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Barriers Related to the Follow-up of the Vaccinal Schedule for the 2nd Dose of The Measles and Rubes Vaccine in The Bafia Health District

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ABSTRACT

Introduction: Compliance with measles-rubella (MR) vaccine completeness is a performance indicator for the immunisation service and helps to protect children. The aim of the study was to determine the factors influencing behavioural change linked to achieving MR2 vaccination coverage in the Bafia health district.

Materials and Methods: This quantitative research conducted in the Bafia health district in May-June 2024 assessed the knowledge, attitudes, practices and perceptions of 51 mothers of children aged between 15 months and 2 years in the community.

Results: 45% of mothers declared that their children had not received the 2nd dose of MR and 45% were not familiar with the vaccination schedule. The factor significantly associated with non-compliance with the vaccination schedule was accurate knowledge of the vaccination schedule (Chi-square =34.412; P-value-0.00). 69% of mothers were partially satisfied with vaccination services and 33% felt that the vaccination site was too far away. The barriers identified were knowledge, access to information and financial resources at individual, family, community and institutional levels respectively.

Conclusion: In order to improve measles vaccination coverage in the Bafia health district, our suggestions focused on: training/raising awareness among mothers; organisation of advanced vaccination strategies, community involvement and nudge.

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Introduction

Vaccination is a public health issue that saves 3.5 to 5 million deaths every year and prevents almost 750,000 children from suffering serious physical, mental or neurological disabilities.

Measles is a serious, highly contagious viral disease considered to be primarily a childhood illness, affecting more than 30 million children worldwide and causing almost 777,000 deaths every year, more than half of which occur in Africa. Measles remains the leading cause of death in children, accounting for 875,000 cases a year, with a mortality rate of between 2% and 15% worldwide [1].

According to a 2016 Weekly Bulletin of the Measles Elimination Programme in Cameroon, between 2008 and 2016 the country experienced nearly 357 measles outbreaks recorded nationwide. With 63 health districts in an epidemic at the beginning of 2021 in the country's 10 regions. In 2022, 59.9% of measles cases will be aged between 9 months and 9 years, and 9.9% will be infants under 9 months. 73.1% of positive cases were unvaccinated, and 26.9% of unvaccinated positive cases were aged between 9 and 59 months [2].

The epidemiological situation of measles in Cameroon shows that in 2023, out of 200 health districts, 100 are experiencing a measles epidemic, with 4,677 cases and 18 deaths. This situation can be explained by insufficient vaccination coverage due to vaccine hesitancy, amplified by Covid-19 [2].

The vision of a 'measles-free world' supported by the WHO, UNICEF and other partners in the new Global Measles and Rubella Strategic Plan 2012-2020 aims to contribute to achieving 95% immunisation coverage with the addition of a 2nd dose of the MR vaccine [1].

Since 2009, the WHO has been recommending that all children receive two doses of measles vaccine (VVR) [3]. The 2nd dose will

be introduced in Cameroon in 2020 as part of the immunisation schedule at 15 months of age, with the aim of reducing measles deaths by 95%.

The first dose of MR vaccine is administered at 9 months of age, and the second dose should be routinely administered at 15-18 months. The administration of MR2 guarantees protection of the individual from the earliest age and reduces the rate of accumulation of susceptible children and the risk of epidemic outbreak [3].

The Bafia Health District is one of the Health Districts that constituted the epicentre of a measles epidemic in 2022. The MR2 vaccine drop-out rate in 2023 is therefore 68.54% (source: Dhis2 Cameroon) and MR2 vaccine coverage 31.46%.

Methodology

Type of Study

We conducted a quantitative research study.

Study Setting

This study was carried out in the Bafia health district, particularly in the health areas of Bayomen, Bafia 1, Bafia 2 and Kiiki.

The Bafia health district is bordered to the west by the Ndikinimeki health district, to the north by the Yoko health district, to the south by the Ebebda and Monatele health district and to the east by the Ntui health district. It has a population of 177,930 over a surface area of 75,000 km2 and is home to several rivers, including Ndjerem (Sanaga), Nguerima (Mbam), Noun, Okolé and Guen.

Health cover is provided by 78 health facilities (1 district hospital, 5 district medical centres and 71 integrated health centres).

Figure 1: Health Map of the Bafia Health District

Location and Period of The Study

The study was conducted from 1 to 30 June 2024 in the Bafia health district.

Reference Theory

The theory used in our study is the socio-ecological model.

Study Population: Audience Segmentation

IDEAL BEHAVIOUR	Children should always take their 2nd dose of MR vaccine when they are 15 months old
Priority audiences	Mothers or nannies (51)
Inclusion criteria	-be responsible for children aged between 15 months and 2 years -have the child's vaccination record -live in the DS of Bafia
Expectations of the priority target	-Mastering the vaccination calendar; -Comply systematically with all appointments in the vaccination calendar

Sampling

The sampling technique used is snowball sampling.

Ethical Considerations

We received authorisation from the head of the Bafia health district to conduct our study in his health district. We then presented each mother with the information leaflet for our study and had them sign an informed consent form for participation in the study.

Data Collection Technique

The data collection technique was a questionnaire administered with the prior consent of the participant. The questions concerned socio-demographic characteristics (age, marital status, place of residence, education, number of children, religion), knowledge (knowledge of the measles-rubella vaccine, sources of information, number of doses), attitudes (compliance with the vaccination schedule, time taken for vaccination, participation in educational talks, participation in vaccination campaigns), perceptions (importance of vaccination, appreciation of vaccination services), and practices (adherence to vaccination, adherence of family and friends to vaccination).

Data Analysis

The data were processed and analysed using Microsoft Excell 2013 and SPSS 18 software.

Results

Socio-demographic characteristics of the study population

Table 1: Socio-Demographic Characteristics

AGE GROUP					
	≤ 24 years	**De 25-34 years**			**TOTAL**
Frequency	18	26	7		51
Percentages (%)	35%	51%	14%		100%
LEVEL OF EDUCATION					
	No education	**Primary**	**Secondary**	**Higher**	**TOTAL**
Frequency	2	26	19	4	51
Percentages (%)	4%	51%	37%	8%	100%

MARITAL STATUS					
	Single	**Cohabiting**	**Married**	**Divorced**	
Frequency	24	13	13	1	51
Percentages (%)	47%	25%	25%	2%	100%
RELIGION					
	Catholic	**Protestant**	**Muslim**		
Frequency	26	5	20		51
Percentages (%)	51%	10%	39%		100%

Fifty-one mothers/nannies of children aged 15 to 36 months were included in the study. The respondents ranged in age from 18 to 49, with an average age of 27 and a median age of 27. The most represented age group was 25-34 (51%). 51% of the mothers/nannies had at least primary education. 47% lived alone, while 50% were couples. 51% were Catholics, followed by Protestants (39%) and Muslims (10%), as shown in table 1.

MR Vaccination Coverage in The Bafia Health District

Table 2: MR1 and MR2 Vaccination Coverage in The Bafia Health District

CHILD VACCINE MR1					
	12months	9months	Not vaccinated		**Total**
Frequency	3	45	3		51
Percentages (%)	6%	88%	6%		100%
CHILD VACCINE MR2					
	12months	15months	18months	Not vaccinated	Total
Frequency	1	23	4	23	51
Percentages (%)	2%	45%	8%	45%	100%
CHILD VACCINATED ACCORDING TO THE IMMUNISATION SCHEDULE (MR1 9 MONTHS AND MR2 15 MONTHS)					
	No		Yes		Total
Frequency	28		23		51
Percentages (%)	55%		45%		100%

Forty-five children (88%) received the first dose of MR vaccine at 9 months. Twenty-three children (45%) received the second dose of MR vaccine at 15 months and also Twenty-three children (45%) did not receive the 2nd dose of MR. Twenty-three children (45%) received both doses of MR vaccine according to the vaccination schedule (9 months and 15 months) as shown in Table 2.

Reasons for Non-Vaccination of Mothers of Unvaccinated or Partially Vaccinated Children in The Bafia Health District

Table 3: Reasons for Non-Vaccination of Mothers of Non- or Partially Vaccinated Children in the Bafia Health District

VACCINATION TIMES NOT ADAPTED TO MOTHERS			
	No	**Yes**	**TOTAL**
Frequency	11	40	51
Percentages (%)	21.6%	78.4%	100%
DISTANCE FROM THE VACCINATION SITE			
	Near	**Far**	**TOTAL**
Frequency	34	17	51
Percentages (%)	67%	33%	100%
REASONS FOR TAKING UP VACCINATION OR NOT			
	important	**Severe risks**	**TOTAL**
Frequency	50	1	51
Percentages (%)	98%	2%	100%
RECEPTION BY HEALTHCARE STAFF			
	Totally satisfied	**Partially satisfied**	**Not satisfied**	**TOTAL**

Frequency	14	35	2	51
Percentages (%)	27%	69%	4%	100%
WAITING TIME AT THE VACCINATION SITE				
	≤1h	>1h		**TOTAL**
Frequency	34	17		51
Percentages (%)	67%	33%		100%

Forty mothers (78.4%) considered the vaccination times to be suitable for their work. Thirty- four mothers (67%) felt that the vaccination site was close to where they lived. Fifty mothers (98%) felt that vaccination was important. Thirty-five mothers (69%) were partially satisfied with the vaccination services. Thirty-four mothers (67%) estimated waiting time at the vaccination site at an average of 1 hour, as shown in Table 3.

Identification of the Barriers Associated with Non-Completion of Immunisation by Children in MR2 at Individual, Family, Community and Structural Levels

Table 4: Mastery of the Vaccination Calendar and Influence of the Social Environment

MASTERING THE VACCINATION CALENDAR						
	Q3_1dose9 month	**Q3_2doses9/ 15months**	**Q3_i don't know**	**Q31dose7 month**	**Q3_2doses 7/24**	**TOTAL**
Frequency	17	28	6	0	0	51
Percentages (%)	33%	55%	12%	0	0	100%
NEIGHBOURS OR RELATIVES VACCINATE THEIR CHILD						
	NO			**Yes**		**TOTAL**
Frequency	6			6		51
Percentages (%)	12%			12%		100%

17 mothers (45%) did not have a good knowledge of when to take the MR vaccine for the second dose, as shown in table 4. Forty-five (88%) mothers said that their close circle of friends and family vaccinated their child, as shown in Table 4.

Table 5: Association between knowledge of the exact schedule for MR Vaccination (9 Months and 15 Months) and compliance with this schedule among children

			Q10_ Age of receipt of MR 1 (9 months) and MR2 (15 months)		
			otherwise	**Yes**	**Total**
Q3_ How many doses of MR vaccine do you think should be taken and when?	otherwise	n	23	0	23
		% ligne	*100%*	*0%*	*100%*
	02 doses (9 m et 15 months)	N	5	23	28
		% ligne	*18%*	*82%*	*100%*
	Total	**N**	**28**	**23**	**51**
		% ligne	***55%***	***45%***	***100%***
	chi-square value 2		**34,412**	**p-value= 0,00**	

There was a significant difference between parents' exact knowledge of the measles vaccination schedule and their compliance with it (Chi-square =34.412; P-value-0.00). This table shows that parents who did not follow the exact measles vaccination schedule because

they did not know the exact dates of vaccination. These were 28 mothers (55%), as shown in table 5 above.

These tables clearly show that:

Behaviour to be promoted	Level of influence	Barriers	Motivating factors
Mothers should always have their children vaccinated at 15 months with the 2nd dose of MR	Individual level	Lack of knowledge	Information on the importance of good compliance with the MR vaccine for strong immunisation of children against measles
	Family level	ND	ND
	Community level	Access to information	Information on the importance of good compliance with the MR vaccine to protect the community from measles epidemics
	Institutional level	Lack of logistical and financial resources	Technical and financial support to improve immunisation services

Discussion

In our study, for a target of 51 mothers/nurses, we found a vaccine completeness rate for the MR vaccine (in its 2 doses) of 57%, 45% of whom complied with the dates for taking the MR2 according to the pre-established vaccine schedule at the 15th month. This result is higher than the district's MR2 vaccine coverage (31.46%), which is certainly due to the small size of our sample and therefore confirms the evidence of low MR2 vaccine coverage in the Bafia Health District (according to the WHO, measles vaccine coverage must be higher than 95% to prevent epidemics) [4]. Our results are similar to those of the study carried out in Madagascar [5].

Mothers' level of knowledge is a determining factor in the use of vaccination services. Our study shows that 51% of mothers have a primary level of education, which is in line with the results of a study conducted in Nigeria in 2005 [6].

55% of the mothers in our study had not administered the 2nd dose of MR to their child, which is similar to the drop-out rate in the Bafia district (68.54%) and confirms the evidence of poor follow-up of MR2 vaccination in the district, hence the need to determine the barriers associated with this behaviour.

In this study, multivariate statistical analyses enabled us to understand that the 55% of mothers who do not take the 2nd dose at 15 months do so because of a lack of knowledge of the immunisation schedule for the MR; this barrier was cited as the leading cause of non- vaccination by the 2005 immunisation coverage survey in Cameroon [7,8]. Parents do not correctly understand at what age their child should start and finish vaccinations, or even the total number of vaccinations to be taken. This result is similar to those found in Nigeria in 2008 and Senegal in 2008 [9,10].

69% of mothers were partially satisfied with the vaccination services, and 67% estimated the average vaccination time at 1 hour. This factor is linked to the organisation of the vaccination post and session, and is cited as the main cause of children not being vaccinated, which corroborates the results of the 2005 vaccination coverage survey in Cameroon [7,11,12].

In the Bafia health district, 33% of women feel that they are far from the vaccination site, and this factor is a barrier to non-adherence to the MR2 vaccine by children from these households, whereas measles vaccination completeness is a performance indicator for the vaccination programme. This was demonstrated in studies conducted in the Djoungolo health district, Cameroon in 2017 [1].

Conclusion

The aim of our study was to identify the barriers associated with following the MR2 vaccination schedule in the Bafia health district according to the socio-ecological model. A sample of 51 mothers of children aged at least 15 months was recruited for this purpose. Using one-factor analysis, Chi 2 and Student's t-tests, we were able to establish the association between knowledge of the vaccine and vaccine uptake, thus confirming the low level of vaccine uptake in the Bafia health district. The low level of knowledge of when to take the vaccine, access to information, and lack of resources are the barriers that prevent the adoption of the desired behaviour (MR2 vaccine completeness) in this district. This has led us to formulate suggestions in terms of social and behavioural change, communication and health facilities/DSs, which could improve not only MR2 vaccination coverage in the Bafia health district but also, and above all, effective protection of the child against measles, the family and even the community [13-18].

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