

Original Research Article

Tetanus Toxoid Immunization Coverage in Federal Medical Centre, Umuahia, Abia State, South East Zone, Nigeria

Abstract

Background: Tetanus toxoid immunization is given to pregnant women and women of child bearing age to prevent neonatal tetanus and maternal tetanus. The tetanus toxoid vaccine is given five times to women of child bearing age. If the vaccination is given with correct dose, through the right route of administration and completely the woman will be protected for life/ all child bearing years. It was therefore necessary to find out the tetanus toxoid coverage in such tertiary health institution where many pregnant women attend and immunization is given.

Objective: To determine the tetanus toxoid coverage in the health facility.

Methods: Records of the data management tools of Tetanus Toxoid (TT) immunization were checked and data collected. The data was collected from tetanus toxoid register in the immunization unit of Federal medical centre, Umuahia. Data was analyzed with Excel and Epi info.

Results: The health facility summary form showed steady increase in coverage rate for TT1 and TT2 pregnant women only from 2006(33%, 28%) to 2012(64%, 50%) except 2010(37%, 29%) where it reduced. The dropout rate of TT1/TT2 ranged from 14% in 2011 to 28% in 2009. The dropout rate in 2012 was 22%. In immunization register 2006-2009, those that completed (took TT1 to TT5) ranged from 10%-16%. However, those that started in 2010 to 2012 were not expected to have taken up to TT5 due to interval of administration

Conclusion: The coverage rate of TT was low with highest coverage rate in 2012 and there was also high dropout rate. This showed that many pregnant women are still not immunized with TT and some that started did not get the second dose indicating no protection.

Key words: Tetanus toxoid vaccine, immunization, Coverage

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33 **Introduction**

34 Tetanus is a preventable infectious disease caused by *Clostridium tetani* a Gram positive rod like
35 spore forming obligate anaerobic bacterium, that produce an exotoxin resulting in the clinical
36 manifestations of tetanus. It is one of the diseases marked for elimination and the persistence of
37 clinical cases in any community is a direct indictment of the health authorities of the country in
38 question, reasons being the simplicity of tetanus toxoid administration, its safety, effectiveness
39 and cheapness.[1]

40 Maternal tetanus is defined as tetanus occurring during pregnancy or within 6 weeks after any
41 type of pregnancy termination, it is one of the most easily preventable causes of maternal
42 mortality. It includes postpartum or puerperal tetanus resulting from septic procedures during
43 delivery, postabortal tetanus resulting from septic abortion and tetanus incidental to pregnancy,
44 resulting from any type of wound during pregnancy [2] while neonatal tetanus is tetanus
45 occurring in a newborn between the 3rd and 28th day after birth.[2]

46 Predisposing factors to Maternal and Neonatal Tetanus (MNT) include limited access to health
47 services, poor hygienic conditions, lack of access to sterilized childbirth delivery tools and
48 unhygienic practices during childbirth. Contact between the bacteria and broken skin or dead
49 tissues, such as the wound resulting when an infant's umbilical cord is cut brings about
50 transmission. Of the 28 countries with high number of tetanus cases, 16 including Nigeria
51 accounting for 90% of global neonatal tetanus cases are in the African region and estimations are
52 that with no cure MNT is responsible for an average 110,000 deaths a year in the African Region
53 of the World [3]

54 In 1988, WHO estimated around 787,000 newborns deaths due to neonatal tetanus. Despite few
55 success stories majority of the Low and Middle Income Countries (LMICs) are still struggling to
56 reduce neonatal mortality due to neonatal tetanus [4].

57 Key measures in the prevention of maternal and neonatal tetanus deaths hinge on hygienic
58 delivery and cord care practices, and/or by immunizing mothers with tetanus vaccine. The
59 eradication of tetanus i.e. the complete extermination of the bacteria is rather impossible unlike
60 for polio and small pox because the spores of *clostridium tetani* are ubiquitous in the
61 environment but MNT Elimination Initiative aims to reduce the number of maternal and neonatal
62 tetanus cases to such low levels that MNT is no longer a major public health problem through
63 immunization of pregnant and **women in child bearing age (WCBA) is between 15-49years of**
64 **age** and promotion of more hygienic deliveries. MNT Elimination is defined as less than one
65 case of neonatal tetanus per 1000 live births in every Local Government Area [5]

66 Current immunization guidelines require administration of 5 doses of **Tetanus toxoid vaccine** to
67 women in child bearing age to prevent MNT

Tetanus toxoid vaccine schedule for women in child bearing age is given at first contact (TT1) which gives no protection, then after four weeks 2nd dose (TT2) which gives 3 years protection, 3rd dose (TT3) at 6 months after the 2nd dose, gives 5 years protection, 4th dose (TT4) 1 year after 3rd dose gives 10 years protection, the 5th dose (TT5) 1 year after 4th dose gives protection for lifetime/ all child bearing years [6]. In pregnancy the woman is expected to have two doses, first and second dose and continue after delivery.

Prior to the 42nd World Health Assembly (WHA) in 1989 where there was call for elimination of neonatal tetanus by 1995, World Health Organization estimated the death 787,000 newborns in 1988 and the annual global NT mortality was approximately 6.7 NT deaths per 1000 live births. World health Summit in 1990 listed neonatal tetanus among its goals while the 44th WHA re-endorsed the goal in 1991. The implementation of the strategies for Neonatal Tetanus (NT) Elimination made only slow progress for which the target date was postponed to 2000. The initiative was reconstituted by adding maternal tetanus elimination when the goal was not achieved in 2000 and the target date shifted to 2005. By 2010 there has been a 93% reduction from the 1980s situation with 58000 newborns dying from NT while by November 2012, 31 countries had not achieved elimination status.[3]

The vaccination of pregnant women and women in child bearing age (WCBA) with tetanus toxoid vaccine is one of the most important strategies in the control of neonatal and maternal tetanus. In pre-natal care tetanus toxoid vaccination is one of the important components of maternal health in developing countries [7]

Neonatal tetanus is still being reported in this hospital. One case was admitted on 7/12/12 age 6 days and the child died, mother received only one dose of TT during pregnancy. The second neonate was admitted on 23/2/13 age 7 days, the baby survived, the mother also received only one dose of TT during pregnancy (source neonatal records FMC, Umuahia). Abia state tetanus toxoid coverage was low TT1 (27%), TT+(34%) in 2007, TT1(38%), TT+(41%) in 2008 (source state report) and tetanus toxoid campaign was carried out in 2009. TT+ is addition of the WCBA immunized with TT2, TT3, TT4 and TT5.

It was therefore necessary to find out the extent of uptake of tetanus toxoid vaccine in such tertiary health institution where many pregnant women attend and immunization is given

Objective: To determine the uptake of tetanus toxoid immunization among women of child bearing age in Federal Medical Centre, Umuahia

Methodology: Records of the TT data management tools (TT immunization Register, Tally sheet and Health Facility Summary form) were checked and data collected. The TT register is used to record all the women of child bearing coming for tetanus toxoid and it also helps to know the defaulters for subsequent doses since they are registered once while the tally sheet is used to know the number immunized per session. The data collected included the number of women immunized at different stages with tetanus toxoid vaccine, pregnant and non pregnant. The women immunized with TT were grouped into two; pregnant and non pregnant. Data collected were from 2006 to 2012 and analyzed with Excel and Epi info.

The data for children 0-11months for DPT 2011 was collected and the monitoring chart compared with Tetanus toxoid coverage. The pregnant and non pregnant who received Tetanus toxoid vaccine were collected from both summary form and immunization register and both compared..

The total population of Umuahia North Local Government area where the Health facility is located is 223,143 according to 2006 census. The total population for the Catchment Area (area covered by the health facility) for the Health facility is 30,600, Target population for 0-11months is 4% of total population was 1224 and pregnant women which is 5% of total population was 1540 for 2011 (source: given by Local Government Area). The data from the tally sheet, summary sheet was compared with the data from the immunization register.

Federal Medical Centre is the only Federal tertiary health facility in the State. It is situated in Umuahia the capital of Abia state, South Eastern Nigeria.

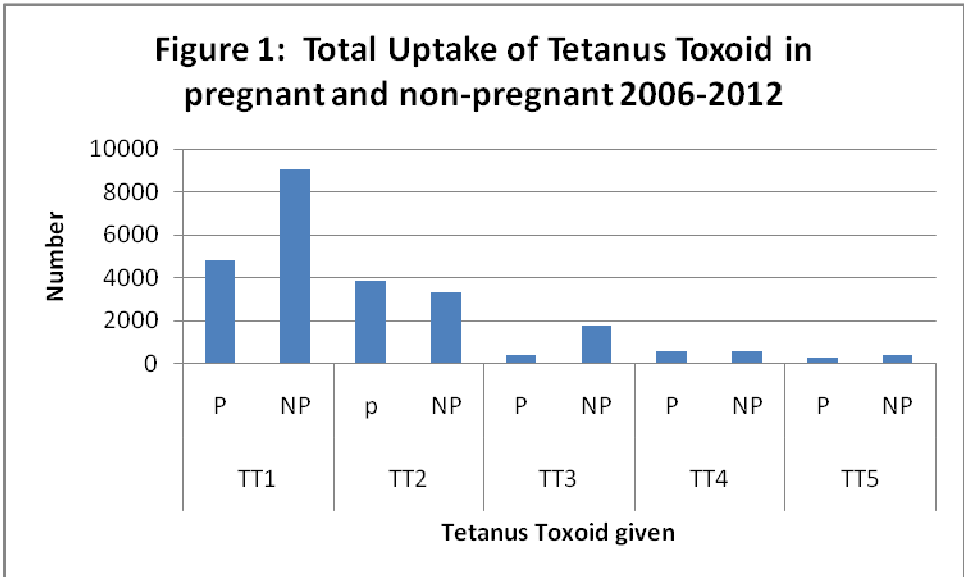
The immunization unit of Federal Medical Centre is under the department of Community Medicine. The hospital provided the infrastructure while the Federal Government through the State Ministry of Health and Local Government provide the vaccine, needle and syringes for immunization. Some Agencies, the Hospital and the Federal Government also provided the cold chain system like refrigerators, freezer, cold boxes, vaccine carriers and ice pack.

In the Facility immunization is given routinely as follows Diphtheria, Pertussis Tetanus (DPT), Hepatitis B Vaccine(HBV), Oral Polio Vaccine (OPV) and Tetanus Toxoid vaccine (TT) Monday to Friday, Measles and Yellow fever only on Tuesday, Bacillus Calmette Gullerin (BCG- vaccine against tuberculosis) is given only on Wednesday. Coverage rate is defined as number of pregnant women and women of child bearing age given TT divided by target population multiplied by 100. Dropout rate for TT1 and TT2 was measured as number of pregnant or women of child bearing age that received TT1 minus TT2 divided by TT1 multiplied by 100

Ethical Clearance: Ethical clearance was gotten from ethical review committee of Federal Medical Centre, Umuahia. The number is FMC/QEH/G596/Vol.10/114.

Result: The Health facility summary form showed steady increase in coverage rate for TT1 and TT2 for pregnant women only from 2006(33%, 28%) to 2012(64%, 50%) except 2010(37%, 29%) where it reduced.

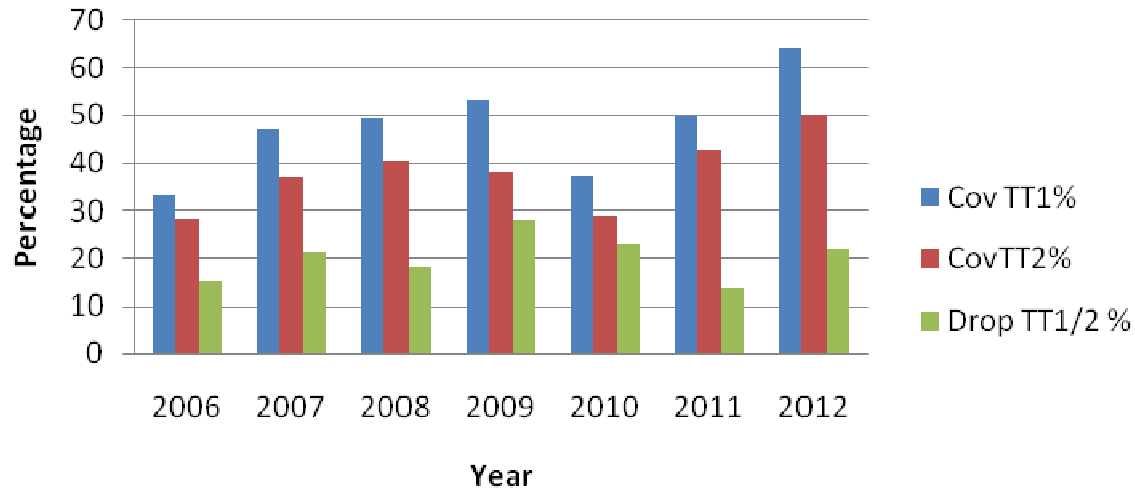
The dropout rate of TT1/TT2 ranges from 14% in 2011 to 28% in 2009. The dropout rate for 2012 was 22%. In Immunization register 2006-2009 those that completed (received TT1 to TT5) ranges from 10%-16%, however those that started in 2010, 2011 and 2012 would not have received up to TT5.



The figure showed the uptake of Tetanus toxoid vaccine from 2006 to 2012 of pregnant and non pregnant. The number decreased with subsequent TT given. The TT1 was highest and TT5 lowest in both pregnant (P) and non-pregnant (NP).

Figure 2

Comparison of TT coverage TT1, TT2 and the drop out rates by year



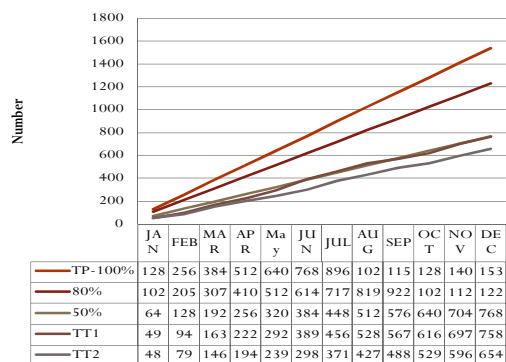
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151 The figure 2 showed the number of pregnant women immunized with TT1 and TT2. In 2009
 152 many of the pregnant women (28%) received TT1 without receiving TT2. The dropout rates for
 153 the other years are 2006(15%), 2007(21%), 2008(18%), 2010(23%), 2011(14%) and 2012 (22%)

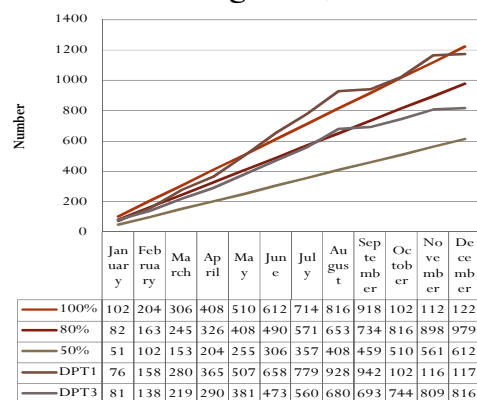
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Figure 3: Comparison of TT and DPT Monitoring Chart for 2011

FMC, Umuahia: TT for pregnant women, Monitoring Chart, 2011

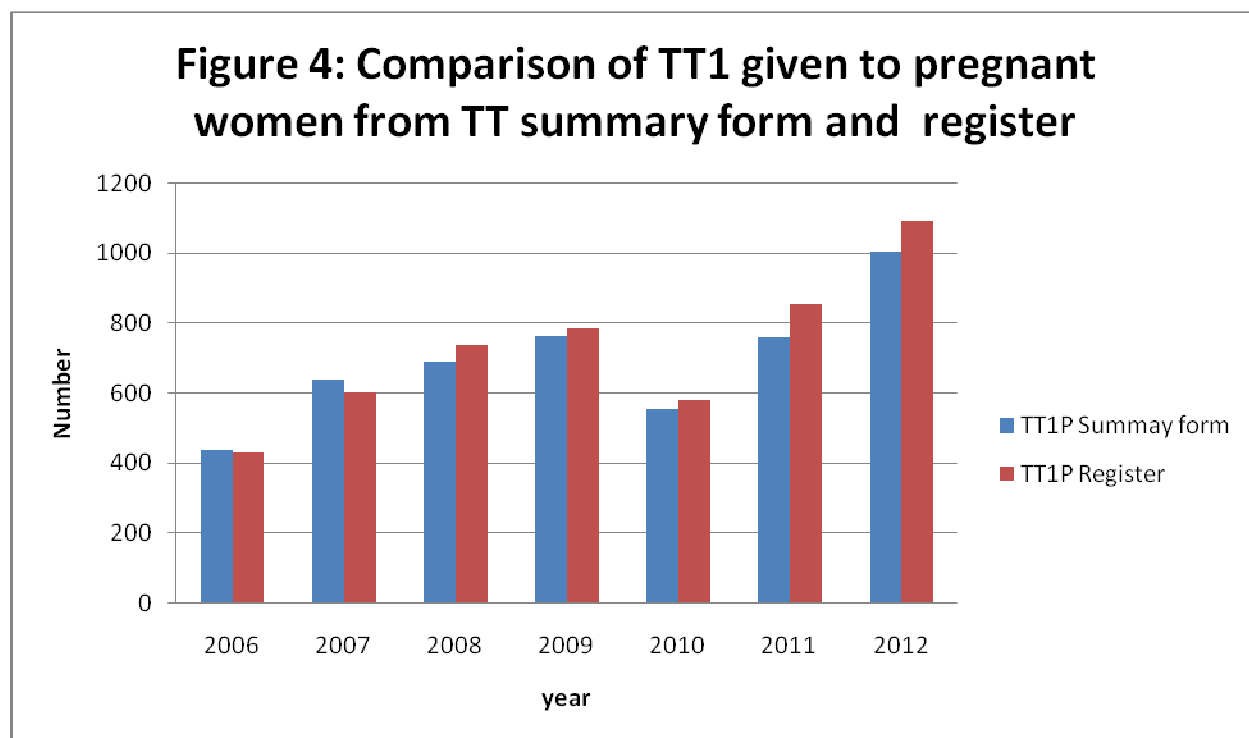


FMC, Umuahia: DPT Monitoring Chart, 2011



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156 The figure 3 showed the monitoring chart of DPT and TT for 2011, the coverage of TT1 and
157 TT2 were 50% and 43% respectively while DPT 1 was 96% and DPT 67%. The target population



158
159 The TT Taken by the pregnant mothers from summary form and register were compared. The in
160 the summary form were higher from 2006-2007 but lower from 2008-2012. This is not
161 statistically significant. $P > 0.05$

162

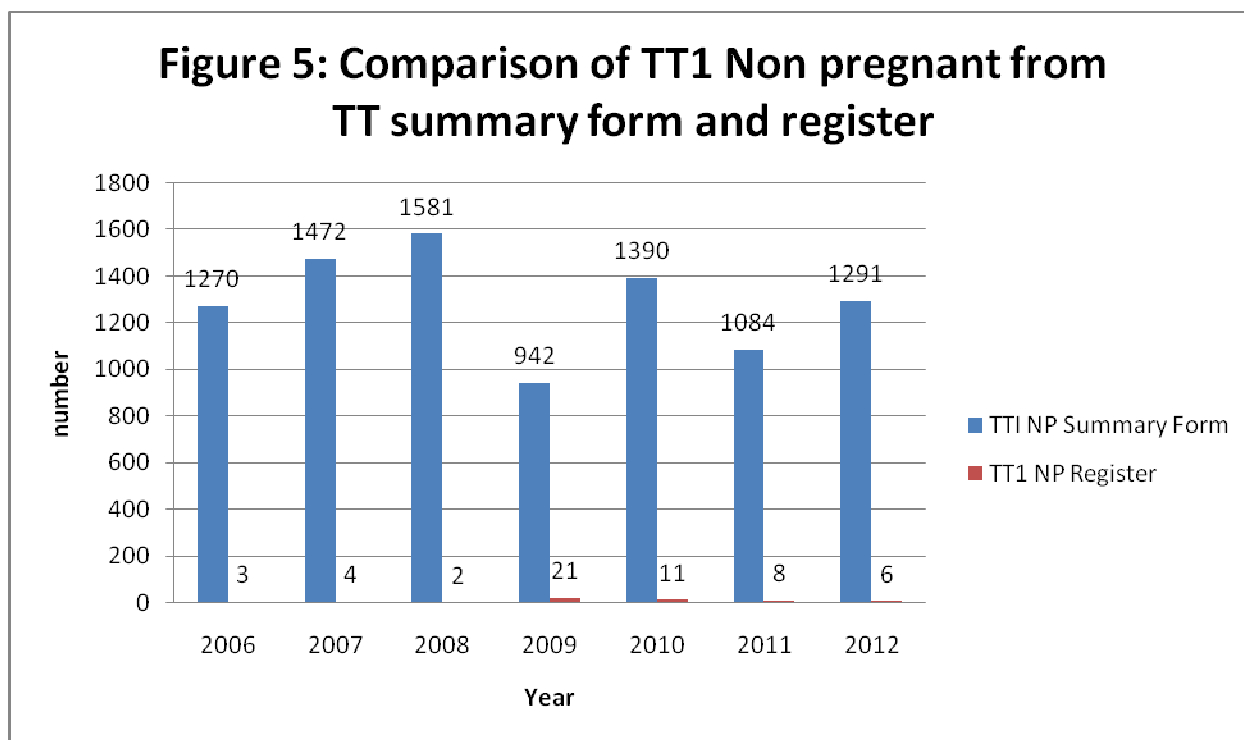


Figure 5 compared the TT1 in non pregnant women from summary form and register. The number immunized in the summary form was very high compared to what was recorded in the register.

Discussion: The TT1 coverage was low and reduced further with subsequent immunization this may be due to many women after the TT1 and TT2 during pregnancy they may not continue with the antigen up to TT5 and this may also be due to lack of awareness creation of the importance of TT immunization in prevention of tetanus in mothers and children. This is similar to study done in Dhaka City, Bangladesh where although 85% of women with children less than 1 year received two doses of TT only 11% of women of child bearing age received five doses of TT[8]

The low coverage rate as seen in this study was similar to some studies done. [9, 10] While some studies done showed much lower coverage[11] However some studies showed higher coverage rate[8,12] Some were able to improve the TT coverage with supplemental immunization activities (SIA) were through the implementation of SIAs 80% of women received 2 or more doses of TT[13]

There was also high dropout rate for TT given to mothers and this indicates poor utilization of the health facility and no protection since the TT1 does not confer any protection [6]. It also showed the likelihood of having neonatal tetanus since studies have shown that TT immunization

is one of the ways to prevent neonatal tetanus [14,15] The high dropout rate recorded in this study is similar to the study done in East Nile Province in Sudan where 15% drop out rate was recorded.[16]

The comparison of monitoring chart of TT and DPT showed higher coverage of DPT than TT, this was similar to a study [17] This calls for another study to know the reason if it could be that many women give preference to their children's immunization or could also be that the awareness of the importance of TT immunization has not been created and the women may not know why the immunization is given or may be that the Government is not paying much attention to TT as it does to routine immunization of children since routine immunization in children will be addressing so many diseases and the relationship between the occurrence of the disease in children and the immunization in the mother may not be understood as shown by high dropout rate, the same finding was seen in another study done [18] and there was lack of knowledge among mothers in Rivers State, South- South zone of Nigeria[19]. There was high dropout rate in both TT and DPT which showed poor utilization in the health facility.

There was higher coverage of TT1 in non pregnant, (women in child bearing age WCBA which is 15-49 years of age) than pregnant women, which is in contrast with some studies [8, 12]. The data for TT for pregnant women from different data management tools were compared (TT summary form and the register). The difference was not statistically significant but when that of non pregnant women were compared, the difference was statistically significant. This showed that the pregnant women record was better than non pregnant record. It may also show that all the people recorded in the summary form were not only women; it could be that the people who had injury and came for TT were recorded to account for the vaccine given. The people will be tallied and put in summary sheet but could not registered in the TT immunization register were, they are suppose to be only female. It therefore means that the data could not be accrued to only WCBA.

Conclusion and Recommendations: The coverage rate of TT was low with improvement in 2012 and also high dropout rate. This showed that many pregnant women are still not immunized with TT and some that started did not get the second dose indicating no protection.

There should be emphases on TT uptake to be able to achieve Millennium development goals (MDG) 4 which is to reduce child mortality, MDG 5 which is to improve maternal health, MDG 6 which is to combat HIV/AIDs, Malaria and other diseases and TT elimination of less than one neonate tetanus per 1000 live births

Separate data management tools (tally, summary form and register) should be provided for those especially male and female not within the women of child bearing age that came for immunization due to other reasons like injury.

219 Study should be done to find out the reasons for low coverage.

220 **Competing Interest:** The authors declare no competing interest.

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222 **Author's Contribution:**

Authors' contribution	NHI	UAU	EUU	NKC	NN	OD	AE
Research concept and design	√	√	√	√	-	-	-
Collection and/or assembly of data	√	-	-	√	√	-	-
Data analysis and interpretation	√	-	-	-	-	-	-
Writing the article	√	-	√	√	-	-	-
Critical revision of the Article	√	√	√	√	√	√	√
Final approval of Article	√	√	√	√	√	√	√

223

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