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Household Income and *Linda Mama* Maternal Healthcare Cover Uptake in Mukuru Slums in Nairobi City County – Kenya

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Abstract

The low utilization of maternal health care coverage in sub-Saharan Africa is a pressing concern, as it impacts the well-being of mothers and children and the reduction of maternal morbidity and mortality. Despite recognizing the critical role of insurance in risk management, there is limited uptake, necessitating swift policy interventions. This study investigates the influence of household income on the adoption of Linda Mama maternal healthcare coverage in Nairobi's Mukuru slums, guided by the Cumulative Prospect Theory. Using a descriptive research design and stratified random sampling, data were collected from 230 individuals, including county health executives, health directors, community health workers, and expectant women aged 18-49 living in Mukuru Slums, out of a possible target population of 524. Both descriptive and inferential statistics were employed for data analysis. The study found a significant positive correlation between household income and the uptake of Linda Mama maternal healthcare coverage in Mukuru slums. Consequently, the study recommends that policymakers take action to alleviate financial constraints for low-income households, with the aim of increasing the utilization of the Linda Mama program among vulnerable populations in Mukuru slums. This intervention would contribute to improving maternal and child health outcomes in the region, addressing the perplexing issue of low maternal healthcare coverage in sub-Saharan Africa.

Key words: *Household Income, Maternal Healthcare, Healthcare Cover*

1. Introduction

At the heart of efforts to decrease perinatal fatalities and complications in sub-Saharan Africa lies the utilization of maternal healthcare services (Adu et al., 2018). Research indicates that a higher utilization rate of healthcare services for children, mothers, and newborns has a substantial impact on reducing illnesses, emphasizing the importance of policy interventions aimed at enhancing the adoption of maternal healthcare packages (Singh, Rai & Kumar, 2013). Therefore, interventions that are targeting specific regions and the disadvantaged that can increase the access to health facilities by women can have far reaching impacts in scaling down maternal mortality (Ononokpono & Odimegwu, 2014).

Global estimates of maternal deaths in the year 2017 by WHO, World Bank, United Nations Populations Division, UNICEF and UNFPA were 295,000 down from 451,000 recorded in the year 2000. The report indicated a 2.9 annual reduction whereby in every 100, 000 births, maternal death rate was at 211 a 38% reduction from what recorded in year 2000 (WHO, 2019).

A concerning reports from the World Health Organization (2014) reveals that on a daily basis, 800 women lose their lives due to avoidable complications during pregnancy and childbirth. Tragically, 99% of these fatalities occur in developing nations, where women are primarily impeded by a lack of access to information, cultural traditions, insufficient healthcare services, geographical distance, and economic hardship.

In the year 2022, the country recorded 98% of women seeking maternal healthcare, 66% sought ANC services at least four times, 89% percent of live births were assisted by skilled health provider whereby it was noted that 26% of women and 27% of men had one sort of insurance (KNBS, 2022). Maternal health cover refers to the proportion of the larger needy women population that are subscribed to a given health intervention (Day et al, 2021). Persistent prevalence of maternal deaths despite the crucial role played by maternal covers forms the basis for inquiry as to what determines the uptake in order to underscore MDG number 5 of improving maternal health care and saving more than 500,000 lives lost.

According to Adebayo, Atia and Cleophas (2021) decision making is influenced by income within households where educated, employed, and married individuals reside. According to Khullar and Chokshi (2018) from clinical, environmental and behavioural perspectives, health is influenced by household income. Clinically, low earners tend to forgo care due to cost concerns; behaviorally, low-income earners engage themselves in risk activities among them smoking, low levels of physical activities, obesity and substance due to challenges at home; and environmentally, meagre income households lack better houses, expose themselves to harmful substances.

1.1 Household income

Household income refers to earnings coming from the holder of the house or any other person in the household whether related or not but over fifteen years and above (Guzman, 2022). Household income take the form of commissions, director fees, direct wages and salaries, profit-sharing bonuses, share entitlements, remuneration on time not worked for and dividends. According to Adebayo, Atia and Cleophas (2021) decision making is influenced by income within households where educated, employed, and married individuals reside. Also, years of marriage, education qualification, religion, monthly income, marital status, patriarchal ideologies and gender roles determine income expenditure.

Family income and maternal health have a strong link with children's health and infant mortality (Woolf et al, 2016). Families who earn meagre income their children experience higher proportions of digestive disorders, asthma, elevated blood lead levels, hearing disorders and heart conditions compared to affluent households who can live a healthy lifestyle and provide medical care. According to Khullar and Chokshi (2018) from clinical, environmental and behavioural perspectives, health is influenced by household income. Clinically, low earners tend to forgo care due to cost concerns; behaviourally, low-income earners engage themselves in risk activities among them smoking, low levels of physical activities, obesity and substance due to challenges at home; and environmentally, meagre income households lack better houses, expose themselves to harmful substances.

1.2 Linda Mama Boresha Jamii Programme

This is Kenya's Free Maternal Care Programme that was conceptualized in 1st June 2013 through the abolishment of maternity healthcare services fee for mothers in public health facilities (Ministry of Health, 2016). The main objective of the programme was to encourage mothers to seek maternity services in public hospitals that are equipped with skilled personnel hence improving pregnancy outcomes. Despite this commitment from the government, still beneficiaries incur out of pocket costs, have no access to some of the covered services and majority of the health facilities in the country lost their financial autonomy as some could not receive money from NHIF on particular services offered (Orangi et al, 2021).

The programme was rolled out with the anticipation of realizing right to health and the potential to place the country in the runway of meeting Universal Health Coverage (Ministry of Health, 2016). This is due to the fact that the programme was designed to widen benefits and accountability (Orangi et al, 2021). Mukuru slums becomes an ideal unit of observation in regard to Linda Mama Boresha Jamii programme since the whooping 71% of the city population reside in the informal settlement therefore exerting pressure of access to the already limited schools, clean water, health care and sanitation (Nyamao, 2020). The scholar further noted that mortality rates remained high in these informal settlements places.

2. Statement of the Problem

The low uptake of maternal health care cover in sub-Saharan Africa is an intriguing phenomenon that seeking to understand what determines the uptake becomes a crucial endeavor (Wanjala, 2016). This is due to the fact that the well-being of mothers and children before, during and after birth and also the curbing of maternal morbidity and mortality hinges on the uptake of the maternal healthcare insurance. Evidence indicates the low uptake of insurance despite the recognition of insurance playing a critical role as a strategy of risk management therefore calling for a speedy intervention by policy makers (Dayour, Adongo & Kimbu, 2020).

Globally, a number of studies indicate utilization of maternal healthcare insurance has been the secret behind the reduction of mortality and morbidity rates. A larger proportion of women who had maternal healthcare coverage made a timely visitation of their first antenatal care than their counterparts who lacked (Kibusi et al, 2018). According to Dahab and Sakellariou (2020) low-income countries specifically those from the Africa continent have a compromised access to maternal health facilities – cultural beliefs, lack of family support, poor quality of care, economic factors and transportation barriers - therefore resulting to upward maternal mortality prevalence.

According to Rashid and Antai (2014) crucial in explaining maternal healthcare uptake are the wealth index, marital status, education and place of residence. Richer wealth quintile, birth order, the mother's age, more than secondary education and access to information are positively and significantly associated with the uptake of maternal healthcare cover in Kenya (Mungai, 2015). The above studies bring forth geographical gap something the current study endeavour to fill.

Locally, though a myriad of empirical examination into the influence of household income on maternal healthcare cover uptake exist in different fronts, there continue to be minimal evidence in place on studies conducted in slum jurisdictions in regard to this phenomenon. It is from this backdrop the current study sought to fill this gap by examining the influence of household on Linda Mama maternal healthcare cover uptake in Mukuru slums in Nairobi City County.

3. Theoretical Framework

3.1 Cumulative Prospect Theory

The proponents of the Cumulative Prospect Theory (CPT) are Tversky and Kahneman 1992. The theory was prompted by the criticism over irrational decision room that was inherent in First-degree Stochastic Dominance (Borß, 2017). The theory is premised on the argument that in some cases people are risk-receptive and in other cases risk adverse (Dayour, Adongo & Kimbu, 2020). The theory portrays people as risk averters therefore through rationality in decision making; they opt to uptake insurance as a strategy of risk aversion. The idea that damages loom larger than gains stem from the point of people seeking gains by averting risks (Wakker & Tversky, 1993).

According to He and Zhou (2011) when it comes to gains and losses, individuals behave differently. They are heterogeneous in risk-averse and peculiarly more sensitive to losses than gains. The theory anchors the study in the sense that women are more sensitive to losses (higher mortality and morbidity rates) than the gains associated from the uptake of the maternal cover. The theory offers a rational explanation on the various aspects or determinants that contribute for mothers to behave differently to maternal healthcare cover gains and losses. Cumulative Prospect Theory provides relevant practical evidence that explains how individuals make decisions over gains and losses (Bernard & Ghossoub, 2010). The study relies on this theory for rational explanation on how mothers decide the uptake of Linda Mama maternal healthcare cover based on their information access.

3.2 Household Income and Maternal Healthcare Cover Uptake

In Ethiopia, Mezmur et al (2017) conducted a study on inequalities of socio-economic in nature in the uptake of maternal healthcare services. To identify dominant factors that lead to the inequality when it comes to maternal care uptake, the study employed decomposition analysis. The study observed that in the last ten years, there was a general improvement of maternal health care services uptake though characterized with inequality to the disadvantage of the less fortunate. The inequalities were seen to exacerbate in the area's tetanus toxoid injection, skilled assistance during delivery, antenatal care consultation and accessing health facilities.

While focusing on the adult patients, Masengeli et al (2017) examined the determinants of health insurance cover uptake attending Bungoma referral hospital. The study utilized interview schedules and questionnaires to collect data from 300 patients who were purposively sampled from four departments in the descriptive cross-section survey. The results from the research suggested that slightly below average number of patients in the health facilities owned a health cover. The study further noted that health insurance cover rose with awareness of the benefits from the insurance, age, education level, insurance concepts and household income. Prevalence of health cover seemed to be predominant among married patients as ownership went upward by 12.5 times due to cover premiums affordability. The study however employed purposive sampling and was carried out in Bungoma whereas the current study was conducted in Nairobi City County.

In Tharaka Nithi County, Gitonga (2017) conducted a study on the determinants to the uptake of focused antenatal care among women. Both systematic sampling and stratified sampling was employed in the descriptive cross-sectional survey. The study found that slightly above average uptake of focused antenatal care across the board. Household income, marital status level of education, parity and type of employment determined the uptake of these maternal services among pregnant women. The study above however utilized systematic sampling and was conducted in Tharaka Nithi whereas the current study was carried in Nairobi city county's slum areas.

While focusing on the Gweru urban region in Zimbabwe, Mhere (2013) conducted a study on determinants of health insurance. The study suggested that participation in the health insurance was as a result of family size, age, and level of education of the household's head, chronic illness and household income. Mupwanyiwa et al (2020) explored the factors influencing the uptake of maternal health care services by women. The study utilized logit model to analyze data from demographic health survey. The study found out that educational level, household income, employment status, region of residence, birth order, number of living children, insurance cover, place of residence and maternal age summed up the factors influencing maternal health care services utilization. The studies above were carried out in Zimbabwe therefore its inferences cannot be generalized locally.

4. Research Design

The research employed a descriptive research design. This choice of design is based on its simplicity, adaptability, and usefulness across various situations, as noted by Doyle (2020). The research employed a combination of stratified and random sampling methods to select the sample size from the entire population for observation. The study opted for the two sampling techniques because stratified and random sampling are applicable in getting samples for responses where the population is heterogeneous and permits a chance for every subject in the target population to be involved in the sample respectively (Etikan & Bala, 2017). The target population of the research was the county executive committee for health (1), county director for health (1), community health workers (378) and expectant women aged between 18 – 49 years residing in Mukuru Slums (162) from whom a sample of 230 was obtained using Yamane formula (1967).

$$n = \frac{N}{1 + N(e)^2}$$

n =sample size,
N = population size
e =level of significance (5%)

$$= \frac{542}{1+542\ (0.05)^2} = 230.$$

The study sample participants were 230 and were apportioned to various strata as shown in the table below.

Table 1 Sample Size Distribution

Category	Proportions	Sample Size
County Executive Committee	1	1
County Director of Health	1	1
Community Health Workers	69	159
Expectant Women	29	69
Total	**100**	**230**

Source: Researcher (2022)

5. Research Analysis and Findings

5.1 Response Rate

The study targeted 230 respondents who comprised the county executive committee for health, county director for health, community health workers and expectant women aged between 18 – 49 years residing in Mukuru Slums, Nairobi City County. During data collection, the study was able to collect data from all the targeted samples, achieving 100% response rate.

Table 2 Response rate

Category	Frequency	Percentage
Expectant women	159	69.2
Community health worker/Community health volunteer	69	30.0
County Executive Committee for Health	1	0.4
County Director for Health	1	0.4
Total	230	100

Source: Primary Data (2023)

According to Sitzia and Wood (1998), and Gilbert (2008), an acceptable response level is approximately 75% for interviews and 65% for self-administered questionnaires. This study achieved an excellent response rate (more than 65%) due to constant follow-up, reminders and general willingness to participate by the research participants.

The respondents, were neutral on whether households with direct wages have been relying on their wages for maternal healthcare upkeep (Mean=3.58, SD=0.89, CV= 24.81) The CV indicates a relatively low variability in the responses. Even though there was a high variability in the responses from these two statements as indicated by the relatively high CVs, on average, respondents were neutral on whether meager income compels one to engage in risk care activities and whether income expenditure, marital status and years of marriage potentially determine a woman's maternal uptake (Mean= 3.27, 3.19 SD=1.05, 1.03 CV=32.02, 32.56) respectively.

Table 3 Descriptive analysis results on household income

Statement	Mean	SD	CV
Household with direct wages have been relying on them for maternal healthcare upkeep.	3.58	.89	24.81
Maternal healthcare matters are always influenced by household income.	3.33	.98	29.44
Meagre income compels one to engage in risk care activities.	3.27	1.05	32.02
Low income household are forced to forgo care on cost concern basis.	3.54	.94	26.56
Infant mortality and children's health is a function of household income.	3.54	.94	26.56
Income expenditure, marital status and years of marriage potentially determine a woman's maternal uptake.	3.19	1.03	32.44
Composite value for Household Income	3.41	.65	19.02

The overall score value for household income perception (Mean: 3.41, SD: 0.65, CV: 19.02%) suggests that, on average, respondents hold a moderately positive perception of the role of income in maternal healthcare decisions. The CV indicates a relatively lower degree of variability perception compared to individual statements.

5.2 Factor Analysis on Household Income

The study used KMO and Bartlett's test for sampling adequacy, total variance explained and component matrix to select the items under the variable household income table 4, table 5 and table 6 below.

Table 4 Sample Adequacy Test for Items under Household income

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.644
Bartlett's Test of Sphericity	Approx. Chi-Square	239.048
	df	21
	Sig.	.000

Source: Primary Data (2023)

As displayed in table 4, the Kaiser-Meyer-Olkin Measure of sampling adequacy was 0.644, surpassing the threshold of 0.5, indicating that there was adequate sample for factor analysis. Furthermore, the P-value, which was 0.000 and less than the significance level of 0.05, affirmed the homogeneity of the items on household income, thereby supporting their reduction into fewer and meaningful factors. The specific components to be derived were calculated through principal component analysis (PCA), as detailed in table 5 below.

Table 5 Variance Explained by Principal Components for Information Access

Component	**Initial Eigen values**		
	Total	**% of Variance**	**Cumulative %**
1	2.844	32.692	32.692
2	1.074	16.884	49.576
.		14.989	**64.565**

Extraction Method: Principal Component Analysis
Source: Primary Data (2023)

From the table above, 2 items were selected from the set of 6 items on household income. These 2 items accounted for 65.29% of the total variance in household income. The specific items selected from factor analysis are identified as shown in the table below.

Table 6 Item Selection for Household Income

Component Matrix	**Component**		
	1	**2**	**3**
Household with direct wages have been relying on them for maternal healthcare upkeep.	.422	-.045	-.569
Maternal healthcare matters are always influenced by household income.	.603	.043	-.180
Meagre income compels one to engage in risk care activities.	.692	-.117	.605
Low income household are forced to forgo care on cost concern basis.	.910	.317	.507
Infant mortality and children's health is a function of household income.	.910	-.129	-.075
Income expenditure, marital status and years of marriage potentially determine a woman's maternal uptake.	.409	.682	-.245
Extraction Method: Principal Component Analysis.		**.763**	.065
a. 2 components extracted			

Source: Primary Data (2023)

From the factor analysis output presented above, the two items selected were; "low-income household are forced to forgo care on cost concern basis", and "Infant mortality and children's health is a function of household income". These 2 items were used to compute the composite values for household income

5.3 Regression Analysis

To address the study objective the study postulated one research question. This research question was answered using one research hypothesis. The research question was; what is the influence of Household income on Linda Mama maternal healthcare cover uptake in Mukuru slums in Nairobi City County? This question was respondent to by testing the null hypothesis that

household income did not have an influence on Linda Mama maternal healthcare cover uptake in Mukuru slums in Nairobi City County.

This study developed a multiple regression model to test the null hypotheses that relates household income on maternal healthcare uptake in Mukuru slums in Nairobi City County. The regression model output presents the model summary statistics, analysis of variance (ANOVA) $F_{statistics}$ and associated p-value, and the respective beta coefficient values, as depicted in the table below.

Table 7 Multiple Linear Regression Model

Maternal Healthcare Cover uptake	Coefficient	Std Error.	t-value	p-value	95% Confidence Interval		Sig
Household income	.085	.032	2.71	.007	.023	.148	***
Constant	2.521	.306	8.24	0	1.918	3.124	***
Mean dependent variable		3.582	SD dependent variable			0.449	
R-squared		0.099	Number of observation			228	
F-test		6.102	Prob > F			0.000	
Akaike crit. (AIC)		266.8 72	Bayesian crit. (BIC)			284.019	

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

Source: Primary Data (2023)

As presented in table 7 above, the independent variable (household income) and the dependent variable (maternal healthcare uptake in in Mukuru slums in Nairobi City County) are linearly related. The coefficient of determination (R-squared) of 0.099 indicated that approximately 10% of the variation in Linda Mama maternal healthcare cover uptake in Mukuru slums in Nairobi City County can be accounted for by household income. The overall ANOVA p-value=0.000< α=0.05 and $F_{statistics}$= 6.102, indicate that the multiple linear regression model was significant, confirming that 10% of the changes in Linda Mama maternal healthcare cover uptake in Mukuru slums in Nairobi City County is attributable to household income.

The study rejected the null hypothesis that household income did not have an influence on Linda Mama maternal healthcare cover uptake in Mukuru slums in Nairobi City County (β=0.085, p-value=0.007<α=0.05). As such, there was evidence that household income had a significant positive influence (β=0.085) on Linda Mama maternal healthcare cover uptake in Mukuru slums in Nairobi City County. This implies that for a one percentage increment in household income of the expectant women, Linda Mama maternal healthcare cover uptake in Mukuru slums in Nairobi City County will significantly improve by 8.5%. From prior factor analysis on household income, since Infant mortality and children's health are a function of household income, low-income households are forced to forgo care because of the cost of healthcare. This result contradicts those of Maina, Kithuka and Tororei who found that household monthly income did not influence the uptake and utilization of healthcare insurance in Rural Kenya. However, this current study results corroborates the findings by Achia and Mageto (2015) who found that increase in income (higher social economic status) lead to adequate healthcare services uptake.

In summary, the estimable multiple regression model is as presented below.

$$Y = 2.521 + 0.085X_1$$

Where:

Y = Maternal Healthcare Cover Uptake in Mukuru slums in Nairobi City County,

X_1 = Household income

5.4 Discussion of Qualitative Analysis of the Interview Schedule

In this section, the study delved into the qualitative analysis, which aims to provide a deeper understanding of the influence of household income on Linda Mama maternal healthcare cover uptake in the context of Mukuru slums in Nairobi City County. While the quantitative analysis provided statistical insights into the relationships between the variables, the qualitative component allows the exploration of the nuanced experiences, perceptions, and motivations of expectant women and the CHW/CHV.

Interviewees were asked to characterize the influence of household income in the process of maternal healthcare cover uptake in Nairobi City County. In their responses, the following insights could be deduced:

On economic factors, financial constraints were considered a significant barrier to maternal healthcare utilization. In Nairobi, there are often disparities in income levels, with many residents facing economic challenges. The cost of healthcare services, transportation to healthcare facilities, and the availability of health insurance can all impact uptake.

On financial accessibility, *Linda Mama* offers free maternal healthcare services, including antenatal care, delivery, and postnatal care. This eliminates the financial barrier that many women in Nairobi face when seeking healthcare during pregnancy and childbirth.

On reduction of out-of-pocket expenses, the program covers the costs of essential maternity services, reducing the need for women to pay for medical expenses out of their pockets. This financial relief is a significant incentive for enrollment.

On health education, health education programs that teach women about the importance of prenatal care, safe delivery in healthcare facilities, and postnatal care motivate them to enroll in Linda Mama.

On awareness and information, effective awareness campaigns and information dissemination about the program were essential. When women are well-informed about the benefits and coverage provided by Linda Mama, they are more likely to register and use the services.

6. Conclusion and Recommendation

The study examined the influence of household income on Linda Mama maternal healthcare cover uptake in Mukuru slums in Nairobi City County. The results indicated that household income had a significant positive influence on Linda Mama maternal healthcare cover uptake in Mukuru slums in Nairobi City County. Thus, the study concludes that household income had a significant positive influence on Linda Mama maternal healthcare cover uptake in Mukuru slums in Nairobi City County.

The study recommended that policymakers should consider measures to alleviate financial constraints for low-income households. This could involve tailoring incentives that cater to other incidental costs like transport to the health facilities and medicine costs (that are not covered), to increase the Linda Mama program utilization for vulnerable populations in Mukuru slums.

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