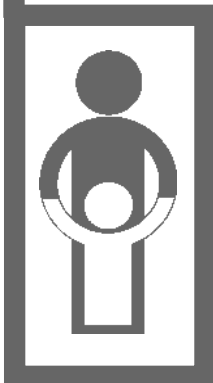


Field manual for neonatal tetanus elimination



**DEPARTMENT OF VACCINES AND
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Contents

<i>List of abbreviations</i>	v
Introduction	1
Eliminating neonatal tetanus	2
Recommended strategies for neonatal tetanus elimination	2
Objectives	4
STEP 1: Conduct routine tetanus toxoid immunization services	5
1.1 Use a recommended tetanus toxoid immunization schedule	5
1.2 Identify the target population	7
1.3 Use quality immunization practices	8
STEP 2: Identify high-risk districts	10
2.1 Collect and record general information.....	12
2.2 Calculate the neonatal tetanus incidence rate	13
2.3 Calculate the percentage of completeness of reporting	14
2.4 Calculate TT2+ immunization coverage	15
2.5 Calculate clean delivery coverage	20
2.6 Use the assessment results to identify high-risk districts.....	22
2.7 Prioritize the list of high-risk districts	24
STEP 3: Identify problems in high-risk districts	25
3.1 Identify problems with tetanus toxoid immunization services.....	26
3.2 Identify problems with clean delivery and cord care practices	28
3.3 Identify problems with neonatal tetanus disease reporting	30
3.4 Prepare a description of the high risk district	33
STEP 4: Plan to improve tetanus toxoid immunization services	34
4.1 Accelerate tetanus toxoid immunization coverage	35
4.2 Strengthen routine tetanus toxoid services for pregnant women	37
4.3 Conduct case response activities	38
4.4 Consider modifications to the tetanus toxoid immunization schedule	39
4.5 Promote lifetime immunization cards	40

STEP 5: Plan to improve clean delivery practices	41
5.1 Improve skills for birth attendants	41
5.2 Improve availability of clean delivery and cord care supplies.....	42
5.3 Conduct social mobilization.....	43
STEP 6: Plan to improve neonatal tetanus disease reporting	44
6.1 Improve routine monthly reporting	45
6.2 Improve active surveillance	46
6.3 Improve case investigation activities	47
6.4 Improve community surveillance	48
STEP 7: Develop the plan of action.....	50
7.1 Set targets for neonatal tetanus elimination activities	50
7.2 Estimate costs for the neonatal tetanus elimination activities	52
7.3 Revise the activity plans	56
7.4 Write the neonatal tetanus elimination component of the national EPI plan of action	57
STEP 8: Take action	58
8.1 Conduct training.....	58
8.2 Conduct supervision	59
8.3 Monitor neonatal tetanus elimination activities.....	63
8.4 Prepare graphs of major indicators	64
8.5 Prepare a spot map for each district.....	66
Annexes	67
Annex 1: Vaccine storage recommendations.....	68
Annex 2: Assessing infants protected at birth against neonatal tetanus.....	69
Annex 3: Sample case investigation form for neonatal tetanus	72
Annex 4: Conducting a series of mass immunization campaigns for tetanus toxoid (TT rounds)	73
Annex 5: Including tetanus toxoid in a national immunization day (NID) activity	77
Annex 6: Sample schedule for including tetanus toxoid booster doses in a school-based delivery schedule	78
Annex 7: Conducting a register review	79
Annex 8: Annual data collection form for neonatal tetanus indicators.....	83
Annex 9: Further reading.....	84

List of abbreviations

ANC	antenatal care coverage
BCG	bacille Calmette-Guérin (vaccine)
DT	diphtheria-tetanus vaccine
DTP	diphtheria-tetanus-pertussis vaccine
EPI	Expanded Programme on Immunization
IPV	inactivated polio vaccine
NGO	non-governmental organization
NID	national immunization day
NT	neonatal tetanus
PAB	protected at birth (against neonatal tetanus)
Td	tetanus toxoid with a low amount of diphtheria toxoid vaccine
TT	tetanus toxoid
TT2+	two doses of tetanus toxoid
UNICEF	United Nations Children's Fund
WHO	World Health Organization

Introduction

Tetanus is a serious disease in newborn infants. Each year, more than 450 000 infants die from neonatal tetanus (tetanus in the first month of life), and nearly 40 000 mothers die from tetanus infection acquired during delivery. If the mother is not immunized with the correct number of doses of a tetanus toxoid vaccine, neither she nor her newborn infant is protected against tetanus at the time of birth.

WHO estimates that only 5% of neonatal tetanus cases are actually reported, even from well developed surveillance systems. For this reason, neonatal tetanus is called “the silent killer”. Cases occur but do not come to the attention of the health system when:

- A vital events reporting system (the systematic reporting of births and deaths) is not well established in an area.
- A sick infant dies before its birth is registered in the vital events registry.
- A sick infant dies at home without being seen by a health worker.

Tetanus is caused by toxic spores that are released from *Clostridium tetani*, a bacteria that grows in dead tissues and decaying matter. The bacteria is found everywhere in the environment: in soil, ash, and animal dung, and on the surfaces of skin and tools. Transmission occurs when there is contact between the bacteria and any broken skin or dead tissues, such as a wound or when an infant’s umbilical cord is cut. Poverty, poor hygiene, and limited access to health services amplify the risk for disease transmission during childbirth.

Signs of neonatal tetanus usually appear three to 10 days after birth. At first the infant is able to feed normally. Then the infant cannot suckle and becomes irritable. Convulsions occur with increasing intensity and frequency. In the developing world, the disease progresses to difficult breathing, exhaustion, starvation and, in most cases, death.

Neonatal tetanus can be prevented if:

- Women are immunized with at least two doses of tetanus toxoid vaccine before childbirth, and
- Clean practices are used during delivery and in the care of the infant’s umbilical cord.

Eliminating neonatal tetanus

The World Health Assembly has resolved to eliminate neonatal tetanus by the year 2000. The WHO global target for neonatal tetanus elimination is to reduce the incidence of neonatal tetanus to less than 1 case of neonatal tetanus (NT) per 1000 live births in every district of every country in the world. Reaching this target will reduce the global incidence of neonatal tetanus to less than 150 000 cases per year.

Fortunately, more than 60% of developing countries have already met the neonatal tetanus elimination target. Fifty-eight countries have made progress toward the elimination target, but have not yet reached it. Twenty-six of them account for 90% of the estimated number of cases. Sixteen are in the African region. The lack of progress is due to competing priorities for health services, social instability and limited resources. While these are difficult problems, some countries have overcome them by using experiences with other disease control or elimination programmes and maximizing existing resources to reduce the number of neonatal tetanus cases.

Recommended strategies for neonatal tetanus elimination

Tetanus transmission can be prevented during childbirth by improving immunization services, especially for pregnant women, promoting clean delivery and cord care practices, and strengthening disease reporting and case investigation systems. Recommended strategies for neonatal tetanus elimination are:

1) *Immunize pregnant women with tetanus toxoid vaccine*

All pregnant women attending routine health services should be screened for their tetanus toxoid (TT) immunization status and immunized during the visit if they are eligible for a dose.

A woman immunized with at least two doses of tetanus toxoid vaccine (TT2+) develops protective antibodies against tetanus.

They are passed along to her fetus, protecting the infant against tetanus at birth, and for the first two months of its life.

Countries with a high percentage of pregnant women who have received at least two doses of tetanus toxoid vaccine have seen a reduction in the incidence of neonatal tetanus to less than 1 case per 1000 live births

2) *Immunize women of childbearing age who live in areas of high risk for neonatal tetanus transmission*

To accelerate progress towards neonatal tetanus elimination, many countries have used a high-risk approach to increase tetanus toxoid immunization coverage among all women living in areas of high risk for neonatal tetanus.¹ The high-risk approach has proven effective in rapidly reducing the incidence of neonatal tetanus by focusing limited resources in the areas of greatest need. To implement this approach:

¹ Detailed guidance for identifying high-risk districts is provided in this manual.

-
- Identify districts that are at high risk for neonatal tetanus transmission.
 - Conduct a series of mass campaigns (or “TT rounds”) in the areas of highest risk to reach all women of childbearing age with at least three doses of tetanus toxoid vaccine.
 - Once the TT rounds are completed, strengthen routine tetanus toxoid immunization services so that women in the area are fully immunized against tetanus.

The high-risk approach should be part of neonatal tetanus elimination activities in countries which have not yet reached the neonatal tetanus elimination target.

3) *Promote clean delivery and cord care practices*

Increasing the proportion of births attended by a birth attendant who is skilled in the use of clean delivery practices and safe cord care will contribute to the reduction of disease transmission risk during childbirth. Examples of skilled birth attendants are:

- Health workers who deliver infants in a health facility.
- Midwives or trained birth attendants who attend home deliveries.
- Family members (or women themselves) who attend home births and use clean delivery and safe cord care practices.

A skilled birth attendant uses “the three cleans” if:

- The birth attendant has *clean hands*.
- The delivery occurs on a *clean surface*.
- The umbilical cord is cut and cared for with *clean instruments and dressings*.

Neonatal tetanus elimination programmes should identify opportunities during or after mass campaigns for local cooperation with maternal and child health programmes to promote tetanus toxoid immunization services and access to clean delivery and cord care.

4) *Conduct effective neonatal tetanus surveillance*

Disease surveillance includes the early detection and control of specific diseases. Neonatal tetanus is a reportable disease for surveillance, and it should be reported separately from other tetanus cases. Every month, each district (or each health facility in the district) reports to the next level the total number of neonatal tetanus cases seen during the reporting period.

At a minimum, improve the reporting of neonatal tetanus cases from high-risk areas. All neonatal tetanus cases seen at health facilities in high-risk areas should be reported to the district level. Cases should be investigated. Results of the case investigation will give programme managers information they can use to identify high-risk areas, plan response activities, and take action to prevent additional cases and reduce the transmission risk for neonatal tetanus.

Objectives

The *Field Manual for Neonatal Tetanus Elimination* is intended primarily for national and district managers who plan and carry out neonatal tetanus elimination activities. The manual is a practical, step-by-step guide to the assessment of current activities for prevention and control of neonatal tetanus. It contains recommended guidelines for improving the activities, especially in high-risk districts. The information is also appropriate for:

- National and district level EPI managers
- National and district level disease surveillance officers
- Maternal and child health programme managers and educators
- Public health officers and programme administrators
- Medical and nursing educators.

Each district has unique problems and priorities that require specific, creative solutions. The recommendations in this manual should be adapted to meet local policies and conditions.

The information and examples in this manual describe how to:

- Improve routine services for delivery of tetanus toxoid vaccine.
- Identify districts at high risk for neonatal tetanus and the specific causes of transmission risk.
- Use the high-risk approach to accelerate immunization coverage in the high-risk district.
- Improve immunization services, clean delivery and cord care practices, and surveillance activities for neonatal tetanus.
- Sustain prevention and control activities in districts where the neonatal tetanus elimination has been achieved.
- Monitor the achievements of neonatal tetanus elimination activities and take action to maintain a high quality programme.

STEP 1:

Conduct routine tetanus toxoid immunization services

Periodically, review routine immunization activities to make sure that tetanus toxoid is offered routinely, reliably, and according to national policy.

1.1 Use a recommended tetanus toxoid immunization schedule

Tetanus toxoid vaccine is a safe vaccine. Extreme reactions are rare, and there are no contraindications to tetanus toxoid vaccine at any time during pregnancy, even in the first trimester. Table 1 lists vaccines that contain tetanus toxoid are:

Table 1: Vaccines containing tetanus toxoid

Vaccine	Abbreviation	Usually included in schedules for:
Tetanus toxoid vaccine	TT	Pregnant women Women of childbearing age
Diphtheria-tetanus-pertussis vaccine	DTP	Infants and children
Diphtheria-tetanus toxoid vaccine	DT	Children (5-7 years)
Tetanus toxoid vaccine with a low amount of diphtheria toxoid vaccine	Td*	Adolescents and adults

* TT can be substituted for Td or DT for purposes of monitoring coverage

For prevention of neonatal and maternal tetanus, WHO recommends giving women a series of five doses of tetanus toxoid (TT) vaccine with a minimum interval between each dose. Protection against tetanus begins two weeks after the second dose. Each dose increases the level and duration of protection against tetanus. Each dose counts as a dose toward the 5-dose schedule, even if it is given at more than the recommended interval.

A woman who receives five doses of tetanus toxoid is considered fully immunized. She is protected against tetanus throughout her childbearing years.

Table 2: WHO-recommended schedule for five doses of tetanus toxoid

TT Dose	When to Give	Level of Protection (%)	Duration of Protection
TT1	At first contact	NIL	None
TT2	At least 4 weeks after TT1	80	3 years
TT3	At least 6 months after TT2	95	5 years
TT4	At least 1 year after TT3	99	10 years
TT5	At least 1 year after TT4	99	30 years

A booster-dose schedule: Some countries use a school-based tetanus toxoid immunization delivery strategy that includes booster-doses. The strategy is effective if a country has achieved high DTP3 coverage rates, a high level of school enrollment for both boys *and* girls, and a minimum level of school drop out rates for girls.²

In a booster-dose schedule, children receive DTP4 between 12 months and 2 years of age. Then either at the time of school-entry or school-leaving, they are given 2 booster doses of a tetanus toxoid vaccine (either Td or DT) 1 year apart. A booster-dose schedule raises protection against tetanus for boys *and* girls. It also ensures that girls reach childbearing age fully immunized against tetanus.

² Please see Step 4.4 for additional information about the booster-dose schedule in a school-based immunization delivery strategy.

1.2 Identify the target population

The target population for routine tetanus toxoid immunization activities depends on national policy and the availability of health services and resources. Possible target populations are:

- All pregnant women who attend antenatal clinics
- All women of childbearing age
- All school-aged children
- All females
- All children and all women.

At a minimum, WHO recommends immunizing pregnant women who attend health services for:

- Antenatal care and
- Childhood immunization or sick child clinics.

The pregnant woman should be screened for her TT status. If she is eligible for a dose of TT, she should be immunized during the visit.

1.3 Use quality immunization practices

Quality immunization practices are recommended for all levels of the immunization delivery system to ensure that vaccines are delivered safely.

1) ***Maintain cold chain and vaccine quality.***

All immunizations must be given with potent vaccines of demonstrated quality, safety and efficacy.³ Tetanus toxoid vaccine should be stored continuously between 0°C and +8°C. If the vaccine becomes frozen at any point in the cold chain, it is damaged and cannot be used. Frozen vaccines may no longer be potent.

2) ***Use recommended injection equipment.***

Accidental needle injuries and the reuse of contaminated injection supplies place patients, health workers, and the community at risk for infection and transmission of serious blood-borne diseases such as HIV infection, viral hepatitis and some viral hemorrhagic fevers.

Make sure health workers use a sterile needle and a sterile syringe for each injection, including injections for immunizations.⁴

Recommended injection supplies include:

- *Auto-destruct syringes.* In a 1997 joint statement, WHO and UNICEF strongly recommended including auto-destruct syringes with shipments of vaccine and immunization supplies for mass campaigns. Auto-destruct syringes are designed to be used only once. It is impossible to reuse them. Using auto-destruct syringes is the only way to ensure safety of injections, especially in mass campaigns.
- *Disposable needles and syringes.* Use them only once and then discard them in safety boxes. The containers for collecting the sharps should be puncture-resistant. Dispose of the sharps containers safely.
- *Reusable needles and syringes.* They must be cleaned and sterilized after each use.

³ Previous reviews in some countries have identified locally produced vaccines of poor quality. The National Control Authority should develop an acceptable system to ensure vaccine quality including monitoring of adverse events of the EPI target vaccines. Please refer to the recommendations in Annex 1 of this manual.

⁴ Please refer to the WHO publication *Safety of Injections in Immunization Programmes* WHO/EPI/LHIS/94.01. It describes how to select injection equipment appropriate for each immunization delivery strategy.

3) *Handle injection equipment safely.*

To avoid accidental needle injury or the reuse of contaminated supplies:

- Do not recap needles.
- Do not reuse contaminated needles and syringes.
- Dispose of used needles and syringes in puncture-resistant containers and dispose of the container safely.
- Clean and sterilize reusable needles and syringes safely before using them again.

4) *Use immunization cards to record the woman's immunization history.*

Every dose of TT (including doses of DTP received in childhood) should be recorded on an immunization card or mother's health record.

Each time a woman (especially a pregnant woman) attends a health service either for herself or for her children, health workers should ask the woman for her immunization card or review her immunization history. Offer her a dose of TT if she is eligible for one.

Remember!

Offer tetanus toxoid immunization services to pregnant women when they attend antenatal care services or when they bring children for childhood immunization services.

STEP 2:

Identify high-risk districts

This section describes how to identify high-risk districts at the national level, and how to assess the indicators of risk within a high-risk district.

To identify high-risk districts, national programme managers should, at a minimum, review data from existing health information systems to obtain a rate for the incidence of neonatal tetanus cases, the extent of clean delivery practices, and the rate of TT immunization coverage in each district.

To assess a high-risk district, the national manager and the appropriate district-level manager of the high-risk district should conduct a more detailed review of the district's situation to define specific problems and their causes.⁵ Sources of information for indicators of risk in the district are:

- Hospitals and health facilities in the high-risk district (both urban and rural).
- Community health workers in rural areas.
- The vital events reporting system (registries of births and deaths).
- Key informants in communities that do not have a formal reporting system.

To collect and calculate the indicators of risk, see Sections 2.1 through 2.5. The steps apply at either the national or district level.

To review the assessment results and identify high-risk districts, see Sections 2.6 and 2.7.

Review the information about neonatal tetanus elimination activities in high-risk districts yearly to update the risk status and reconsider the selection of priority districts.

⁵ After a high-risk district is identified as a priority district for accelerated activities, a more thorough analysis is conducted to identify specific geographic areas and populations at highest risk in the district. The steps for the detailed assessment are described in STEP 3.

Table 3: Identifying districts at high risk for neonatal tetanus

General Information			Neonatal Tetanus Incidence Rate		TT immunization Coverage ⁴			Clean Delivery Coverage ⁵	Assessed as high risk? (Record Yes or No)
Name of District or Health Facility	Estimated population	Estimated Number of Pregnant Women ¹	NT Incidence Rate per 1000 Live Births ²	Percent Completeness of Reporting ³	TT2+ for Pregnant Women	Infants Protected at Birth (PAB)	TT2+ for Women of Childbearing Age		

¹ District's population times the proportion of pregnant women in the population (approximately 3.5%).

² Number of reported NT cases in the district over last 12 months divided by estimated number of live births. (Note: A proxy for the estimated number of live births is the estimated number of pregnant women.)

³ Number of NT case reports received (including reports of "zero cases") divided by the number of reports expected over the last 12 months.

⁴ Immunization coverage — TT2+ coverage: Total doses for TT2 + TT3 + TT4 + TT5 given to pregnant women (or women of childbearing age) over the last 12 months divided by the estimated number of pregnant women (or women of childbearing age). PAB: Total number of infants protected against neonatal tetanus at birth by their mothers' last dose of TT divided by the number of children <1 year old in district.

⁵ Number of births attended by a skilled attendant divided by the estimated number of live births.

2.1 Collect and record general information

Use a data collection form such as the one on the previous page to guide the collection and assessment of neonatal tetanus elimination indicators. The form can be used to assess either districts or health facilities within a high-risk district.

Record for each district (or health facility):

- The name of the district (or health facility).
- The estimated size of the district's (or health facility's catchment area) population.
- The estimated number of pregnant women in the district (or health facility's catchment area).

To calculate the estimated number of pregnant women, multiply the size of the general population times an estimated proportion of pregnant women, 3.5% (0.035).⁶

Estimate the number of pregnant women:				
Size of the general population	x	0.035	=	The estimated number of pregnant women

⁶ The number of pregnant women is usually estimated as 3.5% of the general population. Use a precise percentage for the number of pregnant women, if it is known for the district or catchment area.

2.2 Calculate the neonatal tetanus incidence rate

To calculate the neonatal tetanus incidence rate:

- 1) *Calculate the total number of reported neonatal tetanus cases.*

Calculate the total number of reported NT cases:				
Total number of confirmed NT cases	+	Total number of suspected cases that were not investigated.	=	Total number of reported cases.

- 2) *Next, estimate the number of live births.*

The estimated proportion of live births is the same as the estimated proportion of pregnant women, 3.5% (0.035) of the population. Use a precise percentage if it is known.

Estimate the number of live births:				
Size of the population	x	0.035	=	Estimated number of live births

- 3) *Use the following formula to calculate the neonatal tetanus incidence rate.*

Calculate the neonatal tetanus incidence rate:				
$\frac{\text{Total number of reported cases}}{\text{Estimated number of live births}}$	x	1 000	=	The incidence rate per 1 000 births

- 4) *Record the neonatal tetanus incidence rate on the data collection form.*

2.3 Calculate the percentage of completeness of reporting

Completeness of reporting is *not* a global indicator for neonatal tetanus elimination. In this assessment, the percentage of completeness of reporting is used to:

- Understand the NT incidence rate and
- Identify or confirm areas that are not reporting cases.

To calculate the percentage of completeness of reporting:

- 1) *Add the total number of neonatal tetanus case reports received during the last 12 months from all the districts or health facilities that were required to report.*
- 2) *Multiply the number of districts or health facilities required to report times 12. This is the number of neonatal tetanus case reports expected during the last 12 months.*
- 3) *Use the following formula to calculate a percentage for completeness of reporting.*

Calculate the percentage of completeness of reporting:			
Total number of NT reports <u>received over the last 12 months</u>	x	100	= % Completeness of reporting
Total number of NT reports expected over the last 12 months			

- 4) *Record the percentage of completeness of reporting on the data collection form.*

2.4 Calculate TT2+ immunization coverage

Monitoring tetanus toxoid immunization coverage is difficult because:

- TT2+ coverage is often underestimated.
- It is difficult to find an accurate denominator.
- Reporting does not include private sector or booster doses.

In this assessment, look at tetanus toxoid immunization coverage for:

- Pregnant women who have received at least 2 doses of tetanus toxoid (or the proportion of infants protected at birth against tetanus because their mothers had received the correct number of doses before delivery to offer protection at birth).
- Women of childbearing age who received at least 3 doses of tetanus toxoid during a mass immunization campaign in a high-risk area.
- Women of childbearing age who received up to 5 doses of tetanus toxoid during follow up or supplemental immunization activities for high-risk areas.

The advantages and disadvantages for each coverage method are summarized in Table 4.

Table 4: Advantages and disadvantages of each coverage methods

Method	Advantages	Disadvantages
Administrative method: number of doses given to pregnant women		
Pregnant women who received at least 2 doses of tetanus toxoid vaccine	<ul style="list-style-type: none"> The data is routinely available Pregnant women are more closely associated with the desired goal of protecting newborns. It is a practical method for small areas 	<ul style="list-style-type: none"> Measuring depends on 2 or more doses and retention of an immunization card either by the pregnant woman or the health facility
Administrative method: number of doses given to women of childbearing age		
Women of childbearing age who received at least 2 doses of tetanus toxoid vaccine.	<ul style="list-style-type: none"> Useful for monitoring performance of TT immunization rounds in high-risk areas. Useful for monitoring TT in areas where women do not come for antenatal care. 	<ul style="list-style-type: none"> Hard to estimate extent of annual progress. Can be inaccurate in large populations. Depends on good card retention and good compliance with the immunization schedule.
Protection at birth (PAB): number of infants protected at birth because their mothers received the correct number of doses before delivery		
Infants who came for DTP1 and who were protected at birth because their mothers were immunized with the correct number of doses of a tetanus toxoid vaccine.	<ul style="list-style-type: none"> Useful for monitoring quality of TT services in health facilities. (DTP1 and PAB rates should be close in a good programme). Uses infant EPI register. Reduces missed opportunities for TT. Brings TT2+ coverage up to at least DTP1 levels. 	<ul style="list-style-type: none"> Requires a high level of health worker training and supervision during early implementation. Depends on good retention of card or a reliable immunization history. Difficult to identify and accurate denominator. Access to DTP1 does not seem to equal access to TT.

To calculate TT2+ coverage in pregnant women:

- 1) *For the numerator:* Calculate the total number of doses of TT2 + TT3 + TT4 + TT5 given to pregnant women over the last 12 months.
- 2) *For the denominator:* Estimate the number of pregnant women in the population, or 3.5% (0.035) of the general population in the area. Use a precise percentage if it is known.
- 3) *Use the following formula to calculate TT2+ coverage in pregnant women with at least 2 doses of TT.*

Calculate the TT2+ coverage in pregnant women:

$$\frac{\text{Total TT2 + TT3 + TT4 + TT5 given to pregnant women over the last 12 months}}{\text{Estimated number of pregnant women in the population}} \times 100 = \% \text{ TT2+ coverage in pregnant women}$$

- 4) *Record the coverage rate on the data collection form.*

To calculate the proportion of infants protected at birth against neonatal tetanus:⁷

- 1) *For the numerator, total the number of infants who were assessed at the DTP1 contact as protected at birth against neonatal tetanus because their mothers received the correct number of doses before delivery.*
- 2) *For the denominator, total the number of infants assessed at the DTP1 contact for their mother's immunization status at the time of the infant's delivery.*
- 3) *Use the following formula to calculate the proportion of infants protected at birth against neonatal tetanus (PAB).*

Calculate proportion of infants protected at birth against tetanus (PAB):

$$\frac{\text{Total number of infants who were protected against NT by their mother's last dose of TT}}{\text{Total number of infants assessed at the DTP1 contact}} \times 100 = \% \text{ Infants PAB}$$

- 4) *Record the proportion of infants protected at birth against tetanus on the data collection form.*

To calculate TT3+ coverage for women of childbearing age who were immunized with at least 3 doses of TT in a mass immunization campaign:

NOTE: For the high-risk approach, three rounds of TT immunizations are given during a mass campaign: an initial round followed by a second round 4 weeks later. The third round is conducted at least 6 months after round 2. If mass campaigns have taken place during the year, use data from the activity to calculate coverage as a result of the mass campaign activity.

⁷ How to assess whether an infant was protected at birth against neonatal tetanus during the DTP1 contact is described in Annex 2.

- 1) *Total the number of doses given for each TT dose in all three rounds. For example: Table 5 shows the doses given in a high-risk area with a target population of 200 women of childbearing age:*

Table 5: Tetanus toxoid doses given in a high-risk area

n = 200	1st round	2nd round	3rd round	TT doses given in all 3 rounds
TT 1	120	20	10	150
TT 2		100	20	120
TT 3			100	100

- 2) *For the numerator: Use the total number of TT doses given in all 3 rounds. For example, the total number of doses for TT 1 is 150; for TT2, it is 120; and for TT3 it is 100.*
- 3) *For the denominator: Use the total number of women in the mass campaign's target population. In this example, the total number is 200.*
- 4) *Use the following formulas to calculate the coverage rate for TT1, TT2 and TT3 doses given during the mass campaign.*

Calculate TT coverage for women of childbearing age who attend mass campaigns in high-risk areas:	
TT1 coverage	$= \frac{\text{Total number of TT1 doses given in all sessions}}{\text{Total number of women of childbearing age}}$ <p>Example: $\frac{150}{200} = 75\%$</p>
TT2 coverage	$= \frac{\text{Total number of TT2 doses given in all sessions}}{\text{Total number of women of childbearing age}}$ <p>Example: $\frac{120}{200} = 60\%$</p>
TT3 coverage	$= \frac{\text{Total number of TT3 doses given in all sessions}}{\text{Total number of women of childbearing age}}$ <p>Example: $\frac{100}{200} = 55\%$</p>

NOTE: If tetanus toxoid immunization data is routinely collected for women of childbearing age, use the available data to estimate coverage with tetanus toxoid vaccine in areas where the high-risk approach has been implemented and activities to increase coverage have taken place.

- 1) *For the numerator:* Add the total number of TT2 + TT3 + TT4 + TT5 doses given to women of childbearing age over the last 12 months.
- 2) *For the denominator:* Estimate the number of women of childbearing age in the population, 22% (0.22) of the general population.
- 3) *Use the following formula to calculate TT2+ coverage in women of childbearing age.*

Calculate TT2+ coverage in women of childbearing age:

$$\frac{\text{Total TT2 + TT3 + TT4 + TT5 given to women of childbearing age over the last 12 months}}{\text{Estimated number of women of childbearing age in the population.}} \times 100 = \% \text{ TT2+ coverage in women of CBA}$$

- 4) *Record the TT 2+ coverage rate on the data collection form.*

2.5 Calculate clean delivery coverage

Clean delivery coverage can be calculated for a district, a particular urban or rural area, or for a specific population, depending on the available data from health facilities or traditional birth attendants.

Health facilities. All births that occur in the health facility should be reported by health facilities to a vital events registry. If no vital events registry has been established in an area, use information from health facility registers to estimate the:

- Expected number of live births in a health facility's catchment area. (Or, use the estimated number of pregnant women as a proxy for the expected number of live births.)
- Number of women who delivered in the facility.
- Number of births attended by midwives or other trained attendants.
- Number of births without a trained attendant.

Traditional birth attendants The trained birth attendants should record home births they have attended in a log book. Normally the traditional birth attendant copies the information from the logbook into a vital events registry, if one has been established for the area. Otherwise, they may report home births to the health facility.

To calculate clean delivery coverage:

- 1) *For the numerator*, calculate the total number of births attended by a skilled birth attendant (as defined by national policy) during the last 12 months.⁸
- 2) *For the denominator*, to estimate the number of births that took place over the last 12 months, multiply the estimated birthrate times the population.

(If the precise birthrate is not known, use the estimated number of pregnant women in the area. That is, multiply the size of the population times 3.5% or 0.035).

- 3) *Use the following formula to calculate clean delivery coverage.*

Calculate clean delivery coverage:			
Total number of births over last 12 months attended by a skilled birth attendant		x	100 =
Estimated number of births over the last 12 months			% deliveries attended by a skilled birth attendant

⁸ National policy defines how to measure “a clean delivery”. For example, a country's objective is to improve home deliveries. The indicators measure the distribution of clean delivery kits in a community, the number of home births attended by a midwife, or the number of midwives in a population group.

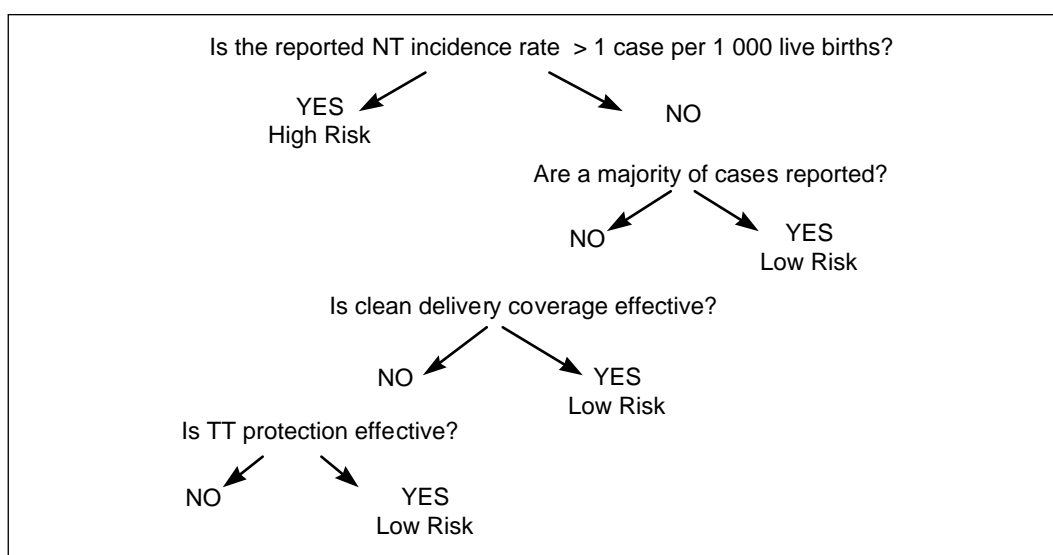
4) *Record the clean delivery coverage on the data collection form.*

NOTE: If data is not available for calculating clean delivery coverage, select a proxy indicator to gain an understanding of the extent of clean deliveries and cord care in the district. Consider, for example, the ratio of midwives per population in the district. Or, later, during the detailed situation assessment of the high-risk district, assess actual delivery practices and determine whether harmful practices are used.

2.6 Use the assessment results to identify high-risk districts

The diagram below describes how to review the assessment results and determine a district's risk status. It uses the WHO global target for neonatal tetanus elimination as a cut-off for selecting high- and low-risk districts. The diagram can be modified to reflect country-specific indicators for selecting high-risk districts.

Figure 1: Example to show comparison of assessment results with WHO global cut-off rates



Review the neonatal tetanus incidence rate and decide if the risk is high or low.

- 1) **The risk is high** if the NT incidence rate is above the cut-off rate. Is the rate more than 1 case per 1 000 live births?
- 2) **The risk may be low** if the NT incidence rate is below the cut-off rate. Assess additional information. If the incidence rate is less than 1 case per 1 000 live births, consider the quality of the reporting system. For example:
 - Is neonatal tetanus a reportable disease?
 - Does the population have access to treatment facilities?
 - Are the majority of cases being seen brought to a health facility?
 - Are the health facilities that see neonatal tetanus cases reporting them accurately?

If these factors are favorable, the neonatal tetanus incidence rate is probably accurate, and the risk for neonatal tetanus is likely to be *low*.

If the reporting system is *not* reporting disease information accurately, you cannot know for sure how many cases are actually occurring.

-
- 3) *Look at the clean delivery coverage rate calculated during the assessment. Does the population have access to a skilled birth attendant (for example, an urban population with access to a health facility, or a rural area with 1 midwife for every 3 000 to 4 000 people). If clean delivery coverage rates are high, and the population has access to a skilled birth attendant, the risk for transmission of neonatal tetanus during childbirth is likely to be low.*

If coverage with clean delivery and cord care practices is low, delivery and cord care practices are *not* preventing disease transmission.

- 4) *Look at the immunization coverage rate for TT2+ in pregnant women. Is the TT2+ coverage rate accurate? Is it high enough to protect women and their infants against transmission of tetanus during delivery?*

For example, have more than 80% of pregnant women received at least two doses of tetanus toxoid vaccine? (If coverage is measured by the proportion of infants protected at birth, are more than 80% of the infants protected at birth against tetanus?)

If the TT2+ immunization coverage rate is accurate and high enough to offer protection against tetanus during delivery, consider the risk for transmission of neonatal tetanus to be *low*.

If the TT2+ immunization coverage rate is not protecting infants against neonatal tetanus, ***this is a high-risk district.***

Because the agent that causes tetanus will never be eradicated:

- *If a district is classified as low risk:*

Take action to sustain progress with the ongoing immunization, clean delivery, and neonatal tetanus surveillance activities. Modify them if necessary. Good quality activities must continue to maintain protection against tetanus at birth.

- *If the neonatal tetanus incidence rate is less than one neonatal tetanus case per 1000 live births, and there is an effective level of tetanus toxoid immunization and clean delivery coverage:*

The neonatal tetanus elimination target may have been achieved. Efforts should focus on detecting cases through a high quality disease surveillance (including investigation of all suspected cases). Modify tetanus toxoid immunization services so that all women reach their childbearing years fully immunized against tetanus.

2.7 Prioritize the list of high-risk districts

If there are a large number of high-risk districts, begin neonatal tetanus activities where activities will have the greatest impact on the interruption of disease transmission. The activities for addressing the problems can occur over a three to four year period to achieve elimination. The priority district's status should be reviewed yearly to observe progress and refine activities.

Give priority to districts with:

- Identified indicators of risk (the lowest TT2+ immunization coverage rates, poor TT immunization services, the known use of harmful practices during delivery or cord care, areas with poor disease reporting)
- Highest neonatal tetanus incidence rate
- Largest population
- A district with several high-risk areas, remote areas or areas with unreliable or no disease reporting
- Availability of resources for carrying out specific activities.
- Feasibility for carrying out specific activities (for example, the logistics for setting up and carrying a neonatal tetanus elimination activity in a district with a small, widely dispersed population may be less feasible than carrying out the activities in an urban or semi-urban area with a large population).

The problems that increase the risk for neonatal tetanus may vary from district to district, and even within districts. How to identify the specific causes of risk in a high-risk district is described in the next section.

STEP 3:

Identify problems in high-risk districts

The national programme manager and the district manager should meet together to analyze the results of the assessment conducted during STEP 2. To do this analysis, use available information to describe:

- Tetanus toxoid immunization services in the district
- Clean delivery and cord care practices
- The quality of the neonatal tetanus disease reporting system.

In this section, there are checklists of recommended elements for each neonatal tetanus elimination strategy. Use the checklist to guide the analysis and define the problems that have resulted in increased risk for neonatal tetanus in the high-risk area.

- If an activity is taking place, determine the extent to which it is present.
- If an ongoing activity demonstrates good results, identify the factors that are contributing to its success. These factors need to be supported in order to sustain the successful outcomes.
- If an activity is *not* taking place, or if current activities are not achieving the desired results, find out what is preventing the activity from taking place. Describe the problem and its causes.

STEPS 4, 5, and 6 describe how to select specific activities to correct the problems and reduce the risk of transmission for neonatal tetanus.

3.1 Identify problems with tetanus toxoid immunization services

The checklist on the next page lists the recommended elements for tetanus toxoid immunization services in STEP 1 of this manual. Compare the recommended elements with the current level of tetanus toxoid immunization services in the high-risk district. For example, review information about:

- TT2+ immunization coverage and how it is calculated.
- Availability of routine TT services at least for pregnant women.
- Obstacles that prevent women from being reached with the immunization services.
- Supplemental immunization activities in the area.
- Activities carried out in response to confirmed NT cases.
- Vaccine supplies and cold chain performance.

Sources of information include:

- Routine EPI monitoring and evaluation reports from the district (or the affected area in a district).
- Health facility supervisors and EPI activity managers in the district.
- Missed opportunity surveys.
- Focus groups with women in the target population.

If routine tetanus toxoid services are working well, expand the assessment to include tetanus toxoid services provided by the private sector and by NGOs.

If a recommended activity is *not* taking place, and women (especially pregnant women) are *not* being immunized with tetanus toxoid, infants will not be protected at birth against tetanus.

Find out what is preventing the desired results in routine delivery of tetanus toxoid services.

Table 6: Identify problems with tetanus toxoid immunization services

Name of district or health facility:	Record Yes or No	If No, what are possible causes for the problem?
1. Is TT2+ coverage validated by: a coverage survey, administrative method, or assessment of protection at birth (PAB)?		
2. Are routine TT services offered to: <ul style="list-style-type: none"> • Pregnant women? • Women of childbearing age (ages 15 to 45 years)? • Adolescent girls (ages 12 to 15 years)? 		
3. Are routine TT services offered at every contact pregnant women have with: <ul style="list-style-type: none"> • Antenatal clinics? • Child immunization or sick child clinics? • Outreach session for other health services? 		
4. If women are not being immunized with TT: <ul style="list-style-type: none"> • Do they have access to a TT service? • Do they know about the service? • Are there ethnic, cultural or linguistic obstacles preventing access? • Are there social or political obstacles preventing access? • Do they believe fees are charged for TT services, and they do not have any money? • Do missed opportunities occur for TT when women bring their children for immunizations (for example, is DTP3 coverage high, but TT2+ low)? 		
5. Can TT vaccine be included in mass campaigns or other supplementary immunization activities?		
6. When suspected NT cases are investigated and NT is confirmed, are confirmed cases followed with a case response?		
7. Is there a reliable supply of tetanus toxoid vaccine and immunization equipment?		

3.2 Identify problems with clean delivery and cord care practices

The checklist on the next page lists the recommended elements for clean delivery and cord care activities. The practices are also described in the Introduction and in STEP 2.5 of this manual. Use the checklist to compare the recommended elements with current clean delivery and cord care practices in the district. For example, review:

- Actual delivery and cord care practices, especially in areas where the NT cases have occurred.
- Women's knowledge of and access to clean delivery services.
- Activities in the area that promote clean deliveries and cord care.

Sources of information include:

- MCH programme supervisors.
- Community health officers.
- Midwife supervisors who have knowledge about delivery and cord care practices in the area.
- Vital events registries.

Use this opportunity to evaluate women's awareness of the importance of clean delivery and cord care practices to their own and their newborns' health. Use the information to develop and deliver health education messages about the importance of TT immunization services and hygienic conditions for childbirth.

If a recommended activity is not taking place, find out what is preventing the clean delivery and cord care activity from achieving the desired results.

NOTE: Information about home deliveries may not be systematically recorded. Use the best information available to make informed decisions about the quality of clean delivery and cord care practices in the high-risk district.

Table 7: Identify problems with clean delivery and cord care practices

Name of district or health facility:	Record Yes or No	If No, what are possible causes for the problem?
1. Are more than 80% of births attended by a skilled birth attendant* either in a health facility or at home? *as defined by national policy		
2. Describe the local cord care practices. Are they clean? If not, specify the geographic location where unclean practices are used and describe the conditions in the area.		
3. Do women know about clean delivery services? If yes, do they know how to obtain them?		
4. If women do not use clean delivery services: <ul style="list-style-type: none"> • Do they have access to clean delivery services? • Are there ethnic, cultural or linguistic obstacles that prevent access • Are there social or political obstacles that prevent access? • Do they believe fees will be charged for the service and they do not have enough money? 		
5. Do birth attendants who attend home deliveries practice the "3 cleans"? Are there ways of supervising or monitoring the practices and providing feedback to birth attendants?		
6. Do birth attendants have the appropriate supplies for clean deliveries?		

3.3 Identify problems with neonatal tetanus disease reporting

The section describes the recommended elements for neonatal tetanus disease reporting. Use the checklist at the end of STEP 3.3.4 to compare the recommended elements with the extent of current disease reporting activities in the district.

3.3.1 Review routine monthly activities

Effective neonatal tetanus disease reporting takes place if:

- Neonatal tetanus is a reportable disease, and it is reported separately from other tetanus cases.
- Suspected cases are reported as soon as they are identified.
- Health workers use a recommended case definition for identifying and reporting suspected and confirmed cases of neonatal tetanus.
- WHO uses the following case definitions for neonatal tetanus:
 - *Suspected case:* Any neonatal death between 3 and 28 days of age in which the cause of death is unknown; or any neonate reported as having suffered from neonatal tetanus between 3 and 28 days and the case is not investigated.
 - *Confirmed case:* Any neonate with a normal ability to suck and cry during the first two days of life, and between 3 and 28 days of age cannot suck normally, and becomes stiff or has convulsions or both.
- Health workers use a standardized form to collect and report NT data to the next level.
- Health workers report “zero cases” when no NT cases occurred during the month. This shows the next level in the reporting system that information has not been lost and reporting tasks have not been forgotten.

3.3.2 Review active surveillance activities

Actively search for suspected neonatal tetanus cases in high-risk districts, especially in “silent” areas where routine surveillance is unreliable, or not taking place at all. During active surveillance, review health records and vital events periodically (every 2 weeks, for example). Look for:

- Neonatal deaths and
- Whether the death may be due to neonatal tetanus.

Search for suspected neonatal tetanus cases during routine reviews of:

- Birth attendants’ logs and vital events registries.
- Information systems describing infant deaths and illness.
- Registers for paediatric wards in large general hospitals
- Registers in small hospitals that serve rural populations
- Registers in health facilities that serve populations known to be at high risk for neonatal tetanus.

Find out if a health staff person in the health facility has been assigned the job of active surveillance and uses a standard case definition to identify suspected cases. At the district level, use a standard case definition to suspect neonatal tetanus during routine reporting of infant deaths and illness.

3.3.3 Review neonatal tetanus case investigation activities

Suspected neonatal tetanus cases should be investigated *as soon as* reports are received from the health facility. Health facility staff should be part of case investigation and case response activities.

Use a standard “Case Investigation Form” to guide and record the collection and reporting of information about the case. Please see the sample case investigation form in Annex 3.

When reports of suspected cases are received, investigate them to:

- Confirm the diagnosis of neonatal tetanus.
- Determine why the case occurred.
- Plan and take action to prevent cases in the future.
- Identify where to strengthen immunization activities.

3.3.4 Review community surveillance activities

In remote areas and in areas where disease reporting is known to be unreliable or incomplete, gather disease information from key informants in the community. How to set up a community-based surveillance activity is described in STEP 6.

The checklist for identifying problems with neonatal tetanus disease reporting is on the next page.

Table 8: Identify problems with neonatal tetanus disease reporting

Name of district or health facility:	Record Yes or No	If No, what are possible causes for the problem?
Routine monthly reporting		
1. Is neonatal tetanus (NT) a reportable disease?		
2. Are NT cases reported separately from tetanus cases?		
3. Do health workers know the standard case definition for reporting suspected cases?		
4. Does the reporting system use standardized NT case reporting forms? Do all staff know how to report NT, to whom and when? Are "zero cases" reported?		
Active surveillance		
5. Are register reviews conducted on a regular basis (for example, once every 2 weeks)?		
Neonatal tetanus case investigation		
6. When suspected NT cases are identified, are they investigated and confirmed for NT?		
Community surveillance		
7. Are all neonatal deaths reported? If Yes, are they investigated?		

3.4 Prepare a description of the high-risk district

At the end of the analysis, review the results of the assessment for each strategy. List the problems that were identified and what caused them.

Select activities that address the problems and what caused them. For example, the following chart gives examples of selected activities based on the current status of the district:

Table 9: Selected activities based on status of districts

If in the district:	Implement activities to:
<p>Neonatal tetanus is a serious public health problem.</p> <p>Little or no progress has been made toward the NT elimination target.</p>	<ul style="list-style-type: none"> • Identify specific geographic areas and population groups at highest risk for neonatal tetanus. • Accelerate TT coverage for all women of childbearing age in the high risk areas. • Promote access to clean delivery and cord care practices, especially in high-risk areas. • Integrate immunization messages into training for birth attendants and health workers who do antenatal care. • Establish routine disease reporting for neonatal tetanus.
<p>Progress has been made toward the NT elimination target, but the target has not yet been reached.</p>	<ul style="list-style-type: none"> • Maintain successful routine immunization and clean delivery services. • Intensify resources and strengthen immunization and clean delivery activities in high-risk areas. • Continue strengthening the disease reporting system. Increase local capacity to detect, investigate, and respond to confirmed cases.
<p>The neonatal tetanus elimination target has been reached.</p>	<ul style="list-style-type: none"> • Modify the immunization schedule so that women will complete the TT schedule by age 15. • Coordinate activities with EPI and MCH to promote clean delivery and cord care practices. • Sustain quality disease surveillance activities. Conduct a case response activity for every confirmed case.

Guidelines for conducting activities are listed in STEPS 4, 5, and 6.

STEP 4:

Plan to improve tetanus toxoid immunization services

The priority activity for prevention of neonatal tetanus is always TT immunization services.

Select a combination of immunization activities to address the problems identified in STEP 3.1. The activities should provide both short- and long-term results in the high-risk district.

If resources are limited, focus activities on a limited target population. For example, define the range of ages between which women in the target area have their first and last pregnancies. In one country, this might be women between the ages of 12 and 35 years of age.

Activities to achieve **short-term** results:

- 1) *Use the high-risk approach to accelerate TT immunization coverage and conduct TT rounds in the high-risk areas or population groups. Give priority to areas where women have never received TT or where they have only received one dose.*
- 2) *Include tetanus toxoid vaccines in supplemental immunization activities (for OPV, for example) aimed at high-risk areas or population groups.*

Activities to achieve **long-term** results:

- 1) *Strengthen routine tetanus toxoid services in the high-risk area, at least for pregnant women who attend antenatal care. Provide training and a reliable supply of immunization equipment as needed.*
- 2) *Expand routine immunization services to include a 5-dose schedule in areas where a “TT rounds” activity has been held. This will increase women’s immunization status so they have full protection against tetanus.*
- 3) *Use outreach strategies to provide routine TT services in geographic or socially remote areas.*
- 4) *Establish the capacity for responding to a confirmed neonatal tetanus case with an immunization response. At a minimum, for every confirmed case, immunize the mother of the case and women of childbearing age who live in the same area.*
- 5) *Educate the community about the benefits of receiving tetanus toxoid immunizations and using clean delivery and cord practices.*

4.1 Accelerate tetanus toxoid immunization coverage

In the high-risk district, target areas where TT immunizations will have the greatest impact on neonatal tetanus incidence. Start in the areas that have:

- Highest rate of neonatal tetanus incidence
- Unreliable or no reporting
- Lowest TT coverage
- Largest population
- Remote areas without access to routine services.

4.1.1 Conduct tetanus toxoid rounds in the high-risk area

Tetanus toxoid “rounds” are a series of mass campaigns. They are conducted over a short period for a specific target population in a limited locality.

For the high-risk approach, conduct 3 rounds of tetanus toxoid immunizations in the high-risk area. Include a 4-week interval between the initial doses, and a third round at least 6 months later. Depending on available resources and logistical considerations, the third round can be conducted up to one year after the second dose.

In areas with the highest risk for neonatal tetanus, especially where access to routine immunization services has been a problem, tetanus toxoid immunization rounds provide a rapid intervention for preventing additional cases and give immunity to women and their newborns. Detailed instructions for planning TT rounds are in Annex 4.

4.1.2 Conduct supplemental immunization activities

Coordinate tetanus toxoid activities with organizers of delivery activities for other antigens. For example, determine the feasibility of including TT vaccine in activities for:

- Women immunization weeks
- National immunization days (NIDs), if appropriate
- House-to-house campaigns
- “Days of tranquility” to reach populations in areas of war and civil strife.

Select activities such as:

- 1) Expand immunization activities to reach women in remote areas or areas with no access to health services. For example, offer outreach immunization services in places where women assemble for community events such as schools, religious buildings, market places, and during home visits.
- 2) Conduct local immunization days for nomadic or dispersed populations. They are not likely to be reached with routine fixed or outreach services.
- 3) Add tetanus toxoid vaccine to National Immunization Days (NIDs).

NIDs are primarily intended for increasing coverage of OPV to interrupt transmission of the polio virus. If NIDs are already well accepted in a high-risk area, and health workers are experienced in conducting them, include TT immunizations as part of the NID activity. For example, include TT immunizations for women of childbearing age who bring their children for the OPV immunizations.

When TT immunizations are included in the NID:

- Increase resources for the additional vaccine and supplies.
- Train health workers to provide injections safely.
- Make available containers for safe disposal of single-use or auto-destruct syringes and needles.

Detailed instructions for including tetanus toxoid vaccine in a NID activity are described in Annex 5.

4.2 Strengthen routine tetanus toxoid services for pregnant women

Identify sites in the high-risk district where women attend antenatal services and where they bring their children for childhood immunization clinics or for curative care when the child is ill. Determine whether tetanus toxoid services are part of the antenatal or child health services.

- 1) If the antenatal or childhood immunization clinic does not routinely include tetanus toxoid immunization services, meet with the health facility administrator and health service supervisors. Explain the impact on the reduction of neonatal tetanus cases when:
 - Health workers review the tetanus toxoid immunization history of every pregnant woman who attends an antenatal clinic (or a health service for her child).
 - If the woman is eligible for a dose of tetanus toxoid, she should be immunized during that visit. Tell the woman when she should return for her next dose.
- 2) Provide appropriate training and supplies so that, at a minimum, health workers can screen and immunize pregnant women who attend the antenatal clinic.
- 3) Take steps to ensure a reliable supply of tetanus toxoid vaccine and safe injection equipment to support the new or expanded tetanus toxoid immunization activities.

4.3 Conduct case response activities

A minimum case response when a case of neonatal tetanus is confirmed is to immunize the mother of the case and the women of childbearing age who live nearby with at least 2 doses of tetanus toxoid vaccine 4 given weeks apart.

- 1) *Identify health workers who will follow up confirmed cases. Make sure the health workers know that an immunization case response is part of case investigation activities.*
- 2) *Take action to respond to other causes of risk identified in the case investigation such as missed opportunities for TT immunization, vaccine quality failure or unclean practices during delivery or for cord care. For example:*
 - Train health workers how to reduce missed opportunities for TT immunizations.
 - Improve logistics to ensure vaccine quality. Coordinate activities with vaccine suppliers and the cold chain manager to ensure safe shipping and storage of vaccines.
 - Include information about the importance of TT immunization activities in initial and in-service training for birth attendants.

4.4 Consider modifications to the tetanus toxoid immunization schedule⁹

WHO recommends that when a country's DTP3 coverage rates for all districts is 80% or higher, the national EPI should consider the feasibility of adding a DTP booster dose (DTP4) to the childhood schedule. It can be given between 12 months and 2 years of age. Two additional booster doses of Td or DT can be given to children ages 5 to 14 years in school-based programmes (for example, either at school-entry or school-leaving).¹⁰

A school-based booster programme:

- Builds on the successes in the infant and childhood immunization programmes.
- Ensures that girls will reach childbearing age fully immunized against tetanus because 5 doses of tetanus toxoid are given to girls before they reach 15 years of age.
- Targets boys as well as girls thereby raising the overall level of protection against tetanus in the general population.

Consider these factors when deciding to modify the EPI schedule to include a school-based booster programme:

- Is the disease surveillance system operating reliably? Is it able to detect a majority of neonatal tetanus cases? Is there a capacity to respond to a confirmed case with an appropriate case response activity?
- Is the TT2+ coverage at least as high as DTP3 (>80%)? Are health workers using every opportunity to screen and immunize women during antenatal or childhood immunization session?
- Is there a high proportion of school attendance for girls (for example, at least 70% to 90% of girls in the population attending school)? Is there a low school dropout rate for girls (for example, less than 50% of girls drop out of school before a certain age)?
- Are there sufficient human, financial, and material resources for implementing and sustaining a school-based booster schedule?

⁹ The number of women reaching childbearing years without being immunized with tetanus toxoid vaccine will decrease as improvements occur in reaching girls in childhood and school-aged schedules. Even when TT coverage rates are high, a high quality of control and prevention activities must be maintained because neonatal tetanus can not be eradicated.

¹⁰ A sample schedule for a school-based booster schedule is in Annex 6.

4.5 Promote lifetime immunization cards

Every TT immunization, including DTP doses received in childhood or later, should be recorded on an immunization card. Women should keep the card to document their history with TT immunizations.

Permanent, lifetime immunization cards can be given to every woman who receives a dose of TT. The lifetime cards help health workers schedule immunizations correctly and avoid giving women too many immunizations.

Help women understand that the card is valuable and should be kept safely. For example, make sure health workers ask women for the immunization cards anytime women attend a health service. Or, charge a small fee for the card when it is issued.

STEP 5:

Plan to improve clean delivery practices

Find opportunities to coordinate resources and opportunities to promote tetanus toxoid immunization services in MCH activities. Select activities that address the problems identified in STEP 3.

5.1 Improve skills for birth attendants

In high-risk areas where local birth attendants attend home deliveries, take advantage of opportunities to promote an increase in women's access to clean delivery and cord care.

- 1) *Promote the training of local birth attendants in the use of "the three cleans": Seek out curriculum and training planners to include information in the training about the risk of disease transmission during delivery and the importance of tetanus toxoid immunizations. Help to make sure the training includes practice in:*
 - Using soap and water to wash birth attendants' hands before the delivery.
 - Cutting the cord with a sterile device (such as a razor or knife).
 - Providing a clean surface for the mother during delivery.
- 2) *Train skilled birth attendants to check the TT status of pregnant women and promote TT services during antenatal visits.*
- 3) *Remind health facility staff to use appropriate infection control practices with all patients in the health facility, and to observe the use of "the three cleans" during deliveries.*
- 4) *Train health workers how to teach mothers to use safe cord care practices once they leave the hospital.¹¹*

¹¹ Detailed recommendations for training health workers in the promotion of safe cord care are in the WHO publication *Mother-Baby Package: Implementing safe motherhood in countries* WHO/FHE/MSM/94.11.

5.2 Improve availability of clean delivery and cord care supplies

For deliveries that occur at home:

In remote areas or areas without access to health facilities, skilled birth attendants can use simple community-based clean delivery kits. The clean delivery kits contain inexpensive, basic items to use during delivery and for cord care:

- A piece of soap
- A piece of cloth or plastic to cover the surface on which the delivery will take place
- A string for tying the cord
- A sterile razor for cutting the cord.

Health workers, birth attendants, or women's groups can assemble kits using locally available, low-cost materials. They can be prepared and given to women during antenatal visits. MCH and other family health programmes can distribute clean delivery kits through social marketing or when immunization teams travel to remote areas for routine services.

For deliveries that occur in health facilities:

If recommended supplies for infection control are not available in a health facility, use supervisory or active surveillance visits to recommend inexpensive and practical substitutes (at least soap, clean water, and solutions of household bleach) for observing infection control practices. Help establish procedures for giving new mothers information about safe home care for the umbilical cord.

5.3 Conduct social mobilization

Use community resources to increase women's expectations for clean delivery and safe cord care. Select communication methods to deliver education messages that help the community understand:

- The definition of clean delivery and safe cord care.
- The importance of clean delivery and cord care to the health of the mother and her newborn.
- The recommendations for a clean delivery and hygienic care of the umbilical cord.
- The importance of tetanus toxoid immunizations for protecting pregnant women and their newborns against tetanus transmission.

To conduct social mobilization:

- 1) *Identify key community leaders* to participate in the design of the social mobilization activity. List their expertise and available resources (vehicles, loudspeakers, newsletters).
- 2) *Identify the target population* for the activity.
- 3) *Develop messages for women and for the general population* about promotion of tetanus toxoid services.
- 4) *Select communication methods* (posters, broadcast messages, house meetings with small groups of women, banners, community plays, skits).
- 5) *Seek support* from the community leaders to:
 - Develop posters to promote “the three cleans.”
 - Include tetanus prevention messages in the school health curriculum.
 - Host small house meetings to discuss prevention of illness through clean delivery and cord care practices.
 - Ask merchants (such as soft drink suppliers who deliver their product to remote areas) to assist with transportation and promotion of clean delivery kits in remote areas.
- 6) *Schedule the activity.* Decide when it will begin. List the tasks involved and assign responsibility for doing them.
- 7) *Prepare materials and distribute them* as planned.
- 8) *Begin the activity.* Meet with the community leaders to discuss progress with the activity and identify any modifications that may be needed.

Remember!

Use clean delivery practices to reduce the risk of neonatal tetanus transmission and other delivery-related infections!

STEP 6:

Plan to improve neonatal tetanus disease reporting

Improving reporting for all EPI diseases, including neonatal tetanus, is a high priority. Especially in high-risk districts, make sure health workers understand how the data gathered from neonatal tetanus reporting is used. Explain that it is important to help:

- Calculate the case incidence rate for neonatal tetanus.
- Identify districts, geographic areas and population groups in which newborns are at high risk for neonatal tetanus.
- Focus resources in areas where the cases are occurring.
- Measure a district's progress towards elimination of neonatal tetanus.
- Monitor the quality of neonatal tetanus elimination activities.

Depending on the problems identified in STEP 3.3 with neonatal tetanus reporting, select activities to strengthen disease reporting.

6.1 Improve routine monthly reporting

To improve routine monthly reporting in high-risk districts:

- 1) *Establish a surveillance case definition* for the national neonatal tetanus elimination programme. Coordinate with appropriate national managers and policy makers to disseminate the case definition to all levels of the health and information reporting system. (Refer to the WHO recommended case definitions for neonatal tetanus in STEP 3.3.)
- 2) *Identify the sites* in the district that will report information about neonatal tetanus cases. In high-risk districts, all health facilities in the district should report monthly.
- 3) *Visit health facilities that should report information and:*
 - Explain the role they play in the NT surveillance system.
 - Identify the health facility staff who will oversee disease reporting, especially neonatal tetanus reporting.
 - Make sure health workers know the recommended case definition for suspecting neonatal tetanus. Be clear about to whom they should report suspected cases and how to report them.
- 4) *Use a standardized form to record and report suspected cases* of neonatal tetanus and for tallying the number of cases for reportable diseases, including neonatal tetanus. Make sure the form allows neonatal tetanus cases to be reported separately from other tetanus cases.
- 5) *Select methods for communicating information between levels* of the reporting system and improving the exchange of information about neonatal tetanus surveillance. For example:
 - Use regularly scheduled visits, telephone calls, newsletters, meetings, bulletins and notices to give and receive feedback on a regular basis about performance with the surveillance system.
 - Praise health staff when activities are working well and state clearly the required actions for improving systems.
- 6) *Follow up with facilities that provide late or no reports.* Talk with the reporting site to identify the problem and help the health facility to solve it so that reports are received on time.
- 7) *When routine activities are working well, expand the activities* to establish communication methods with private sector health services, NGO facilities in the area and other community groups concerned with neonatal tetanus elimination.

6.2 Improve active surveillance

Use active disease surveillance to search for suspected neonatal tetanus cases in “silent areas” where routine surveillance is unreliable or not taking place at all. For example:

- 1) *Coordinate neonatal tetanus surveillance activities with other EPI surveillance activities if surveillance for polio or measles eradication is a regularly scheduled activity in the areas.*
- 2) *Conduct an active search for cases at least every two weeks depending on the situation of risk in the high-risk district. For example, visit health facilities and look for suspected cases in the health facility records. Detailed instructions for conducting a register review are in Annex 7.*
- 3) *Consider establishing and strengthening vital events reporting, depending on the priorities of the neonatal tetanus elimination programme. Make sure there are procedures for including newborns in the registry of births and deaths.*

6.3 Improve case investigation activities

Establish procedures for carrying out case investigation of all suspected cases. Make sure that health workers at the local and district levels who investigate neonatal tetanus cases use a Case Investigation Form to record the case information.

- 1) *Ask the mother or other family members about the case, for example:*
 - The family name and household location
 - The mother's immunization status and her antenatal care
 - Delivery and cord care practices
 - The newborn's symptoms
 - Where the baby was treated
- 2) *After completing the interview, analyze the information to confirm the diagnosis and identify the factors that may have led to the newborn's illness.*
- 3) *Carry out an immunization response to the confirmed case. At a minimum, give 2 doses of TT to the mother of the case and other women who live nearby where the case occurred. Observe the 4-week interval between the 2 doses.*
- 4) *Take corrective action based on the other factors that placed the infant at risk for neonatal tetanus. Refer to the recommended actions listed in STEPS 4 and 5.*

NOTE: In a reporting system of very high quality (more than 80% of the case reports expected are received), modify the programme targets so that all suspected NT cases are investigated to confirm the diagnosis.

6.4 Improve community surveillance

Establish or improve community surveillance for:

- Remote villages
- Sections of urban areas with marginal populations (day workers, squatters, and so on) who lack access to health services
- Migrant worker settlements
- Refugee camps

To strengthen community surveillance:

- 1) *Find out if other health or community services already provide regular outreach services to the community.*

If yes, establish relationships with these services and, to the extent possible, share information and resources about vital events in the remote area.

- 2) *Identify key informants with knowledge of the area.*

Even though a formal vital events or disease reporting system does not exist, informal knowledge of events is probably known through social and other community networks. Possible informants include:

- Teachers
- Community health workers
- Local birth attendants
- Social workers
- Others who may know about vital events in the community.

- 3) *Explain the purpose of surveillance to the key informant.* Explain that he or she can help prevent illness and deaths in infants and their mothers by reporting neonatal deaths to health workers at the health facility, or to the health worker who regularly visits the facility for outreach services or other disease control and prevention activities.
- 4) *Explain the signs and symptoms of neonatal tetanus, its causes, and its impact on the community's health.*
- 5) *Schedule regular visits to collect community surveillance data.* Plan and carry out immunization activities.
- 6) *Line list the neonatal deaths and suspect neonatal tetanus cases that the informant provides.*
- 7) *Conduct a case investigation* when a suspected case of NT is identified through community surveillance. Conduct the investigation and take the appropriate case response action as soon as possible. Make other corrections depending on the investigation's results.
- 8) *Provide feedback to the informant* so that he or she knows that the information provided was important in helping to prevent illness and death.

-
- 9) *Encourage and support effective communication between the health facility and the community to raise awareness about prevention of further cases.*
 - 10) *Take action to provide an outreach or mobile immunization activity for the area. Refer to the recommendations in STEP 4.1 about how to deliver supplemental TT services in remote areas.*

Remember!

***Neonatal tetanus is seriously under-reported.
For every case that is reported, many remain unreported!***

STEP 7:

Develop the plan of action

Once the activities have been selected, prepare and assemble the detailed activity plans for routine TT activities and for new activities selected for the high-risk district. Make sure to specify tasks, assign responsibilities, and set schedules.

7.1 Set targets for neonatal tetanus elimination activities

To set targets:

1) *Identify indicators for measuring progress with each major activity.*

The following tables list examples of neonatal tetanus elimination indicators for improving tetanus toxoid immunization services, increasing access to clean delivery and cord care, and improving neonatal tetanus disease reporting.

Table 10: Indicators for TT immunization activities

Routine Immunization Services	Immunization Rounds	Case Responses	Supplementary activities
% pregnant women immunized with TT2+ during the year	% of districts in country identified as high risk districts	% of mothers of neonatal tetanus cases immunized as a response to a confirmed cases	% of schools where tetanus toxoid is offered to adolescents.
% of infants protected at birth against neonatal tetanus	% of women of childbearing age in high risk districts immunized with TT2+	% of women of childbearing age in the locality immunized as a response to a confirmed case	

Table 11: Indicators for clean delivery and cord care activities

Improving Skills Of Birth Attendants	Improving Availability of Clean Delivery Supplies	Social Mobilization	Clean Delivery Coverage
% of birth attendants trained to use clean delivery and cord care practices	% of communities in district with clean delivery kit distribution	% of antenatal clinics with regular clean delivery and cord care messages	% of deliveries that occurred at home with skilled birth attendant
		% of community meetings with clean delivery messages	% of deliveries that occurred in a health facility

Table 12: Indicators for NT surveillance activities

Routine NT Reporting	Active Surveillance	Case Investigation	Community Surveillance
% completeness of reporting	% of health facilities who have had register reviews	% of reported neonatal tetanus cases investigated % of investigated suspect cases that were confirmed % of confirmed cases followed with a case response (at least immunization of the mother)	% of reported neonatal deaths investigated

2) State the desired outcome for the activity.

Determine the current level of achievement in the activity and then specify where you want to be with the activity in one year.

For example, a district wants to increase services for reaching pregnant women with at least 2 doses of TT. Currently, there are 5 000 pregnant women in the district, and 1 000 of them are reached with TT2+ services. With additional resources that have been made available, the programme manager plans to increase the activities to reach 500 additional pregnant women.

3) Identify the numerator and denominator for calculating the target.

The *numerator* for calculating the target is the number you hope to reach with the new activity. (For example, 1 500 pregnant women.)

The *denominator* is the estimated size of the target population. (For example, 5 000 pregnant women).

4) Calculate the target.

Divide the denominator into the numerator. (For example, $1\ 500 \div 5\ 000 = 0.30$). Multiply the answer times 100. (For example, $0.30 \times 100 = 30\%$). This is the target for the activity.

5) State the target as an objective.

For example: By the end of 1999, 30% of pregnant women will receive at least 2 doses of tetanus toxoid vaccine.

7.2 Estimate costs for the neonatal tetanus elimination activities

Budgets may vary from district to district, depending on the elimination status in each district and the activities selected. Calculate the cost for:

- Continuing all of the routine neonatal tetanus elimination activities, and
- Implementing new activities planned for high-risk areas.

7.2.1 Estimate costs for routine tetanus toxoid immunization activities

Use this checklist to estimate routine programme items:

- _____ *Cold Chain*
(cold boxes, carriers, ice packs, ice)
- _____ *Vaccine Costs*
(number of vials of TT vaccine needed to conduct routine activities, number of vials needed to do new activities, wastage factor, shipment,
- _____ *Quality Immunization Practices*
(syringes, needles, immunization cards, puncture-resistant containers or safety boxes for safe disposal of injection equipment)
- _____ *Personnel*
(salaries, per diem for away-from-post immunization activities, meals, incentives)
- _____ *Social Mobilization*
(incentives for attending an immunization clinic, posters, banners, speakers, developing/printing educational material)
- _____ *Training*
(per diem amounts for attending workshops or training events, training materials, forms)
- _____ *Transport*
(vehicles, vehicle repairs, fuel costs based on estimated total number of kilometers to be driven, spare parts)

7.2.2 Estimate costs for promoting clean delivery and cord care

Coordinate budget activities with MCH and other family health programmes for activities to promote clean delivery and cord care and immunization messages in MCH services. Consider costs for:

- _____ *Training*
(number of training sessions to be held that focus on immunization messages, number of birth attendants who will attend, duration, materials, per diem amounts)
- _____ *Providing Supplies*
(clean delivery supplies for health facilities, promoting community clean delivery kits, distribution costs)
- _____ *Social Mobilization*
(posters, banners, speakers, developing and printing materials for national broadcast campaign)

7.2.3 Estimate costs for routine neonatal tetanus surveillance

To the extent possible, coordinate budget activities with special surveillance activities in other disease eradication elimination programmes. Consider costs for:

- _____ *Forms*
(supplies of tally sheets, monthly reporting forms, case investigation forms, line listing forms)
- _____ *Active Surveillance, Case Investigation and Community Surveillance*
(for each district: transportation costs for field visits, case investigation and follow up; costs for field visits for active surveillance and community surveillance; cost of incentives for field staff)
- _____ *Supervision*
(cost of newsletter, transportation costs for field visits, per diem amounts for field visits)
- _____ *Training*
(number of sessions and duration, materials, per diem for attending events held away from post, evaluation costs)

7.2.4 Estimate costs for supplemental activities in high-risk districts

WHO and UNICEF request that all donors who support mass immunization campaigns finance not only the vaccine but also the supplies for the safe administration of the vaccines. The supplies include auto-destruct syringes and safety-boxes for safe disposal of used immunization supplies.

For all high risk and emergency mass campaigns, a “bundle” of required supplies includes:

- Vaccine in appropriate quantities.
- Auto destruct syringes:
- The reuse of standard single-use disposable syringes and needles places the general public at high risk of disease and death.
The auto-destruct syringe presents the lowest risk of person-to-person transmission of blood-borne pathogens because it cannot be reused. The auto destruct syringe is the preferred type of disposable equipment for administering vaccines. It is the equipment of choice for use in mass campaigns.
- Safety boxes for collecting used needles and syringes

To prepare an estimate that includes “bundling” of vaccine and auto-destruct needles and syringes:

_____ *Establish a working figure* for estimating activity costs in the high risk district. The working figure is the size of the target population to be immunized (for example, the number of pregnant women in a high-risk district, or women of childbearing age in an area of a high-risk district).

_____ *Calculate the vaccine requirements*

Number of women of childbearing age X 1.3 wastage)
vial size = number of TT vials needed to conduct the activity.

NOTE: UNICEF estimates the “bundling” cost for safe administration of one dose of TT at US \$0.16 and one dose of Td or DT at US \$0.18 per dose.

_____ *Estimate additional requirements* for additional cold chain needs (additional refrigerators, cold boxes, vaccine carriers, equipment for safe disposal of used injection equipment)

- Calculate the cold chain space available.
- Subtract the amount needed for routine TT activities. This is the amount available for the supplemental immunization activity in the high-risk district.
- Specify alternate plans for increasing space (such as obtaining or making additional cold boxes, identifying health facilities near the high-risk activity area which have space available and so on.)
- Calculate the costs for any additional cold chain equipment.

_____ *Calculate costs for training.*

- Base the cost on the number of workshops or training sessions that have been planned to train staff in the new activities.
- For each workshop or training activity, calculate the costs for training materials and the per diem rates based on duration of the training.

_____ *Calculate costs for obtaining immunization cards.* Base the estimate on the number of women in the target population.

Paper Card US \$0.02

Plastic Card US \$0.09

_____ *Calculate costs for forms, tally sheets, immunization reports.*

_____ *Calculate personnel costs based on the number of health workers, volunteers, and drivers to be used in the activity. Consider, for example:*

- Per diem rates
- Salaries
- Incentives
- T-shirts for immunization staff

_____ *Calculate transportation costs based on the number of vehicles that will be needed, repair costs and vehicle rental costs. Estimate the total number of kilometers to be driven. Multiply the kilometrage estimate times the unit cost per liter of fuel.*

_____ *Calculate costs for social mobilization. Include estimates for any national broadcast campaign (radio or television), field visits, posters, banners, megaphones, batteries, and so on.*

_____ *Calculate the operational and management costs for conducting the supplemental activity in the high-risk area. The operational cost should not exceed 40% of the total cost for conducting the supplemental activity.*

7.3 Revise the activity plans

Review the budget and activity plans. Talk with the EPI national manager and other donors about support for priority activities in the high-risk district.

Adjust the activity targets according to available resources and support. Revise the activity plans to reflect the changes (either increases or decreases) in the availability of funding for neonatal tetanus elimination activities.

7.4 Write the neonatal tetanus elimination component of the national EPI plan of action

Use the targets, activity plans and estimated budget costs to write the neonatal tetanus elimination component of the EPI National Plan of Action. Use a recommended format that includes:

- Background information about the level of achievement for the neonatal tetanus indicators of risk for each district or for each area in a high-risk district.
- General information such as the size of the target population, number of high-risk districts, and the main problems identified.
- Goals and objectives for the routine programme activities and for high-risk approach activities.
- Activity plans for tetanus toxoid immunization services:
 - Routine tetanus toxoid immunization services (at least for women attending antenatal clinics).
 - Supplemental activities to accelerate coverage in high-risk districts.
- Activity plans for improving clean delivery and cord care practices:
 - Training birth attendants
 - Distributing clean delivery kits
 - Promoting increased access to clean delivery services.
- Activity plans for NT surveillance:
 - Routine monthly surveillance
 - Active surveillance
 - Case investigations
 - Community surveillance.
- Budget for implementing the activities
- Time schedule for programme activities

STEP 8:

Take action

8.1 Conduct training

Begin activities to train health facility staff in:

- Conducting TT rounds to accelerate coverage.
- Improving NT surveillance.
- Assessing infants protected at birth against neonatal tetanus.
- Ensuring safety of injections.
- Sustaining quality of tetanus toxoid vaccine logistics (how to estimate vaccine needs, storing vaccines, ensuring safety of the cold chain).
- Counseling women to return for the next dose of tetanus toxoid.

Make sure plans for the training specify who will be trained, in what skills and how and where the training should take place. Plan to obtain materials and adapt them as needed. Include activities in the training that allow health workers to practice the skills they are learning.

8.2 Conduct supervision

Begin regular periodic supervision in the district to ensure that:

- All neonatal tetanus cases are reported.
- Reported cases are investigated.
- Responses take place to confirmed cases.
- Health workers use safe injection practices.
- Health workers observe correct intervals between TT doses.
- Birth attendants use “the three cleans” during delivery.

8.2.1 Review monthly or quarterly reports

Make sure reporting activities take place as planned and that suspected cases are reported promptly to the next level. Take action to improve problems as soon as they are identified, and follow up with the reporting site as needed.

8.2.2 Visit activity sites

Visit TT immunization sites such as clinics, health education sessions and special promotions for women’s immunization days. Use the opportunity to provide informal training or help solve other problems. For example, demonstrate the skills that health workers should use when talking with mothers about returning for the next dose of tetanus toxoid.

8.2.3 Use a supervisory checklist

Each health facility has unique problems and priorities that require specific problem solving and corrections. A graduated supervisory checklist can contribute to health staff morale because the criteria are based on the current level of development. Specific improvements are identified based on success with reaching each development stage. As the facility improves, the checklist is revised to assess the criteria for the next level of development.

A sample supervisory checklist for neonatal tetanus programmes is on the following three pages. Adapt or modify the questions to meet the specific concerns and level of development in the health facility.

Table 13: Supervisory checklist for neonatal tetanus elimination activities

Health Facility: _____ Date of Supervisory Visit: _____

ACTIVITY	SUPERVISORY QUESTION	ANSWER	COMMENT (What Caused Problem)
NEONATAL TETANUS SURVEILLANCE			
Routine Monthly Surveillance	1. Are reports completed monthly? 2. Are "zero cases" reported when no cases were reported during the month?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	
Active Surveillance	1. Is a register review conducted regularly? 2. Do you see NT cases or neonatal deaths in this facility? 3. Do you line list suspect NT cases and report them regularly?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	
Case Investigation	1. Are all reported suspected NT cases investigated immediately? 2. Are confirmed cases followed by an appropriate case response? 3. How many cases are investigated? 4. Show me the investigation forms. Are they completed correctly? 5. Has line listing been done for each case?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No _____ investigated <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	
Community Surveillance	1. How often do you collect information about NT deaths in the area? 2. Can you estimate the number of neonatal deaths using the infant mortality rate for this area? 3. What proportion of estimated neonatal deaths are reported? 4. What proportion of reported neonatal deaths are investigated for NT?	collect it _____ <input type="checkbox"/> Yes <input type="checkbox"/> No _____ % are reported _____ % investigated	

Table 13: Supervisory checklist for neonatal tetanus elimination activities (continued)

TT2+ IMMUNIZATION SERVICES			
TT2+ Coverage For Pregnant Women	1. Do health workers observe correct intervals between doses? 2. Do women know when to return for the next dose?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	
TT2+ Coverage For Women of Childbearing Age	1. Are messages for health education correctly given? 2. If TT rounds are conducted, are immunization cards kept by the women? 3. If cards are not kept, how do you find out the number of doses the woman has already received? 4. Is the next round correctly scheduled (for example, ?4 weeks later? 1 year later?) 5. Is appropriate injection equipment used and disposed of safely?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No _____ <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	
Percentage of Children Protected At Birth	1. At what contact do you ask mothers about their TT history? 2. How many doses during pregnancy are valid for PAB? 3. Are you checking for all valid doses in the past? 4. Is PAB recorded in the register? Show me how it is recorded. 5. How do you estimate the number of live births in the catchment area?	DPT 1 _____? _____ doses <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No _____	
Percentage of Case Response	1. How many mothers needed an immunization as a result of the case investigations? 2. How many were actually immunized?	_____ mothers _____ immunized	
Vaccine Supply	1. Do you keep stock records for TT vaccine? 2. How do you estimate vaccine needs for routine TT services? TT rounds? case response?	<input type="checkbox"/> Yes <input type="checkbox"/> No _____	

Table 13: Supervisory checklist for neonatal tetanus elimination activities (continued)

CLEAN DELIVERY AND CORD CARE			
Skilled Birth Attendants	1. Do you monitor the performance of skilled birth attendants?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	2. Are there enough supplies for clean deliveries?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Social Mobilization	1. Do you give health messages to women and to the community about delivery and cord care?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	2. Do you assign birth attendants to areas where there is no access to clean delivery services?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	3. Do birth attendants keep records of the deliveries they attend?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

8.3 Monitor neonatal tetanus elimination activities

Periodically (such as once a month) collect monitoring data and review it. Look to see if the programme activities are working as they were planned. Have there been significant increases or decreases in reported data? What has caused the changes? Talk with the district or health facility supervisor to find out the causes and take corrective action as indicated.

Routinely monitor:

- The incidence of neonatal tetanus cases per 1 000 live births.
- The percentage of completeness of reporting. Reporting is complete when all the reports from health facilities required to report are received.
- The percentage of reported neonatal tetanus cases that have been investigated to determine the immunization status of the mother at the time of delivery.
- The percentage of confirmed cases followed by case response for the mother of the case and a case response for the locality.
- Percentage of reported cases with a TT immunization response.
- TT immunization coverage for the target population (especially those in high-risk districts).

Use a standard data collection form to record the monthly data.

Calculate immunization coverage rates and other proportions for each indicator.

Please see the sample form in Annex 8 of this manual.

8.4 Prepare graphs of major indicators

Prepare graphs and display them to show progress with key activities in the district's neonatal tetanus elimination programme. Make graphs for:

- Number of NT cases by location of delivery
- TT2+ immunization coverage
- TT2+ status in mothers of NT case
- Completeness of reporting by health facility

For example, a district used data from the monthly monitoring of major indicators to prepare the following graphs:

Figure 2: Neonatal tetanus deaths by location of delivery

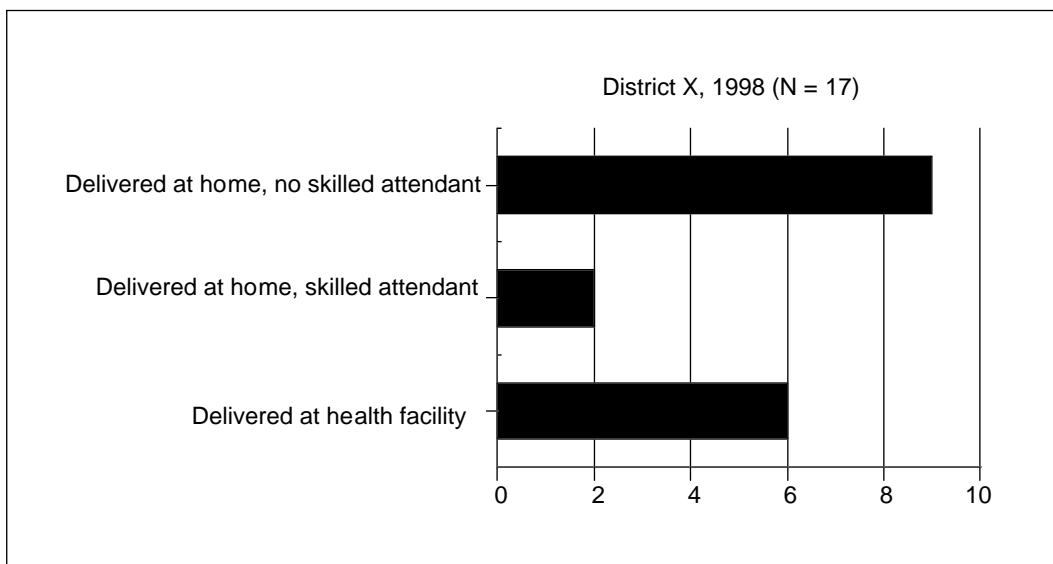


Figure 3: TT+ immunization coverage

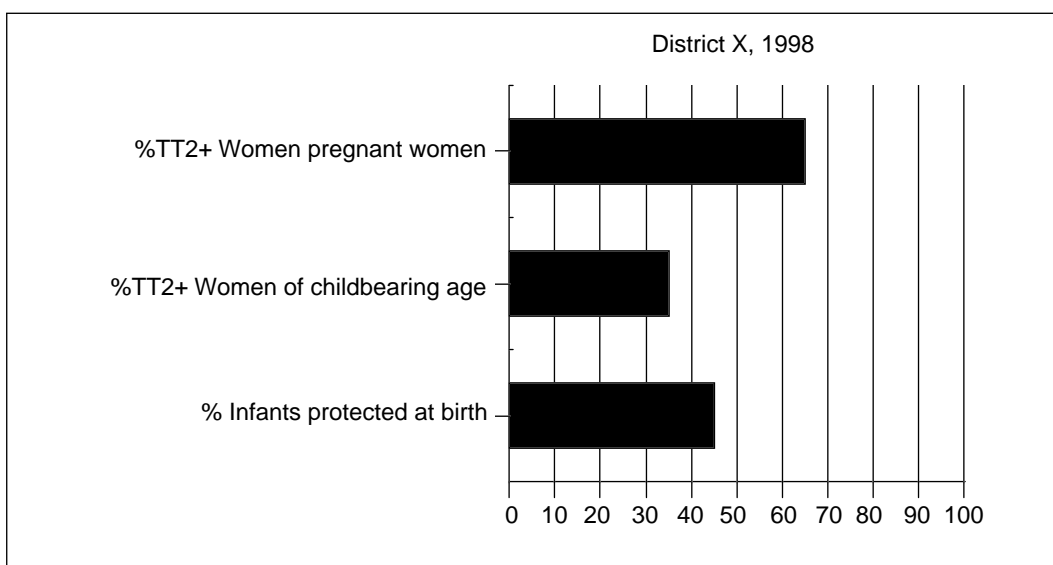


Figure 4: TT immunization status for mothers of cases

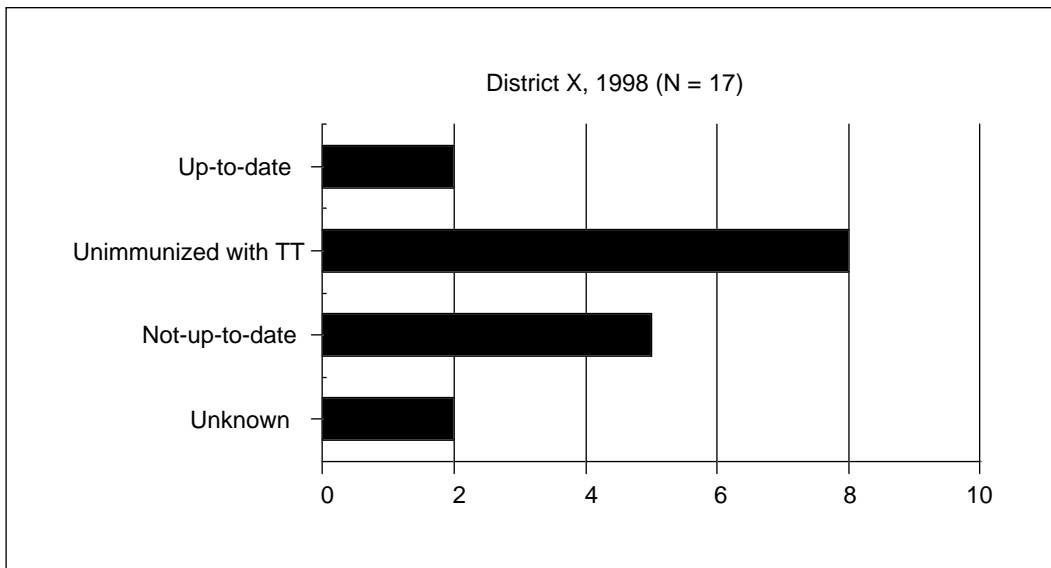
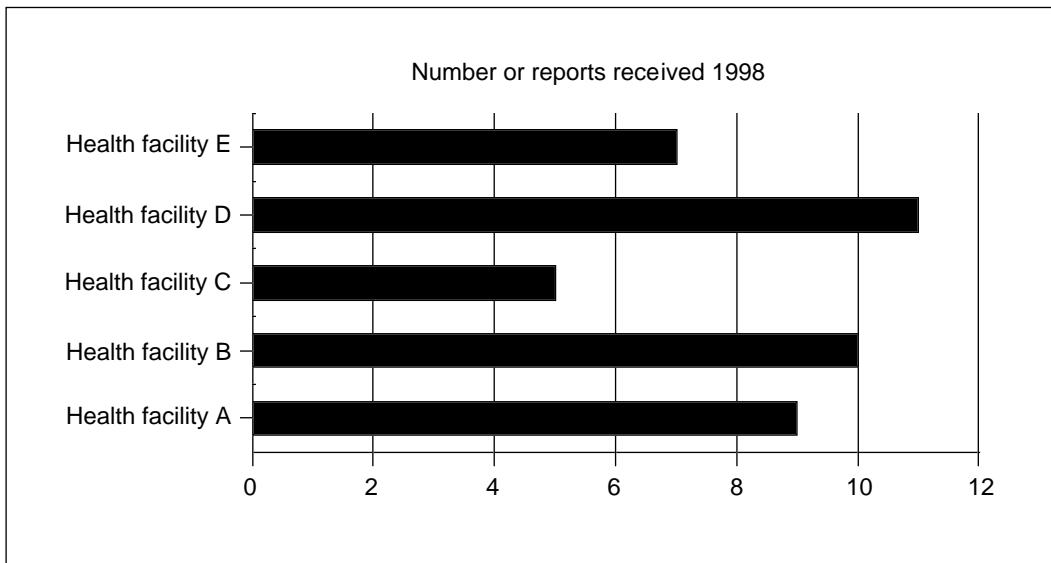


Figure 5: Completeness of reporting, district X



8.5 Prepare a spot map for each district

The spot map shows where the cases are occurring and defines more clearly the conditions of transmission risk. Review the spot map and the assessment information. Make conclusions about what may be causing NT cases and where action needs to be taken.

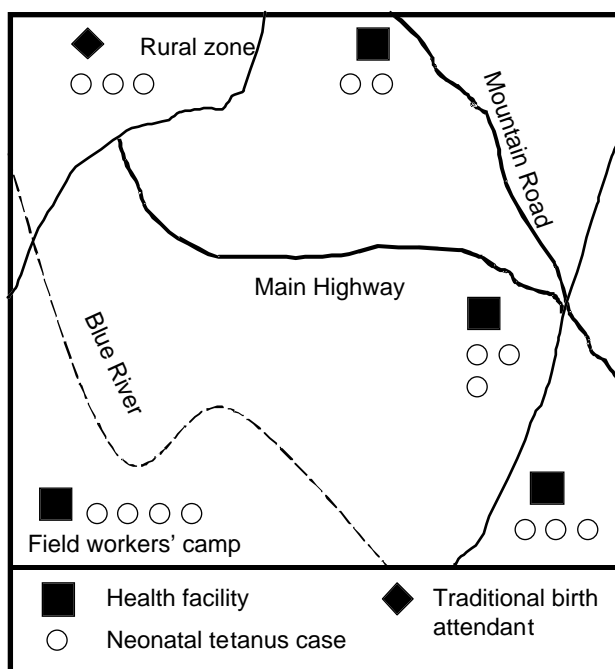
For example, the spot map on the next page shows cases that are located near a workers' settlement. The adults work on road building projects for daily wages. They have limited access to health services because they have not registered as residents of the area. The infants are born at home without a skilled person attending the birth. The result is a rise in the number of neonatal tetanus cases.

Or, the spot map may show a cluster of cases occurring in one particular village or in the locality of one particular birth attendant. It can identify pockets of high risk in an urban areas.

Prepare a spot map of the district to show:

- The location of reported neonatal tetanus case in the district.
- The location of the health facilities near the case.
- The location of clean delivery access points (for example, where skilled birth attendants are located in the community).

Figure 6: Example of a district spot map



Annexes

Annex 1: Vaccine storage recommendations

Annex 2: Assessing infants protected at birth against neonatal tetanus

Annex 3: Sample case investigation form for neonatal tetanus

Annex 4: Conducting a series of mass immunization campaigns for tetanus toxoid (TT rounds)

Annex 5: Including tetanus toxoid in a national immunization day (NID) activity

Annex 6: Sample schedule for including tetanus toxoid booster doses in a school-based delivery schedule

Annex 7: Conduct a register review

Annex 8: Annual data collection form for neonatal tetanus indicators

Annex 9: Further reading

Annex 1:

Vaccine storage recommendations

Recommended temperatures and storage times at different stages of the cold chain for tetanus toxoid vaccine

Vaccine	Central storage with electricity: up to 6 months	Regional storage with electricity up to 3 months	District and Health Centre storage with or without electricity: up to 1 month
Oral polio Yellow fever	-15°C to -25°C		
Measles BCG	-15°C to -25°C or 0°C to +8°C		
IPV DTP DT TT Td Hepatitis B Hib	0°C to +8°C		

- The storage times stated in the above table are recommended maximum figures. Be sure to check expiration dates.
- At any stage of the cold chain, transport vaccine at 0°C to +8°C. Polio vaccine may be thawed and frozen again without danger to the vaccine.
- If IPV, DTP, DT, Hepatitis-B, Td and TT vaccines are frozen at temperatures below 0°C, they are seriously damaged.
- Once the vaccine has lost potency through exposure to either heat or cold, the vaccine cannot be used. The potency is *not* regained by returning the vaccine to the correct storage temperature.
- If potency is lost through heat exposure, vaccines do not change their appearance. It is not possible to see if a vaccine in a vial has lost its potency. Only laboratory testing will be able to confirm whether the vaccine is still potent.

Annex 2:

Assessing infants protected at birth against neonatal tetanus

An infant is considered protected at birth against neonatal tetanus (PAB) when he or she is born during the period of protection conferred by the mother's immunization status (according to the 5-dose tetanus toxoid schedule). The infant's protection status can be assessed by reviewing the mother's immunization card or immunization history.

Measuring an infant's status regarding protection at birth against tetanus is more accurate than the administrative method of calculating coverage in women.

Objectives:

- 1) To routinely monitor the percentage of infants protected at birth against tetanus.
- 2) To reduce missed opportunities for reaching women with TT services when they bring their children for immunization services. These are important opportunities for reaching women with TT, if they are eligible for a dose during that visit.
- 3) To report more accurate coverage levels during periods when TT immunization services are being introduced to the target population of women of childbearing age.

Materials:

- 1) Immunization tally sheets that include space for recording the infant's PAB status when he or she receives DTP 1. Adapt current immunization reporting forms as needed to include PAB totals.
- 2) A PAB calculator is available from the WHO regional office. It can facilitate the process for vaccinators when they assess infants. It contains easy-to-use instructions on the calculator.
- 3) Immunization cards, if mothers and their children do not already have them.
- 4) A copy of the WHO 5-dose schedule for tetanus toxoid.

Method:

When mothers bring their infants for the DTP 1 immunization (also called the DTP 1 contact):

- 1) Ask the mother how many years it has been since her last dose of TT.
- 2) Ask if she has an immunization card. Did she bring it with her today?
- 3) **If she has a card**, ask to see it. Look to see:
 - When was the 1st dose of TT administered?
 - How many TT doses have been given?
- 4) Use the PAB Calculator¹ to find out if the infant was protected at birth against tetanus.
- 5) **If she does not have a card**, ask her questions about her immunization history, such as:
 - How many doses of TT did you receive during your pregnancy?
 - Use the PAB Calculator to find out if the infant was protected at birth against tetanus.
 - If she did not receive enough doses for the infant to be considered protected at birth, ask if she received any doses of TT at any other service besides the antenatal service.
 - If she still did not receive enough doses, ask if she has had previous pregnancies. If yes, ask if she received any doses during the previous two pregnancies. If she did not receive any doses in the previous pregnancy, or the one before that, this infant was not protected at birth against tetanus.
 - If she received additional doses, use the PAB Calculator to determine if the infant was protected at birth.
- 6) On the tally sheet, record the infant's PAB status as "PAB against NT" or "Not PAB against NT".
- 7) If the infant was not protected at birth, then the mother is eligible during this visit for a dose of TT.
- 8) Ask about the delivery practices used during the birth of this child and whether the child was born at home. As appropriate, give messages about the importance of TT immunization services and clean delivery and cord care practices.

¹ Contact the WHO Regional Office for information about ordering a PAB calculator. They are available for free or at very low-cost.

To introduce the PAB method into a district:

- 1) Select 1 or 2 high districts to start implementing this coverage method.
- 2) Select 4 to 5 health centres each with a catchment area population of about 13 000 people. Use selection criteria such as:
 - sites where antenatal care coverage (ANC) is higher than the reported TT2+ coverage.
 - sites where routine childhood immunization services are offered.
- 3) Prepare materials for use in training health staff to use the PAB method:
 - Adapt tally sheets and make sure enough are available for use during training and to distribute after the training.
 - Obtain enough PAB calculators to distribute to trainees during training and after the training to other vaccinators.
 - Adapt, translate, and obtain enough copies of the list of questions to ask the mother during the assessment. Adapt the questions to meet district or health facility policies or practices.
 - Prepare training agenda topics for each category of health worker to be trained (training trainers, training health centre personnel, training vaccinators, for example).
- 4) Make sure health facilities use a recommended immunization schedule. See the WHO recommended 5-dose schedule in Section 1.0 of this manual.
- 5) Conduct training for other health centre personnel such as doctors, midwives, health facility and supervisors. Focus training for this level on the skills required for effective supervision: to estimate the effectiveness of vaccinators when they obtain histories from the mothers and correctly calculate PAB, and to correctly tick the tally sheet and immunize women who are eligible for a dose of TT.
- 6) Conduct practical training for vaccinators. Make sure to include hands-on exercises for skills such as: history taking, correctly calculating PAB, correctly recording the tally sheet, immunizing eligible women.
- 7) Ensure routine assessment for TT status and immunization of eligible women at the DTP 1 contact.
- 8) Make sure district supervisors know to collect and complete:
 - the number of pregnant women or newborns during the year. Verify that the figure for the catchment area is correct.
 - the number of mothers seen at the time their children receive DTP1 during the year who had received the correct number of doses to be considered protected at the time of delivery.

After 2 or 3 months, compare the TT coverage rates assessed by the administrative method with the coverage assessed from the PAB method. Determine if you can extend the method nationally.

Annex 3:

Sample case investigation form for neonatal tetanus

CASE IDENTIFICATION AND HOUSEHOLD LOCATION	
Name of District: _____	Community: _____
Date case reported: ___/___/___	Date case investigated: ___/___/___
Investigated by: _____	Mother's Full Name: _____
Head of Household's Full Name: _____	Household Address: _____
Baby's Date of Birth: ___/___/___	Sex: ___ Male ___ Female
Ethnic group: _____	
MOTHER'S IMMUNIZATION STATUS	
<ul style="list-style-type: none"> • How many doses of TT has the mother received? _____ Doses ___ Unknown • Is her immunization history reported by: _____ Card ___ Memory ___ Both ___ Unknown • If she has a card, copy the dates of all TT immunizations recorded on the card: 1. ___/___/___ 2. ___/___/___ 3. ___/___/___ 4. ___/___/___ 5. ___/___/___ 	
MOTHER'S ANTENATAL CARE	
<ul style="list-style-type: none"> • How many visits did the mother make to a health facility during her pregnancy? _____ Visits • List health facilities she visited: 1 _____ 2 _____ 3 _____ 	
DELIVERY PRACTICES	
<ul style="list-style-type: none"> • Where was the baby delivered? <ul style="list-style-type: none"> _____ Health facility _____ Home with Trained Attendant _____ Home without Trained Assistance _____ Unknown • If the delivery was in a health facility, record the facility's name and address: <ul style="list-style-type: none"> _____ Health Facility _____ Address • How was the cord stump treated or dressed? _____ 	
BABY'S SYMPTOMS	
<ul style="list-style-type: none"> • How old (in days) was the baby when symptoms began? _____ Days ___ Unknown • At birth, did the baby feed normally? _____ Yes ___ No ___ Unknown • After the first two days of life, was the baby unable to feed? _____ Yes ___ No ___ Unknown • Did the baby have convulsions (stiffness or fits)? _____ Yes ___ No ___ Unknown WAS CASE CONFIRMED AS NEONATAL TETANUS? _____ Yes ___ No (If Yes to last 3 questions, tick Yes to show case confirmed as Neonatal Tetanus.) 	
TREATMENT	
<ul style="list-style-type: none"> • Was sick baby cared for in a health facility? _____ Yes ___ No ___ Unknown • Did the sick baby die? _____ Yes ___ No ___ Unknown • Did the mother die? _____ Yes ___ No ___ Unknown • If yes, record the name of health facility and district: _____ Health Facility and Name of District • If yes, complete Case Investigation Form for Maternal Deaths. 	
CASE RESPONSE	
<ul style="list-style-type: none"> • Did a case response for the mother take place? _____ Yes ___ No ___ Unknown • Did a case response take place in her locality? _____ Yes ___ No ___ Unknown 	

Annex 4:

Conducting a series of mass immunization campaigns for tetanus toxoid (TT rounds)

Depending on the factors that have resulted in the increased risk of neonatal tetanus in a high-risk district, offer three TT immunization activities (or “rounds”). The first two rounds must be scheduled at least 4 weeks apart, and the third round from 6 months to one year later. Areas where TT rounds can provide short-term results and accelerate TT coverage are high-risk districts with:

- low TT immunization coverage
- the highest number of reported neonatal tetanus cases
- the highest number of neonatal deaths
- limited or no access to routine health services
- socially or geographically remote areas
- poor sanitation in low- or no-income sections of urban areas
- migrant worker camps or refugee camps
- squatters’ settlements
- areas of civil strife or war

To conduct a “TT rounds” activity, begin planning at least 6 months in advance.

- _____ 1) *Calculate personnel costs* based on the number of health workers, volunteers, and drivers to be used in the activity. Consider, for example:
 - Per diem rates
- _____ 2) Decide where and when to schedule the TT rounds. Remember that the first two rounds must be scheduled at least 4 weeks apart, and the third round at least 6 months later.
- _____ 3) Estimate the size of the target population for the TT rounds activity. The target population is usually women of childbearing age in the area who are not protected against tetanus. For example:
 - Total population of the targeted area x 22% = number of women of childbearing age.

NOTE: The targeted area may be the catchment area of a health facility, a remote village, a worker’s camp, and so on.

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- Determine the number of women of childbearing age who are NOT protected against tetanus.
 - For conducting a TT rounds activity, the target is 100% of the women of childbearing age who are NOT protected against tetanus.
- _____ 4) Estimate the amount of vaccine needed to conduct the TT rounds activity. Consider the number of doses for reaching women with a series of 3 doses.
- Number of women at high risk x 3 doses x 1.2 wastage = number of doses to be given
 - Number of doses to be given) vial dose size (10 dose or 20 dose vial) = number of vials needed
- _____ 5) Estimate the amount of needles and syringes needed. WHO and UNICEF recommend that vaccine shipments include auto-destruct syringes. Generally, the same number of needles and syringes is needed as for the number of doses of vaccine in number 3 above.
- Auto-destruct syringes are recommended for TT rounds and supplemental activities to avoid problems of reuse of contaminated needles and syringes.
 - If auto-destruct syringes are not available, use disposable needles and syringes. Do not reuse them. Take precautions to dispose of them safely in a puncture-resistant container.
- _____ 6) Estimate the quantities of other equipment for providing safe injections.
- estimate number of cold chain carriers needed
 - amount and source of ice during each activity
 - transportation for cold chain
 - any other supplies.
- _____ 7) Coordinate with cold chain staff to estimate storage space at intermediate levels of cold chain: district level to health center to outreach team.
- To calculate total cold chain space available, subtract the space used for routine immunization activities from the space available. This is the amount available for storing extra vaccine needed for the rounds.
- _____ 8) Estimate the number of immunization cards needed. Generally, the number of cards needed is the same as the number of women to be immunized. Also estimate number of tally sheets and any other record keeping tools needed.

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- _____ 9) Estimate the staff needed to conduct the TT rounds. Generally, the activity will require:
- at least two vaccinators
 - one registrar
 - one driver
- _____ 10) Estimate logistics for conducting each of the three rounds.
- Plan the route to determine the number of kilometers to be driven and travel time.
 - Estimate amounts of petrol needed based on the route plan.
 - Investigate alternate routes and other sources of transportation depending on local conditions.
- _____ 11) Design (or adapt) guidelines for procedures (e.g., decide whether to screen or not screen women for previous immunizations with TT, who will be immunized, guidelines for vaccinators, etc.). Also decide whether to collaborate with MCH programme to distribute clean delivery kits during the activity to women in the area.
- _____ 12) Obtain and prepare record keeping tools. Plan to distribute lifetime immunization cards.
- _____ 13) Plan and conduct social mobilization. Identify appropriate channels for reaching the target population, develop and deliver appropriate messages, identify who will help encourage women to come to the activity, and who will follow-up to mobilize for the second round.
- _____ 14) Define the role of the supervisor during the TT rounds activity.
- _____ 15) Train district officer in “vaccinator guidelines”. Identify the vaccinator team (or teams) and prepare clear schedules for them.
- _____ 16) Train vaccinators. If a rounds activity is being conducted elsewhere, invite health staff involved in rounds or the planning of rounds to observe and participate in the activity. This will help increase their awareness of what the activity is and how it is conducted.
- _____ 17) Estimate the cost for conducting the TT rounds activity. Generally, the cost is estimated as US\$1.00 per woman. Individual costs included in the total figure are as follows:

ITEM	UNIT COST (in US\$)
Vaccine (tetanus toxoid)	0.05 to 0.06 per dose
Injection equipment	.09 per dose
Immunization Cards	.10 each (plastic) .03 to .04 each (paper)
Logistics	.20 per dose
Social Mobilization	.03 to .04 per dose
Clean Delivery Kits	.05 each
Training and Planning Supervising and Monitoring	.15 per dose

- _____ 18) **Begin the activity.** Take measures to arrive as scheduled and to use quality practices during the activity so that the population views the activity as a positive one. They will be more likely to support other prevention efforts and the offer of routine services in the area.
- _____ 19) **Plan to report the results of the activity to the next level.** Adapt a Monthly Immunization Report to show the following:
- the estimated number of women of childbearing age in the area
 - the number that were immunized with 2 doses.

Annex 5:

Including tetanus toxoid in a national immunization day (NID) activity

If polio NIDs are being held in districts at high risk for neonatal tetanus, consider maximizing the opportunity to include TT for women 15-44 years of age. Remember to give at least 2 doses of TT with a 4-week minimum interval between the first two doses, if a woman has never before been immunized with TT. Otherwise, use a recommended TT schedule to review the woman's immunization history, and determine whether she is eligible for an additional dose. Be sure health workers know how to calculate the intervals between doses when they assess the history to avoid giving unnecessary doses of TT. If a woman has already received 5 doses of TT within the correct intervals, she does not need to receive a dose of TT.

Offering TT during NIDs requires careful coordination and organization of social mobilization activities. The target group is expanded to include women at risk for tetanus transmission during childbirth. Including the extra activities for mobilizing the community to attend the NID may require extra time and resources.

Calculate the required amounts of vaccine and immunization supplies such as syringes and needles that will be required to integrate TT vaccines into the NIDs activity. Consider the extra requirements for the cold chain to include the TT vaccine. Use a wastage factor of 1.3 when calculating the initial supply. Then, for the next TT round, adjust the wastage factor based on the amounts used in the initial campaign.

Health facility who are already trained in conducting a supplemental activity for TT are the priority staff for conducting a TT activity within a NIDs framework. Otherwise, plan to train health workers in the correct administration and monitoring of doses given during the NID.

Refer to the detailed steps for planning and conducting TT rounds in Annex 4.

Annex 6:

Sample schedule for including tetanus toxoid booster doses in a school-based delivery schedule

**Tetanus toxoid schedule:
Based on DTP booster doses received in childhood**

If the last tetanus toxoid immunization was given:	And, the last dose received was:	At the present contact or pregnancy, give:	Then, after at least a 1-year interval, give:
During infancy (age 0 - 12 months)	DTP 3	2 doses of TT (with a 4-week interval)	1 dose of TT
During childhood (age 12 months to 5 years)	DTP 4	1 dose of TT	1 dose of TT
To school-aged Youth (age 5 to 14 years)	DTP 3 + 1 DT/Td*	1 dose of TT	1 dose of TT
To school-aged Youth (ages 5 to 14 years)	DTP 4 + 1 DT/Td	1 dose of TT	none
During adolescence (age 14 to 21 years)	DTP 4 + 1 DT at age 4 to 6 years and 1 TT/Td at age 14 to 16 years	none	none

* Please see STEP 1 for definitions of other tetanus toxoid vaccines.

Annex 7:

Conducting a register review

A register review for neonatal tetanus cases can be carried out in a medium-sized inpatient facility in less than a day. Record information found in the registers on a line listing form.

1) Select the facilities for review.

Depending on the local conditions, select:

- Any inpatient facility with more than 10 hospital beds. Give priority to government health facilities.
- Large reference or teaching hospitals with paediatric wards because they receive referrals from other health facilities.
- Small hospitals or health facilities that serve remote areas and high-risk populations. For example, nomadic groups, refugees, or areas without regularly scheduled health services.

2) Meet with the health facility staff and explain the purpose of the review.

Explain to the health facility's senior staff the purpose of the review: to collect information on neonatal cases admitted to the health facility during a specific period. Explain that the information will be used to improve the district's NT elimination programme. Emphasize that the activity is an information-gathering exercise, and is not a review of health worker performance.

3) Schedule the review.

Arrange a time to conduct the review when staff who will assist with the review are present and available to help or to answer questions.

4) Visit the health facility one day in advance to become familiar with the record-keeping system.

During the visit, check inpatient registers for the paediatric and infectious disease ward. The inpatient register for the paediatric ward is a good source because it lists all children admitted to the ward. Annual summary reports are not always accurate, and outpatient registers often include only a provisional diagnosis.

Review the system and procedures health workers use to record information in the registers about diagnoses. Make sure that the information needed for investigating any suspect case is available. At a minimum, the register should include the:

- Name of the infant and where it was born
- Infant's signs and symptoms
- Date of death
- Mother's TT immunization status

If the health facility does not keep at least the minimum information, talk with senior staff about how to strengthen the record keeping so that the minimum information is collected.

5) Do the record review at the scheduled day and time.

Go to the paediatric and infectious disease wards as scheduled. During the visit, look in the health facility registers for neonatal deaths and identify any which might be suspected cases of NT. These are deaths that meet the standard case definition for suspected cases. Find out whether the suspected case was investigated and reported according to national guidelines.

6) Line list the suspected cases that are found.

Record information about the suspect case that can be used during case investigation activities. A sample line listing form is on the next page.

7) Provide feedback to the health facility staff.

Meet with the health facility supervisor and discuss the findings of the activity. Use the opportunity to review any features of neonatal tetanus case management that may help health workers in the facility. Reinforce the importance of immediate reporting and case investigation as tools for prevention of additional NT cases.

8) Report any suspected cases to the next level.

Report the suspected cases according to local procedures. Conduct a case investigation to determine the factors that placed the infant at risk for neonatal tetanus. Develop an appropriate case response by at least immunizing the mother of the case and any women of childbearing age who live in the same locality as the mother of the neonatal tetanus case.

Annex 9: Further reading

Contact the WHO regional office to obtain the following World Health Organization publications:

Ensuring the quality of locally produced vaccines and the viability of local production, WHO/VSQ/98.03

Galazka A, Gasse F. The Present Status of Tetanus and Tetanus Vaccinations. *Curr Top Microbiolog Immunol* 1995, 175

Immunization in practice: a course for training health workers in the day-to-day activities of an immunization delivery programme
WHO/EPI/TRAM/98.01-13

Immunological basis for immunization: Module 3: Tetanus WHO Geneva
WHO/EPI/GEN/93.13

Mid-level management, a training course for planning and conducting immunization activities at regional, district or health center levels.
WHO/EPI/MLM/91.01-13

Mother-Baby Package: Implementing safe motherhood in countries
WHO/FHE/MSM/94.11

Safety of injections in immunization programmes, WHO, Geneva
WHO/EPI/LHIS/94.01

Neonatal tetanus protection calculator. A tool to help health workers estimate whether a child was protected at birth against tetanus.
WHO/GPV Catalog ID number 384.