sociological Association. *J Health Soc Behav*. 1995;36(1):1-10.
18. Taffa N, Chepngeno G. Determinants of health care seeking for childhood illnesses in Nairobi slums. *Trop Med Int Heal*. 2005;10(3):240-245. doi:10.1111/j.1365-3156.2004.01381.x.
19. Ahmed SM, Ahmed SM, Tomson G, et al. Socioeconomic status overrides age and gender in determining health seeking behaviour in rural Bangladesh. *Bull World Heal Organ*. 2005;83(2):109-117. doi:Article.
20. Larson CP, Saha UR, Islam R, Roy N. Childhood diarrhoea management practices in Bangladesh: Private sector dominance and continued inequities in care. *Int J Epidemiol*. 2006;35(6):1430-1439. doi:10.1093/ije/dyl167.

21. Steinhardt LC, Waters H, Rao KD, Naeem AJ, Hansen P, Peters DH. The effect of wealth status on care seeking and health expenditures in Afghanistan. *Health Policy Plan.* 2009;24(1):1-17. doi:10.1093/heapol/czn043.
22. Nabyonga-Orem J, Mugisha F, Okui AP, Musango L, Kirigia JM. Health care seeking patterns and determinants of out-of-pocket expenditure for Malaria for the children under-five in Uganda. *Malar J.* 2013;12:175. doi:10.1186/1475-2875-12-175.
23. The Malawi Project. Hospitals and Healthcare Facilities. <http://www.malawiproject.org/about-malawi/hospitals-healthcare/>. Accessed May 1, 2016.
24. Havanon N, Knodel J, Sittitrai W. The Impact of Family Size on Wealth Accumulation in Rural Thailand. <http://dx.doi.org/101080/0032472031000145996>. 2010.
25. London School of Hygiene and Tropical Medicine. Small family size increases the wealth of descendants but reduces evolutionary success. *Proceedings of the Royal Society B: Biological Sciences.* http://www.lshtm.ac.uk/newsevents/news/2012/small_family_size_increases_the_wealth_of_descendants_but_reduces_evolutionary_success.html. Published 2012. Accessed June 21, 2016.
26. Thuan NTB, Lofgren C, Lindholm L, Chuc NTK. Choice of healthcare provider following reform in Vietnam. *BMC Health Serv Res.* 2008;8:162. doi:10.1186/1472-6963-8-162.
27. Makinen M, Waters H, Rauch M, Almagambetova N. Inequalities in health care use and expenditures: Empirical data from. *World Heal Organ Bull World Heal Organ.* 2000;78(1).