

Research Article

Factors Associated with Complete HPV Vaccination Among Girls Aged 11-13 Years in Diakhao Health District in 2021

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Abstract

Introduction: In 2021, (88.6%) of Senegal's 79 districts had not reached the full Human papillomavirus (HPV) vaccination coverage target of (90%). The Diakhao health district had full vaccination coverage of (10%) in the same year. This study aimed to identify factors associated with full vaccination coverage among girls aged 11-13 in Diakhao health district. **Method:** This was a descriptive and analytical study conducted in Diakhao health district among 228 custodial mothers of young girls aged 11-13 years. Data were collected using a questionnaire assessing the knowledge, attitudes, practices, and satisfaction of custodial mothers of young girls aged 11-13 years about HPV vaccination. Descriptive, bivariate analysis, and logistic regression were performed at 5% alpha. **Results:** The majority (74.12%) of mothers and guardians had heard of cervical cancer, and 81.58% had heard of HPV vaccination. According to the mothers and guardians of young girls, there was complete coverage (17.54%). According to the vaccination card, complete coverage was (15.79%). Factors associated with complete coverage were: the girl's schooling (ORa = 3.56 (1.12-11.29)); having heard about cervical cancer vaccination (ORa = 0.09 (0.02, 0.32)); rural residence (ORa = 0.13 (0.04-0.44)); agreement with vaccination for reasons of protection against certain communicable diseases (ORa = 8.95 (1.27-63.11) or reasons of vaccination of neighbors' children (ORa = 3.25 (1.24-8.55), satisfaction with counseling (ORa = 6.49 (1.63-25.8). **Conclusion:** Information to mothers or guardians of young girls is crucial to achieving the goal of full immunization coverage. It could be significantly improved by an acceleration plan focusing on interpersonal communication.

Keywords

Cervical Cancer, HPV Vaccination, Girls, Diakhao, Senegal

1. Introduction

Human papillomavirus (HPV) infections are primarily sexually transmitted and cause the majority of infection-associated cancers. Cervical cancer is a major public

health problem worldwide, with an incidence of over 530,000 cases per year and a mortality of almost 275,000 deaths per year [1]. Approximately 90% of deaths occur in developing

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countries, where incidence rates are higher [2]. The World Health Organization (WHO) recommends vaccination of girls aged 9-13 years against human papillomavirus (HPV) as the most cost-effective public health measure against cervical cancer [3].

HPV vaccination demonstration projects in India, Peru, Uganda, and Vietnam have achieved convincing results, with coverage rates ranging from 77.2% to 96.1% [4]. However, in other countries, such as France, coverage was less than 30% [5]. Even in countries where vaccination is effective, it has sometimes come up against fears about vaccine safety [5, 6], lack of parental motivation, and ignorance about the disease [7].

Cervical cancer is the most common gynecological cancer in Senegal. The number of new cases yearly is estimated at 1,500, or 34% of all annual cancer cases. It is the leading cause of cancer-related death in women aged 15-44 years [8]. Following a pilot phase, Senegal is the first country in West Africa to introduce the cervical cancer vaccine in its Expanded Programme on Immunisation (EPI) on 31 October 2018. In the implementation process, multisectoral collaboration at all levels was chosen, particularly in the education sector (formal and religious). Schools and other educational institutions are considered as occasional vaccination sites.

Cervical cancer is a preventable disease through vaccination against human papillomavirus (HPV) in girls aged 9-14 years and screening for precancerous cervical lesions (PCL) in women aged 30-69 years [9].

Countries (194) have committed to eliminating cervical cancer. The targets for 2030 are 90/70/90. This means vaccinating (90%) of girls under 15, screening (70%) of women aged 35 and 45 with a high-precision test, and treating at least (90%) of women with cervical disease. HPV vaccination combined with screening for precancerous cervical lesions could reduce disease-related deaths by (40%) to 5 million by 2050 [10].

The advent of the COVID-19 pandemic engendered a threat to the prevention of cervical cancer, precipitated by a diminution in vaccination, screening, and treatment services. The slowdown in trade that ensued impeded the supply of materials and inputs [11].

In Senegal, the complete vaccination coverage against HPV in 2020 was only (51%) for the first dose and (31%) for the second dose. A significant proportion of districts (85%) did not attain the stipulated target of (90%) for full coverage [12]. According to administrative data, full HPV vaccination coverage in 2021 was 12% for the first dose and 10% for the second dose in the Diakhao health district.

To date, no research has been conducted on the factors associated with full HPV vaccination in the Diakhao health district. It is imperative to investigate the constraints related to the suboptimal HPV vaccination coverage in the Diakhao health district.

2. Methodology

2.1. Type, Population, and Study Period

This cross-sectional, descriptive, and analytical study covered January to December 2021. The population was comprised of female subjects aged between 11 and 13 who resided in the Diakhao health district.

2.2. Sampling

The sample size was calculated using the Schwartz formula. With a desired precision (i) set at 5%, a reduced error (ϵ) of 1.96, and an administrative coverage $p = 0.10$, where $q = (1-p) = 0.9$, and 10% non-response, the size obtained was $N=228$. A three-stage sampling procedure was used to ensure the representativeness of the data collected. In the first stage, the selection of health facilities was based on a draw proportional to size, according to the number of mothers or guardians of young girls aged 11-13 years attending the service points. In the second stage, villages or neighborhoods were selected by a simple random draw to select one village or neighborhood from among those falling within the area of responsibility of each service point. In the third stage, households were selected randomly: the interviewer stood in the center of the village or neighborhood, threw a pen or pencil in the air, and the direction indicated by the tip determined the starting point. She would then enter the first compound and make a detailed count of the girls aged 11 to 13 living there. If several girls in this age group were found in the same compound, a simple random draw was used to select just one.

2.3. Data Collection

Data was collected throughout the Diakhao health district from 1 to 30 July 2022. A structured questionnaire was administered to mothers or guardians of young girls aged 11-13. It covered socio-demographic information, knowledge about cervical cancer and the HPV vaccine, attitudes towards the Expanded Program on Immunisation (EPI) and HPV vaccination, vaccination practices, and satisfaction with vaccination services. The District Chief Medical Officer (DCMO) coordinated the entire process, from protocol design to interviewer training, data processing and analysis, and final reporting. The Primary Health Care Supervisor, the District Chief Medical Officer, and the Reproductive Health Coordinator supported him. The latter supervised interviewer training, data collection, and data entry. A total of 14 interviewers, including the head midwife of the health center and 22 midwives from the health posts, were trained in the methodology and content of the questionnaire in one day. A pre-test was conducted with a sample of 14 mothers to adapt and improve the questionnaire. The interviewers were responsible for administering the questionnaire after obtaining free informed consent. They conducted individual interviews with the

mothers or guardians and used the vaccination booklets to collect data on the girls' vaccination status. If the booklet was not available, information was collected from the participants' statements.

2.4. Operational Definition of Variables

The dependent variable was the HPV vaccination status of girls aged 11-13. A fully vaccinated girl was any girl aged 11-13 years who had received both doses of the HPV vaccine. A dropout was any girl aged 11-13 years who had received a single dose and had not received the second dose 6 months after the first. Knowledge of at least one method for preventing cervical cancer was categorized as follows: "Good knowledge" refers to awareness of prevention strategies such as HPV vaccination and screening for cervical cancer precursors. In contrast, "poor knowledge" pertains to individuals unfamiliar with any of the aforementioned preventive measures.

2.5. Data Entry and Analysis

Data were entered into Epi info version 7.2.5.0. Epi info 7 and R 4.2.3 were used for data analysis. Qualitative variables were described as absolute and relative frequencies, and quantitative variables as mean with standard deviation. These variables were presented in tabular, graphical, or narrative form. The dependent variable, complete HPV vaccination, was cross-tabulated with the other variables. Statistical tests used were PEARSON's Chi-2 or FISCHER. The adjusted odds ratio (ORa) with its 95% confidence interval was used to measure the strength of the association. The difference was considered significant if $p < 0.05$.

2.6. Ethical Considerations

The survey was clearly explained to participants through an information letter, which was read and explained in the local language. Informed consent was obtained through a signed form from the mother or guardian of a girl aged 11-13 years who agreed to participate in the survey. The data collected will be kept anonymous and confidential and will only be used to improve HPV vaccination coverage.

3. Results

3.1. Descriptive Section

The study showed that the 29-39 age group was the most represented with 46.05% of the workforce, followed by the 39-49 age group (26.44%) and the 19-29 age group (17.54%). Regarding occupation, most participants were housewives (94.3%), followed by matrons and students, each accounting for 1.75%. More than half of the mothers and childminders (60.53%) reported that they had received an education. Of these, 35.51% had primary education, 54.34% had intermediate education, and only 7.25% had completed secondary education. Regarding marital status, most mothers and carers were living with a partner (72.37%), while 13.60% were single and 9.65% were divorced. In addition, a significant proportion of girls (64.91%) were enrolled in school. Despite this relatively favorable socio-demographic profile, it should be noted that just over a tenth of mothers and guardians (13.60%) had an income-generating activity. In addition, 80.65% of those with an income-generating activity reported a monthly income of less than FCFA 50,000, illustrating the precarious economic situation of most participants (Table 1).

Table 1. Distribution of mothers and guardians of daughters by socio-demographic characteristics.

Socio-demographic characteristics	Absolute frequency (n)	Relative frequency (%)
Age range		
[19-29]	40	17,54
[29-39]	105	46,05
[39-49]	60	26,44
[49-65]	23	9,97
Instruction		
Yes	138	60,53
No	90	39,47
Education level		
Primary	49	21,49
Medium	75	32,90
Secondary	10	4,39

Socio-demographic characteristics	Absolute frequency (n)	Relative frequency (%)
Superior	4	1,75
Uninstructed	90	39,47
Profession		
Housekeeper	215	94,30
Student	4	1,75
Matron	4	1,75
Retailer	3	1,32
Tailor	2	0,88
Marital status		
Bride	165	72,37
Single	31	13,60
Divorced	22	9,65
Widow	10	4,38
Girls' schooling		
Yes	148	64,91
No	80	35,09
Revenue-generating activity		
Yes	31	13,60
No	197	86,40
Monthly income		
<50 000	25	10,96
50 A 100 000	6	2,63
No income	197	86,40

The study found that 74.12% of mothers and caregivers had heard of cervical cancer. However, knowledge about prevention and risk factors remains limited. 69.74% of participants were unaware of cervical cancer risk factors, and only 27.63% could name at least one means of prevention. Regarding the HPV vaccine, a significant proportion of mothers and caregivers (81.58%) had heard of it. However, most participants seemed to lack accurate information: 71.93% of parents did not know the vaccine target, and 72.37% did not know the vaccination schedule. Furthermore, the main sources of infor-

mation about cervical cancer were health professionals (68.10%) and radio (60.70%). For HPV vaccination, healthcare providers were the main source of information, cited by 78.67% of participants. Mothers' and caregivers' attitudes towards vaccination were generally favorable. 86.84% of participants were in favor of vaccination in general, and 85.53% of them were in favor of HPV vaccination. This indicates the intervention's high level of acceptability, which is an important lever for improving vaccination coverage ([Table 2](#)).

Table 2. Distribution of mothers and guardians of daughters according to their knowledge, attitudes, and sources of information about the HPV vaccine.

	Absolute frequency (n)	Relative frequency (%)
Knowledge about cervical cancer		

	Absolute frequency (n)	Relative frequency (%)
Heard about cervical cancer		
Yes	169	74,12
No	59	25,88
Knowledge of cervical cancer risk factors		
Yes	69	30,26
No	159	69,74
Knowledge of at least one cervical cancer prevention method		
Yes	63	27,63
No	165	72,37
Heard about the HPV vaccine		
Yes	186	81,58
No	42	18,42
Knowledge of the HPV vaccine target		
Yes	64	28,07
No	164	71,93
Knowledge of vaccination schedule		
Yes	63	27,63
No	165	72,37
Information sources		
Source of information on cervical cancer		
Service providers	143	68,10
Radio	122	60,70
Television	87	42,23
Neighbors	44	22,11
Family	17	8,67
Source of information on HPV vaccination		
Service providers	166	78,67
Radio	119	57,49
Neighbors	39	18,57
Family	9	4,35
Television	3	1,82
Attitudes of mothers and guardians		
In favor of vaccination		
Yes	198	86,84
No	30	13,16
In favor of HPV vaccination		
Yes	195	85,53
No	33	14,47
Satisfaction with HPV vaccination services		

	Absolute frequency (n)	Relative frequency (%)
Yes	153	67,11
No	75	32,89

The study also showed that almost half of the mothers or guardians of young girls (46.05%) reported that their daughters had been vaccinated against HPV. Full coverage was reported by mothers and guardians of young girls (17.54%). The coverage of the first dose according to the vaccination card was (26.75%). Complete coverage was (15.79%). Only 06 cases of Post-vaccination adverse events (PVAE), i.e. (2.63%) of vaccinated girls aged 11 to 13 years, were reported by the mother (Table 3).

Table 3. Distribution of girls by vaccination status.

	Absolute frequency (n)	Relative frequency (%)
1 st DOSE ACCORDING TO MGC		
Yes	105	46,05
No	123	53,95
2 nd DOSE ACCORDING TO MGC		
Yes	40	17,54
No	188	82,46
1 st DOSE ON CARD		
Yes	61	26,75
No	167	73,25
2 th DOSE ON CARD		
Yes	36	15,79
No	192	84,21
PVAE		
Yes	6	2,63

	Absolute frequency (n)	Relative frequency (%)
No	222	97,67

3.2. Analytical Part

Bivariate analysis revealed several statistically significant associations between certain characteristics of mothers or young daughters and the likelihood of complete HPV vaccination. On the one hand, girls' schooling appeared to be a determining factor. Girls with schooling were 3.56 times ($OR_b=3.67$ [1.47-9.19], $OR_a=3.56$ (1.12-11.29)) more likely to receive the whole HPV vaccine than girls without schooling. The mother's place of residence also influenced vaccination coverage. Mothers living in urban areas were 7.69 times ($OR_b=9.62$ [3.62-25.67], $OR_a = 7.69$ (2.27-25.0)) more likely to have their daughters fully vaccinated against HPV than those living in rural areas (Tables 4 and 5).

In addition, mothers' satisfaction with vaccination services appeared to impact adherence to the vaccination schedule significantly. Mothers who were satisfied with vaccination services were 4.15 times ($OR_b=4.15$ [1.55-11.09]) more likely to have their daughters fully vaccinated against HPV than those who were dissatisfied. Receiving vaccination advice was also a key factor. Mothers who received advice were 8.18 times ($OR_b=8.18$ [2.43-27.55]) more likely to have their daughters fully vaccinated against HPV, as were those who were satisfied with the advice ($OR_a = 6.49$ (1.63-25.8)). Other factors associated with complete vaccination were: having heard about cervical cancer vaccination ($OR_a = 0.09$ (0.02, 0.32)), mothers agreeing to vaccination because it protects against certain communicable diseases ($OR_a = 8.95$ (1.27-63.11)), or because their neighbors' children had been vaccinated ($OR_a = 3.25$ (1.24-8.55)) (Tables 4 and 5).

Table 4. Factors associated with full vaccination in girls in bivariate analysis.

Variable	Full vaccination		P value	OR	IC
	Yes	No			
Mother's or guardians's education					
Yes	23 (16,67)	115 (83,33)	0,66	0,85	[0,42-1,71]

Variable	Full vaccination		P value	OR	IC
	Yes	No			
No	17 (18,89)	73 (81,11)			
Practice of an Income-generating activities (IGA) through MGC					
Yes	7 (22,58)	34 (77,42)	0,42	1,44	[0,57-3,52]
No	33 (16,65)	164 (83,25)			
Schooling for girls aged 11 to 13					
Yes	34 (22,97)	114 (77,03)	<0,0033	3,67	[1,47-9,19]
No	6 (7,50)	74 (92,50)			
Mother's age					
Under 35	18 (16,07)	94 (83,93)	0,56	0,81	[0,41-1,62]
35 and over	22 (18,97)	94 (81,03)			
Marital status					
Married	27 (16,07)	38 (83,93)	0,44	0,75	[0,38-1,53]
Unmarried	13 (20,63)	50 (79,37)			
Having heard about HPV vaccination					
Yes	35 (17,95)	160 (82,05)	0,69	1,22	[0,44-3,39]
No	5 (15,15)	28 (84,85)			
Place of residence					
Rural	28 (13,46)	180 (86,54)	< 0,001	9,62	[3,62-25,67]
Urban	12 (60)	8 (40)			
Satisfaction with vaccination services					
Yes	35 (22,88)	118 (77,18)	< 0,001	4,15	[1,55-11,09]
No	5 (6,67)	70 (93,33)			
Declare having received advice on vaccination					
Yes	37 (24,67)	113 (75,33)	< 0,001	8,18	[2,43-27,55]
No	3 (3,85)	75 (96,15)			

Table 5. Factors associated with complete HPV vaccination in girls aged 11 to 13 in logistic regression.

Features	crude OR. (95%CI)	adj. OR. (95%CI)
Girl's schooling: yes vs no.	3.68 (1.47,9.19)	3.56 (1.12,11.29) *
Place of origin: Rural vs Urban	0.1 (0.04,0.28)	0.13 (0.04,0.44) *
Hearing about vaccination against cervical cancer (HPV): yes vs no.	0.33 (0.15,0.7)	0.09 (0.02,0.32) *
Agree with vaccination for protection against certain communicable diseases: 1 vs 0	4.08 (0.94,17.78)	8.95 (1.27,63.11) *
Agree to vaccination because neighbor's children are vaccinated: yes vs no.	1.96 (0.92,4.17)	3.25 (1.24,8.55) *
Board satisfaction (quality of HPV vaccination care): yes vs no.	8.19 (2.44,27.5)	6.49 (1.63,25.8) *
Number of living children	1.2 (1.06,1.36)	1.2 (0.99,1.45)

4. Discussion

Vaccination against the human papilloma virus is extremely important. This study identified factors associated with complete vaccination. Full vaccination was modeled according to the MGC confession.

Our study was conducted on a sample of 228 mothers or guardians of daughters in the Diakhao health district in July 2022. The majority (74.12%) of respondents had heard of cervical cancer. Less than half (30.26%) knew at least one of the risk factors for cervical cancer. 81.58% of the girls' guardians had heard of the HPV vaccine. According to the guardians, full vaccination coverage was 17.54%. Among the results, it can be noted that the mother's vaccination of the girl was statistically associated with factors such as the girl's education, the fact of having heard about the vaccination against cervical cancer and the home environment, the mother's satisfaction with the advice received about the vaccination, the agreement to the vaccination because it protects against certain transmissible diseases or because the neighbors' children had been vaccinated.

The mean age was 36.57 years, with a standard deviation of 8.52. Over three-quarters (75%) of mothers and guardians were under 43. The 30-39 age group was the most represented with 46.05%. The population of mothers and guardians is very young. These results confirm the situation in the district, which is characterized by the early marriage of women in rural areas [13, 14].

In contrast to Thiam's study in Kédougou, where 47% of the women had an income-generating activity, only 13.6% of the women in our series had an income-generating activity. Almost all (80.65%) had an income of less than CFAF 50,000/month. These results confirm the rural situation of the district, where underemployment is particularly prevalent among women [15].

We found that 60.53% of respondents declared they had received an education. These results confirm the study carried out by the ANSD [16], which revealed a net enrolment rate of 54%.

In our study, (74.12%) of mothers and guardians of girls had heard of cervical cancer. (30.26%) of mothers and guardians of girls knew at least one of the risk factors for cervical cancer. (81.58%) of mothers and guardians of girls had heard of the HPV vaccine. (63.60%) of mothers and guardians of girls knew at least one way to prevent cervical cancer. (58.82%) of parents did not know what the HPV vaccine is aimed at. Less than a quarter (27.63%) of mothers and guardians were aware of the HPV vaccination schedule. This level of awareness among mothers or guardians is higher than in Nigeria, where Kabiru A. Rabiou et al. [17] found that 45.9% of women were unaware of cervical cancer and 54.7% were unaware of the HPV vaccine. The same was true in China, where Swen Feng et al. [18] found a low level of knowledge about HPV in rural areas (27.3%), and in Sudan, where Al-

mobarak A. et al. [19] found that only (39.2%) had heard of the HPV vaccine.

Maria Ganczak et al. surveyed 600 parents of schoolgirls. The coverage rate was 1.63%. More than half (55.5%) of the parents who had not vaccinated their daughters were sensitized to HPV, (31.3%) recognized HPV as an STI, (36%) identified it as a risk factor for cervical cancer, and (85%) expressed their willingness to vaccinate their daughters [20].

The main source of information on cervical cancer remains health care providers (68.10%), followed by radio (60.70%). This could be explained by the district's strong network of community promotion and prevention actors. Also noteworthy is the presence of Ndiob FM, a community radio station that broadcasts throughout the district, and its proximity to the regional capital, Fatick, which has 4 radio stations.

Most (86.84%) mothers and guardians of young girls favored vaccination in general and HPV vaccination in particular (85.36%). So our study found that coverage at the first dose was (46.05%), and full coverage was (17.54%), according to mothers and guardians. This could be explained by the context of COVID-19 and the school-based strategy implemented. According to the vaccination card, the first dose coverage was (26.75%) and full coverage was (15.79%).

These estimated and actual vaccination coverage rates are higher than the national average (22% for the first dose and 13% for full coverage), but lower than that reported by district health data for both the first dose (46.05% vs. 10%) and full coverage (17.54% vs. 8%) [6]. The withholding of health information could explain this difference due to the mood swings among providers. Comparatively, these rates are higher than those observed by Allison L et al. in the United States, where full vaccination coverage (3 doses) was lower in rural areas (26.8%) than in semi-urban (30%) or urban areas (39.5%) [21] and in Sudan, where Almobarak et al. found coverage of (11.4%) [19]. However, in China, Julie H. T. Dang et al. found first dose coverage (63%) better than complete coverage (37.7%) among adolescents aged 11-17 years in 2018 [22].

Overall, full HPV vaccination coverage is significantly higher in developed countries and urban areas than in developing countries and suburban and rural areas [23, 18]. Poland has the lowest HPV vaccination coverage in the European Union (EU). Maria Ganczak et al. surveyed 600 parents of school girls. The coverage rate was 1.63% [20].

06 cases of minor post-vaccination adverse events (PVAE) (7.84%) were observed in our study. The HPV vaccine is a safe vaccine. Large-scale use has shown that the vaccine is safe and effective. This may partly explain the low incidence of PVAE in this cohort [24]. This rate of PVAE reporting is significantly lower than that observed worldwide, particularly in Spain [25], Canada [26], rural area in Senegal (Mekhe health district) [27], Australia [28] and the United States [21].

In our series, there was a link between the place of residence of mothers or babysitters and HPV vaccination of young girls. Allison in the USA [21] and the Chinese authors

[18] found the same. Overall, full HPV vaccination coverage is significantly higher in developed countries and urban areas than in developing countries and peri-urban and rural areas [23, 18]. The mother's rural residence is a factor positively associated with vaccination [27].

Girls whose mothers or guardians had heard about cervical cancer were more likely to be vaccinated than those whose mothers or guardians had not ($p < 0.001$; $OR = 17.32$ [10.09-26.06]). This link was found in the series by Ndiaye et al. ($ORa=3.05$; [2.75-4.53] [15]; the mother's level of information, her knowledge, of cervical cancer, of the relationship between HPV and cervical cancer, are factors positively associated with vaccination [15], even the study of A. Faye and al [27]. Factors associated with not vaccinating were lack of knowledge [28]. In France, in the pilot phase, the factors associated with not vaccinating were: lack of information [29-31]. Allison L et al. found that the factors most predictive of vaccination among young girls were knowledge of HPV and having heard of the Vaccine [21]. However, our study found the opposite effect: having heard about cervical cancer vaccination reduced girls' chances of being vaccinated ($ORa = 0.09$ (0.02, 0.32)).

In our study, there was a statistical link between mothers or guardians who had received counseling, as well as those who were satisfied with the counseling, and the vaccination of girls against HPV. These results are in line with those of Kabiru A et al. in Nigeria [17]. Prior information about HPV was a predictor of parental acceptance of vaccination of young girls [22].

Our study found no link between the mother's or guardian's education and the girl's vaccination, unlike the series by Ndiaye et al. ($OR = 1.97$; [1.81-2.25]) [15]. However, a lower coverage (7,50%) was found among young girls not attending school compared with 22.97% among those attending school ($ORa=3.56$ [1.12,11.29]). The girl's schooling is positively associated with vaccination [27]. Girls' schooling increased their chances of being vaccinated. Girls attending school are 3.56 times more likely to be vaccinated against HPV.

There was no relationship between the practice of an Income-generating activities (IGA) by the mother and babysitter and the vaccination of the young girl, in contrast to the series by Ndiaye [15] and Alène T [32], where the link between the vaccination of the young girl and high household income was observed.

These results underline the importance of considering social factors such as education, environment, and the quality of vaccination and vaccination promotion services.

5. Conclusion

Cervical cancer is a serious disease that can be prevented by vaccinating young girls against HPV and screening sexually active women for precancerous cervical lesions. Communication about the Vaccine to mothers or guardians of young people plays a critical role in achieving the 90% vaccination

coverage target. The factors associated with low full HPV vaccination coverage in Diakhao health district are related to poor communication. Full HPV vaccination coverage among young girls could be significantly improved by an acceleration plan focusing on communication for development. It would therefore be advisable to include HPV vaccination in the supervision and coordination of service point activities, strengthen interpersonal and local communication, and adhere to the HPV vaccination schedule for young girls.

Abbreviations

HPV	Human Papillomavirus
WHO	World Health Organization
EPI	Expanded Programme on Immunisation
DCMO	District Chief Medical Officer
FCFA	Franc CFA
PVAE	Post-Vaccination Adverse Events
MGC	mothers and guardians Child
ORb	Crude Odd Ratio
ORa	Adjusted Odd Ratio
IGA	Income-generating activities
ANSD	National Agency for Statistics and Demography
EU	European Union
USA	United States of America

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Fatoumata Binetou Diongue: Conceptualization, Formal Analysis, Investigation, Methodology, Software, Supervision, Validation, Visualization, Writing - original draft, Writing - review & editing

Ablaye Touré: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Resources, Supervision, Validation, Visualization

Oumar Bassoum: Conceptualization, Methodology, Supervision, Validation, Writing - review & editing

Amadou Diallo: Conceptualization, Methodology, Validation, Writing - review & editing

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Conflicts of Interest

The authors declare no conflicts of interest.

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