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Maternal Socioeconomic Characteristics Influencing Measles Vaccine Uptake Among Mothers of Children Aged 9-24 Months in Narok North Sub-County, Narok County

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Abstract

Purpose: This research explored the impact of maternal socioeconomic factors on the uptake of measles vaccination among mothers with children aged 9 to 24 months in the rural area of Narok North Sub-County.

Methods: A cross-sectional analytical survey was performed. Location and Duration of the Study: The research was conducted in Narok North Sub-County, Kenya, from February 2022 to April 2023. A total of 100 mothers and caregivers of children aged 9–24 months filled out structured questionnaires. The data were analyzed using descriptive statistics, logistic regression, and Pearson's chi-square tests to investigate the association between maternal socioeconomic characteristics and the uptake of measles vaccination

Results: Measles immunization coverage showed a strong correlation with mothers' educational background ($p = 0.012$), work status ($p = 0.133$), family earnings ($p = 0.015$), and main source of vaccine information ($p < 0.001$). The study revealed that complete immunization, including both initial (MCV1) and follow-up (MCV2) doses, was achieved in only 11% of participating children. Better-educated mothers demonstrated an increased tendency to vaccinate their children. Among working mothers, those running their own businesses showed higher full vaccination rates (9%) versus formally employed mothers (2%). Families with monthly earnings exceeding Ksh. 10,000 were notably more likely to complete their children's immunizations. Moreover, parents who received vaccination information primarily from nursing staff showed substantially higher complete immunization rates (AOR = 9.86, 95% CI [1.58 – 61.57], $p = 0.014$). Marriage status ($p = 0.536$) and cultural background ($p = 0.209$) showed no significant impact on vaccination decisions.

Conclusion: This research highlights how maternal socioeconomic conditions influence measles vaccination rates. Strengthening women's education, financial stability, and connection to healthcare professionals' guidance can substantially increase immunization coverage. Strategic programs should target socioeconomic challenges to enhance vaccine uptake and strengthen community health outcomes in rural areas.

Keywords: *Measles vaccine uptake, maternal socioeconomic factors, public health, rural Kenya, vaccine hesitancy, Narok County*

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1. Introduction

Measles continues to rank among the world's most common vaccine-preventable causes of death, especially for children under five (WHO, 2019). Many low- and middle-income countries, including Kenya, still have low vaccination coverage despite major advancements in measles vaccination efforts between 2000 and 2018, which led to a significant decline in measles-related child mortality (De Figueredo et al., 2020). The World Health Organization (WHO, 2019) recommends a 95% coverage rate to prevent measles outbreaks, yet this target remains unmet in many regions. Various maternal socioeconomic factors, such as economic disparities, vaccine hesitancy, and logistical challenges, have been identified as key determinants affecting measles vaccine uptake (Phillips et al., 2017; Sarker et al., 2019; Allan et al., 2021). These barriers are more pronounced among vulnerable populations, particularly those residing in rural and remote areas, where access to healthcare services is often limited (Budu et al., 2023; Odero et al., 2024).

Measles continues to pose a significant public health threat in Sub-Saharan Africa, despite ongoing vaccination efforts. While there was a marked increase in vaccination coverage from 2001 to 2010 (WHO, 2019), progress has since stagnated, leading to sporadic outbreaks in several countries. Factors such as maternal education, household income, and employment status greatly affect immunization rates (Adamu et al., 2021; Nakatudde et al., 2019). Households with lower incomes often struggle to access healthcare services due to transportation costs and other financial barriers (Dires et al., 2025). Additionally, misinformation and cultural beliefs prevalent in rural areas contribute to vaccine hesitancy, exacerbating the situation (Adamu et al., 2021; Nakatudde et al., 2019; Shiferie et al., 2023). For instance, the Democratic Republic of Congo reported over 460,000 measles cases and nearly 8,000 deaths between 2018 and 2020 (Shibre et al., 2020). This crisis is largely attributed to socioeconomic disparities and inadequate vaccine coverage

Kenya has achieved notable advancements in decreasing childhood mortality caused by vaccine-preventable illnesses such as measles, polio, and tuberculosis (Allah et al., 2021). The under-five mortality rate has significantly reduced over the years due to enhanced vaccination initiatives. For example, the rate of mortality among children under five has dropped from 1,869 per 100,000 live births in 2000 to 831 per 100,000 live births by 2019 (Allah et al., 2021; Mamuti et al., 2022). Nevertheless, measles vaccination coverage is still inadequate, with the first dose (MCV1) coverage around 85%, while the second dose (MCV2) lingers below 50% (KDHS, 2020). This does not meet the WHO's suggested benchmark, leaving a significant segment of the population at risk for measles outbreaks. Research shows that maternal socioeconomic factors, including education, employment status, and income levels, significantly affect vaccine uptake (Kisangau et al., 2018; Adamu et al., 2021; Masters et al., 2019). Adamu et al. (2021) found a correlation between lower maternal education and income

levels with increased non-vaccination rates, underscoring the necessity for targeted strategies to enhance vaccination coverage (Onsomu et al., 2015; Gibson et al., 2015).

Kenya's Narok North Sub-County, which is primarily a pastoralist and rural area, has particular socioeconomic issues that affect the uptake of the measles vaccine. Vaccination decisions are strongly influenced by maternal socioeconomic factors, such as education, income, and work (Nakatudde et al., 2019; Adamu et al., 2021; Odero et al., 2024). While mothers from lower-income families face obstacles like transportation expenses, conflicting financial priorities, and a lack of knowledge about the advantages of vaccines, mothers with higher education levels and steady jobs are more likely to make sure their kids receive their shots on time (Nakatudde et al., 2019; Adamu et al., 2021; Ongas, 2021). Additionally, cultural beliefs and patriarchal structures may restrict maternal decision-making autonomy, further hindering vaccine uptake (Olaniyan et al., 2021). The low coverage of the second dose of measles-containing vaccine (MCV2) in some parts of Kenya, such as Alego-Usonga Sub-County, has been linked to these socioeconomic factors (Ogutu et al., 2024). Therefore, the purpose of the current study was to investigate the maternal socioeconomic determinants of measles vaccine uptake among mothers of children aged 9–24 months in Narok North Sub-County.

2. Materials and Methods

The socioeconomic factors influencing mothers' adoption of the measles vaccine among mothers of children ages 9 to 24 months were investigated in this study using an analytical cross-sectional methodology. The cross-sectional approach was selected to give a quick overview of the connections between maternal socioeconomic characteristics and the uptake of MCV1 and MCV2 vaccines at a particular moment in time. This method worked well for finding trends and connections within the intended audience. In the southern portion of the Great Rift Valley, in the largely pastoralist and rural Narok North Sub-County of Narok County, Kenya, the study was carried out. The Maasai and Kalenjin communities reside in Narok North Sub-County, which has 1,157,873 residents according to the 2019 census. High rates of poverty, cultural hurdles, and restricted access to medical facilities are some of the region's particular difficulties. Because they regularly provide immunization services to mothers and caregivers, four health centers—Nkoreta Health Center, Ewaso Ngiro CMF, Entoltol Dispensary, and Olchorro Health Center—were specifically chosen for the study. These medical facilities were essential for participant recruitment and immunization data collection.

The study focused on mothers of children aged 9 to 24 months who were either scheduled to receive or had already received at least one dose of the measles-containing vaccine (MCV1 or MCV2). By concentrating on mothers, the research aimed to closely examine socioeconomic factors such as education, employment, and income. Eligible participants were those serving as primary caregivers for children in the specified age range and who accessed healthcare services in the study area. The final sample size was determined to be 100 mothers or caregivers who took part in interviews. To calculate the sample size, Fisher's formula, $N = (Z2 \times p(1-p))/d2$, was used, resulting in an initial figure of 384. Given that there were fewer than 10,000 participants for this study, the formula $nf = n / (1 + (n/N))$ was applied to adjust the sample size. Here, N represented the estimated population size based on the 120-measles vaccination monitors in the Narok North sub-county. This adjustment yielded a result of 91.4. We then factored in a 10% non-response rate, which amounted to 9 in the sample. As a result, the final

sample size was calculated to be 100. A snowball sampling method was used to recruit participants, starting with mothers or caregivers found at the chosen health facilities. Once a participant was identified, they were encouraged to refer other eligible mothers within the community. This method proved to be effective for connecting with mothers in isolated pastoralist areas who may not regularly visit healthcare facilities.

Structured, pretested questionnaires were used to gather data during in-person interviews. Comprehensive data on maternal socioeconomic characteristics, including household income, work position, education level, and sources of income, was gathered through the questionnaire. To confirm vaccination status, more information was gathered from immunization records at the chosen medical facilities (MCV1 and MCV2). The research data underwent examination using SPSS Software Version 26. Statistical measures, including frequencies and percentages, were employed to analyze maternal socioeconomic attributes. Chi-square testing through Pearson's method assessed relationships between maternal socioeconomic variables and measles vaccine acceptance. A logistic regression model was utilized to determine key factors influencing MCV adoption, with $p < 0.05$ established as the threshold for statistical significance.

3. Results and Discussion

3.1. Results

3.1.1 Participants Socio-Demographics

The research encompassed mothers and caregivers of infants aged 9–24 months (n=100). The largest group of participants came from Entoltol Dispensary (39.0%, n=39), with Nkoreta Health Centre (24.0%, n=24) and EwasoNgiro CMF (23.0%, n=23) following, while Olchorro Health Centre had the smallest representation (14.0%, n=14) (table 1). Complete immunization rates differed between facilities, with Entoltol Dispensary showing 2.0% (n=2) of children fully immunized, Nkoreta Health Centre and EwasoNgiro CMF each at 4.0% (n=4), and Olchorro Health Centre at 1.0% (n=1). Within the study group, 97.0% (n=97) were in marriages, with 11.0% (n=11) having completed their children's immunizations, while 3.0% (n=3) were unmarried, with none achieving full immunization (table 1). Participants over 30 years made up 84.0% (n=84), with 9.0% (n=9) having fully immunized children, while those under 30 represented 16.0% (n=16), with 2.0% (n=2) reaching full immunization. Concerning education, 82.0% (n=82) of mothers and caregivers had not completed primary education, with 9.0% (n=9) achieving full immunization, while 18.0% (n=18) had surpassed primary education, with 2.0% (n=2) completing immunization. Among partners, 65.0% (n=65) had not finished primary education, with 7.0% (n=7) achieving full immunization, while 35.0% (n=35) had exceeded primary education, with 4.0% (n=4) completing immunization. Most participants (97.0%, n=97) identified as Maasai, with 10.0% (n=10) fully immunizing their children, while 3.0% (n=3) were from other ethnicities, with 1.0% (n=1) achieving full immunization *(Table 1)*.

Table 1: Sociodemographic Characteristics

Variable	Frequency (n = 100)	Percentage	MCV Uptake	
			Fully Immunized	Not Fully Immunized
Healthcare facility				
Nkoreta Health Centre	24	24.0	4	20
EwasoNgiro CMF	23	23.0	4	19
Entoltol Dispensary	39	39.0	2	37
Olchorro Health Centre	14	14.0	1	13
Marital Status of the mother or Caregiver				
Married	97	97.0	11	86
Not Married	3	3.0	0	3
Age Bracket				
< 30 years	16	16.0	2	14
> 30 years	84	84.0	9	75
Level of Education of the Spouse				
< Primary	65	65.0	7	58
> Primary	35	35.0	4	31
Education Level of the mother or Caregiver				
< Primary	82	82.0	9	73
> Primary	18	18.0	2	16
Ethnic Group				
Maasai	97	97.0	10	87
Others	3	3.0	1	2

3.1.2. Overall Uptake of Measle Containing Vaccine

In this study, full measles immunization was defined as receiving 1) the first dose of measles-containing vaccine (MCV1) at 9 months and 2) the second dose (MCV2) at 18 months. WHO (2024) Expanded Program on Immunization (EPI) recommendations advocate for a two-dose vaccination schedule for complete full MCV immunization as a single dose (MCV1) does not provide adequate protection for all children. Among those eligible for MCV2 (n = 49), 13 received it, whereas 36 did not. Consequently, only 11 children were fully immunized, having received both MCV1 and MCV2 at the appropriate ages *(figure 1*). The remaining 89 children were classified as not fully immunized, including 61 who were partially immunized (received either MCV1 or MCV2 but not both) and 28 who had not received either dose.

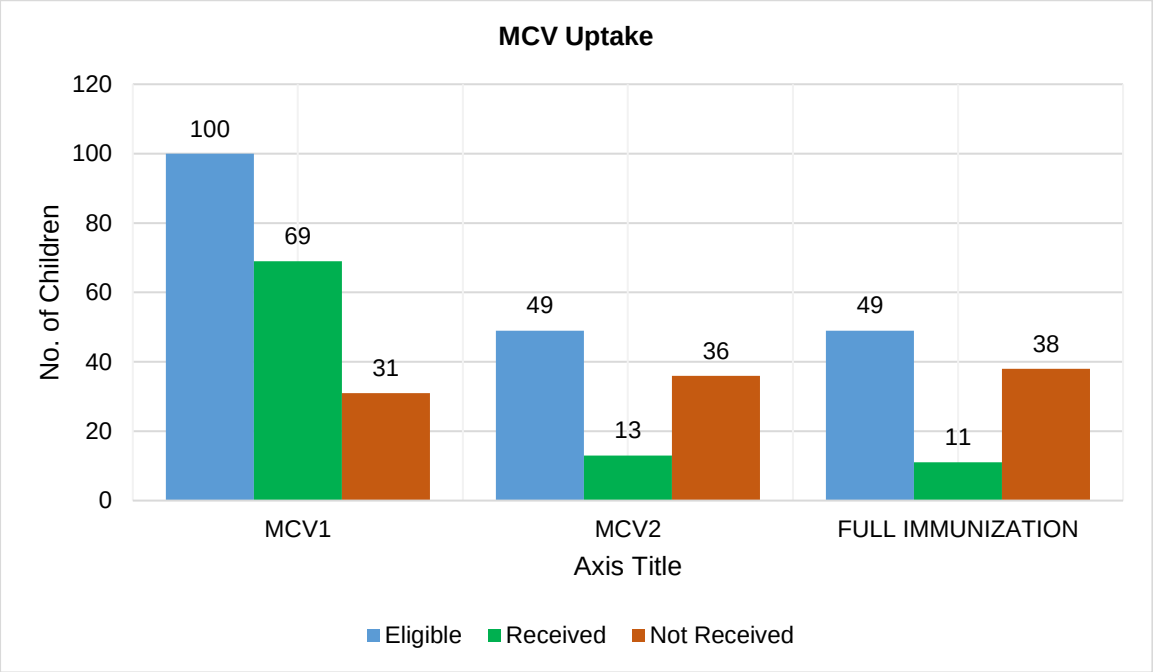

Figure 1: MCV Uptake

3.1.3. Maternal Socioeconomic Characteristics and MVC Uptake

The study involved mothers and caregivers of children aged 9 to 24 months (n=100). Participants had diverse primary sources of income, with 39.0% (n=39) in formal employment and 61.0% (n=61) in self-employment. Among those in formal jobs, only 2.0% (n=2) had fully immunized their children, while 37.0% (n=37) had not (see Table 2). In contrast, among self-employed participants, 9.0% (n=9) had fully immunized their children, while 52.0% (n=52) had not. The monthly income distribution revealed that 87.0% (n=87) of participants earned less than 10,000 KES per month, with only 9.0% (n=9) achieving full immunization. Meanwhile, 13.0% (n=13) earned more than 10,000 KES per month, and among them, just 2.0% (n=2) had fully immunized their children. Concerning vaccination information sources, 92.0% (n=92) of respondents cited nurses as their main source, with 9.0% (n=9) completing their children's immunizations (table 2). Fellow women were indicated as the primary source by 8.0% (n=8) of respondents, of whom 2.0% (n=2) had completed their children's immunizations. When questioned about the most reliable information source, 94.0% (n=94) placed their trust in nurses, with 10.0% (n=10) reaching full immunization, while 6.0% (n=6) relied on villagers, of whom 1.0% (n=1) had completed their children's immunizations (table 2). Knowledge of leaders opposing measles vaccination was indicated by 4.0% (n=4) of respondents, with none achieving full immunization, while 96.0% (n=96) were unaware of such leaders, with 11.0% (n=11) completing immunizations. Furthermore, 32.3% (n=20) of respondents knew individuals who had experienced negative reactions to the measles vaccine, with 4.0% (n=4) completing immunizations, while 67.7% (n=42) knew no one with such reactions, of whom 2.0% (n=2) had completed immunizations.

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Table 2: Maternal Socioeconomic Characteristics and MVC uptake

Variable	Frequency (n = 100)	Percentage	MCV Uptake	
			Fully Immunized	Not Fully Immunized
Source of Income of the mother or Caregiver				
Formal Employment	39	39.0	2	37
Self-Employment	61	61.0	9	52
Monthly Income				
< 10000	87	87.0	9	78
> 10000	13	13.0	2	11
Common Information Source				
Nurse	92	92.0	9	83
Other Women	8	8.0	2	6
Who is Most Trusted for Information				
Nurse	94	94.0	10	84
Villagers	6	6.0	1	5
Know Leaders Who Do Not Agree with Measles Vaccines				
Yes	4	4.0	0	4
No	96	96.0	11	85
Know Someone Who Experienced a Bad Reaction to Measles Vaccines				
Yes	20	32.3	4	16
No	42	67.7	2	40

3.1.4 Bivariate Analysis

The analysis examined links between selected sociodemographic factors and measles vaccine coverage in children from 9 to 24 months old. Analysis showed that the full immunization status of children showed no significant connection to the marital status of mothers or caregivers as measured by $\chi^2(1, N = 100) = 0.382$, p =. 536. Results from Table 3 show that children's vaccination status remained similar regardless of whether caregivers were married or unmarried. The small effect size for this relationship (Cramer's V = 0.062) shows a minimal association between marital status and immunization uptake. In the study, 97.0% of caregivers reported being married (97 individuals) where 11 of those married caregivers fully immunized their children while none of the three unmarried caregivers managed to do so. The statistical analysis showed no significant relationship between marital status and MCV vaccination rates. The analysis identified a significant relationship between age bracket and full immunization status as shown by $\chi^2(1, N = 100) = 7.978$, p = .005, and a moderate effect size measured by

Cramer's V = 0.282 (table 3). Among caregivers younger than 30 years, 5 had fully immunized their children, while 11 had not. In contrast, among those older than 30 years, 6 had fully immunized their children, whereas 78 had not. The significant p-value suggests that age may play a role in immunization uptake, with caregivers above 30 years showing a lower rate of full immunization compared to those younger than 30 years.

The spouse's educational background failed to demonstrate a meaningful correlation with complete vaccination status, $\chi^2(2, N = 100) = 0.250$, $p = .883$, showing minimal impact (Cramer's V = 0.050). Within the group whose partners had not completed primary schooling, 6 children received all vaccines, while 45 did not. For spouses who had completed beyond primary education, 5 children were fully vaccinated, compared to 44 who were not. These results indicate that the educational attainment of spouses played no substantial role in determining vaccination completion rates. In contrast, the educational attainment of the primary caregiver showed a clear statistical relationship with measles vaccine administration, $\chi^2(1, N = 100) = 6.312$, $p = .012$, indicating moderate influence (Cramer's V = 0.251) (table 3). For caregivers without complete primary education, 6 children received full immunization, while 76 remained partially vaccinated. Conversely, among those with higher educational levels, 5 children completed their vaccinations, while 13 did not. This significant finding suggests that maternal education levels may affect vaccination completion, with more educated mothers more likely to fully immunize their children.

Analysis of ethnic identity revealed no significant statistical connection to vaccination completion, $\chi^2(1, N = 100) = 1.576$, $p = .209$, with minimal correlation (Cramer's V = 0.126) (table 3). Most study participants identified as Maasai (97.0%, n = 97), with 10 having fully vaccinated children and 87 having partially vaccinated ones. Among non-Maasai participants (3.0%, n = 3), full vaccination was recorded for 1 child, while 2 remained partially vaccinated. Despite slightly higher vaccination rates among Maasai families, statistical analysis showed no significant link between ethnic background and vaccination completion rates.

The bivariate analysis examined the relationship between various socioeconomic and informational factors and the uptake of the measles-containing vaccine (MCV) among children aged 9 to 24 months. The source of income for the mother or caregiver did not show a statistically significant connection to full immunization, $\chi^2(1, N = 100) = 2.252$, $p = .133$, with a small effect size (Cramer's V = 0.150). Among caregivers with formal employment, 2 had fully immunized their children, while 37 had not. In contrast, among self-employed caregivers, 9 had fully immunized their children, while 52 had not. Although a higher percentage of self-employed caregivers achieved full immunization, this association was not statistically significant. Monthly income, however, demonstrated a statistically significant relationship with full immunization status, $\chi^2(1, N = 100) = 5.965$, $p = .015$, with a moderate effect size (Cramer's V = 0.244). Among caregivers earning less than 10,000 KES per month, 7 had fully immunized their children, while 80 had not. In contrast, among those earning more than 10,000 KES per month, 4 had fully immunized their children, while 9 had not. The significant p-value indicates a possible link between household income and immunization uptake. The primary source of vaccination information also showed a statistically significant association with full immunization, $\chi^2(1, N = 100) = 13.510$, $p < .001$, with a strong effect size (Cramer's V = 0.368)

(table 3). Among caregivers who identified nurses as their main source of information, 7 had fully immunized their children, while 85 had not. Conversely, among those who primarily sought vaccination information from other women, 4 had fully immunized their children, while 4 had not. These findings suggest that caregivers who received information from nurses were more likely to ensure full immunization for their children.

Confidence in vaccine information sources did not show a significant relationship with complete immunization, $\chi^2(1, N = 100) = 0.209$, $p = .647$, with a minimal effect size (Cramer's $V = 0.046$). Among caregivers who placed their highest trust in nurses, 10 had fully immunized their children, compared to 84 who had not. Likewise, among those who relied on villagers for information, only 1 fully immunized their child, while 5 did not. The results indicate that while most caregivers trusted nurses, this trust did not show a statistically significant impact on vaccination uptake. Knowledge of community leaders who opposed measles vaccination showed a statistically significant association with full immunization, $\chi^2(1, N = 100) = 6.473$, $p = .011$, with a moderate effect size (Cramer's $V = 0.254$) *(table 3)*. Among caregivers who knew leaders who disagreed with MCV, 2 had fully immunized their children, while 2 had not. In contrast, among those who were unaware of such leaders, 9 had fully immunized their children, whereas 87 had not. The findings suggest that awareness of anti-vaccine leadership in the community may be linked to lower rates of full immunization.

Table 3: Bivariate Analysis

Variable	MCV Uptake				
	Fully Immunised	Not Fully Immunised	X^2	df	p-value
Marital Status of the Mother or Caregiver					
Married	11	86			
Not Married	0	3	0.382	1	0.536
Age Bracket					
< 30 years	5	11			
> 30 years	6	78	7.978	1	0.005
Level of Education of the Spouse					
< Primary	6	45			
> Primary	5	44	0.250	2	0.883
Education Level of the Mother or Caregiver					
< Primary	6	76			
> Primary	5	13	6.312	1	0.012
Ethnic Group					
Maasai	10	87			
Others	1	2	1.576	1	0.209
Source of Income of the Mother or Caregiver					
Formal Employment	2	37			
Self-Employment	9	52	2.252	1	0.133
Monthly Income					

< 10000	7	80			
> 10000	4	9	5.965	1	0.015
Common Information Source					
Nurse	7	85			
Other Women	4	4	13.510	1	0.000
Who is Most Trusted for Information					
Nurse	10	84			
Villagers	1	5	0.209	1	0.647
Know Leaders Who Do Not Agree with Measles Vaccines					
Yes	2	2			
No	9	87	6.473	1	0.011

3.1.5. Multivariate Logistical Regression

Further analysis was carried out on the variables identified as significant in the bivariate analysis, utilizing multiple logistic regression to explore their independent relationships with full immunization status. The model considered factors such as age group, the education level of the mother or caregiver, monthly income, the primary source of information, and awareness of leaders who opposed measles vaccination. This analysis aimed to evaluate the adjusted odds of achieving full immunization while accounting for potential confounding variables, thereby enhancing our understanding of the factors that may independently affect vaccination rates among children. The results indicated that the main source of vaccination information was a crucial predictor of full immunization status. Caregivers who regarded nurses as their primary source of vaccination information had significantly higher odds of fully immunizing their children compared to those who depended on other women (AOR = 9.86, 95% CI [1.58 – 61.57], p = .014) (table 4). This implies that caregivers receiving vaccination information from healthcare professionals were more likely to ensure their children completed their immunization schedules. Additionally, the analysis revealed that caregivers earning more than 10,000 KES monthly had higher probabilities of complete immunization for their children when compared to those earning below 10,000 KES (AOR = 5.00, 95% CI [0.60 – 41.68], p = .136). The statistical analysis failed to show a significant association. The statistical model showed that age group (AOR = 0.28, 95% CI [0.05 – 1.47], p = .132), mother or caregiver education level (AOR = 0.34, 95% CI [0.03 – 3.46], p = .361; AOR = 0.61, 95% CI [0.05 – 7.27], p = .699), and awareness of leaders opposing measles vaccination (AOR = 0.32, 95% CI [0.01 – 8.22], p = .489) demonstrated no statistically significant connection with full immunization status (table 4). Post-adjustment analysis demonstrates that these factors had no significant impact on full immunization probability.

Table 4: Logistic Regression Analysis

Variable	B	SE	Wald	df	Sig.	Exp(B)	95% CI for Exp(B) (Lower)	95% CI for Exp(B) (Upper)
Age Bracket (1)	-1.270	0.843	2.270	1	0.132	0.281	0.054	1.465
Education Level of the Mother or Caregiver			0.966	2	0.617			
Education Level of the Mother or Caregiver (1)	-1.081	1.184	0.833	1	0.361	0.339	0.033	3.455
Education Level of the Mother or Caregiver (2)	-0.488	1.261	0.150	1	0.699	0.614	0.052	7.274
Monthly Income (1)	1.610	1.081	2.217	1	0.136	5.004	0.601	41.678
Common Information Source (1)	2.289	0.934	5.999	1	0.014*	9.862	1.580	61.567
Knowledge of Leaders Who Disagree with MCV (1)	-1.149	1.661	0.478	1	0.489	0.317	0.012	8.220

***Note:* $p < 0.05$. Variable(s) entered on step 1: Age Bracket, Education Level of the mother or the Caregiver, Monthly income, Common information source, know leaders who do not agree with measles vaccines**.

4. Discussion

Socioeconomic conditions of mothers significantly influence the adoption of measles-containing vaccine (MCV) in children between 9–24 months of age. Research demonstrates that household income levels strongly predict complete vaccination rates, with more affluent families showing higher immunization compliance (Dires et al., 2025; Budu et al., 2023). Economic barriers often restrict access to medical facilities and vaccination programs, emphasizing the importance of financial support measures to reduce immunization disparities (Shiferie et al., 2023).

Research shows that mothers' educational background correlates positively with MCV acceptance, demonstrating how health awareness and literacy impact vaccination compliance (Tesema et al., 2020; Odero et al., 2024). While partner education was expected to affect vaccination choices, no meaningful statistical correlation emerged. This observation supports earlier studies showing that mothers' independent decision-making power and direct childcare involvement more strongly influence vaccine acceptance compared to fathers' education (Shibre et al., 2020). Furthermore, marriage status among mothers showed no substantial effect on MCV coverage, indicating that health service accessibility and maternal knowledge might be more decisive in vaccination decisions (Dimitrova et al., 2023). Similarly, cultural background, though previously considered influential, demonstrated no significant impact, highlighting the relevance of local and situational elements in vaccination patterns (Masters et al., 2019). These discoveries have substantial public health ramifications, emphasizing the necessity for focused initiatives that boost maternal education and economic assistance programs to enhance MCV acceptance. Improving medical communication systems, especially through nursing staff and local health advocates, can boost vaccine receptivity and adherence among mothers (Allan et al., 2021). Decision-makers should contemplate incorporating organized educational programs within maternal and pediatric health services to tackle knowledge deficits and vaccination misconceptions (Dires et al., 2025). Additionally, economic support initiatives, including reduced healthcare expenses or transport assistance for economically disadvantaged households, could minimize financial obstacles to vaccine accessibility (Budu et al., 2023). Subsequent studies should examine the extended effects of mothers' socioeconomic position on vaccination patterns and explore other elements contributing to vaccine reluctance. Comprehending the relationship between maternal factors and healthcare accessibility remains crucial for developing strategies aimed at improving immunization coverage and decreasing preventable disease burden among children in resource-limited environments.

Strengths and Limitations

This study has several advantages. By looking at maternal socio-economic factors it helps to identify the key drivers of measles vaccination in a rural setting. The use of verified vaccination records from the health facilities reduces data errors and recall bias. The combination of descriptive and multivariate analysis allows for a thorough examination of the predictors and evidence-based recommendations for policymakers and health stakeholders. However, the study has some limitations. The cross-sectional design does not allow for causality between maternal socio-economic factors and vaccination uptake. Some data like income and employment status were self-reported and therefore prone to recall and social desirability bias. The small sample size (n=100) may also limit the generalizability of the findings to larger population. Future studies with larger sample sizes and longitudinal design would give deeper insight into the long-term effects of maternal socio-economic status on immunization trends.

5. Conclusion and Recommendations

This study shows how maternal socio-economic factors affect measles vaccination uptake in Narok North Sub-County. Education level, household income and access to reliable health information were key determinants of full immunization, with higher education and income levels associated with higher vaccine uptake. The findings suggest that targeted interventions such as maternal education programs, financial empowerment initiatives, and health education should be implemented to increase vaccination coverage. Policymakers and health organizations should prioritize reducing socioeconomic barriers to immunization by improving healthcare access, community outreach, and vaccine awareness campaigns. Addressing this is crucial for higher immunization rates and public health goals, especially in rural and disadvantaged areas.

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Competing Interest

The author declares that they have no competing interests.

Consent

Written informed consent was obtained from all participants for their involvement in this study. Participants were assured of confidentiality, and their participation was voluntary, with the right to withdraw at any stage without consequences. A copy of the written consent is available for review by the Editorial Office, Chief Editor, or Editorial Board members of this journal upon request.

Ethical Approval

This study received ethical approval from the Kenyatta University Ethics Review Committee (KUERC) and the National Commission for Science, Technology, and Innovation (NACOSTI). The Narok County research committee granted further regulatory approval. All procedures followed ethical guidelines, and written informed consent was obtained from all participants before data collection.

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