

Knowledge, Attitudes and Practices of Tetanus Vaccination by Women of Childbearing Age in the Health District of Commune I of Bamako (Mali)

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Abstract: The aim was to assess the knowledge, attitudes and practices of tetanus vaccination among women of childbearing age. **Materials and methods:** This was a cross-sectional study with a descriptive and analytical purpose that took place from May to July 2021 in the health district of Commune I. It targeted 258 DPFs. The data collection used observation, documentary exploitation, individual interviews and focus groups as a technique. **Results:** We observed that vaccination coverage in TAV2 and above among FAPs was 63.9% but 72.3% of these women had received their doses during antenatal consultations and 61.24% of them were between 14-24 years old. The majority of the FAPs surveyed (95.7%) were not aware of the vaccination schedule. 78.4% were unaware of the required doses. Among the women surveyed, 15.2% had not received any dose of VAT and 87.3% of them said they were unaware of the importance of vaccination. **Conclusion:** the lack of information, awareness and the age of FAPs are the main reasons for the lack of knowledge of the vaccination schedule, the number of doses required and the need for VAT.

Keywords: knowledge, attitudes and practices, tetanus vaccination coverage, FAP.

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INTRODUCTION

Tetanus is a serious vaccine-preventable disease that is non-contagious, non-immunizing and notifiable [1], and cosmopolitan disease affecting both sexes and all ages [2]. It is caused by Nicolaier's bacillus, also known as *Clostridium tetani*. This bacillus enters the body through a wound and causes painful contractures, first of the chewing muscles (trismus) and then of the muscles of the neck, trunk and limbs [3]. To eliminate this disease, it is mainly necessary to promote hygiene during childbirth, the administration of tetanus vaccine to women of childbearing age and the implementation of case-based surveillance in relation to tetanus in newborns and mothers. According to the WHO, nearly 50% of tetanus cases occur in India (2017), the African continent accounted for 2900 cases in 2014 with since 2010 a very significant decrease in tetanus cases

following vaccination campaigns (the Democratic Republic of Congo went from 1038 cases in 2010 to 201 cases in 2014). During the Health and Social Protection survey conducted in 2012, only one in two French people said they were up to date with their tetanus vaccination [4]. Between 2004-2013, 111 cases of tetanus were reported, of which 83% were aged 70 years and above, and 29 of these cases, or 26%, died [4]. If we correct for lack of completeness, we can estimate that 150 cases of tetanus and 40 deaths occurred over this ten-year period, all of which could be avoided by better application of the booster policy, whether during routine vaccination or during a wound [5]. In Mali, with regard to antenatal care, three out of four women (75%) have attended antenatal consultations provided by health personnel. Nearly two in ten women (24%) did not receive any antenatal care

during their pregnancy [6]. It was found that 47% of women had received the number of injections needed to protect their last birth from neonatal tetanus [6]. The situation of the Health District of Commune I of Bamako was as follows: In 2018, for a population of women of childbearing age (FAP) estimated at 67,148 inhabitants, 20144 received their first dose of VAT1 and 16142 their second dose of VAT2 and booster [7]. In 2019, among the 69218 women of childbearing age (FAP), only 24218 received their first dose of VAT1 and 20212 their second dose of VAT2 and booster [7]. In 2020, for a population of women of childbearing age (FAP) estimated at 71165, only 25619 received their first dose of TAV1 and 21512 received their second dose of VAT2 and booster [7]. This statistic allows us to easily see that women of childbearing age (FAP) are not sufficiently motivated for tetanus vaccination. Efforts must be made to improve information and education for families in order to increase the vaccination coverage of the FAP in general and that of the Health District of Commune I of Bamako in particular. This study will allow us to study the knowledge, attitudes and practices of women of reproductive age in the Health District of Commune I of Bamako.

OBJECTIVE

The sample size was calculated using the following formula:

$$N = \frac{SCHWARTZ}{z^2 \alpha \times \frac{p \times q}{P}} \times g$$

- N = sample size
- Zα = reduced deviation corresponding to the α risk consented to 1.96
- P = the prevalence of tetanus vaccination in AFP q = complementary to p = 1 – p
- i = accuracy = 5%
- g = the cluster effect, here is equal to 2

$$N = \frac{2^2(0.08 \times 0.92) 2}{0.05 \times 0.05} = 235$$

Taking into account the non-respondents, we will increase the Size N by 10%; which gives: N = 235 + 23 = 258 FAP. For the selection of health areas, each health area in the Health District will be numbered and four of them will be randomly drawn. After the choice of health areas, a strategic point will be chosen to serve as a starting point for the survey. The survey was carried out from CSCOM to CSCOM until the 26 FAPs desired by the first three CSCOMs and 24 FAPs in the last CSCOM were obtained. The different CSCOMs we have chosen are: the CSCOM of: Korofina North, Korofina South, Djelibougou and that of Banconi. **The method and tools of data collection:** Survey sheet; in-depth individual interview guide and focus group guide. Data were collected through interviews with the DPFs. **Data analysis and entry:** Data were entered in Word and analyzed on SPSS 2017 software. **The Ethical considerations:** Any research activity poses an ethical

The aim was to determine tetanus vaccination coverage among women of childbearing age; assess women's knowledge of reproductive age about the best time for tetanus vaccination; identify knowledge; attitudes and practices of women of childbearing age in relation to the existence and free administration of VAT in the Health District of Commune I of Bamako.

MATERIALS AND METHODS

This was a cross-sectional, descriptive and analytical study that took place over two months (from May 15 to July 15, 2021) in the Health District of Commune I of Bamako (Mali). The study population: The FAPs of the Health District of Commune I were involved in this study. **Inclusion criteria:** Any woman of childbearing age who has been residing in the Health District of Commune I for more than 6 months, for whom we have obtained informed consent. **The criteria for non-inclusion:** women residing in the Health District of Commune I refusing the survey; Women under 14 years of age and those over 45 years of age residing in the Health District of Commune I. **Sampling:** This is a non-exhaustive survey, which concerned certain women of childbearing age in the Health District of Commune I.

problem, especially in the area of health. Our team, to solve this problem, we found it necessary to obtain the consent of the people targeted by the investigation. To achieve this, contacts have been made with the administrative authorities of the Health District. Their authorization has been obtained to conduct the survey in the various health areas. The investigator made it clear that there will be no adverse consequences for any person to participate in the investigation. The investigator interviewed the individuals after obtaining their consent. Confidentiality has been ensured with respect to information obtained anonymously.



RESULTS

Quantitative study of the data

Epidemiological aspects

The quantitative survey of 258 women of childbearing age yielded the following results. Of the women surveyed, **61.24%** were between **14 and 24 years old**. They were married in 52.8% and had a primary level in **44.6%**. Female saleswomen were the most represented

with a proportion of **49.7%**. **Vaccination coverage of women of childbearing age:** Among the women surveyed, **84.9%** had received at least one dose of VAT and **63.9%** had received at least two (2) doses of VAT or more. They were vaccinated during prenatal consultations (ANCs) in **72.3%** and in **93.2%** they were not returned for VAT boosters. These epidemiological aspects are summarized in Table 1.

Table-1: Distribution of women surveyed by age

Age range	Staff	Percentage
14-24	158	61,24
25-35	87	33,72
36-45	13	5,04
Marital status	Actual	Percentage
Bachelor	114	44,2
Bride	136	52,8
Divorcee	06	2,2
Widow	02	0,8
Level of education	Actual	Percentage
Not in school	38	14,6
Primary	115	44,6
Secondary	54	21,1
Upper	51	19,7
Profession surveyed	Actual	Percentage
Housewife	26	10,0
Saleswoman	128	49,7
Student	31	12,1
Official	73	28,2
Administration de VAT	Actual	Percentage
Yes	219	84,9
No	39	15,1
VAT doses received	Actual	Percentage
VAT1	54	20,9
VAT2 and above	165	63,9
NSP	39	15,2
Used VAT	Actual	Percentage
VAT campaign	54	24,6
During the ANC	158	72,3
During an Injury	7	3,1
VAT reminders	Actual	Percentage
Yes	15	6,8
No	204	93,2

Women's knowledge of tetanus vaccination

The family was the main source of information, mentioned in **43.9%** of the women surveyed. Almost all of the FAPs were aware of the targets to be vaccinated against tetanus, i.e. **90.3%** of the study population. More than half of the women surveyed, **68.7%**, report that the best time for VAT was during pregnancy alone. Of the women surveyed, **78.4%** did

not know the number of doses of VAT that a FAP should receive. Of the women surveyed, 70.2% were informed about the importance of VAT. More than half of the women surveyed mention maternal and neonatal tetanus as the goal of tetanus vaccination. They were unaware of the tetanus vaccination schedule in **95.7%**. These knowledge aspects are presented in Table 2.



Table-2: Women's knowledge of tetanus vaccination among women of childbearing age

Source of information	Actual	Percentage
Family	96	43,9
Telly	50	22,8
Radio	4	1,8
School	33	15,1
The Hospital	36	16,4
Knowledge of the targets to be vaccinated against tetanus	Actual	Percentage
Wives	11	4,1
Children	7	2,8
Adults	3	1,2
Everybody	233	90,3
Ignore (no response)	4	1,5
Timing of vaccination	Actual	Percentage
during his childhood	18	7,0
from 14 years old	25	9,7
during pregnancy	177	68,7
14 to 45 years	20	7,7
Ignore (no response)	18	6,9
VAT dose to be received for DPFs	Actual	Percentage
Ignore the number	202	78,4
At least 2 doses	36	13,9
More than 3 doses	20	7,7
Knowledge of the importance of VAT	Actual	Percentage
Yes	181	70,2
No	77	29,8
Purpose of VAT	Actual	Percentage
To avoid maternal tetanus	12	4,7
To avoid tetanus in newborns	6	2,3
To avoid maternal and neonatal tetanus	133	51,5
To prevent all diseases	19	7,4
NSP	88	34,1
Vaccination schedule	Actual	Percentage
Yes	11	4,3
No	247	95,7

Attitudes of women of childbearing age towards tetanus vaccination

Of the women surveyed, **87.3%** were unaware of the need for vaccination. The majority of the women surveyed, **77.2%**, were unaware of the need for a 2nd and 3rd dose and **17.8%** had not attended health centers. Of the women surveyed, **51.8%** attended health centres for curative care. All the women surveyed said

that the distance between their residence and the CSCOM was accessible and 60% were more than one km away and **40%** less than one km away. The majority of the women surveyed knew where the CSCOM was, **i.e. 86.1%**. Of the women surveyed, **72.8%** found the reception at the CSCOM good. Table 3 summarizes the attitudes of women of childbearing age towards tetanus vaccination.

Table-3: Aspects of attitudes of women of childbearing age in relation to tetanus vaccination

The reasons given by those who have not received a dose of VAT.	Actual	Percentage
Ignores the need for vaccination	35	87,3
Lack of time	5	12,7
The reasons given for the non-implementation of VAT reminders.	Actual	Percentage
Ignores the need for a 2nd and 3rd dose	169	77,2
Fear of side reactions	3	1,3
Forgetting appointment dates	44	20,2
Trips by the FAP without the vaccination record	3	1,3
Attendance	Actual	Percentage
Yes	212	82,2
No	46	17,8



Dating Opportunity	Actual	Percentage
ANC	53	25,1
EPI	16	7,5
Healing	110	51,8
Childbirth	33	15,6
distance from places of residence to CSCOM	Actual	Percentage
More than a km	154	60,0
Less than a km	104	40,0
Situation of the CSCOM	Actual	Percentage
Yes	222	86,1
No	36	13,9
Opinion on the reception at the CSCOM.	Actual	Percentage
Good	188	72,8
Bad	10	3,9
Ignore (no response)	60	23,3

Practical aspects of tetanus vaccination for women of childbearing age

Among the women surveyed, the 14-24 age group was the most represented to have received VAT doses, **i.e. 78.5%**.

VAT administration is strongly associated with age with $P= 0.001$. Of the women surveyed who had received doses of VAT, **90.2%** were married women. There is a link between VAT administration and marital status. Of the women surveyed who had received VAT doses, **78.3%** had a primary level. The level of education has a strong influence on the doses received.

The P value is equal to 0.01477. Of the women surveyed who had received VAT doses, **88.3%** were saleswomen. The profession has no influence on the doses received. The P value is equal to 0.2703. Of the women surveyed who had received VAT doses, **90.9%** were less than one km from the CSCOM.

There is a link between the VAT administration and the distance between the CSCOM and the place of residence with $P= 0.0013$. These practical aspects are presented in Table 4.

Table-4: Practical aspects of vaccinating women of childbearing age.

Slice of age	VAT doses received				Total	P
	Actual	Percentage	Actual	Percentage		
14-24	124	78,5	34	21,5	158	X2= 13.108; P= 0.001
25-35	83	95,4	4	4,6	87	
36-45	12	92,3	1	7,7	13	
Total	219	84,9	39	15,1	258	
Status Marital	VAT doses received				Total	P
	Actual	Percentage	Actual	Percentage		
Bride	110	90,2	12	9,8	122	X2= 5.029; P= 0.03576 P= 0.03576.
Bachelor	109	80,1	27	19,9	136	
Total	219	84,9	39	15,1	258	
Level of instruction	VAT doses received				Total	P
	Actual	Percentage	Actual	Percentage		
Primary	90	78,3	25	21,7	115	X2= 10.205; P= 0.01477
Secondary	51	94,4	3	5,6	54	
Upper	47	92,2	4	7,8	51	
Not in school	31	81,6	7	18,4	38	
Total	219	84,9	39	15,1	258	
Profession of instruction	VAT doses received				Total	P
	Actual	Percentage	Actual	Percentage		
Housewife	22	84,6	4	15,4	26	X2= 3.902; P= 0.2703
Saleswoman	113	88,3	15	11,7	128	
Student	27	87,1	4	12,9	31	



Official	57	78,1	16	21,9	73	
Total	219	84,9	39	15,1	258	
Distance between the	VAT doses received				Total	P
CSCOM and place of residence	Actual	Percentage	Percentage			X ² = 10.81; P= 0.0013
< 1 km	140	90,9	9,1	154		
1 Km and More	79	76,0	24,0	104		
Total	219	84,9	15,1	258		

Qualitative study of the data

During the in-depth individual interviews, we were able to interview thirty (30) women, including fifteen (15) primigravida women and fifteen (15) women composed of pauciparous and multiparous women whose age group was between 14 and 45 years old. After analyzing the data collected, we obtained the following results: all women reported having used the VAT. To the question of whether they appreciated the care received, we had various answers such as the quality of the care received or the reception at the level of the vaccinators. As for what they didn't like, the most represented response was the bad reception *"When you go to a health center to treat yourself, the agents shout at you as if you were a child, especially the women there."* Most of the women interviewed recognized the definite advantages of the tetanus vaccination, especially during pregnancy: *"if you get vaccinated against tetanus, you will be protected; and if you give birth in the best conditions in a health center, your child will be out of danger against tetanus; doctors can find you diseases that you yourself did not know about and prescribe you medicines"*, but besides that some women have declared that they do not recognize any particular advantages in using the tetanus vaccine: *"Me, I don't know of any advantage in doing the weighings, especially since getting vaccinated against tetanus, I have had nine (9) pregnancies and I have only two children alive while I have kept all my appointments and I have done all my vaccinations."* Women did not find any disadvantage in using tetanus vaccination. The main constraint to using VAT mentioned by women is that related to reception *"Health services are easily accessible, but the only problem is the way in which vaccinators treat us; In Mali, if you are told that a treatment is free, tell yourself that you will be humiliated and unwelcome before benefiting from it. I prefer to pay money with respect than to receive care for free in humiliation."* The women we met have quite limited knowledge of the vaccination schedule. Several participants did not know why they were getting vaccinated *"I know that I am pregnant but as long as I am not sick, I do not do the weighings and occasionally, I get vaccinated; I also didn't know that you have to be vaccinated outside of pregnancy."* And most of the women did not know how many times to be vaccinated: *"I don't know how many doses I need to receive to be immunized, but I respect all the appointments that vaccinators give me."* The women we met used VAT for certain personal reasons, in particular to obtain information on the course of the

pregnancy, to receive anemic prophylaxis and to obtain information on the behaviour to adopt during pregnancy.

During the focus groups, we interviewed two groups: Group 1: primigravida women; Group 2: pauciparous and multiparous women. The number of participants per focus group was seven (7). The mean age of the participants was 20.6 years in group 1 and 26.4 years in group 2. Group 1: First-time women. Q1. What can you tell us about VAT in your community? Women attended VAT services, but the use of these services was most often late and irregular due to the lack of knowledge of the vaccination schedule *" It was my mother-in-law who told me to go and start the weigh-in and at that time I was already 4 months pregnant; on occasion, I have done the VAT"*. Q2. Who is responsible at the family level for decisions about health? In the majority of cases, decisions concerning health were the responsibility of the husband because he is the head of the family and he is the one who bears the family's expenses. But in some cases where the husband did not have enough means, it was the mother-in-law who made the decisions for the couple. *" As my husband has no means to pay the costs of the weighing, it is always my mother-in-law who decides."* Q3. Does VAT in your structures meet your expectations? The first-time women we met were generally satisfied with the way VAT was carried out and they had nothing to reproach with the practice of VAT in their community. In addition, two (2) women told us that they were not at all satisfied with the reception from the vaccinators: *"When you go to the health center for vaccination, they welcome you so badly that you don't want to continue"*. Q4. Do you know the interest of VAT? Is it of interest to you? We found in this group that first-time women had a lot of interest in doing VAT. They felt that VAT was important for their health and that of their fetus. *"For me, VAT is very important, first of all you are protected against tetanus and on top of that, you are given free care."* Q5. What proposal would you make to bring women to a better use of VAT services in your community? The proposals made by the women in this group boiled down to: Improve the reception; Developing health facilities to make them cleaner; Raise awareness among women about the importance of VAT. For Group 2: pauciparous and multiparous women. Q1. What can you tell us about VAT in your community? The women in group 2 that we interviewed in the focus groups attended all the VAT services.



"When you know you are pregnant, you go to the health centre and do your best to respect the advice given by the health workers and in particular the vaccination schedule." Q2. Who is responsible at the family level for decisions about health? The final decisions about health always rested with the husband. When a woman wants to go to the health centre for her treatment, she informs her husband and he decides according to his means whether she can go or not. "In general, I do my vaccination at the same time as my weigh-ins, so if I have to go to the weigh-in, I tell my husband who gives me the money to go." Q3. Does VAT in your structures meet your expectations? For poor and multiparous women, VAT in their structures perfectly meets their expectations and they have nothing to reproach with this practice. Q4. Do you know the interest of VAT? Is it of interest to you? There is a lot of interest in VAT among women in this group. For these women, it helps protect the woman and her fetus against tetanus: "Doing VAT is good for me and the child I carry in my womb." Q5. What proposal would you make to bring women to a better use of VAT services in your community? For women in this group, the lack of awareness means that many women do not use VAT services. As a result, the women insisted on raising awareness and informing women about the vaccination schedule. The women made other proposals such as improving the reception.

DISCUSSION

Epidemiological aspects

In our study, VAT administration is strongly associated with age with $P=0.001$; The age group of 14-24 years old was the most represented with 61.24%. This result is justified by the fact that our study mainly focused on women of childbearing age. COULIBALY DOSSE in his medical thesis Bamako 2019 [10], DIARRA D Y [9] and DIALLO Z [8] found similar results. Marital status: Our study found that half of the FAPs surveyed were married, i.e. 52.8%. This can be explained by the fact that women tend to marry quite early. This result corroborates that of the vast majority of socio-demographic studies carried out in Mali as well as the EDSM-VI. In 2012-2013, the same trend was found in MAGUIRAGA and DIARRA D Y [9]. Our study also showed that these 52.8% of married women had received at least one dose of VAT. Marital status had an influence on the administration of VAT doses with $P=0.03576$. Level of education: Our study found that 44.6% of the women surveyed had a primary level. This is because most of them were married without completing their studies. In the Malian context in general, when a woman is married, she drops out of school. Also, our study found that 78.3% of the FAPs that had received VAT doses had a primary level. The level of education has a strong influence on the doses received with $P=0.01477$. Our results are similar to those of DIARRA D Y [9] and COULIBALY DOSSE [10]. Profession: Female saleswomen were the most represented with 49.7%. DIARRA D Y [9] finds in his

study that housewives were the most represented with 35.33%. Our study also showed that 88.3% of saleswomen had received at least one dose of VAT. The profession had no influence on the administration of VAT doses with $P=0.2703$. DIARRA D Y [9] finds that the profession had an influence on the administration of VAT doses with $P=0.02$.

Immunization coverage: Immunization coverage is the proportion of people vaccinated during a given period of time. This administrative vaccination coverage in VAT of women of childbearing age in the health district of Commune I was 74.7% (source SIS). It is slightly higher than the one our study found during the same period, i.e. 63.9%. This difference is explained by the fact that administrative vaccination coverage was calculated over a quarter (May, June and July 2021), whereas in our study we estimated vaccination coverage by making the history of VAT among our respondents. Our study found that 63.9% of the DPFs surveyed had received at least two (2) doses of VAT or more. This can be explained by the fact that the vast majority of the women surveyed were multiparous and at each pregnancy they started the vaccination from scratch. Diallo Z., in his medical thesis in Bamako on tetanus vaccination in FAPs [8], also reported that among the FAPs informed about the VAT, 70.3% had received at least two doses of VAT, representing 47.5% of the study population. Our study also revealed that 72.3% of the women surveyed were vaccinated during prenatal consultations. The same trend is observed in Diallo Z. [8] and Diarra D. Y. [9] who reported successively that 61.5% and 74.54% were vaccinated during prenatal consultations.

Aspects on the knowledge of women of childbearing age on tetanus vaccination:

The family, the TV and the health centre (CS Ref) were the main sources of information mentioned by the FAPs surveyed with proportions of 43.9%, 22.8% and 16.4% respectively. Diallo Z. [8] and DIARRA D Y [9] found similar results. Our study found that 78.4% of the DPFs surveyed were unaware of the number of VAT doses that a DPF should receive. In contrast to the external review EPI Mali May-July 2006, 56.47% of women generally understood that it takes at least three consecutive vaccinations for a woman of childbearing age to be fully protected against tetanus. However, 13.9% of mothers believe that less than three times of vaccination is sufficient for the protection of FAP. Of our respondents, 95.7% were unaware of the VAT vaccination schedule. This could be explained by a lack of information.

Aspects of the attitudes of women of childbearing age on tetanus vaccination:

Reasons for the non-use of tetanus immunization services by FAPs. Of the AFPs surveyed who had not received VAT, 87.3% were unaware of the need for vaccination. The in-depth review of the 2009 EPI Burkina Faso [9] approaches in



the same direction by reporting that 22.8% of mothers of children aged 0 to 11 months were unaware of the need for vaccination. Of the half of the women surveyed who did not come for boosters, 77.2% of these women were unaware of the need for a 2nd and 3rd dose. In our study, we found that the majority of women surveyed knew the location of a CSCOM, i.e. 86.1%. And 82.2% attended at least one CSCOM. This could be explained by the proximity of the population's health centres. The same trend can be found in COULIBALY [9], Banamba (89%) and Dioila (60%). Curative care, ANC and childbirth were retained as the main reasons for attendance with respective proportions of 51.8%; 25.1% and 15.6%.

Limitations and difficulties: The difficulties encountered were mostly related to the reluctance of some women to answer the questionnaires, as well as the multiple occupations, especially of housewives, who were mostly housewives. The vaccination status of some could not be attested by the presence of a tetanus vaccination card. But this inadequacy does not affect the quality of the data.

CONCLUSION

The lack of information, awareness and the age of the FAP are the main reasons for the lack of knowledge of the vaccination schedule, the number of doses required and the need for VAT.

Conflict of interest: none.

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