

Immunization Coverage and Factors Associated with the Non-Completeness of Vaccination of Children from 12 to 23 Months of the Health District of Djoungolo-Cameroon in 2012

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Abstract

In 2011 the health district of Djoungolo experienced two measles epidemics with a 69% vaccination completion rate according to district data. The objective of this study was to determine immunization coverage and factors associated with the non-completeness of vaccination of children aged 12-23 months in Djoungolo district in 2012. We used a cross-sectional, community-based study was conducted in 2012. A total of 210 mothers / nannies of 12 to 23-month-old children from Djoungolo district, selected according to the WHO 30 X 7 cluster survey method, were interviewed about vaccines; received by the child before the age of one and the reasons for non-vaccination using a structured questionnaire. Vaccine completeness was 64.3%, ranging from 85.7% for BCG to 66.2% for measles Vaccine. Multivariate logistic regression showed that mothers who were afraid of side effects ($P = 0.0454$), who did not know the importance of vaccination ($P = 0.0139$), had missed opportunities for vaccination ($P = 0.0055$), who took more than one hour to vaccinate their child ($P = 0.0005$) and who did not master the vaccination schedule ($P = 0.00001$) were significantly associated with vaccine non-completeness children.

Keywords: Immunization coverage, factors, non-completeness, children from 12 to 23 months.

Introduction

Vaccination is recognized as one of the most effective measures to prevent the mortality, morbidity and complications of infectious diseases in children. It is estimated that around 3 million deaths are prevented each year worldwide through immunization and that, moreover, each year it prevents nearly 750,000 children from suffering serious physical, mental or neurological disabilities. In May 1974, the World Health Organization (WHO) launched a global immunization program, known as the Expanded Program on Immunization (EPI), as one of the major public health interventions to prevent morbidity and infant mortality. The EPI aims to vaccinate children worldwide to prevent disease, decrease disability and deaths due to vaccine-preventable diseases. In Cameroon, the EPI of the Ministry of Public Health has developed and adopted a comprehensive 2007-2011 multi-year comprehensive vaccination plan. This plan had set a target for immunization coverage for all routine EPI antigens including

vitamin A by at least 88% nationwide by following the vaccination schedule. The health district of Djoungolo is the most important health district of the Central Region in terms of population.

According to district administrative data, its vaccination coverage was 90% in 2009, 87 % in 2010 and 69% in 2011; in 2011, the district experienced two measles outbreaks; the first case outbreak occurred from April to June 2011 and made 23 cases with 01 deaths and the second outbreak from November to December 2011 with 17 cases and 0 deaths. In spite of these epidemics and low administrative vaccination coverage, no study to our knowledge has been conducted in this district to determine the vaccination coverage of this district using a standardized method on the one hand and the reasons for non-vaccination children. This study therefore fills this gap. The objective of this study was to determine routine immunization coverage and factors associated with the non-completeness of immunization of

children aged 12-23 months in the Djoungolo health district in 2012 with the aim of contributing to the implementation of specific strategies for achieving immunization coverage targets and preventing the emergence of new outbreaks of vaccine-preventable diseases in this district.

Methods

We conducted a community-based cross-sectional study between February and August 2012, administering a pre-pretested structured questionnaire to 210 mothers / nannies of children aged 12 to 23 months in the Djoungolo health district (7 per week). District, selected from 30 wards using the WHO 30 X 7 cluster sampling method. Our inclusion criteria were to be residents of the district at the time of the study and to have been in 2011. 30 neighbourhoods were randomly selected out of the 90, taking into account the size of the population in each health area (proportional allocation). In the households visited, only one eligible child, the youngest, was surveyed. The second concession visited was the one immediately to the right, coming out of the first one. Thus, the evolution was done gradually until the completeness of the number of children to recruit for the district. Tools and data collection technique using a pre-tested structured questionnaire, mothers / nannies were asked about the vaccines received by the child before the age of one and the reasons for non-vaccination.

The information collected included socio-demographic characteristics, immunization system factors, and mothers' knowledge, attitudes and practices about immunization. The vaccines received by the child were obtained from the vaccination card or through the history of the child's vaccine recounted by the mother. Our dependent variables were vaccine completeness and antigen-specific vaccine coverage for children aged 12 to 23 months. A child was said to be fully vaccinated if he had received the following 06 doses of vaccine before the age of 12 months: BCG, DTChepB1 + Hib1, DTP-HepB1 + Hib2, DTP-HepB1 + Hib3, VAR and Anti-Amaril according to the vaccination card and / or the mother / nurse's declarations. The independent variables were the frequencies of the different patterns of socio-demographic characteristics of the sample,

factors related to the immunization system, and mothers' knowledge, attitudes and practices regarding immunization. The data was entered into a database and analyzed using the Epi Info 3.5.3 software. A P value <0.05 and an adjusted coast ratio (AOR) with its 95% confidence interval that does not contain 1.00 was considered significant. Ethical considerations: This study has been approved by health authorities of the Central Region to be conducted. Verbal informed consent was required for each participant prior to administering the questionnaire.

Results

Socio demographic characteristics of the study population: Two hundred and ten mothers / nannies of children aged 12 to 23 months were included in this study. The age of the respondents ranged from 17 to 44 years with an average of 27 ± 6 years. The most represented age group was 25 to 34 years old (49.5%). One hundred thirty-six (64.8%) mothers / nannies had a level of education at least equal to high school level and fifteen (7.1%) had never attended school. Thirty-five (16.7%) lived alone, while 175 (83.3%) were in a relationship. Among couples, common-law unions were the most common form (40.55%) followed by monogamous marriage (32.4%); 59% were Catholic, followed by Protestants (22.4%) and Muslims (11%); 40.5% of households had an average monthly income of between 50,000 and 150,000 CFA.

Of the 210 children included in this study, 50% were male; their age ranged from 12 to 23 months with an average of 17 ± 3 months and 68.6% were counted among the first three children of the siblings. Immunization coverage of children aged 12 to 23 months in the Djoungolo health district of the 210 children aged 12 to 23 months included in this study, 140 (66.7%) had a vaccination card. Immunization coverage according to immunization cards was 54.3%. According to the immunization card and the declarations of mothers / nannies, 135 (64.3%) were fully vaccinated, 67 (31.9%) were partially vaccinated and 8 (3.8%) had received no vaccine. Reasons for non-vaccination of mothers of children aged 12 to 23 months who were not or partially vaccinated in the Djoungolo health district in 2012 Seventy-five mothers / nannies of children aged 12 to 23

months who were not or partially vaccinated gave the reasons for not vaccinating of their child. Lack of information on vaccination (65.3%), unsuitable hours of vaccination for mother / nanny (45.3%) and unavailability of

mother / nanny (28.0%) were the three reasons most frequently mentioned. Three respondents, all mothers / nannies of children who did not receive any vaccine, said that vaccination was contrary to their religious beliefs.

Table 1: Vaccine completeness rates for children 12-23 months in the district of health of Djoungolo in 2012

Variable	Categories	According to Map		According to Card + Declarations mothers / nannies	
		Frequency	(%)	Frequency	(%)
Availability Map Vaccination	yes	140	(66,7)	--	--
Vaccinated child (at less dose)	yes	140	(66,7)	202	(96,2)
Vicinal status	Completely vaccinated	114	(54,3)	135	(64,3)
Partially vaccinated	26	(12,4)	67	(31,9)	
No vaccine	--	--	8	(3,8)	
%: percentage					

Table 2. Frequency of reasons for non-vaccination reported by mothers of children aged 12 to 23 months unvaccinated or partially vaccinated from the Djoungolo health district in 2012

Reasons for non-vaccination	In mothers of partially vaccinated children		In mothers of children who have not received any vaccine		Total*		OR	95% IC	P value
	(N = 67)		(n = 8)		(n = 75)				
	n	%	N	%	n	%			
Lack information about the vaccination (calendar vaccination, dates Appointment)	46	68,7	3	37,5	49	65,3	3,6587	0,6412 – 25,2409	0, 117
Hours of vaccination not adapted to the mother	34	50,7	0	0,0	34	45,3	--	--	0,008
Unavailability of the mother / nurse	21	31,3	0	0,0	21	28,0	--	--	0,064
Child unavailable (illness, travel)	19	28,4	0	0,0	19	25,3	--	--	0,083
Distance from site of vaccination	17	25,4	2	25,0	19	25,3	1,0245	0,1981 - 7,9413	0,835
Child brought but not vaccinated	17	25,4	0	0,0	17	22,7	--	--	0,108
Fear of effects secondary	15	22,4	0	0,0	15	20,0	--	--	0,137
Lack of money	12	17,9	0	0,0	12	16,0	--	--	0,195
Bad reception by the staff health	12	17,9	0	0,0	12	16,0	--	--	0,195
Vaccination no effective	6	9,0	4	50,0	10	13,3	0,10	0,02 - 0,56	0,001
Convictions religious contrary to vaccination	0	0,0	3	37,5	3	4,0	--	--	0,000

Other	14	20,9	0	0,0	14	18,7	--	--	--
* Some respondents gave more than one reason. (n = effective, OR = odds ratio, 95% CI = 95% confidence interval; % = percentage)									

Table 3. Factors associated with vaccine incompleteness of 12 to 23-month children in Djoungolo health district in 2012, result of multiple logistic regressions

Factors*	AOR	95%IC		P value
Fear of the occurrence of side effects (YES/ NO)	3,7608	1,0275	13,7551	0,0454
Failure to attend at least one IEC session on vaccination at the vaccination center (YES / NO)	2,3314	1,0555	5,1494	0,0363
The lack of knowledge about the importance of vaccination (YES NO)	4,4147	1,3514	14,4216	0,0139
Missed opportunity experience (YES / NO)	4,1928	1,5234	11,5340	0,0055
Waiting time at vaccination site greater than 1h (PLUS 1H / LESS 1H)	8,3892	2,5329	27,7778	0,0005
The lack of mastery of the vaccination schedule (YES NO)	16,4148	4,8917	55,0824	0,0000
* Only significant factors are presented in this table. AOR = adjusted rib ratio; 95% CI = 95% confidence interval				

Discussion

Immunization completeness

Our study found a vaccination completion rate of 64.3% in the health district of Djoungolo in 2012 with 3.8% of unvaccinated children. This result, although lower than district data (69%), shows an improvement over the results of the 2011 DHS-MICS (59.9% in Yaoundé in 2010).

But the goal of coverage of the district of 90% has not been reached and this for any antigen. The risk of epidemics of targeted diseases is therefore important in this district. The possession rate of the vaccination card was 66.7%. This result is consistent with most immunization coverage surveys conducted in Cameroon [8-10] and Africa [11-16]. Raising the awareness and strengthening of the immunization card requirement before enrolling the child in kindergarten could improve the rate of immunization cards held by parents. The lack of a public health facility and the lack of implementation of the strategies advanced by the district in this area would explain this poor performance. These children pose a threat to the collective immunity and control of target diseases in this district. The factors associated with the non-vaccination of these children will have to be identified and specific strategies to achieve these implemented.

Limitations of the study

The main limitation of our study was the memory bias which could lead to a misclassification of vaccination status. In our study, only 66.7% of children had a vaccination card. To improve immunization coverage in this district, we recommend strengthening maternal education on immunization and reorganizing immunization services.

Contributions of the authors

Conception and elaboration of the protocol: Simon Franky Baonga Ba Pouth, Marie Kobela, Dieula Delissaint, Ditu Kazambu. Data Collection: Simon Franky Baonga Ba Pouth, Marie Kobela, Ekanga Mvele Dominique Arnaud. Data Analysis: Simon Franky Baong Ba Pouth, Ditu Kazambu, Dieula Delissaint.

Interpretation of the results: Simon Franky Baonga Ba Pouth, Dieula Delissaint, Ditu Kazambu. Writing of the manuscript: Simon Franky Baonga Ba Pouth, Ekanga Mvele Dominique Arnaud, Dieula Delissaint, Ditu Kazambu.

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