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# **List of Abbreviations**

EAs Enumeration Areas

OOP Out-of-pocket

PPS Probability Proportional to Size

SLIHS Sierra Leone Integrated Household Survey

# **Introduction**

Financial resources are an integral part of a health system. Global health spending has been increasing in recent years due to the ageing population and the desire to improve quality of life, among other factors. However, there has been a disparity between low- and medium-income countries and high-income countries. In 2019, high-income countries spent more than two hundred times what low-income countries spent in healthcare (Micah et al., 2023).

Any country's healthcare system can be funded in a variety of ways, including out-of-pocket expenses, social insurance, and taxation. In low- and medium-income countries, out-of-pocket (OOP) expenditure has contributed significantly to healthcare finance (Kruk et al., 2008; O’Neill et al., 2015; Saksena et al., 2014; World Bank, 2020), posing a financial burden among the population when accessing healthcare services.

In Sierra Leone, out-of-pocket healthcare expenditure has consistently been the primary source of funding for the healthcare system. According to the World Bank, in 2020, out-of-pocket expenditures accounted for 55.7% of total health expenditure in Sierra Leone. However, it decreased from 75.7% in 2000 to 55.7% in 2020, as demonstrated in Figure 1 (World Bank, 2020).

Figure 1: Trend in out-of-pocket expenditure as a percentage of current health expenditure: Source: World Development Indicators, World Bank, 2023

The relatively high out-of-pocket expenses over the last two decades in Sierra Leone can contribute to household financial hardship or catastrophe for necessary healthcare services. It is projected that 3.7 billion individuals are at danger of catastrophic expenditure worldwide (Meara et al., 2016; Saksena et al., 2014).

This paper assesses the impact of out-of-pockect expenditure of household economy among households in Sierra Leone. The findings will contribute to both policy formulation and literature on healthcare financing.

## 1.1 Objectives

The main objective of the study was to assess the impact of out-of-pocket healthcare expenditure on the household economy in Sierra Leone.

**Specific objectives**

The specific objectives of the study were to:

* Determine the average household out-of-pocket healthcare expenditure
* Assess the effects of out-of-pocket healthcare expenditure on household economy

# **Literature Review**

Low and middle-income countries, which are among the most vulnerable, are especially concerned about the financial burden of healthcare spending. According to studies, insufficient public investment in health, a lack of adequate safety net mechanisms, and a poor quality of public health system in these nations are among the key causes of heavy financial burden on individuals (El-Sayed et al., 2018; Panikkassery, 2020).

A large and growing body of literature has investigated the association between out-of-pocket healthcare expenditure and poverty. Out-of-pocket healthcare expenses were cited as a major cause of household impoverishment in general (Hamid et al., 2014; Koch et al., 2017; McIntyre et al., 2006; Wagstaff et al., 2018; Wagstaff & Doorslaer, 2003). High out-of-pocket healthcare expenses have a tendency to push households into poverty or exacerbate existing poverty (McIntyre et al., 2006; Van Doorslaer et al., 2006; Xu et al., 2003). Due to out-of-pocket medical expenses, about 3.5 percent of India's population fell below the poverty line in 2011-12 (Hooda, 2017). Studies have shown that high out-of-pocket medical expenses play a role in the creation of "medical poverty traps" in developing countries (Whitehead et al., 2001).

Poor health was one of the factors that contributed to higher poverty rates, especially in developing countries like Ghana (Novignon et al., 2012). According to Arsenijevic et al. (2013), out-of-pocket healthcare payments are disastrous for poor households and a major cause of poverty in Serbia. Rashad & Sharaf (2015) discovered that out-of-pocket healthcare spending pushed 7.4 percent more Egyptian households into poverty.

Out-of-pocket health spending accounts for 65 percent of total current health expenditure in India, making it one of the countries at high risk of financial burden (World Bank, 2020). Poor and daily wage laborers in India face a high risk of financial burden, according to Karan (2015). Borrowing money from friends, relatives, or money lenders, reducing or adjusting household consumption bundles, and selling assets to compensate for the amount spent are common coping strategies used to survive financial hardship. Poor households typically borrow first, then modify their consumption to cover out-of-pocket healthcare costs (Dhanaraj, 2016; Flores et al., 2008; Nguyen et al., 2012). There is limited evidence on the impact of out-of-pocket health expenses in Sierra Leone.

Datta et al. (2018) also investigated the relationship between noncommunicable illnesses and out-of-pocket healthcare costs, financial stress, and family poverty. Noncommunicable diseases have been linked to increased medical spending, the possibility of catastrophic out-of-pocket health spending, financial stress, and the danger of poverty.

According to the researchers, out-of-pocket health spending has different effects on the household economy. Panikkassery (2020) argued that as the share of out-of-pocket health expenditure increases, the poorest households' consumption patterns change. Similarly, Kabir et al. (2000) hypothesized that the poorest households tend to reduce household expenditure, particularly on food, fuel, and transportation, as a coping strategy in the face of high medical expenses. Pal (2013), on the other hand, claimed that poor households increase their consumption of food, fuel, and transportation while decreasing their consumption of clothing and education in order to cover healthcare costs.

Out-of-pocket medical expenses, according to the literature, have a negative impact on household consumption of items other than food. Households generally watch their food budgets and make changes to their education, clothing, and other consumption items. In most cases, households would borrow, use savings, or take on additional work (Flores et al., 2008; Kruk et al., 2008; Murphy et al., 2019). Families in Ethiopia had to use their savings and borrow from others to cover the costs of seeking care for their children and newborns (Onarheim et al., 2018). In Sierra Leone, there is limited evidence to suggest the same.

Moreover, households bear a heavy financial burden from out-of-pocket medical expenses, which lowers their general well-being. Poorer households were shown to be less likely to experience catastrophic out-of-pocket expenses as a result of forgoing or postponing critical medical care, according to studies by Falkingham (2004) and Brown et al. (2014). Different research, however, points to low-income households seeking care from fewer skilled providers, which led to uncontrollably high out-of-pocket expenses (Seeberg et al., 2014).

The notion that the influence of out-of-pocket health expenses on impoverishment is asymmetric with regard to specific criteria, such as the ratio of out-of-pocket health expenses to the household's income or budget, has been backed by all of the research that have been evaluated thus far. When it comes to utilizing health system indicators to look into the threshold influence of out-of-pocket health expenditure on poverty, there is, however, a notable lack of research in the field (Sirag & Mohamed Nor, 2021).

# **Methodology**

This section focuses on the study methodology, with a particular emphasis on the research design, data collecting and analysis procedures, and ethical issues, which are discussed below.

## 3.1 Research Design

The study was based on the positivism philosophy. To assess the impact of out-of-pocket healthcare expenditure on household economy secondary data from the 2018 Sierra Leone Integrated Household Survey (SLIHS) was used. SLIHS is a nationally representative retrospective quantitative cross-sectional study of 6,840 households. The SLIHS employed a two-stage stratified cluster random sample technique, selecting households based on locales designated as Enumeration Areas (EAs) in the 2015 national housing and population census. The probability proportional to size (PPS) technique was used to choose 684 enumeration areas (EAs) for survey clusters. The survey included 6,840 families with men and women ages 15 to 49.

## 3.2 Data collection process/data extraction

The 2018 SLIHS gathered data on health, household income, consumption and spending, demographics, and education. The relevant data for this study was extracted from the 2018 SLIHS dataset in STATA format. The data was extracted from Statistics Sierra Leone's website. Only 15 variables were picked from the many available. The data was then re-cleaned, classed, and coded as required.

## 3.3 Data Analysis Techniques

The extracted data was analysed using STATA version 15, with a focus on out-of-pocket healthcare expenses. This includes all medical care expenses paid to health facilities used by members of the family. Descriptive analysis was used to determine the average household out-of-pocket healthcare expenditure. The impact of out-of-pocket healthcare spending was assessed using inferential statistics. A chi-square test of independence was used to assess whether there was a link between out-of-pocket healthcare spending and household economy.

The household economy was measured by the poverty indices. The poverty indices were measured by three variables:

1. food poor - food consumption expenditure < food poverty line;
2. absolute poor – total consumption expenditure < total poverty line and
3. extremely poor – total consumption expenditure < food poverty line).

Binary logistics regression analysis was also used to calculate the odds ratios.

The data was collected in local currency and converted to US dollars using 2018's average exchange rate.

## 3.4 Ethical Considerations

The study employed public domain, anonymized secondary data without ethical concerns, ensuring no harm or injury to respondents who provided data for SLHIS 2018.

# **Results**

## 4.1 Household out-of-pocket healthcare expenditure

This section presents the results of the study by objectives.

*Table 1: Out-of-pocket expenditure as a proportion of the total household expenditure*

|  |  |  |
| --- | --- | --- |
| **Variable** | **Average Out-of-pocket expenditure (US$)\*** | **Proportion of total household expenditure (percent)** |
| **Sierra Leone (all households)** | **219.79** | **9.92** |
| **Sex of household head** |
| Female  | 216.29 | 9.8 |
| Male | 220.82 | 10 |
| **Place of Residence**  |
| Rural  | 185.04 | 12.4 |
| Urban | 275.54 | 8.4 |
| **Wealth quintile**  |
| Poorest | 143.87 | 12.4 |
| Poorer | 157.29 | 10.4 |
| Middle | 158.58 | 8.7 |
| Richer | 253.59 | 7.2 |
| Richest | 328.45 | 6.4 |
| **Province**  |
| Eastern  | 163.77 | 13.4 |
| Northern  | 296.29 | 7.4 |
| North-West | 157.29 | 7.1 |
| Southern | 158.58 | 8.2 |
| Western | 322.35 | 7.2 |
| **Whether there is anyone in the household with health insurance** |
| Yes | 230.29 | 9.1 |
| No | 291.88 | 11.2 |

*\*The average annual exchange rate in 2018 was USD1:7,712 Leones. The expenses were converted to usd using this exchange rate.*

Table 1 reveals that the average annual out-of-pocket healthcare expenditure for households in Siera Leone was US$219.79. This represented 9.9% of all household spending on consumption. The male-headed households paid an average of US$ 220.82 per annum out-of-pocket expenditure and the female-headed households US$ 216.29. However, the difference was not statistically significant (p =0.152). The male-headed households’ out-of-pocket expenditure accounted for 10% of the total household expenditure among male-headed households and the female-headed households’ out-of-pocket expenditure accounted for 9.8% of the total household expenditure among female-headed households. Urban households spent an average of US$275.54 per year on healthcare, which constituted 8.4% of their total household expenditure. In contrast, rural households spent an average of US$185.04 annually, accounting for 12.4% of their total household expenditure. This disparity in out-of-pocket (OOP) healthcare expenses between rural and urban households was statistically significant (p < 0.001). The findings indicated that rural households faced catastrophic health expenditures due to OOP costs. Health insurance appeared to mitigate these expenses, as insured households spent an average of US$230.29 per year on healthcare, amounting to 9% of their total household expenditure. Conversely, households without health insurance spent an average of US$291.88 annually, representing 11% of their total expenditure.

Out-of-pocket (OOP) healthcare costs rose with the improvement of a household's socioeconomic status. Wealthier households incurred higher expenses compared to lower-income groups. The richest households spent an average of US$328.45 per year, while the poorest households spent an average of US$143.87 annually. However, for the poorest households, OOP costs represented 12.4% of their total household expenditure, whereas for the richest households, it accounted for only 6.4%. Consequently, the poorest households faced catastrophic health expenditures due to OOP costs.

## 4.2 Effects of out-of-pocket expenditure on household economy

The association between out-of-pocket expenditure and extreme poverty was statistically significant χ2 = 20.083, p < 0.001. There was a statistically significant association between out-of-pocket expenditure and food poverty (χ2 = 27.745, p < 0.0011). The association between out-of-pocket expenditure and absolute poverty was also statistically significant (χ2 = 11.139, p = 0.001). Binary logistics regression analysis results are shown in Table 2.

Table 2: Logistic regression coefficients of out-of-pocket expenses by poverty type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | **OR** | **Std. Err** | **p** | **95% CI** |
| **Extreme poverty** |
| Out-of-pocket expenditure  |  |  |  |  |
| No (reference)  |  |  |  |  |
| Yes  | 0.6803116 | 0.0587531 | <0.001 | 0.574376- 0.805785 |
| **Absolute poverty** |
| Out-of-pocket expenditure  |  |  |  |  |
| No (reference)  |  |  |  |  |
| Yes  | 0.8491512 | 0.041615 | 0.001 | 0.771382- 0.934761 |
| **Food poverty** |
| Out-of-pocket expenditure  |  |  |  |  |
| No (reference)  |  |  |  |  |
| Yes  | 1.296961 | 0.0640745 | <0.001 | 1.177266 - 1.428826 |

As shown in Table 2, households with out-of-pocket (OOP) expenses had a 0.68 probability of experiencing extreme poverty compared to those without OOP expenses (P<0.001). This means that households facing OOP expenses were 0.68 times more likely to fall into extreme poverty than those without such expenses. Additionally, the likelihood of experiencing absolute poverty for households with OOP expenses was 0.85 times that of households without OOP expenses (P<0.001). Households with OOP costs were 0.85 times more likely to experience absolute poverty than those without OOP costs. Lastly, the odds of experiencing food poverty were 1.3 times higher in OOP households compared to non-OOP households (P<0.001). Food poverty was 1.3 times more likely in households with OOP expenses than in those without. Further analysis revealed a positive relationship between OOP expenses and total household expenditure (P<0.001).

# **Discussion**

## 5.1 Household out-of-pocket healthcare expenditure

Households in Sierra Leone spent an average of US$219.79 annually on out-of-pocket (OOP) healthcare expenses, making up 9.9% of their total household consumption. Male-headed households had slightly higher OOP costs at US$220.82 per year compared to US$216.29 for female-headed households, though this difference was not statistically significant (p = 0.152). For male-headed households, OOP expenses constituted 10% of their total expenditure, while for female-headed households, it was 9.8%. This data highlights the financial strain caused by OOP healthcare spending, aligning with previous studies by (McIntyre, 2012; Van Doorslaer et al., 2006; Xu et al., 2003). Notably, rural households experienced greater financial hardship, with OOP costs representing 12.4% of their total expenditure, compared to 8.4% for urban households. This discrepancy echoes findings by Ahadinezhad et al. (2021) and Yahyavi Dizaj et al. (2019), suggesting a lack of adequate medical insurance in rural areas and highlighting the need for social protection measures to alleviate this burden.

As household socioeconomic status improved, OOP healthcare costs increased, with the wealthiest households spending an average of US$328.45 per year, while the poorest households spent US$143.87. Despite higher spending, the richest households' OOP costs accounted for only 6.4% of their total expenditure, compared to 12.4% for the poorest households, leading to catastrophic health payments for the latter. This inequity in health financing is consistent with studies from other countries. For instance, Mahumud et al. (2017) found that in Bangladesh, the wealthiest 20% spent more on OOP healthcare but a smaller percentage of their income, while the poorest spent a larger proportion. Similar patterns were observed by Bock et al. (2014); Kumara & Samaratunge, (2016); Masiye & Kaonga, 2016; Molla et al. (2017) and Mukherjee & Kamal, (2017).

## 5.2 Effects of out-of-pocket expenditure on household economy

The findings indicated a link between out-of-pocket (OOP) expenditure and household economic status in Sierra Leone, consistent with existing literature. OOP healthcare costs are a significant factor in driving households into poverty. Studies by Hamid et al. (2014); Koch et al. (2017); McIntyre et al. (2006); Wagstaff et al. (2018); and Wagstaff & Doorslaer, (2003) have identified OOP expenses as a primary cause of household impoverishment. High OOP costs can push households into poverty or worsen their existing financial conditions (McIntyre et al., 2006; Van Doorslaer et al., 2006; Xu et al., 2003). Research has also shown that substantial OOP expenses contribute to the creation of "medical poverty traps" in developing countries (Whitehead et al., 2001). A 2022 study in India found that the total poverty headcount increased from 16.4% before OOP payments to 19.1% after these payments (Sriram & Albadrani, 2022). Similarly, a study on the financial impact of OOP health payments on Moroccan households revealed that OOP expenses made 1.11% of households poorer (Oudmane et al., 2019). These studies corroborate the current study's results, highlighting the financial strain households face due to OOP healthcare costs.

# **Conclusion**

Households in Sierra Leone allocate a significant portion of their expenditures to healthcare, averaging 9% of their total annual consumption. This burden is particularly heavy for rural households, where healthcare costs exceed 10% of their total expenditures, leading to financial hardships. The poorest households, despite spending less on healthcare overall, also devote more than 10% of their expenditures to medical expenses. The study highlights the excessive out-of-pocket (OOP) healthcare costs in Sierra Leone, attributing it to the insufficient government funding for the health sector. In 2023, only 9.2% of the national budget was allocated to health (Ministry of Finance, 2022), falling short of the 15% target set by the Abuja Declaration of 2001, to which Sierra Leone is a signatory.

Sierra Leone's reliance on OOP payments for healthcare creates substantial financial difficulties, especially for low-income households. High healthcare costs pose significant barriers to access, causing many individuals to delay or forgo necessary medical treatment due to financial constraints. This can result in delayed diagnoses and the progression of preventable diseases, necessitating more complex and expensive treatments, ultimately leading to poorer national health outcomes. The study also indicates that OOP expenditures negatively impact household economies, particularly influencing food poverty. High medical costs force families to cut back on essential expenses like housing, education, and food, sometimes leading to bankruptcy due to medical debt.

The financial burden of OOP healthcare spending is disproportionately felt by low-income households, where even minor expenses can constitute a significant portion of their income, limiting their access to quality healthcare. In conclusion, OOP healthcare spending significantly affects household economies, causing financial stress, reduced access to healthcare, increased inequality, and poorer health outcomes. This underscores the urgent need for comprehensive healthcare policies that prioritize affordability and access for all members of society.

# **Implications**

Given the issue of high out-of-pocket (OOP) health expenditures in Sierra Leone, these findings are crucial for policymakers. Sierra Leone's policymakers should focus on enacting legislation and interventions to expand health insurance coverage, thereby protecting households from financial vulnerability and improving overall health outcomes. It is particularly important to include employees in the informal sector in health insurance schemes. By increasing public health spending, policymakers can reduce the country's reliance on OOP payments to fund the healthcare system. Developing and implementing a tax-based, non-contributory health financing system for the poor, vulnerable, and informal sector workers would enhance national participation. This approach would also improve access to healthcare and alleviate the financial burden of OOP healthcare costs.

This course has enhanced my knowledge on health economics. As a public health specialist, I would use the knowledge I have gained to advocate to the government of Sierra Leone through the Ministry of Health to formulate policies that would address the healthcare disparities brought about by the high out-of-pocket healthcare expenditure. I would also be actively involved in advocating to the government of Sierra Leone to increase fiscal space towards health, ensuring that the budget allocation to health meets the 15% stipulated by the Abuja Declaration to which Sierra Leone is a signatory. At community level, I would work with the community leaders on how they could initiate social protection mechanisms to help the less privileged in the community who cannot afford to pay for healthcare.

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