



# Maternal and neonatal tetanus elimination in Latin America and the Caribbean

*Field Guide*

**PAHO**



Pan American  
Health  
Organization



World Health  
Organization  
REGIONAL OFFICE FOR THE  
Americas



# Maternal and neonatal tetanus elimination in Latin America and the Caribbean

*Field Guide*

Washington, D.C., 2024



Maternal and neonatal tetanus elimination in Latin America and the Caribbean. Field Guide

ISBN: 978-92-75-12855-8 (PDF)

ISBN: 978-92-75-12856-5 (Print version)

© Pan American Health Organization, 2024

Some rights reserved. This work is available under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO license ([CC BY-NC-SA 3.0 IGO](https://creativecommons.org/licenses/by-nc-sa/3.0/igo/)).



Under the terms of this license, this work may be copied, redistributed, and adapted for non-commercial purposes, provided the new work is issued using the same or equivalent Creative Commons license and it is appropriately cited, as indicated below. In any use of this work, there should be no suggestion that the Pan American Health Organization (PAHO) endorses any specific organization, product, or service. Use of the PAHO logo is not permitted.

**Adaptations:** If this work is adapted, the following disclaimer should be added along with the suggested citation: “This is an adaptation of an original work by the Pan American Health Organization (PAHO). Views and opinions expressed in the adaptation are the sole responsibility of the author(s) of the adaptation and are not endorsed by PAHO.”

**Translations:** If this work is translated, the following disclaimer should be added along with the suggested citation: “This translation was not created by the Pan American Health Organization (PAHO). PAHO is not responsible for the content or accuracy of this translation.”

**Suggested citation:** Pan American Health Organization. Maternal and neonatal tetanus elimination in Latin America and the Caribbean. Field Guide. Washington, D.C.: PAHO; 2024. Available from: <https://doi.org/10.37774/9789275128558>.

**Cataloguing-in-Publication (CIP) data:** Available at <http://iris.paho.org>.

**Sales, rights, and licensing:** To purchase PAHO publications, email: [sales@paho.org](mailto:sales@paho.org). To submit requests for commercial use and queries on rights and licensing, visit: <https://www.paho.org/en/publications/permissions-and-licensing>.

**Third-party materials:** If material that is attributed to a third party, such as tables, figures, or images, is reused from this work, it is the user’s responsibility to determine whether permission is needed for that reuse and to obtain permission from the copyright holder. The risk of claims resulting from infringement of any third-party-owned material or component from this work rests solely with the user.

**General disclaimers:** The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of PAHO concerning the legal status of any country, territory, city, or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers’ products does not imply that they are endorsed or recommended by PAHO in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by PAHO to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall PAHO be liable for damages arising from its use.

CIM/2024

Cover: © Victor Sanchez/OPS Guatemala.

# Contents

Acknowledgments .....	iv
Abbreviations and acronyms .....	v
1. Introduction .....	1
2. Disease epidemiology, clinical aspects, tetanus vaccines, and epidemiological surveillance.....	3
3. Strategies for sustaining maternal and neonatal tetanus elimination.....	5
3.1 Routine immunization program for children and adolescents .....	7
3.2 Routine vaccination program for women of reproductive age or pregnant women .....	7
3.3 Intensification of vaccination of women of childbearing age and pregnant women .....	10
4. Recommendations of the PAHO Technical Advisory Group on vaccine-preventable diseases for maternal and neonatal immunization.....	11
5. Annual data review .....	13
6. Clean delivery and umbilical care .....	17
Bibliography.....	21
Table. Recommended vaccination schedule for previously unvaccinated adolescents and adults, pregnant women with incomplete vaccination schedules, and women of reproductive age in at-risk areas.....	8
Figure. WHO algorithm to assess risk for neonatal tetanus at the district level.....	16

# Acknowledgments

This publication was prepared under the overall coordination of Anne Eudes Jean Baptiste and Daniel Salas Peraza from the Pan American Health Organization (PAHO) Special Program for Comprehensive Immunization with inputs from colleagues within PAHO Headquarters, consultants, groups of experts made up of health professionals from countries of the Americas, and partner organizations.

The following made noteworthy contributions: Lorena Mercedes Binfa and Marcela Diaz from Chile; Carolina Duarte, Cristina Mariño, and Alejandro Mojica from Colombia; and Javier Santisteban Ponce from Peru. Within PAHO, Emilia Cain, Ana Elena Chevez, Bremen De Mucio, Jose Luis Diaz Rossello, Pablo Duran, Mirta Magariños, Cristina Pedreira, Pilar Ramón Pardo, Gloria Janneth Rey-Benito, Alba Maria Roper, Joao Toledo, and Martha Velandia made key inputs.

The authors recognize the valuable efforts of colleagues from the World Health Organization, namely M. Carolina Danovaro, Shalini Desai, Tracey Goodman, Anna Minta, and Nasir Yusuf.

Additionally, experts from the U.S. Centers for Disease Control and Prevention, including Nino Khetsuriani, Heather Scobie, Rania Tohme, and Annemarie Wasley, made significant contributions to this publication.

# Abbreviations and acronyms

<b>DPT</b>	diphtheria-tetanus-pertussis-containing vaccine
<b>MNT</b>	maternal and neonatal tetanus
<b>MNTE</b>	maternal and neonatal tetanus elimination
<b>NT</b>	neonatal tetanus
<b>PAHO</b>	Pan American Health Organization
<b>SDGs</b>	Sustainable Development Goals
<b>SIA</b>	supplementary immunization activities
<b>TAG</b>	Technical Advisory Group on Vaccine-preventable diseases
<b>TTCV</b>	tetanus toxoid-containing vaccine
<b>Tdap</b>	tetanus toxoid, diphtheria toxoid, and acellular pertussis vaccine
<b>UNFPA</b>	United Nations Population Fund
<b>UNICEF</b>	United Nations Children’s Fund
<b>WHO</b>	World Health Organization
<b>WRA</b>	women of reproductive age



# 1. Introduction



Neonatal tetanus (NT), a severe newborn illness from the toxigenic strains of *Clostridium tetani*, persists in middle- and low-income countries due to non-sterile childbirth practices. Unlike smallpox and polio, tetanus cannot be eradicated because *C. tetani* spores exist in the environment and in animal reservoirs. However, elimination as a public health problem is achievable through widespread tetanus vaccination, clean deliveries, and proper umbilical cord care. The goal of eliminating maternal and neonatal tetanus (MNT) as a public health problem is considered met when all municipalities in a country have an annual incidence rate of NT of less than 1 case per 1000 live births.

The Region of the Americas achieved the maternal and neonatal tetanus elimination (MNTE) target in 2017 when elimination was validated in Haiti. Yet maintaining this achievement requires continued efforts. High vaccination coverage, booster doses in countries lacking them, hygienic practices, and strong maternal and child health services are key. The Pan American Health Organization's (PAHO) integrated maternal and neonatal immunization platform further strengthens this fight against early childhood diseases. One of the goals of the PAHO Regional Immunization Action Plan is to establish and strengthen maternal and childhood vaccination in the context of improving health services for the effective administration of vaccines.

## **Update from previously published MNTE field guides**

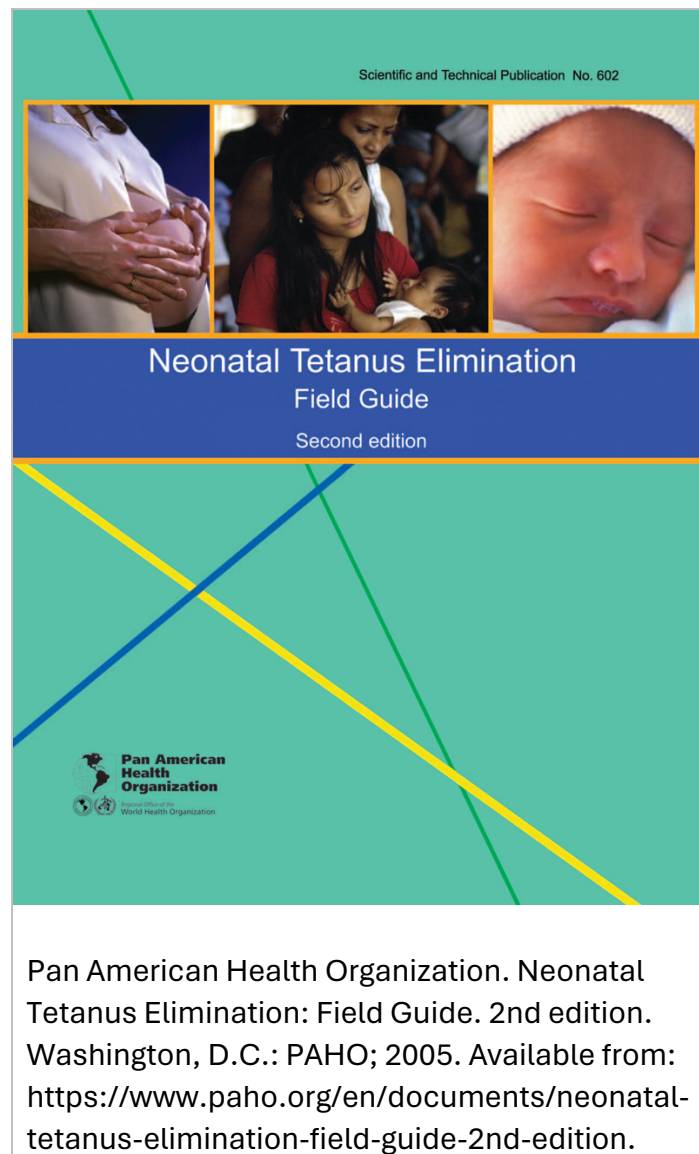
This field guide places specific emphasis on the objective of sustaining the elimination of MNT in Latin America and the Caribbean. The primary audience for this field guide consists of managers of the Ministry of Health immunization, epidemiological surveillance, and maternal and child health programs.



## **2. Disease epidemiology, clinical aspects, tetanus vaccines, and epidemiological surveillance**

**Neonatal Tetanus Elimination Field Guide, Second edition** – The sections covering the pathogenesis and clinical characteristics of tetanus, diagnosis, differential diagnosis, complications, and treatments, as well as other technical details about the bacterium, disease surveillance, and the vaccines, were previously published in the 2005 *Neonatal Tetanus Elimination Field Guide*.

The information presented in these sections remains unchanged.





### **3. Strategies for sustaining maternal and neonatal tetanus elimination**

Sustaining MNTE requires a comprehensive approach. Key activities will continue to focus on women, but plans must begin to shift toward a national immunization schedule that provides long-term protection against tetanus for all persons. Consequently, antenatal care contacts will increasingly be targeted to verify the vaccination status of pregnant women and will be less and less the primary strategy for vaccinating them with tetanus toxoid, diphtheria toxoid, and acellular pertussis vaccine (Tdap).

To sustain MNTE it is recommended that all countries:

- Strengthen routine vaccination so that all children/adolescents receive a primary series of three doses of tetanus toxoid-containing vaccine (TTCV) in the first year of life, followed by three boosters, administered at 12–23 months, 4–7 years, and 9–15 years.

## Recommendation for Routine TTCV Vaccination Schedule



**Primary series:** The primary series of vaccination with three doses of TTCV is the basis for the development of lifelong immunity, with the first dose administered at 6 weeks of age and subsequent doses at a minimum interval of four weeks. The primary series should be completed at 6 months of age.

**Booster doses:** Three booster doses should be administered at ages 12–23 months, 4–7 years, and 9–15 years. Ideally, there should be an interval of at least four years between booster doses.

*Note:* All HIV-infected children should be vaccinated against tetanus following the same vaccination schedule.

*Source:* World Health Organization. Tetanus vaccines: WHO position paper – February 2017. Wkly Epidemiol Rec. 2017;92(6):53–76. Available from: <https://iris.who.int/handle/10665/254582>.

- Assess the tetanus vaccination history of a woman in any contact she has with health services, whatever the reason, including the following:
  - Visits for prenatal care.
  - Visits for postnatal care.

- When she goes to the maternity ward. While the maternity ward is primarily for childbirth, women with late pregnancy complications or mothers and babies recovering from delivery may also be there.
- When she takes her children for vaccinations.
- During extramural vaccination activities.
- During vaccination campaigns.
- During visits to curative services.
- Ensure that all women of reproductive age (WRA) and pregnant women are adequately vaccinated.
- Maintain good quality epidemiological surveillance of NT and other age groups to identify districts at risk of resurgence of MNT as a public health problem, and identify the need for corrective actions.

## Closing the Gap: Protecting Children from Tetanus for Equitable Disease Prevention



To achieve equity in disease prevention, all children should be adequately protected against tetanus to avoid any future risk from contamination of wounds due to medical interventions, occupational hazards, or accidents. Therefore, it is essential to:

**Incorporate strategies for sustaining MNTE into the multiannual action plan of each country's immunization program.**

Some aspects to be considered in this plan are:

### 3.1 Routine immunization program for children and adolescents

The routine vaccination schedule with six doses of TTCV consists of a primary series of three doses of vaccine in the first year of life followed by three booster doses during childhood and adolescence. Alternatively, five doses of vaccine, when vaccination is initiated after the age of 1 year, will protect WRA during their reproductive life, with no additional doses of vaccine being necessary to prevent NT.

### 3.2 Routine vaccination program for women of reproductive age or pregnant women

All WRA, including pregnant women, should be guaranteed a complete vaccination schedule (see **Table**):

- If a woman does not have an immunization card or if previous TTCV dose history cannot be verified, her vaccination status is considered unknown, and she should receive at least two doses of TTCV as soon as possible, with a four-week interval between doses. The second dose should be administered at least two weeks before her child’s birth to allow for an adequate immune response. After delivery, she should receive three additional doses of TTCV to complete the vaccination schedule of five doses. Key to this effort is the use of all the woman’s contacts with the health service, as well as the nominal record of the doses administered. Unnecessary restarting of the vaccination schedule should be avoided.
- If a pregnant woman can confirm via an immunization card that she has received some but not all of the required doses of TTCV, she should receive the missing doses of vaccine following the schedule for partially vaccinated women.
- If a pregnant woman has received one to four doses of TTCV in the past, she should receive one dose of TTCV at least two weeks before delivery, completing the vaccination schedule of five doses of vaccine after delivery. In some cases it may be possible to complete two doses before delivery.

**Table.** Recommended vaccination schedule for previously unvaccinated adolescents and adults, pregnant women with incomplete vaccination schedules, and women of reproductive age (WRA) in at-risk areas

Group	Dose timing/schedule					Total doses
	As soon as possible	4 weeks later	At-least 6 months since last dose	1 year since last dose	1 year since last dose	
Adolescents and adults with no previous vaccination or no record of previous vaccination, including WRA and pregnant women	TTCV	TTCV	TTCV	TTCV	TTCV	5

(Continued)

Group	Dose timing/schedule					Total doses
	As soon as possible	4 weeks later	At-least 6 months since last dose	1 year since last dose	1 year since last dose	
Pregnant woman who received 3 doses of TTCV in childhood	TTCV	TTCV (at least 2 weeks before due date)		TTCV		6
Pregnant woman who received 4 doses of TTCV in infancy	TTCV			TTVC		6
Pregnant woman who received 3 doses of TTCV in infancy and 2 boosters before pregnancy	TTCV					6
WRA vaccination in high-risk areas	TTCV – Round 1 of SIA	TTCV – Round 2 of SIA	TTCV – Round 3 of SIA	TTCV <sup>a</sup>	TTCV <sup>a</sup>	5

Note: The intervals indicated in the table refer to minimum acceptable intervals between vaccinations; there are no maximum intervals.

<sup>a</sup>Or in the next pregnancy.

SIA = supplementary immunization activities; a "round" of SIA refers to a focused mass vaccination campaign aimed at rapidly increasing immunity levels in a population against a specific disease. TTCV = tetanus toxoid-containing vaccine.

## Tetanus Protection after Miscarriage or Unsafe Abortion



If a woman has had a miscarriage or unsafe abortion and is considered unprotected against tetanus, vaccinate her immediately to protect her against future tetanus risks.



All women should receive a permanent immunization record or card documenting all doses of tetanus and diphtheria toxoids they have received, including childhood doses of diphtheria-tetanus-pertussis-containing vaccine (DPT). The registry will help health workers to schedule vaccination appointments correctly and to avoid administering more or fewer doses than necessary. Women need to understand that the record or card is valuable and should be kept securely. Requesting the vaccination record at each visit to the health unit will reinforce its importance and will facilitate timely retrieval of information in case of loss to issue another record or card.

### 3.3 Intensification of vaccination of women of reproductive age and pregnant women

It is essential to implement vaccination strategies in all municipalities/districts with >1 NT case per 1000 live births to ensure the protection of all unvaccinated or partially vaccinated women and to sustain MNT status.

A comprehensive approach is required to sustain the elimination of MNT. In the short and medium term, key activities will continue to focus on women, but vaccination plans and schedules should be geared to provide long-term protection against tetanus for all people. This means achieving high coverage for all children/adolescents with six doses of TTCV: three doses in children under 1 year of age (primary vaccination) and three booster doses through routine vaccination of children and adolescents.

Once homogeneous and high vaccination coverage (95%) has been achieved with the six-dose schedule for children and adolescents, a large proportion of future cohorts of WRA will be fully protected against tetanus throughout their reproductive years and beyond.

#### How Does Childhood Immunization Reduce Maternal Needs?



As countries implement the six-dose tetanus vaccination schedule in children/adolescents, fewer and fewer pregnant women will require tetanus vaccination during their pregnancy because they will already be fully protected by the vaccines they received as children/adolescents.



## **4. Recommendations of the PAHO Technical Advisory Group on vaccine- preventable diseases for maternal and neonatal immunization**

During its 25th Regional Meeting in 2019 and following the regional validation of MNTE, the PAHO Technical Advisory Group on vaccine-preventable diseases (TAG) issued the following recommendations for sustaining MNTE in Latin America and the Caribbean:

- TAG reinforces the need to sustain high vaccination coverage for DTP third dose among infants, and DTP fourth dose in the second year of life.
- TAG encourages countries to continue documenting maternal immunization practices, associated challenges, and best practices to achieve high coverage and the local impact of the strategy.
- TAG encourages countries to monitor and report Tdap vaccine coverage among pregnant women, as it is important to reach and sustain coverage of more than 50% to ensure the effectiveness of this vaccination strategy.
- TAG recognizes the value of vaccinating pregnant women with Tdap to protect the neonate as an effective complementary strategy to routine primary infant pertussis vaccination, particularly in countries or settings with high infant mortality from pertussis. Thus, TAG endorses the Strategic Advisory Group of Experts (SAGE) on Immunization recommendation for Tdap vaccination in pregnancy, during the second or third trimesters, and at least 15 days before delivery.
- Continue monitoring vaccine safety among pregnant women. TAG recognizes the Region's progress in maternal immunization, including pertussis and seasonal influenza vaccination.
- TAG encourages countries to introduce maternal Tdap vaccination to evaluate the impact of the vaccine on the long-term protection of children against pertussis, particularly in countries using infant whole-cell pertussis-containing vaccines.
- TAG recommends considering the vaccination of healthcare facility personnel with the Tdap vaccine, prioritizing maternity ward personnel and caregivers for newborns and children under 1 year of age.

The recommendations cover both tetanus and pertussis, given the interrelationship between the diseases and their combination in a single vaccine (such as the DPT vaccine), which enhances immunization efforts by concurrently protecting against both diseases.



## **5. Annual data review**

Given the presence of *C. tetani* throughout the environment, if high TTCV vaccination coverage is not maintained, in the absence of high rates of safe delivery practices and adequate cord care, a country can lose its MNTE status. For this reason, all countries in the Americas should periodically assess whether they are sustaining MNTE and, if they identify weaknesses or concerns, should promptly plan and implement corrective actions.

The World Health Organization (WHO) recommends that countries that have achieved MNTE conduct an annual review of the surveillance system and other relevant data to identify whether any municipality/district is at risk of a resurgence of neonatal tetanus as a public health problem.

## WHO Recommendation Following the Declaration of MNTE – Post-Validation Assessment



Following the declaration of MNTE, **the country/health service/health ministry should conduct an in-depth evaluation exercise to validate that elimination status is being sustained.** This review/exercise can be conducted periodically in any country that has achieved MNTE status but is particularly relevant for those that have concerns about the sustainability of their program performance (e.g., declining vaccination coverage, immunization program implementation and management problems, humanitarian crises, natural disasters).

It is also recommended that when countries conduct immunization program evaluations every three to five years, or other similar evaluations, a validation of the maintenance of MTNE be incorporated.

*Source:* World Health Organization. Protecting all against tetanus: guide to sustaining maternal and neonatal tetanus elimination (MNTE) and broadening tetanus protection for all populations. Geneva: WHO; 2019. Available from: <https://iris.who.int/handle/10665/329882>.

For example, review can be done every year when the immunization program collects data for the WHO/UNICEF joint annual report submission. The data should be reviewed for completeness and consistency. This exercise serves as a critical resource for tracking the maintenance of MNTE by identifying whether any district is at risk of NT recurrence and, if necessary, designing and implementing corrective actions quickly.

When conducted in conjunction with the maternal, newborn, and child health program, this annual data review can serve to further enhance the synergy of this program with the immunization program. Therefore, in addition to surveillance and immunization coverage

data, the review should include data regarding the quality of prenatal, hospital delivery, and newborn care for the identification of areas of risk.

The vision is that, by using data for action, all countries will continuously improve the performance of their national immunization programs.

Municipalities with one or more reported cases of NT in each of the last three years, as well as municipalities with more than 1 case of NT per 1000 live births in one or more years, should be reclassified as high-risk areas.

Municipalities or localities with questionable data on disease incidence or vaccination coverage of WRA, or where deliveries take place mainly outside a hospital and cases have never been reported, will be considered as possible “silent areas” for NT by national health authorities and PAHO/WHO. In these sites, case detection will need to be intensified through tasks such as hospital record checks, house-to-house interviews, and community surveys.

Countries should implement control measures in areas considered at-risk to sustain MNTE in these areas, as well as conduct active searches in “silent areas” to confirm that the absence of reporting reflects the absence of NT cases.

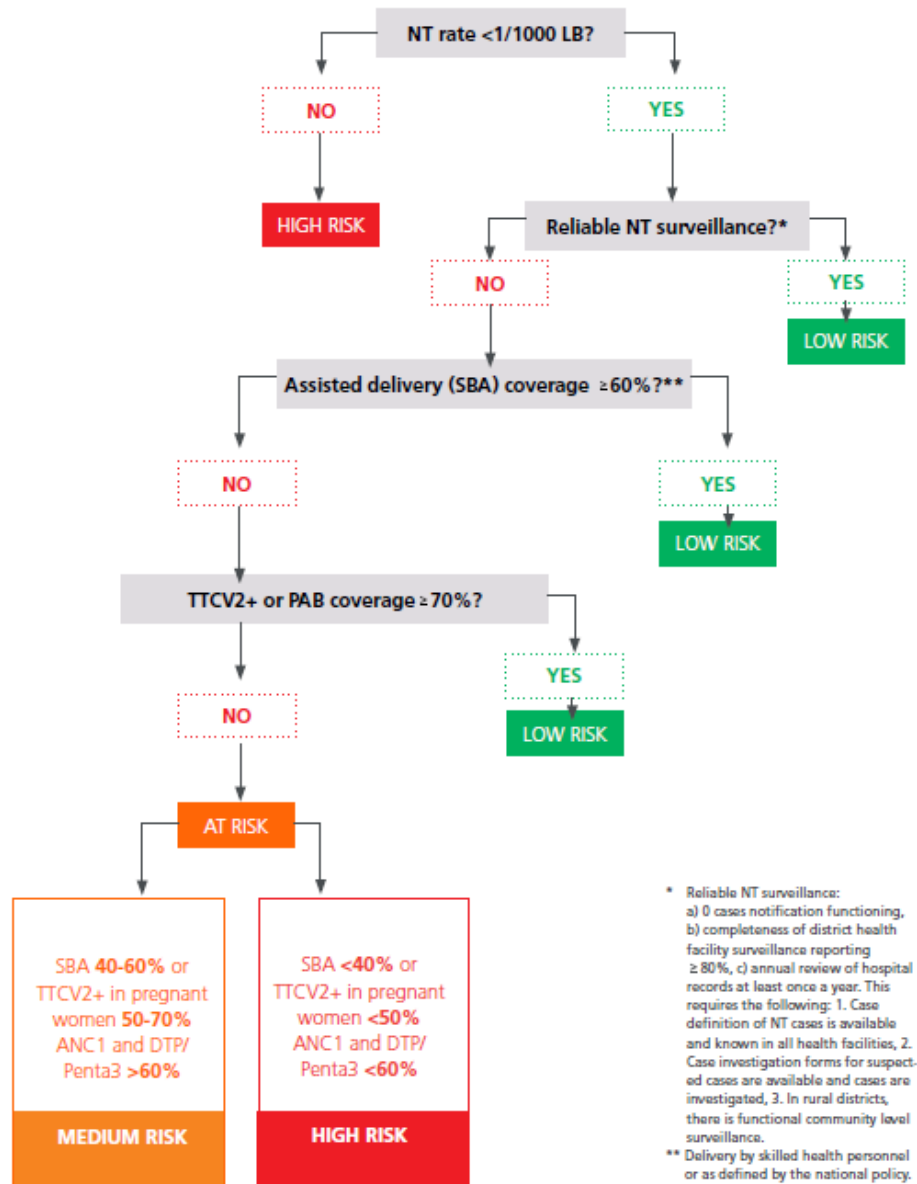
This evaluation should include a review of each district’s data for the past three years, including:

- NT incidence rate;
- Coverage of delivery care by skilled personnel; and
- Vaccination coverage (DPT 1, DPT 2, DTP 3, Td1, Td2, Td3).

The data obtained will make it possible to determine the risk level of each municipality, by applying the algorithm shown in the following **Figure**. Each district should be classified as low, medium, or high risk, depending on its performance level.

**Figure.** WHO algorithm to assess risk for neonatal tetanus at the district level

WHO algorithm to classify potential risk of NT in districts  
(Step 3 of MNT risk assessment)



Note: ANC, antenatal care; DTP, diphtheria–tetanus–pertussis-containing vaccine; LB, live births; MNT, maternal and neonatal tetanus; NT, neonatal tetanus; PAB, protection at birth; Penta, pentavalent vaccine; SBA, skilled birth attendant; TTCV2+, two or more doses of tetanus toxoid-containing vaccine.

Source: World Health Organization. Protecting all against tetanus: guide to sustaining maternal and neonatal tetanus elimination (MNTE) and broadening tetanus protection for all populations. Geneva: WHO; 2019. Available from: <https://iris.who.int/handle/10665/329882>.



## **6. Clean delivery and umbilical care**



Clean delivery, together with proper hygienic practices after birth, can effectively reduce tetanus risks, even if TTCV coverage is not optimal in a country. Clean delivery can also reduce causes of perinatal mortality other than tetanus that could lead to neonatal sepsis.

A clean delivery is defined as one in which hygienic practices are used and which is attended by competent maternal and newborn health personnel in a health facility or at home.

Freshly cut umbilical cords are vulnerable to infection, especially in areas with poor hygiene. While cultural practices like applying oils or dung exist globally, these hinder drying and can be harmful. Proper cord care by skilled personnel can significantly reduce preventable newborn deaths.

## Definition of Skilled Health Personnel



A critical indicator of progress adopted by the Sustainable Development Goals (SDGs) and the Global Strategy for Women's, Children's, and Adolescents' Health (2016–2030) is the "proportion of births attended by skilled health personnel."

WHO, UNFPA, UNICEF, the International Confederation of Midwives, the International Council of Nurses, the International Federation of Gynecology and Obstetrics, and the Independent Doctors Association proposed a revised definition of "skilled health personnel" to standardize and improve measurement accuracy.

Skilled health personnel are competent maternal/newborn health professionals trained, qualified, and regulated according to international standards. They are competent to:

- a) Provide and promote evidence-based, human-rights-based, quality, socioculturally sensitive and dignified care to women and newborns;
- b) Facilitate physiological processes during labor and delivery to ensure a clean and positive childbirth experience; and
- c) Identify and manage or refer women and/or newborns with complications.

In addition, as part of an integrated team of maternal health professionals (including midwives, nurses, physicians, obstetricians, neonatologists, pediatricians, and anesthesiologists), skilled health personnel perform all emergency maternal and newborn care to optimize the health and well-being of mothers and newborns in a nurturing and supportive environment.

Source: World Health Organization. Definition of skilled health personnel providing care during childbirth: the 2018 joint statement by WHO, UNFPA, UNICEF, ICM, ICN, FIGO and IPA. Geneva: WHO; 2018. Available from: <https://iris.who.int/handle/10665/272818>.

Skilled health personnel at the community level are often the sole accredited individuals responsible for the comprehensive care of women during pregnancy, childbirth, and the postnatal period. Despite a global increase in the proportion of births attended by these professionals, there are substantial disparities in coverage and quality of care between and within countries. The urgent recommendation by PAHO/WHO is for countries to ensure prompt access to skilled health personnel for all pregnant women and newborns.

Clean delivery practices should include:

- **Clean hands:** The birth assistant should wash hands with clean water and soap once before delivery and once before cutting the umbilical cord.
- **Clean birthing surface:** The mother should lie on a clean plastic sheet during labor to keep the birth canal and perineum clean and to protect the newborn from possible sources of infection.
- **Clean cut of the umbilical cord:** The birth assistant should use disposable sterile plastic scissors, a new sterile scalpel blade, a new razor blade, or other new sharp instrument to prevent transmission of tetanus-causing spores and other pathogens through the umbilicus.
- **Clean cord tying:** The birth assistant should use disposable sterile plastic forceps, clean or sterile thread, or narrow tape to tie the umbilicus tightly and keep the stump healthy.
- **Clean umbilical cord stump care:** In out-of-hospital settings, a parent or caregiver should apply chlorhexidine to the umbilical cord stump. In health centers, skilled health personnel should follow dry umbilical cord care, according to the national protocol.

Standard precautions and cleanliness precautions should always be observed as principles of good care. These principles are:

- Wash hands with soap and water.
- Wear sterile gloves when caring for women in labor, delivery, and postpartum care; when cleaning and handling instruments; and when handling contaminated waste, blood, and body fluid spills.
- Prevent exposure to blood and other body fluids (by the use of gloves, long apron, and eye and mouth protection).

- Practice safe disposal of sharps.
- Practice safe waste disposal.
- Treat contaminated clothing (do not directly touch clothing or linens stained with blood or body fluids).
- Sterilize and clean contaminated equipment.

## WHO Recommendations on Umbilical Cord Care



Apply daily chlorhexidine (7.1% chlorhexidine digluconate aqueous solution or gel, 4% chlorhexidine) on the umbilical cord stump during the first week of life in newborns born at home or in settings with high neonatal mortality (30 or more neonatal deaths per 1000 live births).

# Bibliography

Aceh Epidemiology Group. Outbreak of tetanus cases following the tsunami in Aceh Province, Indonesia. *Glob Public Health*. 2006;1(2):173–177. Available from: <https://doi.org/10.1080/17441690600652803>.

American Academy of Pediatrics. Tetanus. In: Kimberlin DW, Brady MT, Jackson MA, Long SS, editors. *Red Book: 2018–2021 Report of the Committee on Infectious Diseases*. 31st edition. Itasca, IL: AAP; 2018. Available from: <https://doi.org/10.1542/9781610021470-part03-tetanus>.

Afshar M, Raju M, Ansell D, Bleck, TP. Narrative review: tetanus—a health threat after natural disasters in developing countries. *Ann Intern Med*. 2011;154(5): 329–335. Available from: <https://doi.org/10.7326/0003-4819-154-5-201103010-00007>.

Apte NM, Karnad DR. Short report: The spatula test: a simple bedside test to diagnose tetanus. *Am J Trop Med Hyg*. 1995;53(4):386–387. Available from: <https://doi.org/10.4269/ajtmh.1995.53.386>.

Hodowanec AC, Bleck TP. Tetanus and Botulism. In: Cohen J, Powderly WG, Opal SM. *Infectious diseases*. 4th edition. Amsterdam: Elsevier; 2017.

Khan R, Vandelaer J, Yakubu A, Raza AA, Zulu F. Maternal and neonatal tetanus elimination: from protecting women and newborns to protecting all. *Int J Womens Health*. 2015;7:171–180. Available from: <https://doi.org/10.2147/IJWH.S50539>.

Kliegman RM, Behrman RE, Jenson HB, Stanton BM. *Nelson textbook of pediatrics*. 18th edition [e-book]. Amsterdam: Elsevier Health Sciences; 2007.

Pan American Health Organization. Final report. 54th Directing Council. 67th Session of the WHO Regional Committee for the Americas. CD54/7, Rev. 2. Washington, D.C.: PAHO; 2015. Available from: <https://iris.paho.org/handle/10665.2/28313>.

Pan American Health Organization. *Immunization Newsletter*. Volume XXXVI Number 6 October 2014. Available from: <https://iris.paho.org/handle/10665.2/54229>.

Pan American Health Organization. *Immunization Newsletter*. Volume XXXX Number 2 June 2018. Available from: <https://iris.paho.org/handle/10665.2/54255>.

Pan American Health Organization. Control of diphtheria, pertussis, tetanus, Haemophilus influenzae type b infection, and hepatitis B: a practical guide. Washington, D.C.: PAHO; 2005. Available from: <https://iris.paho.org/handle/10665.2/46726>.

Pan American Health Organization. Elimination of neonatal tetanus: a practical guide. Washington, D.C.: PAHO; 2005. Available from: <https://iris.paho.org/handle/10665.2/52743>.

Pan American Health Organization. Final Report of the XV Technical Advisory Group Meeting on Vaccine-Preventable Diseases - Municipalities: Improving Immunization Services. Conclusions and Recommendations. Washington, D.C.: PAHO; 2002. Available from: <https://www.paho.org/en/documents/final-report-xv-meeting-technical-advisorygroup-vaccine-preventable-diseases>.

Pan American Health Organization. Final report of the Third ad hoc meeting of the Technical Advisory Group on Vaccine-Preventable Diseases. Washington, D.C.: PAHO; 2018. Available from: <https://www.paho.org/en/documents/03-ad-hoc-tag-final-report-2018>.

Pan American Health Organization Special Program for Vaccines and Immunization. Twelfth Technical Advisory Group Meeting on Vaccine-preventable Diseases: conclusions and recommendations. Washington, D.C.: PAHO; 1997. Available from: <https://www.paho.org/en/documents/12-tag-final-report-1997>.

Pan American Health Organization. Plan of action for the eradication of indigenous transmission of wild poliovirus [Resolution CD34.R11]. 34th PAHO Directing Council, 41st Session of the Regional Committee; 25–29 September 1989. Washington, D.C.: PAHO; 1989. Available from: <https://iris.paho.org/handle/10665.2/1530>.

World Health Organization. Protecting all against tetanus: guide to sustaining maternal and neonatal tetanus elimination (MNTE) and broadening tetanus protection for all populations. Geneva: WHO; 2019. Available from: <https://iris.who.int/handle/10665/329882>.

Roper MH, Wassilak SG, Scobie HM, Ridpath AD, Orenstein WA. Tetanus toxoid. In: Plotkin SA, Orenstein WA, Offit PA, Edwards KM, editors. Plotkin's Vaccines. 7th edition. Amsterdam: Elsevier; 2018. Available from: <https://doi.org/10.1016/C2013-0-18914-3>.

Vieira LJ, de Oliveira MHP, Lefèvre F. The use of the expression “seven-day disease” by mothers of children who died of neonatal tetanus in Minas Gerais (1997–2002). *Texto Contexto Enferm*. 2006;15(1):51–59. Available from: <https://doi.org/10.1590/S0104-07072006000100006>.

World Health Organization. Current recommendations for treatment of tetanus during humanitarian emergencies. WHO technical note, January 2010. Geneva: WHO; 2010. Available from: <https://iris.who.int/handle/10665/70219>.

Galazka A, Milstein J, Zaffran M. Thermostability of vaccines. Geneva: WHO; 1998. Available from: <https://iris.who.int/handle/10665/64980>.

World Health Organization. Neonatal tetanus: vaccine preventable diseases Surveillance Standards. Geneva: WHO; 2018. Available from: <https://www.who.int/publications/m/item/vaccine-preventable-diseases-surveillance-standards-neonatal-tetanus>.

World Health Organization. Non-neonatal tetanus: vaccine preventable diseases surveillance standards. Geneva: WHO; 2018. Available from: <https://www.who.int/publications/m/item/vaccine-preventable-diseases-surveillance-standards-non-neonatal-tetanus>.

World Health Organization. Tetanus vaccines: WHO position paper – February 2017. Wkly Epidemiol Rec. 2017;92(6):53–76. Available from: <https://iris.who.int/handle/10665/254583>.

World Health Organization. The immunological basis for immunization series: module 3: tetanus. Geneva: WHO; 2018. Available from: <https://iris.who.int/handle/10665/275340>.

World Health Organization. Validation of Maternal and Neonatal Tetanus Elimination. Geneva: WHO; 2018. Available from: <https://www.who.int/publications/m/item/WHO-IVB-18.15>.

World Health Organization, United Nations Children's Fund. Replacement of TT with Td vaccine for dual protection. Version 28 June 2018. Geneva: WHO; 2018. Available from: [https://cdn.who.int/media/docs/default-source/immunization/who\\_unicef\\_joint\\_communique\\_on\\_tt\\_to\\_td\\_replacement\\_final28june2018.pdf](https://cdn.who.int/media/docs/default-source/immunization/who_unicef_joint_communique_on_tt_to_td_replacement_final28june2018.pdf).

To sustain the elimination of maternal and neonatal tetanus,, the focus is shifting from primarily vaccinating women during pregnancy to a broader strategy. Countries are now advised by PAHO/WHO to strengthen routine vaccination schedules for all children and adolescents, with three doses in the first year of life followed by boosters at designated intervals. This approach ensures long-term individual protection against tetanus and reduces reliance on antenatal care as the sole vaccination avenue.

Achieving and maintaining the elimination of maternal and neonatal tetanus (MNTE) requires a two-pronged approach. First, robust routine vaccination programs must be in place, ensuring everyone receives the complete tetanus vaccination schedule. Second, thorough epidemiological surveillance is crucial to identify any potential resurgence risks and to take quick corrective action. This active monitoring includes assessing vaccination history throughout various health services, like prenatal care, maternity wards, and vaccination campaigns.

To achieve equity in disease prevention, integrating MNTE sustainability plans into each country's multiannual immunization action plan is vital. This comprehensive approach encompasses vaccination programs for all age groups, avoids unnecessary restarts, and regularly evaluates the impact of implemented strategies. Additionally, annual data reviews and periodic evaluations ensure continued progress and address any vulnerabilities in program performance, especially in areas facing challenges. By taking these proactive steps, countries can solidify their MNTE status and contribute to a healthier future for all.

The promotion of clean delivery practices, along with hygienic care after birth, is emphasized to reduce tetanus risks and perinatal mortality causes. The urgent global recommendation is to ensure prompt access to skilled health personnel for all pregnant women and newborns, with specific guidelines for clean delivery practices and umbilical cord care.



**PAHO**



Pan American  
Health  
Organization



World Health  
Organization  
REGIONAL OFFICE FOR THE  
Americas

[www.paho.org](http://www.paho.org)