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Determinants of Parental Hesitancy toward Routine Vaccination among Children under Five Years in the Matoto Health District, Conakry, 2025

Niouma Nestor Leno[1,2,3*], Abdoulaye Maciré Camara[1,3], Sékou Solano[4], Bah Ibrahima III[1], Aissata Kolonga Bangoura[1,3], Tamba Gaston Kambadouno[1,3], Gassim Cissé[5], Delamou Alexandre[1,2]

[1]Faculty of Health Sciences and Techniques, Gamal Abdel Nasser University of Conakry, Conakry, Guinea
[2]African Center of Excellence for the Prevention and Control of Communicable Diseases (CEA-PCMT), Gamal Abdel Nasser University of Conakry, Conakry, Guinea
[3]Expanded Program on Immunization, Ministry of Health and Public Hygiene, Conakry, Guinea
[4]Country Office, World Health Organization, Conakry, Guinea
[5]National Directorate of Epidemiology and Disease Control, Ministry of Health and Public Hygiene, Conakry, Guinea
Email: *nnleno81@gmail.com

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Abstract

Introduction: In Guinea, vaccination coverage remains low despite various initiatives. This study assessed the prevalence of parental hesitancy toward routine childhood immunization in the Matoto health district and identified factors associated with this hesitancy, a key barrier to improving vaccination uptake. **Methods:** An analytical cross-sectional survey was conducted in June 2025 in the Matoto health district, targeting parents of children under five years of age. The SAGE group's WHO questionnaire (10 items) was used to determine the proportion of parents hesitant toward vaccination. Factors associated with hesitancy were assessed using multivariate logistic regression. **Results:** Among 429 parents surveyed, 21.2% expressed vaccine hesitancy. Factors significantly associated with higher hesitancy included lack of formal education (AOR = 2.21; 95% CI: 1.51 - 3.61), having a child with an adverse event following immunization (AOR = 2.67; 95% CI: 1.34 - 4.26), residing over 5 km from a vaccination center (AOR = 1.87; 95% CI: 1.20 - 3.22), and experiencing poor reception at health facilities (AOR = 1.54; 95% CI: 1.10 - 2.28). Conversely, lower hesitancy was linked to attending at least four antenatal visits (AOR = 0.29; 95% CI: 0.11 - 0.42), receiving follow-up from qualified health personnel during pregnancy (AOR = 0.32; 95% CI: 0.21 - 0.53), and delivering in a health facility (AOR = 0.49; 95% CI: 0.34 - 0.67). **Conclusion:** The findings highlight a

substantial level of parental vaccine hesitancy in the Matoto health district. Developing and implementing context-specific and targeted strategies is essential to reduce hesitancy and improve routine immunization coverage. Future research should examine the impact of digital media on vaccine confidence in this population.

Keywords

Parental Hesitancy, Routine Vaccination, Determinants, Matoto, Conakry

1. Introduction

Vaccination is widely recognised as one of the most effective and cost-efficient public health interventions for reducing morbidity and mortality due to infectious diseases in children under five years of age. Routine immunization programs have prevented countless illnesses (e.g. diphtheria, measles, pertussis, polio, tetanus, neonatal tetanus, Haemophilus influenzae B, rotavirus) and substantially lowered death rates among infants and young children worldwide. The Expanded Programme on Immunization (EPI), launched by the World Health Organization (WHO), has played a central role in this achievement; over 50 years, vaccination against a set of 14 vaccine-preventable diseases has averted an estimated 154 million deaths, including 146 million among children under five years, of whom 101 million were infants under one year [1]. These gains translate into vast improvements in child survival; in the African Region, immunization has contributed more than 50% of the observed decline in infant mortality over the same period [1] [2].

Despite these successes, challenges remain. According to the WHO and UNICEF, in recent years global childhood vaccination coverage has held steady but significant numbers of infants still miss doses. In 2024, about 14 million infants remain unvaccinated with even a single dose of "DTP" vaccine [3]. These gaps expose children to risks of vaccine-preventable diseases and threaten the continued health gains made under EPI.

One of the major barriers to achieving high vaccination coverage is vaccine hesitancy. WHO defines vaccine hesitancy as "delay in acceptance or refusal of vaccines despite availability of vaccination services", influenced by factors such as confidence, complacency, and convenience [4]. In 2019, WHO ranked vaccine hesitancy among the top ten global health threats, noting that although vaccines currently prevent between two to three million deaths per year, improving global coverage could prevent another 1.5 million deaths annually [5] [6].

In Sub-Saharan Africa, vaccine hesitancy has emerged as a significant impediment to reaching immunization coverage targets. Cultural beliefs, rumours or misinformation about vaccine safety, lack of trust in health authorities, and low perceived risk of disease are recurrent in many studies. These barriers, combined

with access issues, have contributed to outbreaks of measles, yellow fever, pertussis, and other preventable infections [7]-[10].

In Guinea, the Expanded Program on Immunization (EPI) has expanded access to essential childhood vaccines over the decades, supported by partners such as Gavi, WHO, and UNICEF. Coverage has improved, but remains below the targets set by WHO and by Gavi goals. There are substantial disparities across health districts, socioeconomic strata, and urban versus rural areas. Densely populated urban settings, including Conakry, present challenges: high population density, mobility, diversity of population origin, and sometimes strain on health services. The municipality of Matoto, as Conakry's largest health district, is densely populated and socio-culturally diverse, but the specific determinants of parental hesitancy in Matoto have not been sufficiently studied.

Previous studies in Guinea have identified various contributing factors to low vaccine acceptability: rumours and misinformation, distrust in vaccine safety, low perceived risk of vaccine-preventable disease, limited knowledge or awareness, lack of prenatal care attendance, lack of health infrastructure, and socioeconomic determinants [11]-[14]. However, many of these are from broader surveys or cover national or regional samples, without focusing on Matoto specifically.

Understanding parental hesitancy toward routine childhood vaccination in Matoto is crucial. First, because hesitancy can directly reduce vaccine uptake, undermining herd immunity and exposing children to outbreaks. Second, because tailored interventions (communication, community engagement, service delivery) require knowledge of which factors (educational, geographic, experiential, health system related) are driving hesitancy locally. Finally, densely populated urban districts such as Matoto may have unique dynamics: greater exposure to rumours via media or social networks; greater heterogeneity; variable health service access; and possibly more negative facility experiences due to overload or staff constraints.

Therefore, this study aims to estimate the prevalence of parental hesitancy toward routine childhood vaccination in the Matoto health district, Conakry, Guinea; and to identify the factors associated with this hesitancy. This will provide evidence to guide targeted interventions, strengthen trust in vaccines, improve communication, enhance access and thus improve vaccination coverage and child health in Matoto and similar urban settings in Guinea.

2. Methods

2.1. Study Design and Setting

An analytical cross-sectional study was conducted in June 2025 in the Matoto Health District, located within the Conakry Health Region. The Matoto Health District is one of the five health districts of Guinea's capital, Conakry. Situated in the southeastern part of the city and home to the Ahmed Sékou Touré International Airport in Gbessia, it is among the country's most densely populated municipalities. The district comprises multiple health areas with public and private

health centers, supported by community health posts. High population density, urban mobility, and socioeconomic diversity present challenges for access to health services, especially vaccination. Matoto thus represents a relevant setting for studying determinants of parental vaccine hesitancy regarding the vaccination of children under five years of age.

2.2. Population

The study targeted parents of children under five years old residing in the Matoto Health District.

Inclusion criteria

Included were parents, legal guardians, or individuals primarily responsible for childcare (mothers, fathers, grandparents) who:

- Participated in or made decisions regarding the child's health and vaccination.
- Had resided in the Matoto Health District for at least three months.
- Provided informed consent (oral or written).
- Were able to communicate in French or in one of the local languages used for the survey.

Exclusion criteria

Excluded from the study were:

- Parents of children with a medical contraindication to vaccination.
- Parents of children who were absent or unavailable at the time of the survey.
- Parents suffering from severe cognitive impairment or mental disorders preventing understanding of the interview or informed consent.
- Temporary visitors or non-residents.
- Parents who refused to provide consent.
- Parents working in public health or vaccination at a decision-making level.

2.3. Sampling and Data Collection

Sample size was determined using the Schwartz formula:

$$n = \frac{z^2 \times p \times (1-p)}{d2}$$

where:

- n: sample size,
- Z: value from the normal distribution corresponding to risk α (1.96 for a 5% risk),
- p: expected proportion of parental hesitancy towards routine childhood vaccination (50% selected as a conservative maximum),
- d: absolute acceptable margin of error (precision set at ±5%).
- Numerical application of the formula yielded a minimum sample size of 384 parents. Anticipating a 10% non-response rate, the sample was increased to 422 parents. At the end of data collection, 429 parents were include.

Data collection was conducted using the standard parental vaccine hesitancy questionnaire from the World Health Organization's SAGE group [15].

2.4. Study Variables

The dependent variable of interest was parental hesitancy towards routine vaccination of children under five years. This refers to the proportion of parents exhibiting hesitancy toward routine childhood vaccination (number of parents classified as hesitant/total number of parents surveyed).

Independent variables included sociodemographic characteristics, experiences with routine vaccination services, and obstetric history of mothers. To assess the experience of parents at vaccination centers, we asked a question about overall satisfaction with health services, considering several aspects: reception, waiting time, environment, communication, and information sharing, among others. The question was phrased as follows: "Overall, how would you rate your experience at the vaccination center?" (Very good/Good/Poor/Very poor).

Parents who answered "Very good" or "Good" were classified as having had a positive experience with vaccination services. Those who answered "Poor" or "Very poor" were classified as having had a negative experience.

2.5. Data Analysis

Data analysis was performed using SPSS software (version 25). Characteristics were described using means and medians for numerical variables, and percentages for categorical variables. The parental attitudes toward vaccination scale were used to identify hesitant parents. The SAGE group's WHO questionnaire (10 items) was used to determine the proportion of parents hesitant toward vaccination. The SAGE-10 questionnaire uses a Likert scale [15]. The assessment of vaccine hesitancy was based on a five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. Items 5, 9, and 10 were reverse-coded to ensure consistency of measurement. A strict threshold was applied to classify parents into two categories (mean > 3 = hesitant; mean ≤ 3 = non-hesitant). The dependent variable "parental hesitancy toward vaccination" was coded as 0 = non-hesitancy and 1 = hesitancy.

Multivariate logistic regression was conducted to identify factors associated with parental hesitancy toward routine vaccination of children under five years. The regression model used the stepwise backward procedure according to the criterion, with statistical significance set at $p < 0.05$.

3. Results

3.1. Description of the Sample

Table 1 shows that 31.1% of participants were between 18 and 24 years old, with a mean age of 30 ± 4.6 years. Most respondents were women (68.4%), and 67% were married. More than half of the participants (51.4%) had no formal education, while 34.4% were not engaged in formal employment at the time of the survey.

About access to vaccination services, 57.7% of participants lived 5 km or more from a vaccination center. In addition, 5.6% reported that their children had experienced an adverse event following immunization (AEFI), and 10.6% stated that

they had at least once encountered poor reception at a vaccination center.

Concerning the obstetric history of female participants, 81.4% had attended at least four antenatal care (ANC) visits during their most recent pregnancy, 86.6% had received ANC from a skilled health professional, and 89.4% delivered with the assistance of a skilled birth attendant.

Table 1. Sociodemographic profile, access to vaccination services, and obstetric history of the 429 participants in the study conducted in Matoto, Conakry (Guinea), in 2025.

Variables	Number	Percentage (%)
Age (years)		
18 - 24	142	33.10
25 - 34	163	37.90
35 - 44	56	13.00
45 - 54	47	11.00
≥55	21	5.00
Sex		
Male	136	31.60
Female	293	68.40
Religion		
Christian	24	5.99
Muslim	392	92.10
Traditional religion	7	0.80
No religion	6	1.11
Marital status		
Single	81	18.90
Married/cohabiting	287	67.00
Divorced	22	5.08
Widowed	39	9.02
Educational level		
No formal education	221	51.40
Primary	78	18.10
Secondary	69	16.20
Higher education/university	61	14.30
Employment/occupation		
Unemployed	281	65.60
Employed	148	34.40
Distance from residence to vaccination center		
≥5 km	248	57.70
<5 km	181	42.30

Continued

Number of dependent children		
1 - 2 children	148	34.60
3 - 4 children	193	45.10
≥5 children	87	20.30
Number of antenatal care (ANC) visits during last pregnancy (women only)		
<4 ANC visits	54	18.60
≥4 ANC visits	239	81.40
Type of health personnel providing ANC follow-up		
Unskilled	39	13.40
Skilled	254	86.60
Place of ANC follow-up		
Outside a health facility	20	6.80
Within a health facility	273	93.20
Delivery assisted by skilled personnel		
Yes	268	91.60
No	25	8.40
Type of health personnel attending delivery		
Unskilled	39	13.40
Skilled	254	86.60
Negative experience with reception at vaccination center		
Yes	45	10.60
No	384	89.40
Experience of children with adverse events following immunization (AEFI)		
Yes	24	5.60
No	405	94.40

3.2. Prevalence of Parental Hesitancy toward Routine Vaccination

The prevalence of parental hesitancy toward routine vaccination was 21.1%. More than seventy percent of parents strongly agreed on the importance of vaccines for their children (75.82%). This study also revealed that 76.31% strongly agreed with the statement that "vaccines provided by the government are beneficial for their children." It is also noteworthy that nearly forty percent (39.35%) of parents were neutral (neither agreeing nor disagreeing) with the assertion that new vaccines carry greater risks than older ones (Table 2).

Table 2. Distribution of parental responses toward routine vaccination using the 10-item vaccine hesitancy scale from the sage group, Matoto, Guinea, 2025 (n = 429).

Parental attitudes toward routine vaccination	Strongly agree		Agree		Neutral/Neither agree nor disagree		Disagree		Strongly disagree	
	Number	%	Number	%	Number	%	Number	%	Number	%
Childhood vaccines are important for my child's health	325	75.82	96	22.28	8	1.76	0	0.11	0	0.03
Childhood vaccines are effective	310	72.20	109	25.33	4	1.02	2	0.39	5	1.06
Vaccinating my child is important for the health of others in my community	311	72.51	57	13.23	31	7.28	26	6.09	4	0.89
All childhood vaccines provided by the government program in my community are beneficial	327	76.31	74	17.29	22	5.02	6	1.30	0	0.08
New vaccines carry more risks than older ones	44	10.23	41	9.51	169	39.35	149	34.71	27	6.20
The information I receive about vaccines from the vaccination program is reliable and trustworthy	135	31.56	181	42.12	52	12.03	57	13.21	5	1.08
Vaccination is a good way to protect my child/children against diseases	333	77.52	100	23.20	8	1.78	2	0.50	4	1.00
In general, I follow what my doctor or healthcare provider recommends regarding vaccination of my child/children	310	72.26	99	23.11	9	2.21	6	1.32	5	1.10
I am concerned about serious side effects of vaccines	138	32.10	146	34.01	71	16.59	44	10.20	30	7.10
My child/children do not need vaccines for diseases that are no longer common	101	23.55	61	14.31	87	20.22	109	25.32	71	16.60

3.3. Factors Associated with Parental Hesitancy toward Routine Vaccination of Children under Five Years of Age

The analysis revealed several factors significantly associated with an increased likelihood of parental hesitancy toward childhood vaccination. First, lack of formal education emerged as a major determinant: parents with no schooling were more than twice as likely to exhibit hesitancy (AOR = 2.21; 95% CI: 1.51 - 3.61). Similarly, having a child who had previously experienced an adverse event following immunization markedly heightened doubts and mistrust (AOR = 2.67; 95% CI: 1.34 - 4.26). Geographic barriers also played an important role: residing more than 5 kilometers from a vaccination center limited access and was associated with higher hesitancy (AOR = 1.87; 95% CI: 1.20 - 3.22). In addition, a negative experience at a health facility—often linked to a perceived lack of consideration or disrespectful behavior—further reinforced parental reluctance (AOR = 1.54; 95% CI: 1.10 - 2.28) (Table 3).

Conversely, several factors were associated with reduced hesitancy and greater confidence in vaccination. Attending at least four antenatal care visits served as a strong protective factor (AOR = 0.29; 95% CI: 0.11 - 0.42). Being followed by qualified health personnel during pregnancy also contributed to parental reassurance (AOR = 0.32; 95% CI: 0.21 - 0.53). Finally, giving birth in a health facility was

positively associated with adherence to childhood vaccination (AOR = 0.49; 95% CI: 0.34 - 0.67) (Table 3).

Table 3. Factors associated with parental hesitancy toward routine vaccination of children under five years of age, Matoto, Guinea, 2025 (n = 429).

Variables	Number	Parental Hesitancy Toward Routine Vaccination Yes (%)	Univariate Analysis			Multivariate Analysis		
			OR	95% CI	p-value	Adjusted OR	95% CI	p-value
Age (years)								
18 - 24	142	21.03	1.08	(0.66 - 1.34)	0.24	-	-	-
25 - 34	163	21.1	1.06	(0.52 - 1.31)	0.21	-	-	-
35 - 44	56	22.61	1.21	(0.88 - 1.34)	0.22	-	-	-
45 - 54	47	20.23	1.10	(0.56 - 1.49)	0.23	-	-	-
≥55	21	20.04	1					
Sex								
Male	136	25.12	1.34	(1.21 - 1.50)	0.04	1.12	(0.88 - 1.28)	0.07
Female	293	17.21	1			1		
Religion								
Christian	24	20.69	1.18	(1.06 - 1.32)	0.05	1.11	(0.90 - 1.53)	0.061
Muslim	392	21.46	1.19	(1.08 - 1.44)	0.02	1.10	(0.89 - 1.45)	0.056
Traditional religion	7	21.34	1.11	(0.99 - 1.24)	0.08	0.79	(0.56 - 1.23)	0.09
No religion	6	20.56	1			1		
Marital status								
Single	81	21.01	1.35	(1.21 - 1.67)	0.04	1.17	(0.55 - 1.57)	0.08
Married/cohabiting	287	20.85	1.10	(1.05 - 1.25)	0.05	1.09	(0.43 - 1.23)	0.07
Divorced	22	21.56	1.35	(1.12 - 1.54)	0.06	1.16	(0.67 - 1.11)	0.10
Widowed	39	20.66	1			1		
Educational level								
No formal education	221	27.12	2.87	(2.12 - 3.74)	<0.001	2.21	(1.51 - 3.61)	<0.001
Primary	78	24.23	1.35	(1.11 - 1.56)	0.04	1.11	(0.77 - 1.24)	0.07
Secondary	69	21.21	1.44	(1.23 - 1.64)	0.001	1.23	(0.89 - 1.43)	0.09
Higher education/university	61	15.23	1			1		
Employment/occupation								
Unemployed	281	21.34	1.10	(0.9 - 1.23)	0.23	-	-	-
Employed	148	20.89	1					
Distance from residence to vaccination center								
<5 km	181	25.12	1.91	(1.45 - 3.56)	0.002	1.87	(1.20 - 3.22)	0.034
≥5 km	248	17.91	1			1		

Continued

Number of dependent children							
1 - 2 children	148	21.0	1.08 (0.67 - 1.22)	0.31	-	-	-
3 - 4 children	193	21.67	1.12 (0.80 - 1.34)	0.34	-	-	-
≥5 children	87	20.8	1				
Number of antenatal care (ANC) visits during last pregnancy (women only)							
≥4 ANC visits	239	13.45	0.54 (0.22 - 0.67)	0.001	0.29	(0.11 - 0.42)	0.002
<4 ANC visits	54	29.23	1		1		
Type of health personnel providing ANC follow-up							
Unskilled	39	12.16	0.45 (0.23 - 0.88)	0.002	0.32	(0.21 - 0.73)	<0.001
Skilled	254	30.12	1		1		
Place of ANC follow-up							
Outside a health facility	20	20.67	1.09 (0.67 - 1.34)	0.33	-	-	-
Within a health facility	273	21.34	1				
Delivery assisted by skilled personnel							
Yes	268	13.67	0.67 (0.55 - 0.87)	0.003	0.49	(0.34 - 0.67)	0.0012
No	25	29.55	1		1		
Type of health personnel attending delivery							
Unskilled	39	21.78	1.25 (1.12 - 1.31)	0.05	1.10	(0.67 - 1.24)	0.10
Skilled	254	20.86	1		1		
Negative experience with reception at vaccination center							
Yes	45	24.25	1.66 (1.21 - 2.56)	0.004	1.54	(1.10 - 2.28)	0.002
No	384	19.12	1		1		
Experience of children with adverse events following immunization (AEFI)							
Yes	24	27.81	3.05 (2.05 - 4.33)	0.003	2.67	(1.34 - 4.26)	<0.001
No	405	16.06	1		1		

4. Discussion

Vaccine hesitancy poses a significant barrier to the efforts of childhood immunization programs, which have nevertheless led to substantial reductions in morbidity and mortality associated with vaccine-preventable diseases. Overcoming this obstacle is therefore essential to increase the uptake of vaccination services,

particularly within the context of routine immunization, where parental hesitancy can influence the decisions of parents of children under five years old regarding the vaccination of their children. The objective of this study was to assess the proportion and frequency of parental hesitancy toward routine vaccination of children under five years of age in the Matoto health district of Conakry.

The present study found that the prevalence of parental hesitancy toward routine childhood vaccination in the Matoto health district was 21.1%. This indicates that roughly one in five parents are hesitant to some degree, even when vaccination services are available. Meanwhile, more than 70% of parents strongly agreed on the importance of vaccines for their children (75.82%), and 76.31% strongly agreed with the statement that "vaccines provided by the government are beneficial for their children." Yet nearly forty percent (39.35%) of parents were neutral with respect to the claim that new vaccines carry greater risks than older ones. These findings highlight both a high baseline acceptance of vaccination, and the presence of ambivalence or uncertainty about risk, especially regarding newer vaccines.

A hesitancy prevalence of approximately 21% aligns with the range reported in other urban or low- and middle-income country (LMIC) settings, although comparisons can be challenging due to differing definitions of hesitancy, vaccine schedules, and survey methods. In Sub-Saharan Africa, systematic reviews of vaccine hesitancy, often centered on COVID-19 vaccines but relevant to routine immunization, indicate that levels can be higher or lower depending on the specific context, access, and trust in the health system [16] [17]. About routine immunization, prior surveys in Guinea have documented low rates of full immunization coverage (for example, among children aged 12 - 59 months), with incomplete coverage often linked to limited prenatal care attendance or missing vaccination cards [11]. The high proportion of parents in our study who strongly agreed on the importance of vaccines and on the benefits of government-provided vaccines demonstrates that many parents in Matoto recognize the positive role of vaccination. However, a significant minority remain hesitant or uncertain, particularly regarding the safety of newer vaccines or the risk of potential adverse events.

Regarding the factors associated with parental hesitancy toward routine vaccination of children under five years old, our analysis identified several factors significantly associated with increased hesitancy, and conversely several protective factors.

Parents with no schooling had more than twice the odds of being vaccine hesitant (AOR = 2.21). This aligns with many prior findings showing that lower educational attainment often correlates with reduced knowledge about vaccines, greater susceptibility to misinformation, and lower health literacy. In Guinea, as elsewhere, education has been associated with improved immunization uptake. For example, studies have shown that mothers' education is a strong determinant of whether children are fully immunized [11]. In populations with low formal schooling, tailored communication strategies (using community health workers,

peer educators, local languages, radio or other media) to explain vaccine safety, address rumours, and clarify risk may be especially important.

Having a child who previously experienced an adverse event following immunization markedly increased parental doubts and mistrust (AOR = 2.67). This underscores how personal experience can strongly affect perceptions of vaccine safety, often more than general messaging. Fear of side effects is a common theme in vaccine hesitancy literature globally [16] [18]. Therefore, immunization systems need robust surveillance, timely reporting, transparent communication about adverse events following immunization, and concerted efforts to reassure parents about the rarity of serious outcomes and the fact that the benefits far outweigh the risks. Addressing rumors and misinformation is especially critical in this regard.

Residing more than 5 kilometers from a vaccination center was another important factor (AOR = 1.87). This reflects issues of convenience and physical barriers: distance, transportation costs or difficulties, time cost. Even when people believe in vaccines, logistical constraints can reduce uptake or amplify hesitancy if service provision is seen as burdensome [19] [20]. Distance > 5 km to vaccination centers being a factor suggests that convenience and physical accessibility remain major constraints. Strategies such as outreach services, mobile vaccination teams, or establishing additional vaccination points in underserved areas may help.

Perceived lack of respect, or other negative interactions with health personnel, were associated with higher hesitancy (AOR = 1.54). Trust in health workers and health services is key, and disrespectful or unwelcoming patient treatment undermines confidence. These findings echo research elsewhere showing that quality of service, patient-provider communication, and perceived dignity strongly influence attitudes towards vaccination [16] [21] [22]. Negative experiences at health facilities are modifiable. Training health workers in respectful care, communication, listening to parental concerns, minimizing wait times, ensuring availability of vaccines and addressing perceived neglect or disrespect may help rebuild trust, reduce hesitancy [23].

On the protective side, this study found that parents who attended at least four ANC visits had much lower odds of hesitancy (AOR = 0.29). ANC visits are opportunities for health education, building trust, encountering health workers, and gaining knowledge about preventive child health interventions including immunization. Studies in Guinea and elsewhere have consistently shown that prenatal care attendance is positively associated with knowledge, acceptance, and uptake of vaccination [11] [22].

Follow-up by qualified health personnel during pregnancy: Being followed by qualified personnel (e.g. trained midwives, nurses, doctors) served as another protective factor (AOR = 0.32). It suggests that the quality and perceived legitimacy of antenatal care matters; skilled providers tend to be more trusted, better able to give accurate information, and more responsive to concerns. The strong protective effect of antenatal care and skilled personnel during pregnancy suggests that

maternal health services are key entry points for strengthening vaccine confidence. Interventions that reinforce ANC attendance, improve the quality of provider-client communication during ANC, and use ANC visits to deliver vaccine education could reduce hesitancy.

Giving birth in a health facility was associated with greater adherence to routine childhood vaccination (AOR = 0.49; 95% CI: 0.34 - 0.67). This is consistent with literature indicating that facility births often facilitate early immunization (e.g. at birth for BCG, polio, sometimes hepatitis B), and provide contacts with health staff who can counsel parents [11] [24]. Therefore, improving facility delivery rates could have dual benefit: better maternal and neonatal outcomes and improved vaccination uptake. Ensuring that when mothers deliver in facilities, effective counselling is provided on childhood immunization, and that follow-up services (e.g. postnatal visits) are well organized, likely improves vaccine acceptance [25] [26].

4.1. Strengths and Limitations

This study contributes important evidence on parental vaccine hesitancy in Guinea, particularly in the Matoto health district, where routine vaccination coverage remains suboptimal. A key strength lies in the use of the validated Parent Attitudes about Childhood Vaccines (PACV) scale, which enhances the reliability and comparability of findings with other international studies. The relatively large sample size of 429 participants, drawn from diverse households within Matoto. Furthermore, the use of multivariate logistic regression enabled the identification of independent predictors of hesitancy, providing valuable insights for targeted interventions.

However, some limitations should be acknowledged. The cross-sectional design restricts the ability to infer causal relationships between identified factors and vaccine hesitancy. Data collection relied on self-reporting, which may be subject to recall bias or social desirability bias, especially regarding sensitive issues such as adverse events following immunization. The study was limited to one health district, which may affect the generalizability of findings to other regions of Guinea with different cultural, socioeconomic, or health system contexts. Finally, factors such as exposure to misinformation on social media or cultural beliefs were not fully explored, leaving potential determinants unexamined. Despite these limitations, this study provides a robust evidence base for the Ministry of Health and its Expanded Program on Immunization to guide the implementation of targeted strategies aimed at reducing parental hesitancy toward routine vaccination. These findings represent an important lever to strengthen vaccination coverage in Matoto and, potentially, nationwide.

4.2. Conclusion and Recommendations

This study reveals that more than one in five parents in the Matoto health district express hesitancy toward routine childhood vaccination. Key determinants of hes-

itancy included lack of education, previous adverse events following immunization, long distance to vaccination centers, and poor reception in health facilities. Conversely, adequate antenatal care, delivery in health facilities, and follow-up by qualified health personnel during pregnancy significantly reduced hesitancy.

To address this challenge, tailored strategies should be prioritized. Strengthening community-based communication to counter misinformation and build trust is crucial. Enhancing the quality of interpersonal interactions at health facilities, including respectful and supportive care, can improve parental confidence in vaccination services. Expanding access to immunization through outreach services and reducing geographic barriers are also needed. Additionally, reinforcing maternal health services, especially antenatal care and institutional delivery, can indirectly contribute to higher acceptance of childhood vaccines.

Ultimately, reducing parental vaccine hesitancy requires a multisectoral approach that integrates health education, service quality improvement, and community engagement. Implementing these context-specific interventions could significantly improve immunization coverage and contribute to reducing preventable childhood morbidity and mortality in Guinea. Future research should examine the impact of digital media on vaccine confidence in this population.

Ethical Consideration

This study was conducted as part of the master's thesis in Public Health at Gamal Abdel Nasser University of Conakry. Prior to the commencement of field data collection, the study protocol was reviewed and approved by the Scientific Committee of the master's Program in Public Health at the university and subsequently registered under number (N˚128/2025). Participation in the study was entirely voluntary, and informed consent was obtained after a clear explanation of the study objectives. The confidentiality of the collected information was strictly maintained: only the research team had access to the data, and participants' anonymity was preserved throughout the process.

Authors' Contributions

All co-authors contributed to the study design, manuscript drafting, and critical revision. Data collection and analysis were conducted by BI III and TGK under the supervision of NNL.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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