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Government of the People's Republic of Bangladesh

**National Plan
for AFP and EPI Disease
Surveillance**

Field Guide

1997

**Ministry of Health & Family Welfare
Directorate General of Health Services
Expanded Programme on Immunization**

Government of the People's Republic of Bangladesh
 Directorate General of Health Services
 Expanded Programme on Immunization
 Mohakali, Dhaka 1212

Bangladesh is standing at the threshold of a new era of health: an era in which we speak not of disease reduction, but of eradication; an era in which we speak not of government programs, but of the national efforts of all Bangladeshis; an era in which none of our children will ever again suffer from the crippling and life-threatening ravages of polio.

What has brought us to this threshold? A process which began in 1985 with the intensification of EPI in a stepwise fashion throughout the country, and along with it, a dramatic increase in routine vaccination coverage from <2% in 1985 to more than 80% for most antigens. The process continued when the Government of Bangladesh joined with other countries in the 1988 World Health Assembly and committed itself to eradicate polio and eliminate neonatal tetanus. The final countdown for polio eradication began in 1995, when Bangladesh showed leadership in the region by conducting its first National Immunization Days (NIDs) on March 16 and April 16, 1995. Each of the 3 NIDs we have conducted since 1995 has met with great success in providing supplementary doses of OPV to all children <5 years old regardless of previous vaccination status. These truly historic events would not have been possible without the support of our friends and partners at Rotary International, BASICS and USAID, SIDA, the Government of Japan, the Centers for Disease Control and Prevention, Atlanta, UNICEF, and the World Health Organization. We express to them our heartfelt gratitude, and we look forward to their continued support for polio eradication and other EPI activities.

What will take us into this new era? While achieving and maintaining high vaccination coverage in all parts of Bangladesh is a fundamental necessity for polio eradication and neonatal tetanus elimination, improving surveillance for acute flaccid paralysis (AFP) and neonatal tetanus (NT) is now a critical priority. Improved detection of AFP cases will not only allow us to assess the impact of NIDs and routine immunization, it is critical for the implementation of specific actions to prevent additional cases in a targeted fashion. *Immediate* notification of every case of AFP in children <15 years old is necessary so that medical officers may quickly investigate the case, collect stool specimens within 14 days of paralysis onset, look for additional AFP cases, provide OPV to children <5 years old in the surrounding area, and target that area for annual supplementary immunization campaigns. To eliminate NT, the timely identification of cases is important so that the mother of the case and other child bearing age (CBA) women who live nearby and are eligible to receive TT can be vaccinated at a time when motivation to receive vaccine is high. Data from case response investigations, which will include both case-specific data and local TT coverage estimates, will help identify areas to be targeted for annual supplementary immunization campaigns.

This National Plan for AFP and EPI Disease Surveillance provides specific guidelines on improving notification, investigation and response for cases of AFP, NT and outbreaks of measles. We are grateful for the extensive technical support of the World Health Organization in developing this Field Guide. We thank our other partners including BASICS, USAID, UNICEF, and Rotary International, who also are helping improve AFP and EPI disease surveillance, and appeal to other and potential partners to join us in this surveillance effort which is necessary for the eradication of polio and elimination of NT. Most importantly, we thank you, colleagues and partners, who deserve the greatest credit for bringing us to the threshold of making polio eradication a reality in Bangladesh. Let us all work together to finally make Bangladesh polio-free!

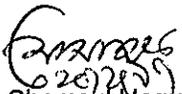

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 February 20, 1997

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1. Introduction

1.1 Surveillance: General Concepts

Disease surveillance may be defined as the ongoing collection *and analysis* of information about cases of a disease as a basis for *planning, implementing, and evaluating* disease prevention and control activities. The type of information collected by disease surveillance consists of the descriptive epidemiologic categories of **person** (age, sex, vaccination status, mortality), **place** (where infected) and **time** (date of symptom onset).

Disease surveillance may be **active or passive**. Surveillance is active when the person collecting data goes out to actively collect information from individuals or by reviewing registries, log books, medical records, etc.. Surveillance is passive when data are received from designated individuals or facilities without actively seeking.

Disease surveillance may be **facility-based or community-based**. Facility-based disease surveillance refers to the collection of data (actively or passively) from fixed facilities regardless of size. Community-based disease surveillance refers to the collection of data from individuals in the community rather than from fixed facilities.

Reliable disease surveillance is essential for public health officials to conduct appropriate measures to prevent disease (e.g., polio outbreak response immunization and neonatal tetanus case response immunization) and identify potential problems in service delivery (e.g., sub-potent vaccine identified in measles outbreak case-control investigations). Moreover, good disease surveillance allows public health officials to plan or measure the impact of specific interventions (e.g., supplementary vaccination campaigns) and determine if a particular disease prevention or control strategy is effective.

**The purpose of collecting data is
to guide decision making for public health actions!**

1.2 Surveillance needs for AFP and other EPI diseases

Bangladesh has an urgent need to improve surveillance for polio and neonatal tetanus. To achieve and confirm **polio eradication** in Bangladesh by the year 2000, *every* case of *Acute Flaccid Paralysis* (AFP) must be **immediately reported and quickly investigated**. The information is needed to:

- ensure that 2 stool specimens (collected 24 hours apart) are obtained within 14 days of paralysis onset;
- provide outbreak response immunization (ORI) to local children when AFP is confirmed;
- identify high risk areas to target supplementary vaccination activities;
- monitor progress toward the polio eradication goal.

Neonatal tetanus (NT) elimination is defined as the reduction of NT incidence to <1 per 1000 live births per year in every district of Bangladesh. The only way to monitor progress toward NT elimination is to identify and clinically confirm NT cases. More importantly, the timely identification of NT cases is the best method to identify and target high risk areas for supplementary immunization and other preventive activities. Several actions should be taken upon notification of a suspected case of NT:

1. clinically confirm the case as NT;
2. vaccinate the mother of the case regardless of previous immunization status;
3. identify and vaccinate additional child-bearing age (CBA) women (15-49 years old) who are eligible for TT vaccine.
4. encourage CBA women to practice clean delivery methods

NT case investigations and response should occur soon after disease onset or death in order to ensure accurate recall of symptoms by the mother and to offer TT vaccine to other eligible women at a time when motivation to receive TT vaccine is high.

Measles control in Bangladesh does not depend on individual case identification and response, but on understanding the evolving epidemiology of measles and modifying vaccination policy to maximize vaccination coverage in those most susceptible to disease and death. Epidemiologic data may be obtained through outbreak investigations and individual case reports from health facilities.

When measles cases occur despite fairly high coverage with measles vaccine, questions frequently arise concerning the usefulness of vaccination. Outbreak investigations which include data on vaccination status of cases and non-cases allow vaccine efficacy to be measured and assure public health staff, civil authorities, and the general public that measles vaccine is effective in preventing measles.

To achieve polio eradication and neonatal tetanus elimination, reliable disease surveillance is not a luxury; it is a necessity!

1.3 Objectives of Field Guide

The Field Guide for the Disease Surveillance Focal Person and Local Surveillance Officer is intended to help health and medical officers to strengthen surveillance for EPI diseases with special emphasis on acute flaccid paralysis (AFP) and neonatal tetanus (NT). Specific guidelines are given on actions that should be taken in response to every reported case of AFP or NT and outbreak of measles. As noted above, identifying, investigating, and responding to individual cases of AFP and NT are critical for their eradication and elimination, respectively. It is hoped that medical officers, supervisors, field workers, and all health and family planning workers will recognize EPI disease surveillance as an integral component of the EPI service delivery which they and their colleagues provide.

2. The importance and use of case definitions

A "case definition" consists of a *standard* set of criteria used to decide if a person has a particular disease. Even though no case definition is likely to correctly diagnose individual cases all of the time, it is extremely important to use *standard* case definitions rather than clinical impressions for reporting disease to minimize interobserver bias and to allow comparison of data from different time periods and geographic areas.

For polio eradication, use of the standard case definition of "acute flaccid paralysis" (AFP) is critical to monitor the ability of the surveillance system to detect cases of polio. In addition to poliovirus, clinical AFP may be caused by Guillain Barré syndrome, transverse myelitis, tumors, hypokalemia, and other conditions. It is important to remember that AFP is not a disease, but a nonspecific syndrome which can have one of several underlying causes.

Once polio is eradicated, a baseline of 1 per 100,000 children <15 years old will continue to develop AFP each year due to other diseases. To certify Bangladesh as polio free, Bangladesh must demonstrate that it could detect polio if it were present. In other words, it must be able to detect at least 1 case of AFP per 100,000 children <15 years old (approximately 550 cases per year in 1997) in the absence of polio. Annex 1 lists the expected number of non-polio AFP cases by district.

2.1 Surveillance case definition for AFP/Polio

I. A **suspected case of AFP** is defined as a child <15 years old with

Acute: rapid evolution from onset of weakness to paralysis

Flaccid: floppy, NOT stiff or spastic

Paralysis: inability to move affected part

in at least one limb or a person of any age in whom polio is suspected by a physician.

Any suspected case of AFP is a PUBLIC HEALTH EMERGENCY!
All suspected AFP cases must be immediately reported!

II. A **confirmed case of AFP** is defined as any suspected AFP case which is confirmed by the investigator (medical officer) to have acute flaccid paralysis and whose paralysis is not present at birth or a result of injury. All confirmed AFP cases must be investigated; this includes

- a completed case investigation form
- 2 stool specimens collected 24 hours apart and within 14 days of paralysis onset
- follow-up exam 60 days or more after paralysis onset.

Stool specimens should be collected from any confirmed AFP case for up to 3 months after paralysis onset.

III. A **confirmed case of polio** is defined as any confirmed AFP case which the National Expert Review Committee determines to be confirmed as *polio* after consideration of all available data including

1. the clinical presentation of the case;
2. the identification of wild poliovirus in stool specimens;
3. the continued presence of paralysis or weakness 60 days or more after paralysis onset.

2.2 Surveillance case definition for neonatal tetanus (NT)

A case of NT is any neonate who

1. Sucks and cries normally during the first 2 (two) of life;
2. Becomes ill at 3 to 28 days of age and develops BOTH
 - a. Inability to suckAND
 - b. Diffuse muscle rigidity (stiffness)

Because a large number of neonatal deaths are caused by NT, any neonatal death occurring in babies 3-28 days old should be suspected as NT and evaluated according to the above criteria. In calculating age, the day of birth is considered the first day of life (i.e., the baby is 1 day old on the day it is born).

2.3 Surveillance case definition for measles

A case of measles is defined as anyone with a fever and rash of at least 3 days duration, and any one of the following 3 symptoms:

- cough
- coryza (runny nose)
- conjunctivitis (red eyes)

An *outbreak* is defined as an increase in the number of expected cases of a given disease in a given area over a given period of time in comparison with similar time periods in preceding years. For practical purposes, an **outbreak of measles will be defined as the occurrence of ≥ 50 cases in any ward (rural or urban) within one month.**

3. Surveillance System Management

Management of disease surveillance must be decentralized. Table 1 lists the designated **disease surveillance focal persons (DSFPs)** and **proposed local surveillance officers (LSOs)** for thanas, major municipalities, and city corporations as determined in consultation with local health authorities at the time of writing of this field guide. The **DSFP** will designate his **LSO**, who ideally should be the medical officer for disease control (MODC) for thanas and MODC & Surveillance for district municipalities. The role of the **DSFP** is to serve as the contact person for notification and response management. The role of the **LSO** is to conduct case or outbreak investigations and case or outbreak response immunization.

Table 1: List of designated DSFPs and LSOs

Location	DSFP	LSO
460 Thanas	THFPO	MODC
Dhaka City Corp	Chief Health Officer	7 Assistant Health Officers
Chittagong City Corp	Chief Health Officer	7 EPI Medical Officers
Rajshahi City Corp	Chief Health Officer	EPI Medical Officer
Khulna City Corp	Chief Health Officer	EPI Medical officer
Municipalities of Narayanganj, Sylhet, Barisal, Chandpur, Rangpur, Gazipur, Narsingdi, Cox's Bazar, Sirajganj, Magura, Satkira, Tongi	Municipal Medical Officer	Municipal Medical Officer
50 Other District Capital Municipalities	Civil Surgeon	Determined by Civil Surgeon (e.g., Medical Officer for Disease Control & Surveillance)

Divisional and city corporation **Disease Surveillance Coordinators (DSCs)** have been designated and trained to assist the **DSFPs** and **LSOs** in case and/or outbreak investigations. **DSCs** include **Divisional Surveillance Officers (DSOs)** for thanas and small municipalities in each division, **Urban Operations Officers (UOOs)** for major municipalities in each division, and **Urban Surveillance Officers (USOs)** for each of the four city corporations.

The **DSFP** will receive reports of cases of AFP and NT from hospitals, private physicians, health and family planning field workers, NGO workers, surveillance volunteers designated as Key Informants (see section 7), or any concerned Bangladeshi citizen. Measles cases will be reported from health facilities and field workers.

4. Polio

4.1 Epidemiology and Clinical Aspects of Polio

4.1.1 Epidemiology of Polio

Poliomyelitis is caused by the infection of the anterior horn cells of the spinal cord by poliovirus. Understanding the epidemiology of poliomyelitis is important for understanding the surveillance methods necessary for its eradication.

The polioviruses

The polioviruses are three related RNA enteroviruses: types 1, 2, and 3. All three types cause paralysis. The poliovirus is rapidly inactivated by heat, chlorine, and ultraviolet light. The most frequent cause of epidemic polio is poliovirus type 1. The most frequent cause of vaccine associated polio is poliovirus type 3.

Reservoir

Poliovirus is found only in human beings; there is no animal reservoir. Although very few studies have documented small amounts of wild poliovirus persisting for several months in very cold water, in tropical climates the virus does not survive long in the environment outside the human body. There is no long-term carrier state.

Occurrence

Poliomyelitis occurs worldwide, except in areas where the virus has been eradicated, such as in the Western Hemisphere and most industrialized countries. Incidence is presently highest in developing countries, especially where immunization coverage is low and sanitation poor. The disease is seasonal, occurring more frequently in summer and early autumn in temperate climates, and during the rainy season in tropical climates. In countries with low OPV3 coverage, most cases of polio occur in children <3 years old, among whom wild poliovirus most commonly circulates. As more and more infants are protected during successive years of vaccination programs, an increasing proportion of confirmed polio cases are likely to be older children.

Communicability

Poliovirus is highly communicable. An infected individual will probably infect all other non-immune persons in a household, especially where sanitation is poor.

Transmission

Transmission is primarily person-to-person via the fecal-oral route, i.e. polio virus multiplies in the intestines and is spread through the feces. The time between infection and onset of minor illness is between 3-8 days; the time between infection and onset of paralysis is 10-21 days. The virus spreads rapidly to non-immune persons and transmission is usually widespread by the time of paralysis onset. The virus is intermittently excreted for 1½ months or more after infection, *with heaviest excretion occurring just prior to the onset of paralysis and during the first two weeks (14 days) after paralysis onset.*

Prevention

The only way to prevent poliomyelitis is to develop immunity against poliovirus. Protective immunity against poliovirus infection develops by either immunization or prior natural infection. However, immunity against one poliovirus type does not protect against other poliovirus types. Acquired natural immunity does not confer protection against all three types of poliovirus, whereas trivalent OPV protects against all 3 types of poliovirus. Immunity following natural infection or by 3 doses of *live attenuated* oral polio vaccine (OPV) is believed to be lifelong. The duration of protective antibody after administration of *inactivated* polio vaccine (IPV) is unknown. Infants born to mothers with high antibody levels against poliovirus are protected for the first several weeks of life.

4.1.2 Clinical Aspects of Polio

Clinical course

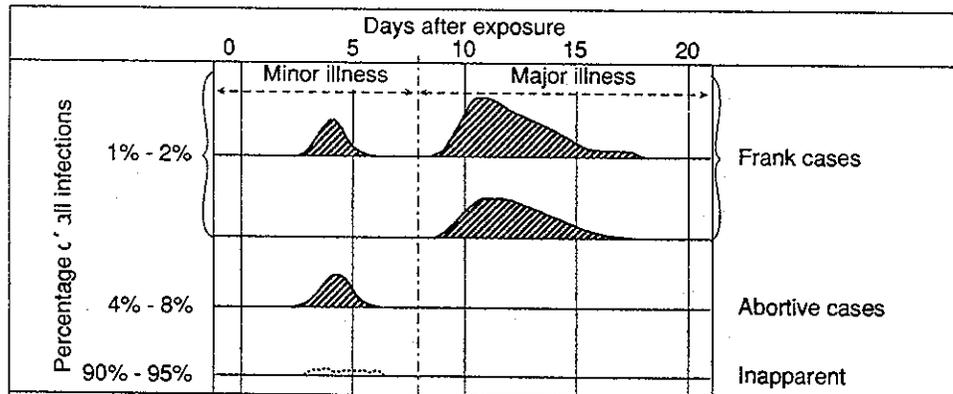
In 90-95% of infected individuals, poliovirus infection is inapparent. "*Abortive polio*" occurs in 4-8% of infections and is characterized by a minor illness with low grade fever, sore throat, vomiting, abdominal pain, loss of appetite, and malaise. Recovery is rapid and complete, and there is no paralysis. It cannot be distinguished from other mild, viral infections. "*Nonparalytic aseptic meningitis*" occurs in 1-2% of infections and is typified by headache and neck, back, and/or leg stiffness several days after a prodrome similar to abortive polio. Cases recover within 2-10 days. Symptoms are clinically indistinguishable from other causes of aseptic meningitis.

"*Paralytic poliomyelitis*" occurs in 0.5-1% of infections. Symptoms often occur in two phases, minor and major, and are often separated by several days without symptoms (figure 1). The minor phase consists of symptoms similar to those of abortive poliomyelitis. The major phase of illness begins with muscle pain, spasms and the return of fever. This is followed by rapid onset of flaccid paralysis which is usually complete within 72 hours (hence the term acute flaccid paralysis [AFP]). There are 3 types of paralytic poliomyelitis:

1. *Spinal paralytic poliomyelitis* results from a lower motor neuron lesion of the anterior horn of spinal cord. It affects the muscles of the legs, arms and/or trunk. Severe cases may develop quadriplegia and paralysis of the trunk, abdominal and thoracic muscles. Spinal paralytic polio, the most common form of paralytic poliomyelitis, accounts for approximately 79% of paralytic cases. The affected muscles are floppy and reflexes are diminished. The sense of pain and touch are normal. The paralysis is often asymmetric, affecting the legs more often than the arms and the proximal part of the extremities more often than the distal part. Residual flaccid paralysis is usually present after 60 days.
2. *Bulbar polio* results from a cranial nerve lesion and may result in respiratory insufficiency and difficulty swallowing, eating and speaking. It accounts for 2% of paralytic cases.
3. *Bulbo-spinal polio* is a combination of spinal paralytic and bulbar polio and accounts for approximately 19% of paralytic cases.

The case fatality rate (CFR, percentage of deaths among cases) for spinal paralytic polio in children is 2-5%; bulbar involvement increases the CFR to 25-75%.

Figure 1: Interval between Exposure to Poliovirus and Symptom Onset



Differential diagnosis

The differential diagnosis of acute flaccid paralysis is principally paralytic poliomyelitis, Guillain-Barré syndrome and transverse myelitis. Traumatic neuritis, encephalitis, meningitis and tumors may also be considered. Distinguishing characteristics of paralytic polio are *asymmetric, flaccid paralysis, fever and muscular pain at onset, rapid progression from weakness to paralysis, intact sensory nerve function, and residual paralysis after 60 days.*

4.1.3 Treatment/Rehabilitation of Children with Polio

Specific therapeutic techniques should be used from the earliest stages of poliomyelitis to minimize muscle paralysis and disability. Treatment should not wait for laboratory confirmation. Treatment is targeted to maintain and restore as much muscle strength as possible in the affected limbs and will benefit the child for the rest of his or her life.

LSOs or other medical officers can play an important role in preventing deformities in children with polio. These children can lead normal lives if they receive proper care and are given opportunities to participate in activities with other children. For children recently infected with polio, the *LSO* or other medical officer should explain to the family that *proper positioning and movement of the affected limbs* several times each day will not only prevent deformities, but can help the child's limbs to get stronger. If polio occurred more than one year ago, positioning and moving of affected limbs will help prevent deformities but unfortunately will not help increase strength. Positioning and movement of the affected limbs should continue throughout the child's lifetime. If substantial deformity is already present, exercises can be tried but may not improve strength in the affected limb. Finally, the *LSO* or other medical officer should emphasize to the family that, as the child grows, he or she should participate in activities with other children in order to develop normally.

The 4 stages of paralytic polio can be described as

Pre-paralytic: This stage is marked by fever, aches, pains and muscle spasms. During this stage, *warm moist cloths should be applied to the painful muscles*. Also, the child's limbs should be positioned to prevent later deformities as explained below.

Paralytic: *Applying warm moist cloths to the muscles and positioning the limbs* is important during this stage. However once muscle pain and tenderness of the muscles have decreased, *the affected limbs should be moved gently* through their full range of motion several times each day.

Recovery: This phase usually occurs three weeks after paralysis onset and may last up to one year. During this phase, *positioning of the limbs and gentle movements of the affected limbs* through their full range of motion should continue several times each day to help increase muscle strength and prevent permanent deformities. The child should also be encouraged to do as much active movement as possible and to do activities that are normal for his/her age.

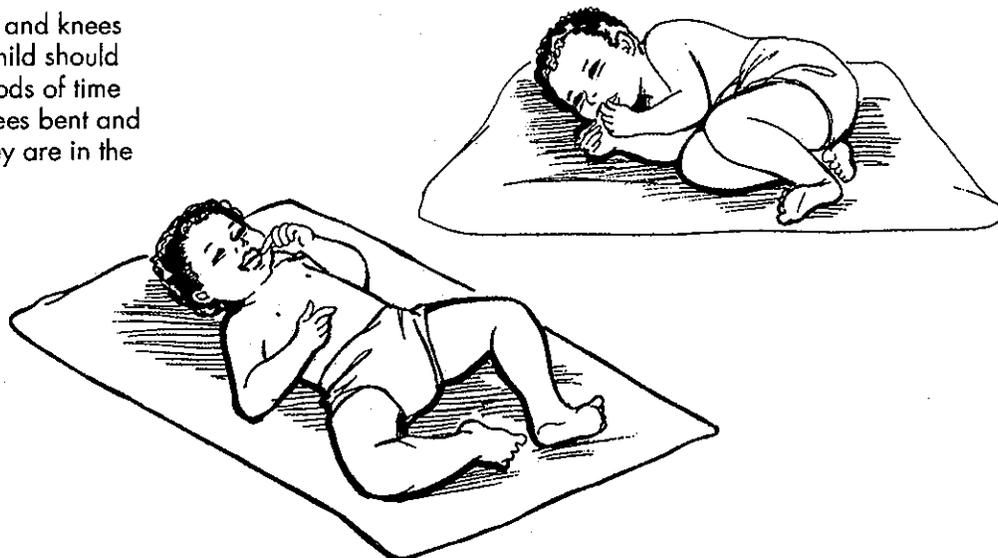
Residual paralysis: After the first year, paralyzed muscles will not become stronger. However the child can learn to use muscles that were not paralyzed to compensate for lost muscle movement. The family should continue to make sure that the body and limbs are positioned correctly, move the limbs regularly and encourage the child to do normal activities for his/her age. Proper positioning and movement of the limbs is a lifelong activity.

Poor Positioning

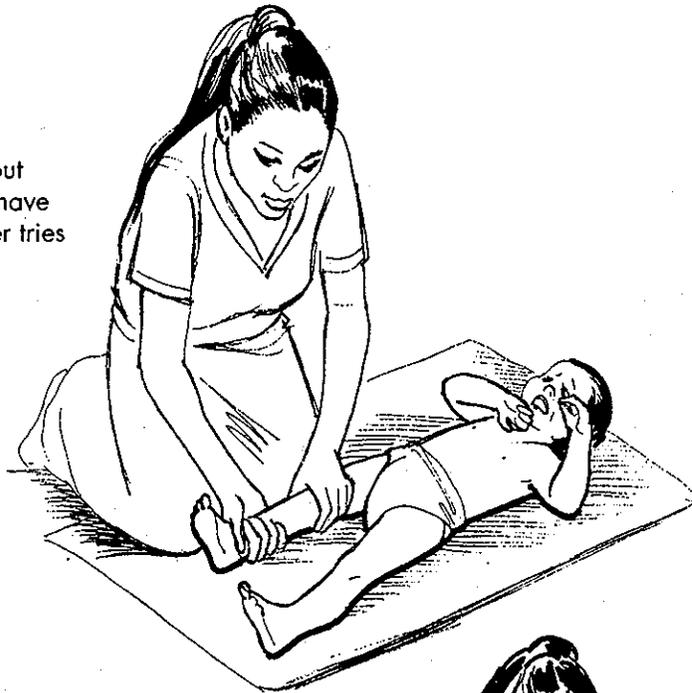
The usual deformities associated with polio are caused by limitations in joint movement and most frequently involve the knee, hip, and foot. Limitation of joint movement usually results from permanent shortening of muscle fibers in unused muscle groups. These limitations may begin as early as the pre-paralytic stage when the muscles are painful. Because the child cries when the limbs are moved, family members often allow the child to rest in a position which seems most comfortable. However, *allowing the child to remain with the hips and knees bent and the foot in a downward position is dangerous*. If the limbs are allowed to remain bent, the child will eventually be unable to straighten them.

Dangerous Positions

If muscles at the hips and knees are paralyzed, the child should not rest for long periods of time with the hips and knees bent and the legs apart, as they are in the pictures below.



After a few weeks without proper care the child may have pain when a family member tries to straighten the knee.



After a few months the knee will not straighten completely.



Gradually the joint movement will become more and more limited. Two or three years later the child's knee may not be able to straighten very much beyond the position used for sitting.



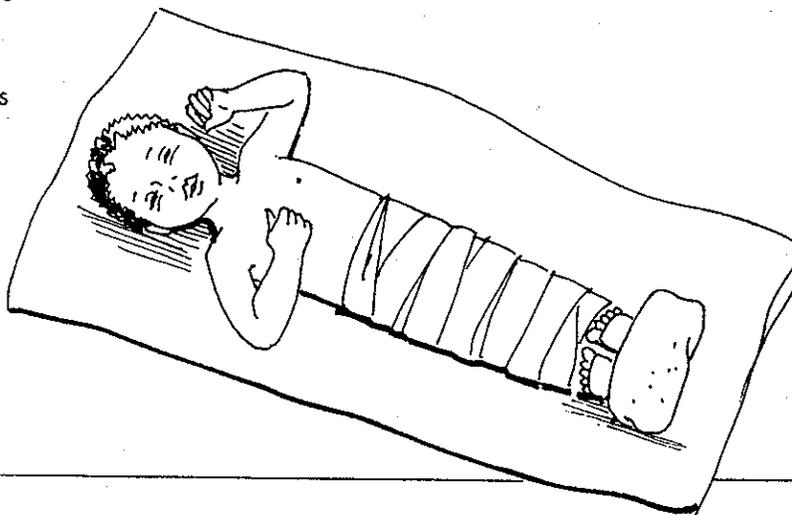
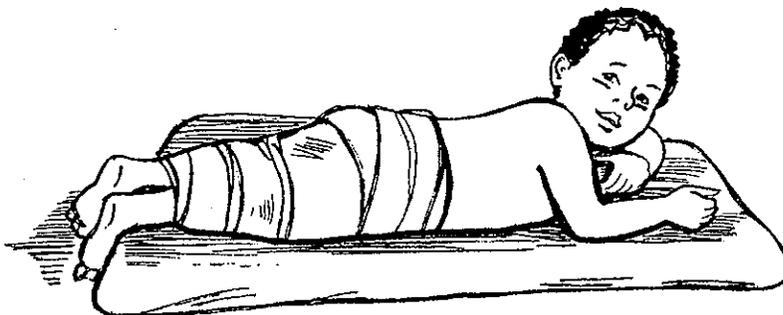
Proper Positioning

To avoid deformities in affected limbs, the child should spend as much time as possible with the trunk, hips, and knees straight and the feet at a right angle with the legs. If the arms are affected, the elbow should be kept straight. Proper positioning should be conducted several times during the day for at least 30 minutes each time, and for as long as possible during the night. Proper positioning should be conducted even if the muscles are painful.

Helpful Positions

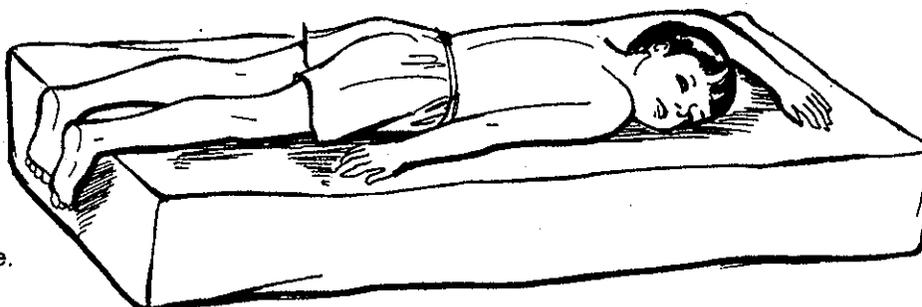
The trunk, hips and knees need to be kept straight. It may be necessary to wrap the legs together, or to put both legs into one leg of a trouser. Do not wrap the child's trunk because he or she may have difficulty breathing. When the child is lying on the back, use sandbags or something firm to keep the feet pointing upward.

Put the child in these positions for brief periods during the day and during the night.



Lying on the stomach

Proper position on the stomach with the trunk, hips and knees straight and the feet hanging over the edge of the mat. The weak arm is placed over the head, as shown in the picture.

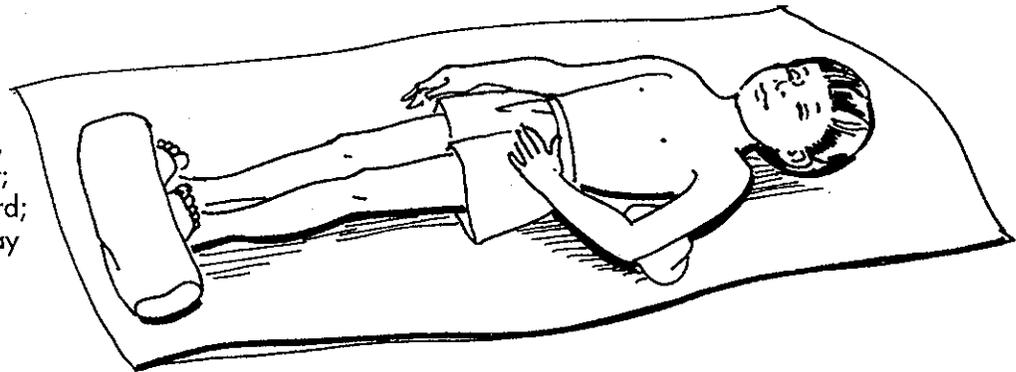


Lying on the back

The back should be flat and straight, and the legs should be straight and close to each other. However, it is unlikely that a child will remain in this position throughout the night.

- To keep a baby's legs straight, the mother can put the legs into one trouser leg, or wrap them together in a straight position. She can put a sandbag next to the child's feet to keep them pointing upward.
- For an older child, splints can be used to keep the feet pointing upward and the knees straight. If the knees are straight, the legs usually remain straight at the hips as well. This also helps to keep the trunk in a straight position.
- If the child has weakness in the arms, they should be kept away from the trunk with the elbows bent and the hands resting on the hips. The picture below shows a child with one weak arm. A small cushion placed under the upper arm keeps pressure off the elbow. A sling can be used to keep the elbow bent.

Proper position on the back with the trunk, hips and knees straight; the feet pointing upward; and the weak arm away from the trunk with the elbow bent.

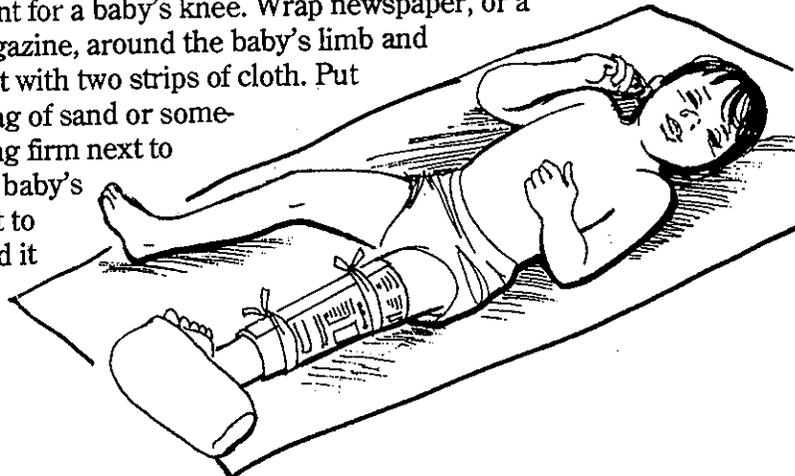


Splints

Splints may be required to maintain the positions if the limb is completely paralyzed, and may be made from plastic or metal, wood or bamboo, cardboard, or even paper.

Paper

You can also use many layers of paper to make a splint for a baby's knee. Wrap newspaper, or a magazine, around the baby's limb and tie it with two strips of cloth. Put a bag of sand or something firm next to the baby's foot to hold it up.

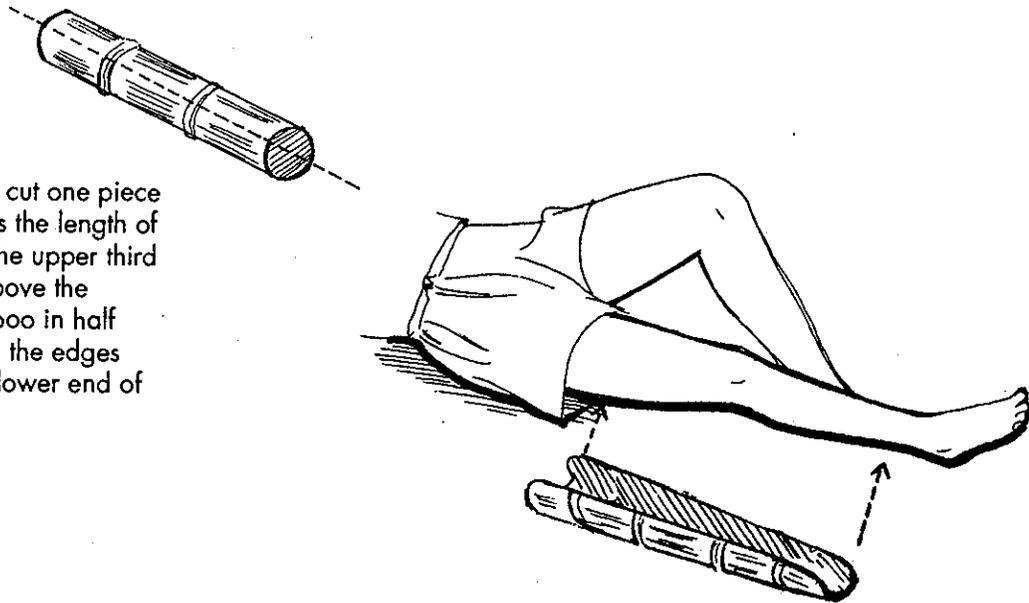


Splints Made from Bamboo

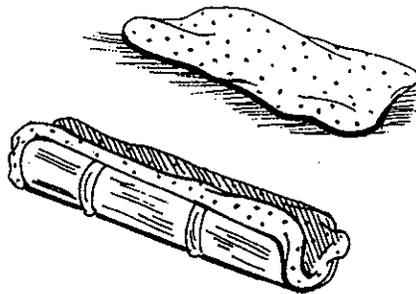
You can use bamboo for knee splints, but not for the foot. If bamboo is used for a knee splint, find another way to support the child's foot in the proper position.

It is necessary to split the bamboo open so that the limb can rest inside the curve. Make certain that the bamboo is wide enough to fit the limb without causing too much pressure on the skin.

For a knee splint, cut one piece of the bamboo that is the length of the child's leg from the upper third of the thigh to just above the ankle. Split the bamboo in half along its length. Trim the edges from the knee to the lower end of the splint.

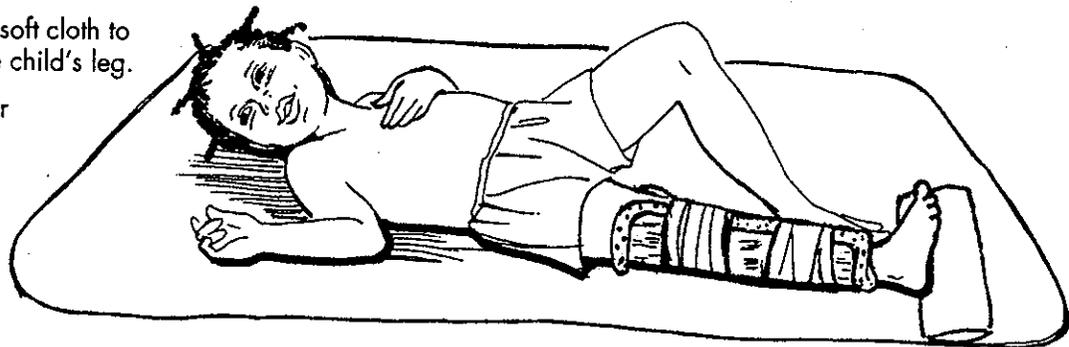


Put soft padding inside the bamboo to protect the child's skin.



Use two strips of soft cloth to tie the splint onto the child's leg.

Use a sandbag or something firm to hold the child's foot up.

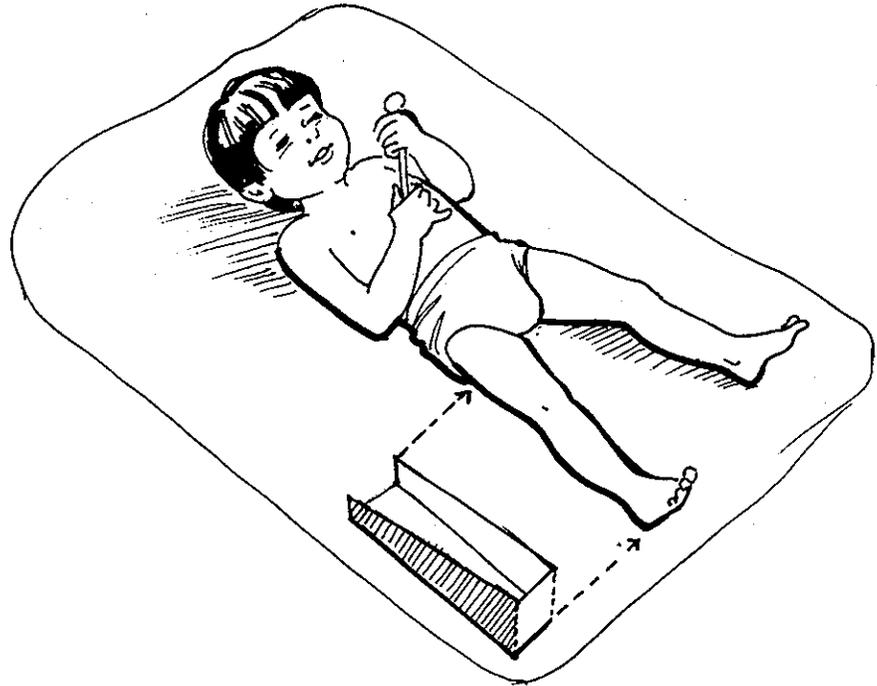


Foot and Knee Splint for Babies

For babies, and for small children, you can make a foot and knee splint using cardboard.

This splint is like the one described for the baby's foot, but the sides of this splint go above the child's knee.

Cut a piece of cardboard twice the length of the child's leg from the upper third of the thigh to the heel, plus the width of the child's foot.



Movement of affected limbs

To increase strength and prevent deformities, the child should *actively* move the affected limb as much as possible, with a family member assisting in completing the movement when active movement is no longer possible. When the family member assists in this *passive* movement of the muscles, he or she should move the limb gently with moderate speed. The movements should never be done quickly. Movements should be repeated 10 times during each exercise session. As noted above, movement of the limbs should not begin until *after* the pre-paralytic stage, when muscle pain has diminished. Annex 2 illustrates 11 exercise movements which can help restore some strength to paralyzed limbs. Exercises 1-6 are for the lower extremities. Exercises 7 through 11 are for the upper extremities. The guidelines on positioning and exercise movements can be found in the WHO publication "Guidelines for the Prevention of Deformities in Polio" (WHO/EPI/POLIO/RHB/91.1).

4.2 AFP Surveillance

4.2.1 AFP Case Notification - facility based

- Passive surveillance

DSFPs should contact all health facilities and physicians in their catchment area and ask them to *immediately* report to them any case of AFP (not only polio), including Guillain Barré syndrome. Periodic follow up visits should be made to ensure accurate reporting. In addition, district, medical college, pediatric, and infectious disease hospitals should record limited data on AFP cases (along with NT and measles cases) on the *Monthly EPI Disease Report Form for Hospitals* (Appendix 1) and submit this form to EPI monthly.

All health facilities and physicians must be informed that **AFP** is an **immediately notifiable** disease. Any health facility or physician who identifies a case of AFP (including Guillain Barré syndrome) must **immediately** notify the **DSFP** who must then contact the **DSC** and then send the **LSO** with the **DSC** to investigate the case within 48 hours of notification and take appropriate actions (see below). If the **DSC** is unavailable, the **LSO** or **DSFP** should conduct the investigation without him. *If the case has already left the hospital and resides outside of the LSO's catchment area, the DSFP or LSO should notify the DSFP corresponding to the AFP case's residence and advise him of the need to investigate the suspected AFP case.* If the case is still in the hospital, the DSFP corresponding to the AFP case's residence should still be advised of the need to conduct additional case finding and outbreak response immunization.

- Active surveillance

For hospitals which are most likely to see cases of **AFP** (i.e., district hospitals, medical college hospitals, pediatric hospitals, and infectious disease hospitals), a health official designated by the **DSFP** must conduct **ACTIVE** surveillance for AFP. Ideally this should be the **LSO**. *These hospitals must be visited every week* to review registries and hospital logs for any case of **AFP** (not just polio) and to contact pediatricians and neurologists to determine if any case of **AFP** (including Guillain Barré Syndrome) <15 years old was seen during the previous week, or since the last visit. If International Classification of Disease (ICD-9 or ICD-10) diagnostic code numbers are used, he should search for ICD numbers 045.0 - 045.9 (polio) and 357.0 (Guillain Barré syndrome). *A Hospital Based Active AFP and NT Surveillance Form* (Appendix 2) should be completed weekly and submitted to the **DSC** monthly.

4.2.2 AFP case notification - community based

DSFPs must take an active role in persuading community members to accept *their* responsibility for eradicating polio in order to protect *their* children. Any community member who identifies a case of AFP should **immediately** notify the **DSFP** either directly or through **field workers, NGO workers, or Key Informants**. **Key Informants** are community volunteers willing to immediately report cases of AFP and NT (including neonatal deaths occurring 3-28 days after birth). Essential data for notification of any suspected case of AFP include case name, age, sex, date of paralysis onset, if case has died, if case is now in the hospital, father's name, and address. *Suspected AFP, NT, and ND Immediate Notification Forms* (Appendix 3) will be distributed to facilitate collection of the needed data.

4.2.3 AFP case investigation and response

Forms needed for suspected AFP case investigations

The forms which should be used to investigate and monitor AFP cases include:

- 1) *Suspected AFP Line Listing Form*: the line listing is used to follow AFP cases during investigation and follow-up (Appendix 4);
- 2) *Investigation Form for Acute Flaccid Paralysis (AFP)*: the investigation form is used to collect important information on each case (Appendix 5);
- 3) *60+ Day Follow Up Examination Form* (Appendix 6).

An example of each form has been attached and is explained at the end of this guide. The steps that are needed to conduct a full AFP case investigation follow.

Stepwise approach to AFP case investigations and response

The DSFP and LSO should follow the following steps after receiving notification of a suspected AFP case.

- | | |
|-------------------|--|
| Step 1: | Assign a case identification number to the AFP case |
| Step 2: | Complete the left side of the “Suspected AFP Line Listing Form” |
| Step 3: | Mobilize all members of the investigation team and prepare for the investigation; contact DSC via the DGHS Control Room at the district and divisional level |
| Step 4: | Investigate the suspected AFP case within 48 hours of report |
| Step 5: | Collect 2 stool specimens and send to National Polio Laboratory in Dhaka together with completed “Investigation Form for Acute Flaccid Paralysis (AFP)”; teach family members proper positioning and exercises for the affected limbs |
| Step 6: | Search for additional cases and conduct outbreak response immunization (ORI) |
| Step 7: | Complete the right side of the “Suspected AFP Line Listing Form” |
| Step 8: | Conduct follow up exam 60-90 days after paralysis onset and complete “60+ Day Follow Up Examination Form” |
| Note well: | 1. Stool specimens should always be collected before ORI to avoid specimen contamination with vaccine virus; |
| | 2. Stool specimens should be obtained even if case was recently immunized with OPV; |
| | 3. Stool specimens should be obtained up to 3 months after paralysis onset; they are not required if paralysis onset occurred >3 months prior to investigation; |
| | 4. A case whose paralysis onset was more than 6 months prior to notification does not require investigation (but <i>should be registered in the “Suspected AFP Line Listing Form”</i>); therefore, <u><i>all AFP cases regardless of date of onset should be reported to the DSFP by field workers or key informants.</i></u> |

Step 1: Assign a “case identification number” to the AFP Case

Every suspected AFP case must have a unique case identification number that can be used to follow-up the case and track the stool samples and other information. The AFP case identification (ID) number (also called the epidemiologic identification [EPID] number) is a unique number which includes a 3 letter country code followed by 4 series of digits: the code number for the district where the case developed paralysis, the code number for the thana, municipality, or city corporation where the case developed paralysis, the year of paralysis onset, and the suspected AFP case serial number for that site during that year. Either the DSFP or LSO will assign a case ID number to the suspected AFP case immediately upon notification.

AFP case ID numbers in Bangladesh consist of the letters BAN followed by 4 sets of numbers:

Example: BAN - ## - ### - ## - ###

The first 3 letters are given to any case occurring in Bangladesh.

The first group of numbers (3 digits) identify the **district where the case became paralyzed**, and the second group of numbers (3 digits) identify the site (thana, municipality, or city corporation) where he became paralyzed. Annex 3 lists the codes of all districts, thanas, municipalities, and city corporations. Every DSFP and LSO must know their district and site code.

The third group of numbers (two digits) indicate the **year in which the case became paralyzed** (e.g. 97, 98, 99, 00, 01, etc.).

The last group of numbers (three digits) identify the **sequential (serial) number of the case** detected at the given site during in the given year.

For example, the case ID number BAN-01-002-97-001 refers to the first AFP case in 1997 occurring in Mireshari thana (Chittagong District) in Bangladesh.

Step 2: Complete the left side of the “Suspected AFP Line Listing Form”

The DSFP or LSO should enter the case ID number on the *Suspected AFP Line Listing Form* (Appendix 4) along with the name, address, age, sex, identification (ID) site (whether the case was identified from a health facility [H] or from the community [C]), date the case was reported to the DSFP, and date of paralysis onset. Additional information will be entered on the right side of the form during or after the investigation. This line listing is used to

- 1) ensure that all cases are fully investigated and have a follow-up exam, and
- 2) monitor the performance of the investigating units.

Step 3: Mobilize all members of the investigation team and prepare for the investigation; contact the DSC via the DGHS Control Room

As soon as the DSFP receives notification of a suspected AFP case, he should contact his LSO and, after assigning a case identification number and registering the relevant data on the *Suspected AFP Line Listing Form*, immediately contact the **Disease Surveillance Coordinator (DSC)** by telephoning the Divisional Director of Health or by notifying the **DGHS Control Room** at the **district level** and providing the line listing data. The **district level Control Room** will in turn

contact the **divisional level Control Room** and the **divisional level Control Room** will contact the **DGHS Control Room in Dhaka**. In this way, the **DSCs** and **EPI HQ** will be immediately informed of all suspected AFP cases and will provide appropriate assistance and follow up. The **DSC** will immediately meet with the **DSFP** and **LSO** and actively participate in every AFP case investigation (described below).

The **LSO** should prepare to bring the following materials with him to the field:

1. *Suspected AFP Line Listing Form* (Appendix 4);
2. 5 copies of the *Investigation Form for Acute Flaccid Paralysis (AFP)* (Appendix 5);
3. a vaccine carrier with ice packs and 200 doses of OPV (i.e., 20 10-dose vials or 10 20-dose vials);
4. 5 stool specimen collection kits or specimen containers;
5. a stool transport carrier (i.e., a vaccine carrier designated for stool specimen transport) with ice packs.

Step 4: Investigate the suspected AFP case within 48 hours

The **LSO** should investigate the suspected AFP case *no later than 48 hours after the report is received by the DSFP*. He should be accompanied by the **DSC** and field worker supervisor or field worker pertaining to the particular site. If the **DSC** does not arrive within 36 hours of notification, the **LSO** should proceed with the investigation without him. If the **LSO** is unavailable, the **DSFP** should investigate the case himself.

The investigating team must go to the hospital or village where the child is located. The investigators should introduce themselves to the child's mother and explain that children with AFP must be examined to see if they have polio. The investigator should then interview the mother and examine the child. The **LSO** should carefully complete the *Investigation Form for Acute Flaccid Paralysis (AFP)* by obtaining the necessary information from the suspected AFP case patient and his/her family and conducting a physical (neurological) examination. Instructions on form completion are given at the end of this *Field Guide* with a sample copy of the form. *Be sure to use the Roman (English) calendar dating system and not the Bangla system*. If the **LSO** verifies that the patient has AFP and that the paralysis was not present at birth and was not a result of injury, the suspected AFP case is reclassified as a **confirmed AFP case** and the rest of the investigation form must be completed; the confirmed AFP case should be brought to the Thana Health Complex (THC) or other facility where 2 (two) stool specimens will be collected and kept cold and family members will be instructed on proper positioning and exercises (Step 5). If convenient, the first stool specimen may be collected in the field and placed in a stool specimen carrier if ice is present. If the family refuses to come to a facility, a specimen carrier with ice packs may be left with the family. Additional case finding and outbreak response immunization (ORI) in the community will be required (Step 6).

If the suspected AFP case patient does *not* have **acute, flaccid paralysis** (i.e., does not meet the standard case definition) or if the paralysis was present at birth or is a result of physical injury, he/she is **not** a confirmed AFP case and should be "discarded". In this event, only the top portion of the investigation form is completed; stool specimens, additional case finding, and ORI are not necessary. "NO" should be entered under the column "Confirmed AFP" on right side of the *Suspected AFP Line Listing Form*, and a suspected diagnosis should be entered. The investigation form should be submitted to the **DSC** and **EPI HQ**:

Step 5. Collect 2 stool specimens and send to National Polio Laboratory in Dhaka together with completed “Investigation Form for Acute Flaccid Paralysis (AFP)”; teach family members proper positioning and exercises for the affected limbs

Stool specimens should be collected at the THC or urban health facility, and parents or other family members should be instructed by the LSO or an assistant on proper positioning (section 4.1.3) and exercises (Annex 3) to reduce the extent of disability in the child. The benefits of bringing the confirmed AFP case patient to a health facility include

1. Stool specimens will be less likely to be contaminated by vaccine virus (OPV) which is given as part of outbreak response immunization;
2. Specimen quality control will be improved and specimens will be kept cold;
3. Disability in the case-patient will be reduced by teaching family members proper positioning and movements of the affected limbs;
4. The community, recognizing the role and value of the THC in caring for children as part of polio eradication, may increase health facility utilization for other diseases.

Stool specimens must not be contaminated by vaccine virus (OPV) used during outbreak response immunization (ORI).

Each confirmed AFP case-patient should submit **2 stool specimens** of approximately **8 grams each (each the size of half of an adult thumb)** collected **24-48 hours apart** which will be labeled and sealed in 2 separate containers, sealed again in 2-3 plastic bags, and kept **continuously cold**. If possible, a separate refrigerator could be designated for these specimens: it is always better to place the stool specimen in a different refrigerator than the one with OPV to avoid the possibility of contamination. If no refrigerator is available, specimens may be kept in stool specimen carriers with periodic changes of ice packs.

Both stool specimens must be sent on ice in a stool specimen carrier by messenger or courier to the National Polio Laboratory (NPL), Bangladesh Institute of Public Health (IPH), Dhaka. The completed *Investigation Form for Acute Flaccid Paralysis (AFP)* (Appendix 5) must be sent to the NPL together with the stool specimens. The stool specimen carrier should be a separate carrier designated exclusively for specimen transport and should not be used for transport of both vaccine and stool specimens. If a vaccine carrier is used, it should be cleaned with an antiseptic before use as a stool specimen carrier. Similarly, if a stool specimen carrier should be cleaned with an antiseptic after each use. The messenger will be given travel and daily allowances by the National Polio Laboratory upon delivery of the specimen and completed *Investigation Form for Acute Flaccid Paralysis (AFP)*. The LSO should keep a copy of the completed *Investigation Form for Acute Flaccid Paralysis (AFP)* for review.

Both stool specimens should arrive to the laboratory in a specimen carrier with icepacks within 72 hours (3 days) of collection.

Step 6: Search for additional cases and conduct outbreak response immunization (ORI)

An active search for additional AFP cases which may have occurred in the previous 6 months must be conducted in the immediate area surrounding the identified case patient. Ask village doctors, fakiraj, pharmacists, homeopaths, etc. and **Key Informants** if they know of additional AFP cases with paralysis onset during the previous 6 months. If any other suspected cases of AFP are found, assign case ID numbers and enter names and other information on the *Suspected AFP Line Listing Form*, conduct case investigations, and collect 2 stool specimens from each case in the same manner as the original case.

After investigating additional cases of suspected AFP, OPV should be administered to children 0-59 months old regardless of vaccination status residing near the confirmed AFP case patient(s) through household visits. The number of children to be vaccinated should be limited to approximately 200. ORI should be conducted only if paralysis onset in the probable case(s) occurred within the previous 3 months. In general, OPV should not be given to the AFP case patient himself because of the potential for contamination of his stool specimens with vaccine virus. However, OPV may be given to him if the family insists and if he has already submitted 2 stool specimens.

7: Complete missing information on “Suspected AFP Line Listing Form”

After the investigation, the LSO should complete the missing data on the *Suspected AFP Line Listing Form* with the date of birth, whether the suspected AFP case is a confirmed AFP case, the date of the investigation, and the dates of stool specimen collection. The LSO will maintain the *Suspected AFP Line Listing Form* throughout the year and should send a copy to the DSC and EPI HQ annually. The DSC will forward the copy to EPI HQ. If no AFP cases were identified during the quarter, the LSO will write “NO CASES REPORTED” on the line listing form and send it to the DSC.

The routine EIS (WER) and EPI-6 Disease Report Forms should continue to be completed and submitted monthly, with an additional copy sent to the DSC. Urban areas should also submit monthly report forms for AFP and NT even if not done previously.

Step 8: Conduct follow up exam 60-90 days after paralysis onset and complete “60+ Day Follow Up Examination Form”

The LSO must follow-up every confirmed case of AFP at 60-90 days after paralysis onset and submit a completed *AFP Follow-Up Examination Form* to the DSC who will forward it to EPI HQ. The LSO should bring with him a copy of the original *Investigation Form for Acute Flaccid Paralysis (AFP)* to help compare neurological exam findings. The purpose of the follow-up exam is to determine if residual paralysis or weakness is present and if it is asymmetric, to look for muscle wasting, to verify that the paralysis is flaccid (floppy), and to confirm that sensation is normal. *Information from the 60+ Day Follow-Up Examination Form is important for the Expert Review Committee to determine final case status.*

If residual paralysis or weakness is present >60 days after the onset of the paralysis, the AFP was likely caused by poliovirus.

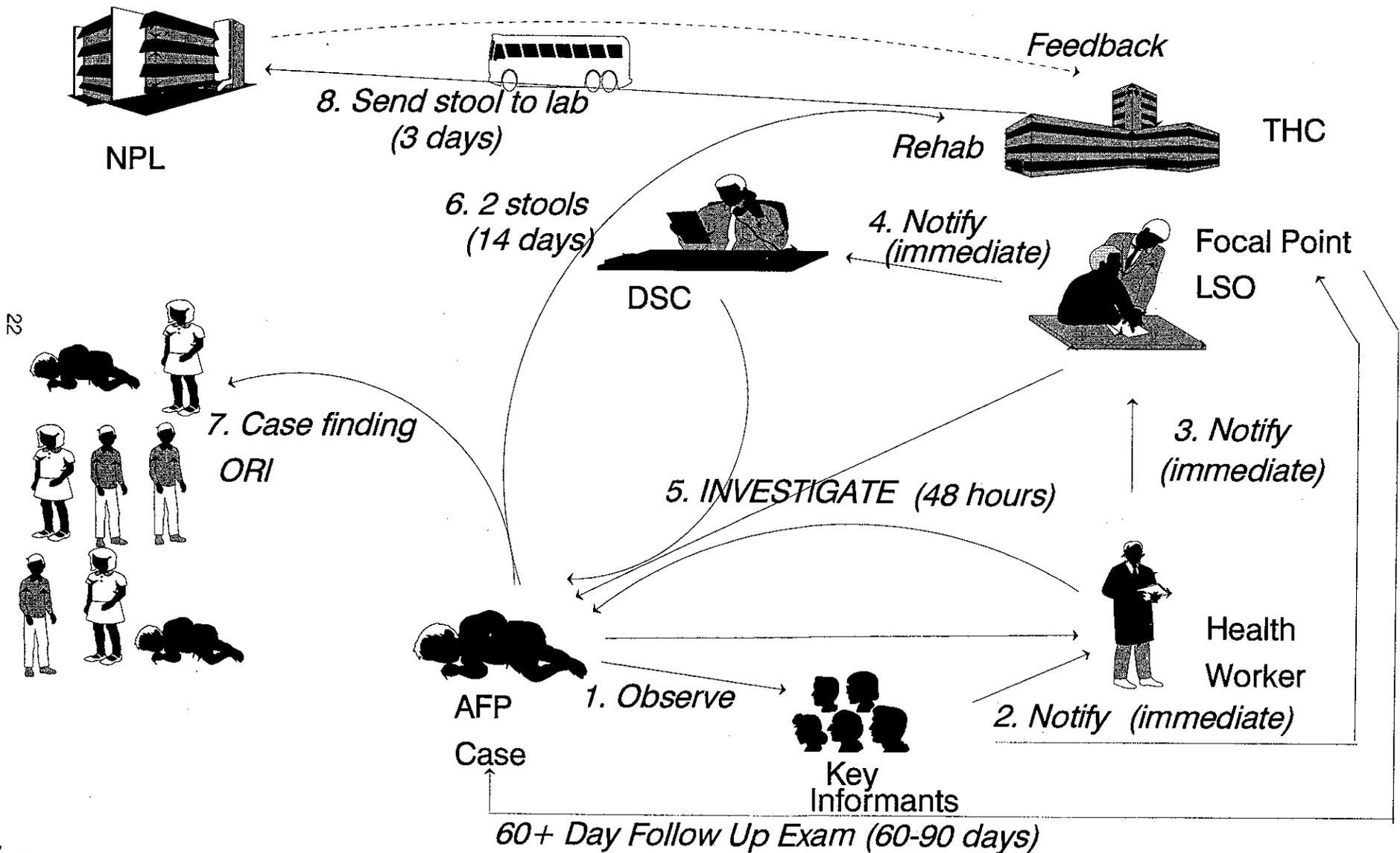
In conducting the follow-up exam, the LSO must examine the child and interview the mother again. First, interview the mother and ask if paralysis or weakness is still present. Second, observe the child to see how he/she moves the affected arm or leg, how well he/she can walk, and if there is atrophy of the muscles. Third, examine the child to see if the paralysis is flaccid and if the sensation is normal.

A complete AFP case investigation includes

- a completed case investigation form
- 2 stool specimens collected 24 hours apart and within 14 days of paralysis onset
- follow-up exam 60- 90 days after paralysis onset.

Ten performance indicators have been developed to measure the quality of AFP surveillance (Annex 4). The indicators are helpful in identifying and correcting specific problems in the surveillance network. The performance indicators are also important because they will be part of the criteria used to certify that Bangladesh is polio-free.

Flowchart for Community-Based AFP Surveillance, Bangladesh



5. Neonatal Tetanus (NT)

5.1 Epidemiology and Clinical Aspects of Neonatal Tetanus

5.1.1 Epidemiology of Neonatal Tetanus

Neonatal tetanus (NT) is a preventable disease which occurs most often in areas where poor hygiene, poverty, misbelief, social stigma and inefficient preventive health services provide ideal conditions for the causative agent, *Clostridium tetani*.

The causative agent

C. tetani is an anaerobic bacteria which forms a spore. The spore is quite resistant to boiling and antiseptics. After germinating under anaerobic conditions, toxins are produced and then released when bacteria lyse. It is the toxins, primarily tetanospasmin, which actually cause the disease.

Reservoir

Tetanus spores are widely distributed in animals and the environment, and may be found in soil, street dust, and in the intestines and feces of horses, sheep, cattle, dogs, cats, rats, guinea pigs, and chickens. Manure may contain large amounts of the organism.

Occurrence

Neonatal tetanus is primarily a problem of developing countries, where clean obstetric services are not available or utilized by many women. Two thirds of developing countries have reached the goal of NT elimination (<1 case per 1000 live births); globally, 87% of the developing world's estimated 438,000 cases are clustered in 25 countries. According to national surveys conducted in 1986 and 1994, Bangladesh has substantially reduced the number of neonatal tetanus deaths. However, NT remains a significant public health problem, causing death in 6 of every 1000 live births. It accounts for approximately 25% of all neonatal deaths.

Neonatal death and neonatal tetanus mortality rates, 1986 and 1994, Bangladesh

Year	TT Coverage (%)	Neonatal Mortality Rate (per 1000 live births)	Neonatal Tetanus Mortality Rate (per 1000 live births)
1986	40%	82	41
1994	90%	25	6

Communicability

Unlike polio and measles, infection occurs from exposure to contaminated material rather than from person-to-person spread. Neonatal tetanus is more of an environmental hazard than a communicable disease.

Transmission

The spores of *C. tetani* enter the body through direct contact. In a newborn baby, the portal of entry is via the umbilical cord. Unclean methods of cutting, tying, or dressing the cord may allow tetanus spores to enter the baby's bloodstream, germinate, and release toxins which cause illness when the baby is 3 to 28 days old (day 1 = day of birth). Most cases of NT occur between 3 and 14 days of life. Seasonality of NT parallels seasonality of births, and appears to increase in incidence during the summer and fall.

Prevention

Neonatal tetanus is preventable by ensuring clean conditions during childbirth and the post partum period and by immunizing mothers with tetanus toxoid (TT) vaccine before or during pregnancy. Ensuring clean delivery is effective at reducing NT incidence. Most developed countries were able to reduce NT incidence to near zero simply by ensuring hygienic child birth. By using a "3 Cleans" strategy (Clean hands, Clean umbilical cord care, Clean delivery surface), China reduced its NT mortality rate by 90% over 25 years. Clean delivery practices have the added advantage of preventing other puerperal infections as well. It is important to remember, however, that if the baby is born without protective antibody from its mother, he or she will remain susceptible to tetanus until receiving at least the 2nd dose of DPT.

Because ensuring the behavioral changes needed to ensure clean deliveries has been difficult in Bangladesh and other developing countries, immunization of mothers against tetanus has been a more reliable method to prevent NT. Antibodies against tetanus which develop in the mother are passively transferred to her unborn baby via the placenta, thereby conferring immunity against tetanus in the neonate. TT vaccine does not confer immunity with the first dose. Protection begins 2 weeks after the second dose, which should be given no earlier than 4 weeks after the first dose. The following table summarizes the recommended schedule for TT and the duration of protection for each dose:

<u>Dose</u>	<u>When given</u>	<u>Duration of Protection</u>
TT1	At first contact after 15th birthday or earlier if pregnant	None
TT2	4 weeks or more after TT1	3 years
TT3	6 months or more after TT2	5 years
TT4	1 year or more after TT3	10 years
TT5	1 year or more after TT4	Throughout child-bearing years

5.1.2 Clinical Aspects of Neonatal Tetanus

In neonates, tetanus almost always presents in the generalized form. Usually, the first sign is inability to suck because of spasm of the jaw muscles, and rarely occurs earlier than 3 days of age. The baby may then cry continuously. The jaw becomes clenched (trismus), thus causing the baby to have the appearance of a smile (*risus sardonius*). Soon after, the baby develops stiffness of the neck and then the entire body, with contraction of the spinal muscles causing the baby to arch its

back (*opisthotonos*). Increasingly violent spasms frequently occur and convulsive fits can result from the slightest stimulus (sound, light, or touch). The baby's breathing becomes difficult, spasms and convulsive fits become more frequent, and death finally occurs in most babies.

The differential diagnosis of tetanus may include bacterial meningitis, encephalitis, rabies, strychnine poisoning, and muscle spasms due to hypocalcemia or hyperventilation. Severe mouth or dental infection may simulate trismus. However, the occurrence of these conditions is rare during the early neonatal period (3-14 days) when NT occurs most frequently.

Treatment of NT frequently requires modalities not generally available in Bangladesh, making prevention the best form of treatment. The principles of treatment of all cases of tetanus are to remove the source of tetanospasmin, to neutralize circulating toxin, and to provide intensive supportive care until tetanospasmin has been metabolized by the body. Antibiotics may also be given. Tetanus antitoxin or Tetanus Immune Globulin should be administered as quickly as possible. Supportive care of the neonate ideally includes endotracheal intubation, use of neuromuscular blocking agents, and assisted ventilation. When facilities are not available, sedatives and muscle relaxants such as chlorpromazine (3 mg every 6 hours), elixir of phenobarbital (10-20 mg every 6 hours), or elixir of mephenesin (130-160 mg every 6 hours) may be given orally. Diazepam may be used to control convulsive fits.

5.2 Neonatal tetanus (NT) Surveillance

5.2.1 NT case notification - facility based

As with AFP, all health facilities and physicians should be informed that **NT is an immediately notifiable disease**. Any health facility or physician which identifies a **clinically confirmed case of NT** should **immediately** notify the **DSFP**. **DSFPs** should contact all health facilities and physicians in their catchment area to encourage immediate reporting of all cases of **clinically confirmed NT**. Periodic follow up visits should be made to ensure accurate reporting. Note that health facilities are **not** asked to report all neonatal deaths. In addition, limited data from NT cases should be routinely collected and recorded on the *Monthly EPI Disease Report Form for Hospitals* (Appendix 1) and submitted to EPI monthly.

Health officials who actively search for AFP cases in major hospitals on a weekly basis should also search for clinically confirmed NT cases. Provision is made to record the number of NT cases per hospital in the *Hospital Based Active AFP and NT Surveillance Form* (Appendix 2). The investigator should always bring with him/her blank *Neonatal Tetanus/Neonatal Death Case Investigation Forms* (Appendix 7) when he or she visits the hospital.

5.2.2 NT case notification - community based

Key informants should be oriented on NT case definitions and requested to **immediately** report to **Field Workers (e.g., HAs, FWAs, urban EPI workers, NGO workers)** any **suspected case of NT, including a neonate who dies at 3-28 days of age** (day of birth = day 1). The Field Worker or NGO worker should notify his/her **supervisor (e.g., AHI, FPI, EPI Supervisor, Sanitary Inspector, or NGO Field Supervisor)** who should in turn evaluate the suspected case (or neonatal death occurring at 3-28 days of age) and, if NT, will contact the **DSFP** who will send the **LSO** to conduct a full investigation and case response immunization (see section 5.2.3). *If the suspected NT case is still alive*, the Field Worker or NGO worker should *immediately report* to the supervisor who should *immediately evaluate* the suspected case, refer the baby to a hospital, and *immediately notify*

the DSFP. If the suspected NT case is dead, the Field Worker or NGO worker should report the case within one week to his/her supervisor (as is routinely done as part of the EIS) who will evaluate the suspected case and, if confirmed, report the case to the DSFP. *The supervisor should collect the field worker's TT Registration Book for the outreach site in which the NT case occurred so that he may use it during the NT case investigation and case response immunization.*

Essential data for notification of any **suspected or clinically confirmed NT case** include case name, age (in days), sex, date of symptom (stiffness) onset, if case has died, if case is now in the hospital, father's name, and address, as written in the *Suspected AFP, NT, and ND Immediate Notification Form* (Appendix 3).

Neonatal death data routinely collected by FWAs are a valuable source of information concerning suspected NT cases. Because any neonatal death occurring between 3 and 28 days of life should be suspected as a NT case, the FWA or her supervisor (either FPI, FWV, or AHI) should verify if the neonatal death resulted from tetanus according to the standard case definition (section 2.2). If the neonate died from tetanus, the **DSFP** must be notified so that a complete investigation and outbreak response may be conducted. *Health and Family Planning wings must work closely together at the ward, union, and thana level to ensure investigation of all suspected NT cases.*

5.2.3 NT case investigation and response

Forms needed for NT case investigations

The only forms used for NT case investigations is the *Neonatal Tetanus/Neonatal Death Case Investigation Form* (Appendix 7). The AHI or other supervisor should request the field worker's TT Registration Book and deliver it to the LSO so it can be brought to the site for registration of additional doses of TT given as part of case response immunization. The AHI or other supervisor should utilize this opportunity to supervise the field worker by reviewing his Registration Books.

Stepwise approach to NT case investigations and response

Investigation and response to NT cases confirmed at facilities or reported by field workers should follow a stepwise approach:

- Step 1:** Mobilize members of the investigation and response team and prepare to bring 5 "NT/ND Case Investigation Forms", the field worker's TT Registration Book, and sufficient supplies to vaccinate 20 child bearing age (CBA) women;
- Step 2:** Interview the mother, evaluate the infant (if living), complete the "NT/ND Case Investigation Form";
- Step 3:** Vaccinate the mother with TT;
- Step 4:** Ask village doctors, pharmacists, homeopaths, etc. and Key Informants if additional cases of NT or ND at 3-28 days of age occurred in the past 6 months;
- Step 5:** Investigate any additional reported cases of NT or ND and vaccinate their mothers;

Step 6: Conduct up to 20 house to house visits in the area surrounding the index case's home to identify CBA women who are eligible to receive TT, recording the findings on the worksheet on the back side of the *NT/ND Case Investigation Form*;

Step 7: Vaccinate eligible CBA women until 2 10-dose vials of TT are exhausted and register the doses in the TT Registration Book; instruct the rest to attend the next scheduled EPI outreach site session

Step 8: Anticipate increased TT vaccination needs for the next scheduled EPI vaccination session

Step 1: Mobilize members of the investigation and response team and prepare to bring 5 "NT/ND Case Investigation Forms", the field worker's TT Registration Book, and sufficient supplies to vaccinate 20 CBA women;

If the suspected NT case is alive, the LSO should *immediately* investigate and examine the suspected case. In city corporations, **NGO Medical Officers** may also lead the NT investigation and response team. If the suspected NT case has died, *immediate* investigation is not needed. The **DSFP** should send the **LSO** or **NGO Medical Officer** and his team to investigate dead NT cases and take appropriate actions *within one week of notification*. It is important to bring the field worker's TT Registration Book during case response immunization to register the TT doses being given and review the field worker's prior performance.

If the Field Worker or his/her supervisor have already brought the suspected NT case to the hospital, or if the suspected NT case was identified in the hospital, the LSO or NGO Medical Officer can investigate the suspected case alone and complete the *Neonatal Tetanus/Neonatal Death Case Investigation Form*. Afterwards, he should assemble the investigation and response team, visit the case's community to search for additional NT cases and vaccinate eligible 15-49 year old women. If the suspected NT case is not in the hospital at the time of notification, the LSO or NGO Medical Officer and his investigation and response team should jointly investigate the suspected case in the field and identify and vaccinate eligible women in the surrounding area.

The **investigation and response team** should consist of at least the **LSO** or **NGO Medical Officer** and the **Field Worker's Supervisor** (e.g., AHI, FWI, NGO supervisor, etc.) and, if needed, the **Field Worker** who reported the case. The **DSC** will not routinely participate in NT investigations but may be contacted if assistance is required.

Preparation for additional case finding and response includes collecting the following materials:

1. 5 *Neonatal Tetanus/Neonatal Death Case Investigation Forms*;
2. Field Worker's TT Registration Book
3. Vaccine carrier with ice packs and 20 doses of TT;
4. Container(s) with 20 pre-sterilized needles and syringes
5. Empty container for used needles and syringes
6. Cotton swabs and antiseptic
7. Extra TT vaccination cards

Note: Needles and syringes should be pre-sterilized and placed in a sterile container at the Thana Health Complex or other health facility prior to case response immunization. The use of sterilizers and cookers as part of case response immunization will likely be too cumbersome and time consuming to vaccinate 20 women in a house to house strategy.

Step 2: Interview the mother, evaluate the baby (if living), complete the "NT/ND Case Investigation Form";

After introducing themselves to the baby's mother and explaining that it is important to determine why the baby became ill or died, the LSO or NGO Medical Officer should then interview the mother and examine the case (if alive), carefully completing the *NT/ND Case Investigation Form*. If the baby is alive and still at home, the mother should be encouraged to bring the baby to a hospital.

Step 3: Vaccinate the mother with TT

If the case is confirmed by the LSO or NGO Medical Officer, the mother should be vaccinated with TT regardless of her vaccination status (unless she was vaccinated after giving birth).

Step 4: Ask village doctors, pharmacists, homeopaths, etc. and Key Informants if additional cases of NT or ND occurred in the past 6 months

The investigator(s) should ask kabiraj, fakiraj, homeopaths, pharmacists, imams, etc. and Key Informants if they know of additional cases of NT or neonatal deaths occurring at 3-28 days of age which may have occurred during the previous 6 months.

Step 5: Investigate any additional reported cases of NT or ND and vaccinate their mothers if indicated;

If additional NT cases or NDs occurring at 3-28 days of age are found, they should be investigated in the same manner as the index (first) case, and their mothers vaccinated with TT if not already vaccinated after their babies developed NT.

Step 6: Conduct up to 20 house to house visits in the area surrounding the index case's home to identify CBA women who are eligible to receive TT, recording the findings on the worksheet on the back side of the *NT/ND Case Investigation Form*

In 1993, the Bangladesh EPI officially changed its recommendation for TT administration to include a 5-dose schedule for all CBA women. However, implementation of the 5-dose schedule has been inconsistent. The presence of an NT case in the community provides an important opportunity to improve TT coverage among CBA women at a time when women are likely to be motivated.

CBA women (15-49 years old) living in the area of the EPI outreach site or other vaccination site nearest to the case patient's residence should be evaluated to determine if they are eligible to receive TT. The investigation team should visit consecutive households near the case household, identify all CBA women within the household, and determine which are eligible for TT vaccination. A woman's eligibility to receive TT vaccine is determined by the number of valid TT doses she has received and the amount of time since her last dose, according to the following schedule:

Number of valid TT doses received	Next eligible TT dose	When eligible
None	TT1	Immediately
TT1	TT2	1 month or more after TT1
TT2	TT3	6 months or more after TT2
TT3	TT4	1 year or more after TT3
TT4	TT5	1 year or more after TT4
TT5	None	Fully protected

The woman's vaccination card should be reviewed to determine her eligibility for TT. If the vaccination card is unavailable, the following questions may be asked:

1. How many total doses of TT have you received?
2. What was the time interval between each dose?
3. When was the last time you received TT vaccine?

A valid TT dose is a dose given after the woman becomes eligible for the dose. For example, a dose of TT given 5 months after TT2 would *not* be a valid TT3 dose (it should be given 6 months or more after TT2).

The investigator should record his data on the worksheet on the back side of the *NT/ND Case Investigation Form* (Appendix 7) for the index NT case and summarize the data in section V on the front side of the form. Any household with a CBA woman should be listed on the worksheet, even if no one is eligible for TT. Households without CBA women should not be listed. Data to be recorded on the worksheet include the household number, the number of CBA women living in the household, the total number of CBA women eligible for TT, a breakup of eligibility by eligible vaccination dose, and the number of women vaccinated (see Appendix 7).

It is important to record the data on the worksheet because the THFPO can then have an idea of the magnitude of under-vaccinated CBA women in the area where the NT case occurred and plan additional supplementary vaccination activities if needed. For example, if the worksheet shows that 40 (80%) of 50 CBA women were eligible for TT2 or TT1, there is likely to be a problem with TT coverage in the ward: the ward should be identified as "high risk area" and can be targeted for supplementary TT vaccination efforts. However, if the worksheet shows that only 5 (10%) of 50 CBA women were eligible for TT2 or TT1, there is no reason to expect a problem with TT coverage and the ward would not be considered a "high risk area". Future NT Campaigns will thus be able to efficiently focus on the wards in greatest need of TT vaccination. A "high risk area" for NT could be defined as a ward with a recent NT case and >20% of CBA women eligible for TT2 or TT1 vaccine as determined by the NT case response investigation.

Step 7: Vaccinate the first 20 eligible CBA women with TT, and instruct the rest to attend the next scheduled EPI outreach site session

The first 20 eligible 15-49 year old women should be vaccinated as they are identified; any additional unvaccinated women should be instructed to attend the next EPI outreach or other routine vaccination session. Be sure to register the TT dose and date in the woman's vaccination card and in the TT Registration Book. If the woman doesn't have a card, one should be supplied.

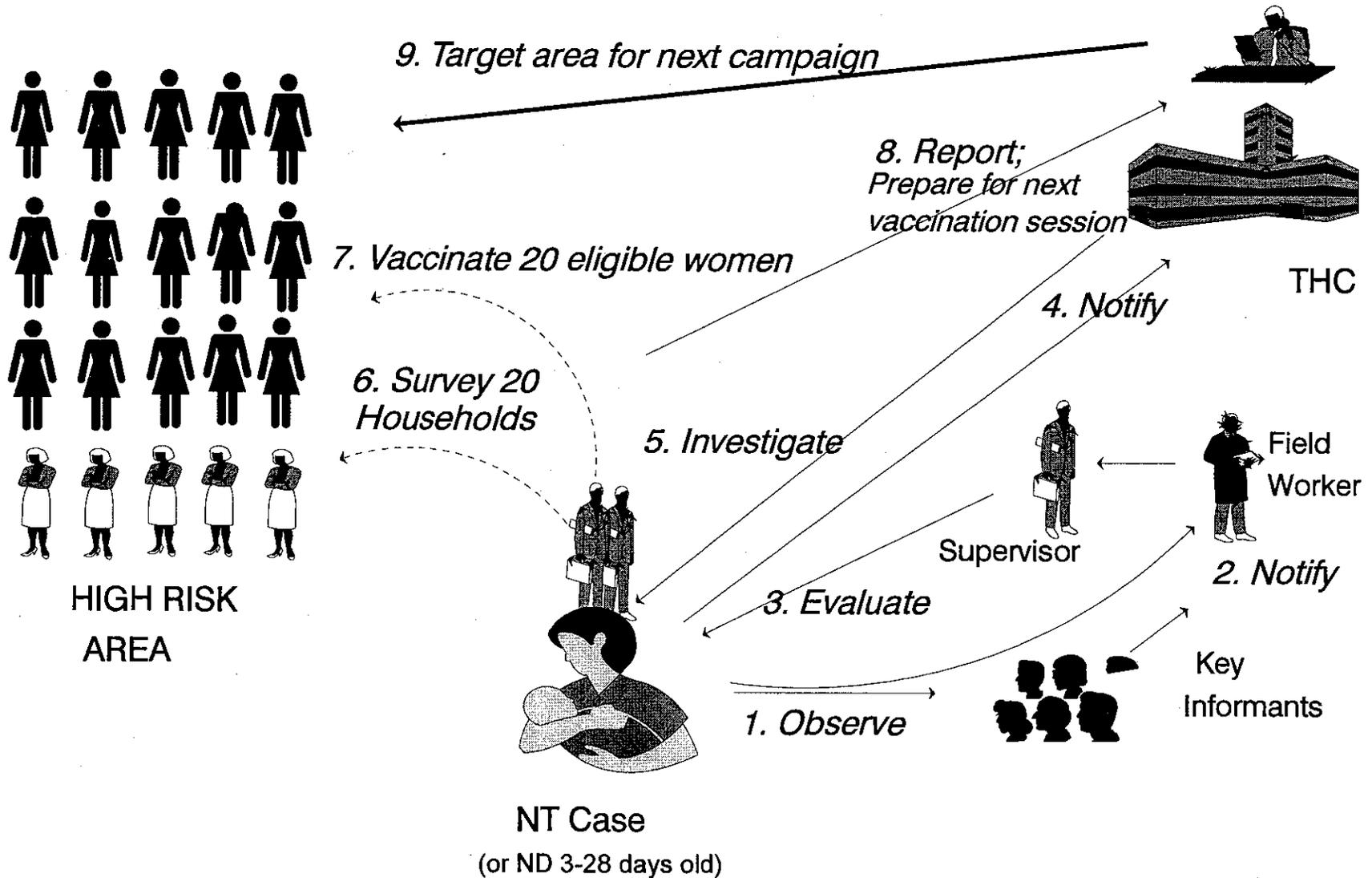
Because a single dose of TT vaccine does not protect against tetanus, it is very important that women receiving their first dose of TT be instructed to return in 1-2 months during the regularly scheduled outreach vaccination session to receive a second dose of TT.

Step 8: Anticipate increased TT vaccination needs on the next scheduled EPI outreach vaccination session

Field workers working at the outreach or other vaccination site should bring additional TT vials, needles, and syringes to the next scheduled vaccination session in anticipation of the increased demand for TT following the news of the neonatal tetanus case or death and investigation.

All completed investigation forms should be submitted on a monthly basis with the EPI 6 Disease Reports to the civil surgeon, DSC, and EPI HQ. The DSC and EPI will analyze the data and provide periodic feedback.

Flowchart for Community-Based NT (and ND) Surveillance, Bangladesh



6. Measles

6.1 Epidemiology and Clinical Aspects of Measles

6.1.1 Epidemiology of Measles

In Bangladesh, measles is often not considered a serious disease by the physicians, health workers, or the public. However, in many developing countries where children are affected by protein-calorie malnutrition, measles is an important cause of death and disability in young children, and should therefore be prevented.

The Causative Agent

Measles virus is a member of the genus *Morbillivirus* of the family Paramyxoviridae. Measles virus is rapidly inactivated by heat, light, acidic pH, ether and trypsin, is destroyed in the stomach and has a short survival time (<2 hours) in air, or on contaminated objects and surfaces.

Reservoir

Measles is a human disease. There is no known animal reservoir and an asymptomatic carrier state has not been documented.

Communicability

Measles is highly communicable with >90% secondary attack rates among susceptible persons. Measles is contagious from the onset of prodrome (4 days before rash onset) to 4 days after rash onset. The vaccine virus has not been shown to be communicable.

Transmission

Transmission is usually via the respiratory route by droplet spread. However, direct contact with nasal or throat secretions of infected persons and less commonly with articles freshly soiled with nose and throat secretions may also result in infection. Measles is one of the most highly communicable infectious diseases.

Susceptibility and Resistance

All persons who have not had measles or who have not been successfully immunized are susceptible. Acquired immunity after infection is life-long. Infants born to mothers who have had measles are immune for periods varying from 3-14 months after birth, depending on the amount of residual maternal antibody at the time of pregnancy and the rate of antibody degradation in the newborn child. The presence of maternal antibody interferes with the infant's immunologic response to measles vaccine.

Occurrence

Without immunization, virtually all children contract measles. WHO estimates that approximately 1.4 million children worldwide die from measles every year. Baseline (pre-immunization) measles data in Bangladesh from a 1984 EPI study found that nearly 2.6 million cases of measles occurred annually in Bangladesh among children 0-4 years of age, with a case fatality rate

of 1.74%¹. Thus, there were an estimated 45,240 measles deaths among children 0-4 years (i.e., <59 months) in 1984. Routine surveillance data from the Epidemiology Information System (EIS) in 1995 found that 38.5% of all reported measles cases occur in children <12 months old. The following data were reported for 1995:

Number of measles cases reported by EIS, by age group, Bangladesh 1995

<u>Age Group</u>	<u>No. Cases (%)</u>
<1 month	121 (2.6%)
1-11 months	1,649 (35.9%)
1-4 years	1,327 (28.9%)
5-14 years	1,050 (22.9%)
15+ years	442 (9.6%)

The World Summit for Children in 1990 adopted the target of reducing by 90% the number of measles cases and by 95% the number of measles deaths among children <5 years old compared to pre-immunization levels. To reach this objective, each thana or district would require an annual incidence rate less than 22 measles cases per 10,000 total population and a case fatality rate less than 1 percent.

Pre-immunization and 1990 World Summit for Children targets for measles cases and deaths

	Annual Number of Measles Cases	Case fatality rate	Annual Number of Measles Deaths
1984 (Pre-immunization)	2.6 million	1.74%	45,240
1994 (estimated)*	1-1.2 million	-do-	17,000-20,400
Target	260,000		2,260

* Assumes average coverage of 60% in children <12 months over previous 5 years, additional 20% coverage in children 12-23 months old, vaccine efficacy of 80%, and that 80% of unprotected children would develop measles by their 5th birthday

Prevention

Live attenuated measles vaccine is the agent of choice and is indicated for all individuals susceptible to measles. A single injection of measles vaccine induces active immunity in more than 80% of infants vaccinated at 9 months by producing a mild or inapparent noncommunicable infection. The recommended age for measles vaccination in Bangladesh is from 9 to 11 months (i.e., from 9 months to before the first birthday). Mild fever and fleeting rash may occur in a small percentage of the children 6-11 days after vaccination. High rates of population immunity $\geq 95\%$ are needed to limit community transmission.

¹The Public Health Importance of Measles in Bangladesh, Expanded Programme on Immunizations, Directorate General of Health Services, MOHFW, 1984

Patients with immune deficiency diseases or suppressed immune responses from leukemia, lymphoma or generalized malignancy or from therapy with corticosteroids, irradiation, alkylating drugs or anti-metabolites should not receive any live vaccine virus (including measles vaccine). Infection with HIV or clinical AIDS, however is not a contraindication because of the greater risk of severe measles in such individuals. Patients with a *high* fever or *severe* acute illness should have vaccination deferred until recovery. *Minor* illnesses, such as diarrhoea or respiratory infections are **not** a contraindication to vaccination. Malnourished children should *certainly* be given measles vaccine as they are at greater risk for infection and death.

6.1.2 Clinical Aspects of Measles

Measles is a systemic infection. The primary site of infection is the respiratory epithelium of the nasopharynx. There is replication in nasopharynx and regional lymph nodes with primary viremia 2-3 days after exposure. Secondary viremia appears 5-7 days after exposure with spread to tissues.

Incubation Period

About 10 days, varying from 7 to 18 days from exposure to onset of fever; the time period between exposure and rash is approximately 14 days but may vary from 11-22 days.

Prodrome

The prodrome lasts 2-4 days (range 1-7 days). It is characterized by fever, which increases in stepwise fashion, often reaching as high as 103-105°F. This is followed by the onset of cough, coryza (runny nose), and/or conjunctivitis (the 3 C's). Koplik's spots, which are found in buccal mucous membrane, are pathognomonic for measles. They occur from 1-2 days before rash onset to 1-2 days after rash onset and appear as punctate blue-white spots on a bright red background of buccal mucosa.

Rash

The measles rash is a maculopapular eruption which usually lasts 5-6 days. It begins at the hairline of the scalp, then involves the face and upper neck, and gradually proceeds downward and outward, reaching hands and feet by the 3rd day after rash onset. The maculopapular lesions are generally discrete, but may become confluent, particularly on the upper body. Fine desquamation occurs over more severely involved areas. The rash fades in the same order that it appears, from head to feet.

Other symptoms and signs

Other symptoms and signs of measles include anorexia, diarrhoea (specially in infants), and generalized lymphadenopathy.

Complications

Approximately 30% of reported measles cases have one or more complications. Complications of measles are more common among children <5 and adults >20 years of age. Common complications are otitis media, pneumonia, and severe diarrhoea, and may result from either viral replication or viral or bacterial superinfection. Measles is a more severe disease in the

very young and in malnourished children, in whom it may be associated with hemorrhagic rash, protein-losing enteropathy, mouth sores, dehydration, diarrhea, blindness and severe skin infections. In children who are borderline nourished, measles often precipitates acute kwashiorkor and exacerbates vitamin A deficiency, leading to xerophthalmia, keratomalacia, and blindness. Measles encephalitis occurs in approximately one in every 1,000 infected children. Subacute sclerosing panencephalitis (SSPE) develops rarely and may occur several years after infection.

Deaths from measles complications may be acute (within one month) or delayed (1-12 months after infection). Case fatality rates are highest in infants and progressively decrease with age throughout childhood. Diarrhea and pneumonia are the most common cause of death.

Differential Diagnosis

The differential diagnosis of measles includes rubella, scarlet fever, roseola, erythema infectiosum (fifth disease), enteroviral infections, Kawasaki syndrome, and others. Common causes of rash among the poor such as scabies may be mistaken for measles if the child also develops fever. Serologic methods exist to confirm clinical diagnoses but are not routinely available in Bangladesh at this time.

Treatment

There is no specific treatment for measles itself. However, complications from measles can be limited by giving vitamin A supplementation to children who may be vitamin A deficient and by appropriately managing cases of pneumonia and diarrhea using WHO-recommended methods. Vitamin A is important to help support intestinal and respiratory epithelial integrity and prevent post-measles pneumonia, severe diarrhea, and blindness. Parents should not be discouraged from bringing their children to health facilities once the period of communicability has passed (≥ 5 days after rash onset).

Vitamin A Treatment Schedule for Children with Measles

Age	Dose	Interval
<6 months	50,000 IU	Days 1 and 2
6-11 months	100,000 IU	Days 1 and 2
≥ 12 months	200,000 IU	Days 1 and 2

Children with ocular complications should receive a 3rd dose 6 months after the second dose.

6.2 Measles Surveillance

6.2.1 Measles case notification - facility based

District, Medical College, Infectious Disease, and Pediatric Hospitals should report all inpatient and outpatient (clinic) measles case data on the *Monthly EPI Disease Report Form for Hospitals* (Appendix 1) and submit it to EPI HQ monthly. All health facilities should be reminded that all cases of measles seen at health facilities should also be reported through the Monthly Disease Report.

6.2.2 Measles case notification - community based

Measles cases in the community will be identified in the current manner by field health staff. The **HA, AHI, HI, and FPDS** should monitor case reports by ward to identify outbreaks *involving 50 or more cases from one ward (rural or urban) in a month*. If an outbreak has been identified, the **DSC** should be contacted for assistance in outbreak investigation. The reason for limiting investigations to outbreaks involving 50 or more persons is because vaccine effectiveness determinations from case-control studies require a fairly large number of cases and controls to be precise.

Key Informants and teachers will be asked to report suspected measles outbreaks (but not individual cases). These reports should be evaluated by Field Worker Supervisors (**AHI, FPI, EPI Supervisor, Sanitary Inspector, or NGO Field Supervisor**) and referred to the DSFP for investigation if appropriate.

6.2.3 Measles Outbreak Investigations

Outbreaks provide an opportunity for the medical officer to obtain epidemiologic data regarding measles which will be used to guide future vaccination initiatives and to determine if there may be a problem with vaccine effectiveness. Measles outbreak response vaccination is not thought to be an effective means of preventing additional outbreak-associated cases (except in well-identified high risk populations) as most children have already been infected before the vaccination team takes action.

When a measles outbreak occurs, the **FPDS** or **LSO** should contact the **DSC** to assist in the investigation. The **LSO** should take 20 *Measles Outbreak Investigation Forms* (Appendix 8), a bottle of vitamin A capsules, and a pair of scissors to the site of the outbreak. Every case of measles in the community, regardless of age, which occurred during the outbreak should be included in the line listing on the *Measles Outbreak Investigation Form*. All data items on the line listing should be completed.

In addition to listing all of the measles cases, a rapid case-control study should be performed to evaluate vaccine effectiveness (VE). To determine VE, it is necessary to collect data on a comparison group which did not have measles (i.e., controls). Controls should be 9 months to 5 years old (i.e., up to 71 months old). The total number of controls should be at least twice the number of cases from the same age group (9 months-5 years), but may be greater. Controls should *not* be matched to cases! Controls should be taken from both households with cases *and* without cases. To avoid selection bias and to make control selection easier, all children 9 months to 5 years old from the same household should be included in the study. For example, if the investigator identifies a 2 year old case in house no. 1, and house no. 1 also contains a 3 year old and 5 year old child who were not cases, both the 3 and 5 year old children should be included as controls and data should be recorded from all 3 children. If house no. 2 has 3 children who are 9 months-5 years old

and did not have measles, data should be recorded from all 3 "controls". Note that controls may be listed on the *Measles Outbreak Investigation Form* consecutively with cases or group-wise after listing the cases. Be sure to identify whether the child is a case or control in the first column of the form.

Data to be collected from cases include demographic factors, vaccination status, symptoms, vitamin A administration, and complications (including death). Data collected from controls would *not* include symptoms, vitamin A administration, or complications. All data should be listed on the *Measles Outbreak Investigation Form* (Appendix 8). Determination of VE is based on data analysis from cases and controls between 9 and 59 months old only because children in this age group had an equal chance of being vaccinated (and therefore protected) against measles. VE can be calculated by using a 2x2 table as follows:

		MEASLES CASE?		
		YES (Case)	NO (Control)	
VACCINATED?	YES	a	b	a+b
	NO	c	d	c+d
		a+c	b+d	a+b+c+d=T

a = all vaccinated cases
c = all unvaccinated cases

b = all vaccinated controls
d = all unvaccinated controls

Odds ratio = ad/cb
VE = 1 - odds ratio

Completed *Measles Outbreak Investigation Forms* should be submitted to the DSC and EPI HQ for review.

7. Orientation of Field Workers & Key Informants

Field workers, NGO workers, and Key Informants are the foundation of community based disease surveillance, because it is they who will motivate the community and notify the **DSFP** of cases of AFP and NT. Consequently, their orientation and supervision is a critical component of disease surveillance.

The **DSFP** and **LSO** should first orient **Field Workers** from both the Health wing (e.g., HAs, AHIs, HIs, SIs, MAs, municipal vaccinators, and EPI Supervisors) and Family Planning wing (e.g., FWAs, FWVs, FPIs,) concerning the importance of immediate AFP and NT notification and the use of proper case definitions during a special orientation session at the thana level. **NGO Managers or Medical Officers** should similarly orient their workers. **AFP and EPI Disease Surveillance Field Guides for Teachers** should be distributed at these orientation sessions. The responsibilities of the field workers are to

1. **Identify and *immediately* report** any child <15 years old with **AFP** to the Disease Surveillance Focal Person;
2. **Identify and *immediately* report *live* NT cases** to your supervisor (AHI, FPI, EPI Supervisor, Sanitary Inspector, NGO Supervisor, etc.);
3. **Report any deaths occurring in babies 3-28 days old** to supervisors **every week**;
4. **Report measles cases or outbreaks** to supervisors **every week** (as is currently done through EIS (WER));
5. **Identify potential Key Informants** to help in the identification and reporting of suspected cases of AFP, NT (including neonatal deaths 3-28 days old), and outbreaks of measles;
6. **Maintain regular weekly communication with the Key Informants and supervisors**;
7. **Educate and motivate the community**, through meetings (e.g., during Friday prayer) or individual contact on the importance of immediately reporting suspected cases of AFP or NT (including neonatal deaths at 3-28 days of age) to the Key Informants or Field Workers;
8. **Assist the medical officer** when needed in identifying the house of suspected cases, investigating the case, and conducting outbreak response immunization;

The **DSFP** and **LSO**, with the assistance of **Field Workers** and **NGO workers**, should identify at least 5 **Key Informants** from the catchment area of each outreach site or urban mahalla, assess their willingness to participate in polio eradication and NT elimination, and provide a 3 hour orientation regarding the mechanism and importance of AFP and NT case notification. **AFP and EPI Disease Surveillance Field Guides for Key Informants** should be distributed to key informants at these orientation sessions. **Key Informants** may form a “**community surveillance committee**” and should act as liaisons between the community and health and family planning staff. Wall charts and other materials will be given to Key Informants to encourage participation and facilitate case identification.

Responsibilities of Key Informants will be to

1. Understand how to identify **acute flaccid paralysis (AFP), neonatal tetanus (NT), and measles**;
2. **Immediately** report any case of suspected AFP or NT (including any baby who dies when 3-28 days old) or outbreak of measles to the Field Worker; if possible, AFP cases should be reported directly to the DSFP; data to report on AFP and NT cases should include case name, age, sex, date of symptom onset, if case has died, if case is now in the hospital, father's name, address
3. Tell community members through individual contact or group meetings that to prevent additional cases of polio and NT in their community, **any case of suspected AFP and NT** (including any baby who dies when 3-28 days old) **must be immediately reported to you so that you may inform the appropriate health officials** and actions may be taken to protect other children;
4. **Tell parents that paralyzed limbs can regain some (but not full) strength** if exercises begin early after paralysis onset;
5. **Tell parents to bring children with AFP or NT to the Thana Health Complex or hospital for proper diagnosis and treatment**;
6. **Identify and train additional Key Informants.**

Likely candidates for Key Informants would include but not be limited to

1. Homeopaths
2. Kabiraj
3. Village Health Volunteers
4. NID Volunteers
5. Outreach site care takers
6. ORS and/or contraceptive depot holders
7. Pharmacists
8. Traditional Birth Attendants (TBAs)
9. Imams
10. Union Council members/Ward Commissioners
11. Social club or group members
12. Income generating group members
13. Students and Teachers
14. Mother's group leaders
15. Chowkidars/Dafadars
16. Ansar/VDP members
17. General Practitioners

Health and family planning workers should visit key informants weekly to remind them about the importance of notifying cases of AFP and NT or neonatal deaths occurring at 3-28 days of age and ask them about possible cases.

8. Role of schools in polio eradication and NT elimination

Primary and secondary school children, as a cross-section of their community, can play an important role as a media of communication to and from the community. Aspects of EPI diseases have already been included in primary and secondary school curricula since 1990. The roles of teachers in polio eradication and NT elimination are to

1. Understand how to identify acute flaccid paralysis (AFP), neonatal tetanus (NT), and measles;
2. Teach students how to identify AFP and neonatal tetanus (including deaths in babies 3-28 days old) and to **immediately report** to the Field Worker or to you any suspected cases; students can report AFP cases directly to the FPDS;
3. **Immediately report any case of suspected AFP to the Disease Surveillance Focal Point**; report a suspected case of NT (including deaths in babies 3-28 days old) to the Field Worker or his supervisor (AHI, FPI, EPI Supervisor, NGO Supervisor) within one week;
4. Teach students that **children with polio can be helped** by proper positioning and moving the affected limbs if this begins soon after paralysis begins;
5. Teach students that **any child with recent onset AFP or NT should be brought to the thana health complex or hospital** for positive diagnosis and treatment;
6. Ask students to share with family and friends what they have learned about AFP and NT in school.

In addition to directives by the Ministry of Education, personal requests to teachers and school headmasters by the DSFPs and others may help encourage them to accept their roles in polio eradication and NT elimination. The following table lists others who can request teachers to cooperate:

Geographic Area	Intermediate Contact
Rural thanas; small municipalities	Thana Nirbahi Officer (TNO) Thana Primary Education Officer Junior Health Education Officer Senior Health Education Officer
Large Municipalities	Junior Health Education Officer Senior Health Education Officer School Health Medical Officers
City Corporations	School Health Medical Officers Thana Primary Education Officers School Inspectors

Teachers and school headmasters should be given *Suspected AFP, NT and ND Immediate Notification Forms* (Appendix 3) to assist in the collection of appropriate information on each case.

AFP and EPI Disease Surveillance Field Guides for Teachers should be distributed through the Ministry of Education or through the intermediate contacts listed above. Teachers receiving reports from their students should **immediately** notify the **DSFP** of any suspected AFP case or living NT cases. NT cases which have died should be reported to the Field Worker within one week. Private and NGO-administered schools should also be included in school-based AFP and NT surveillance.

9. Summary

The eradication of polio and elimination of neonatal tetanus from Bangladesh are a national effort requiring the participation of all Bangladeshis. Surveillance is the tool which will make polio eradication and neonatal tetanus elimination a reality. The Disease Surveillance Focal Person and Local Surveillance Officer are critical components of the national surveillance network. Your dedication and enthusiasm will determine whether Bangladesh conquers these diseases or whether thousands of children will continue to become paralyzed or die needlessly each year. Please help Bangladesh eliminate neonatal tetanus; please help make Bangladesh polio-free.

Annex 1: Expected Number of Non-Polio AFP Cases, by District, 1997

District	Estimated Total Pop (1997)	<15 Pop (1997)	Expected Annual Number of Non-Polio AFP Cases	District	Estimated Total Pop (1997)	<15 Pop (1997)	Expected Annual Number of Non-Polio AFP Cases
CHITTAGONG	5,967,800	2,694,500	26	DHAKA	6,580,300	2,971,000	29
COX'S BAZAR	1,599,300	722,100	7	MANIKGANJ	1,325,000	598,200	5
BANDARBAN	259,800	117,300	1	NARSHINGDI	1,861,700	840,600	8
RANGAMATI	452,300	204,200	2	NARAYANGANJ	1,977,400	892,800	8
KHAGRACHARI	385,900	174,200	1	MUNSHIGANJ	1,339,100	604,600	6
NOAKHALI	2,498,300	1,128,000	11	GAZIPUR	1,827,200	825,000	8
FENI	1,235,800	558,000	5	TANGAIL	3,383,200	1,527,500	15
LAXMIPUR	1,478,800	667,700	6	FARIDPUR	1,696,600	766,000	7
CHANDPUR	2,290,200	1,034,000	10	RAJBARI	941,100	424,900	4
BRAHMANBARIA	2,413,400	1,089,700	10	MADARIPUR	1,204,800	544,000	5
COMILLA	4,544,100	2,051,700	20	SHARIATPUR	1,073,900	484,900	4
SYLHET	2,426,400	1,095,500	10	GOPALGANJ	1,195,300	539,700	5
MAULVIBAZAR	1,551,100	700,300	7	MYMENSINGH	4,438,300	2,003,900	20
SUNAMGANJ	1,925,300	869,300	8	KISHOREGANJ	2,598,600	1,173,300	11
HABIGANJ	1,720,200	776,700	7	NETROKONA	1,950,500	880,700	8
				JAMALPUR	2,112,200	953,700	9
				SHERPUR	1,283,000	579,300	5
TOTAL	30,748,700	13,883,200	138	TOTAL	36,788,200	16,610,100	166

Annex 1 (continued): Expected Number of Non-Polio AFP Cases, by District, 1997

District	Estimated Total Pop (1997)	<15 Pop (1997)	Expected Annual Number of Non-Polio AFP Cases	District	Estimated Total Pop (1997)	<15 Pop (1997)	Expected Annual Number of Non-Polio AFP Cases
RAJSHAHI	2,126,300	960,000	9	KHULNA	2,265,700	1,023,000	10
NAWABGANJ	1,320,000	596,000	5	BAGERHAT	1,612,900	728,200	7
NATORE	1,563,800	706,100	7	SATKHIRA	1,799,700	812,600	8
NAOGAON	2,420,500	1,092,900	10	JESSORE	2,374,200	1,072,000	10
PABNA	2,163,400	976,800	9	NARAIL	738,900	333,600	3
SIRAJGANJ	2,550,700	1,151,700	11	MAGURA	815,900	368,400	3
BOGRA	3,007,800	1,358,000	13	JHENAIDAH	1,520,800	686,600	6
JOYPURHAT	862,000	389,200	3	KUSHTIA	1,672,500	755,100	7
RANGPUR	2,434,300	1,099,100	10	CHUADANGA	904,500	408,400	4
GAIBANDHA	2,196,500	991,700	9	MEHERPUR	554,300	250,300	2
NILPHAMARI	1,519,800	686,200	6	TOTAL	14,259,400	6,438,200	64
KURIGRAM	1,806,300	815,500	8	BARISAL	2,487,400	1,123,100	11
LALMONIRHAT	1,074,400	485,100	4	PATUAKHALI	1,435,400	648,100	6
DINAJPUR	2,546,800	1,149,900	11	BHOLA	1,663,600	751,100	7
THAKURGAON	1,139,200	514,300	5	PIROJPUR	1,198,000	540,900	5
PANCHAGARH	802,300	362,200	3	JHALAKHATI	719,000	324,700	3
				BARGUNA	874,100	394,700	3
TOTAL	29,534,100	13,334,700	133	TOTAL	8,377,500	3,782,600	37

Exercises to do with the child lying on the stomach

Exercise 1. Bend the child's knee.

This exercise stretches the muscles which straighten the knee. Begin with the child's legs straight and close together.

Put one hand on the child's buttocks to prevent the hips from moving.

With the other hand, hold the ankle of the leg you will move.

Gently bend the knee, then straighten it. If the knee has full movement when it bends, the foot will touch the buttock.

Repeat the movements of bending and straightening 6 times.

If the other leg is weak, do this exercise for the other leg.

**Exercise 2. Straighten the hip by moving the leg backwards.**

This exercise stretches the muscles which bend the hip. Begin with the child's legs straight and close together.

Put one hand on the buttock of the leg you will not move.

With the other hand, hold the ankle of the leg you will move and bend the knee to a right angle.

Gently lift the leg so that the thigh is off the ground. Then lower the thigh to the ground.

Repeat the movements of lifting and lowering the thigh 6 times.

If the other leg is weak, do this exercise for the other leg.



Exercises to do with the child lying on the back

Exercise 3. Bend the child's hip with the knee bent.

This exercise stretches two muscle groups. On the leg which is moved, the exercise stretches the muscles which straighten the hip. On the leg which remains straight down on the ground, this exercise stretches the muscles which bend the hip.

Begin with the child's legs straight and close together.

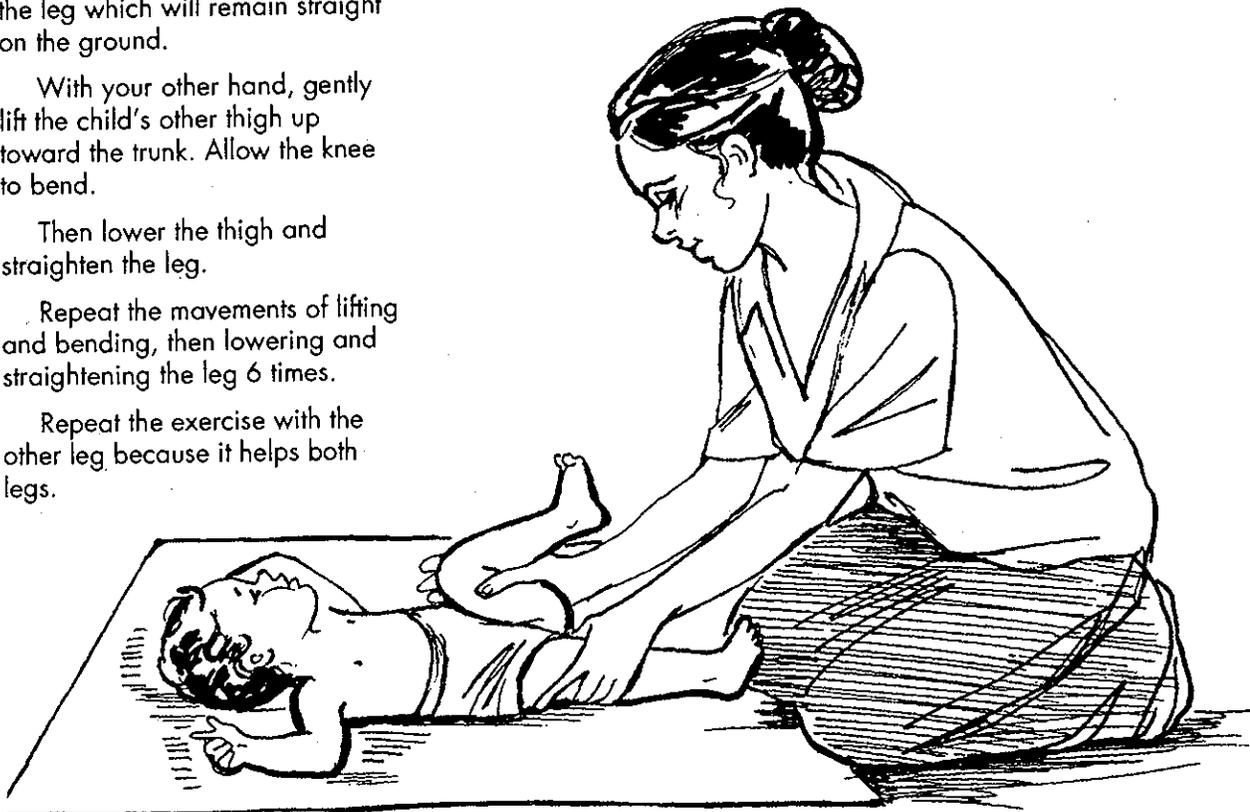
Put one hand on the thigh of the leg which will remain straight on the ground.

With your other hand, gently lift the child's other thigh up toward the trunk. Allow the knee to bend.

Then lower the thigh and straighten the leg.

Repeat the movements of lifting and bending, then lowering and straightening the leg 6 times.

Repeat the exercise with the other leg because it helps both legs.



Exercise 4 Bend the child's hip with the knee straight.

This exercise stretches the muscles which bend the knee.
Begin with the child's legs straight and close together.

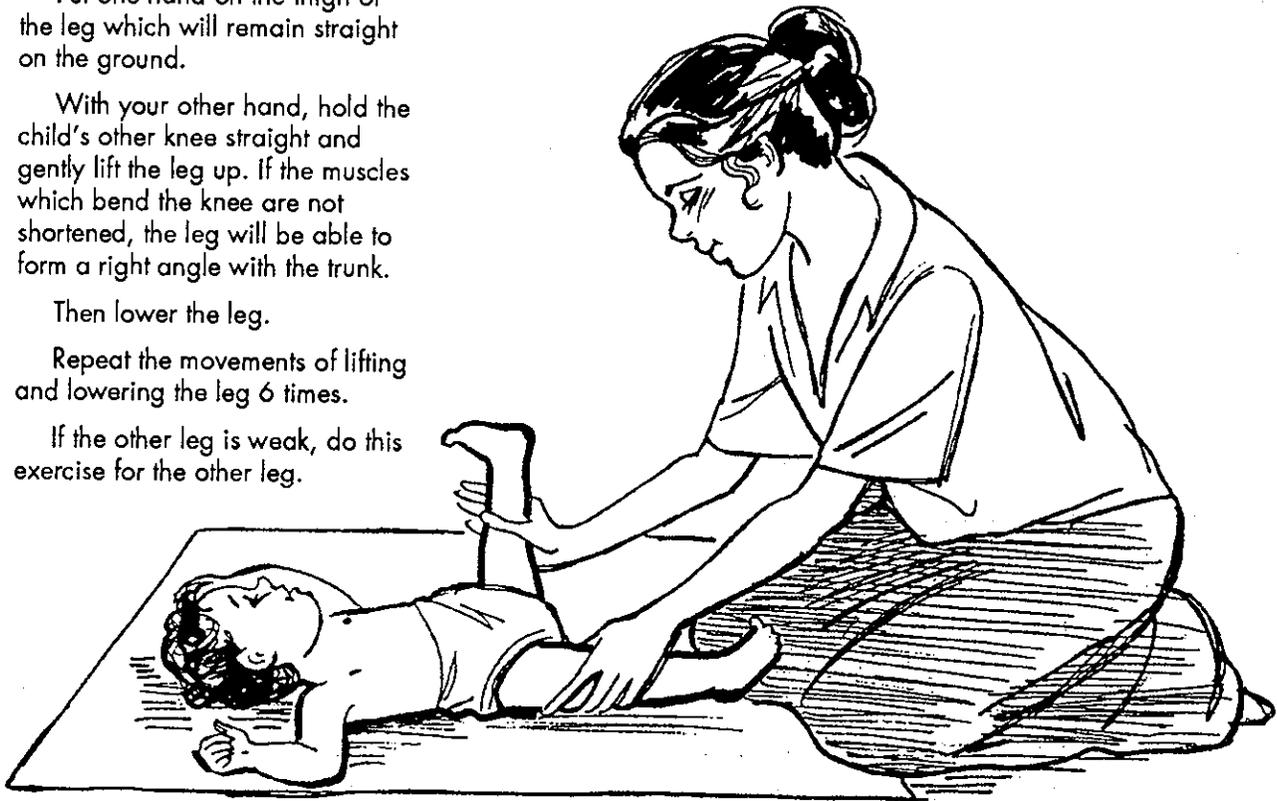
Put one hand on the thigh of the leg which will remain straight on the ground.

With your other hand, hold the child's other knee straight and gently lift the leg up. If the muscles which bend the knee are not shortened, the leg will be able to form a right angle with the trunk.

Then lower the leg.

Repeat the movements of lifting and lowering the leg 6 times.

If the other leg is weak, do this exercise for the other leg.



Exercise 5. Move the child's legs together, away from each other, and together again.

This exercise stretches the muscles which move the child's legs apart and the muscles which move the child's legs together.

Begin with the child's legs straight.

Put your hands around the child's knees and thighs.

Gently move the legs together and cross the right thigh under the left one. Keep the knees straight. Do not turn the legs. Keep the legs as close to the ground as possible.

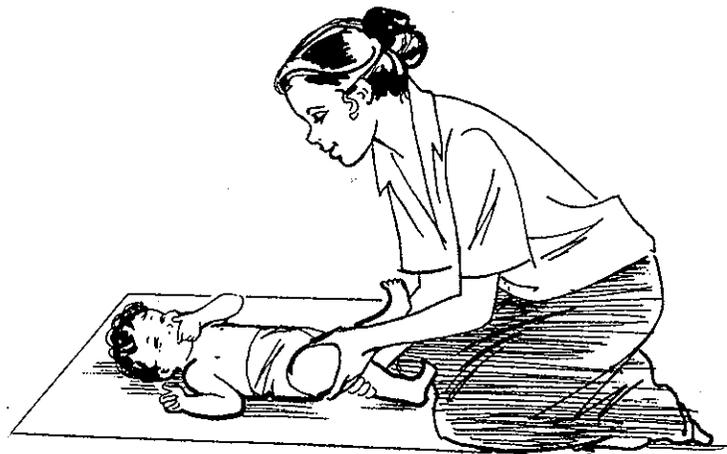


Then move the child's legs apart.



Then move the legs together and cross the left thigh under the right one.

Repeat these movements of the legs coming together and crossing under each other and then moving apart 6 times.



Exercise 6. Move the child's foot upward.

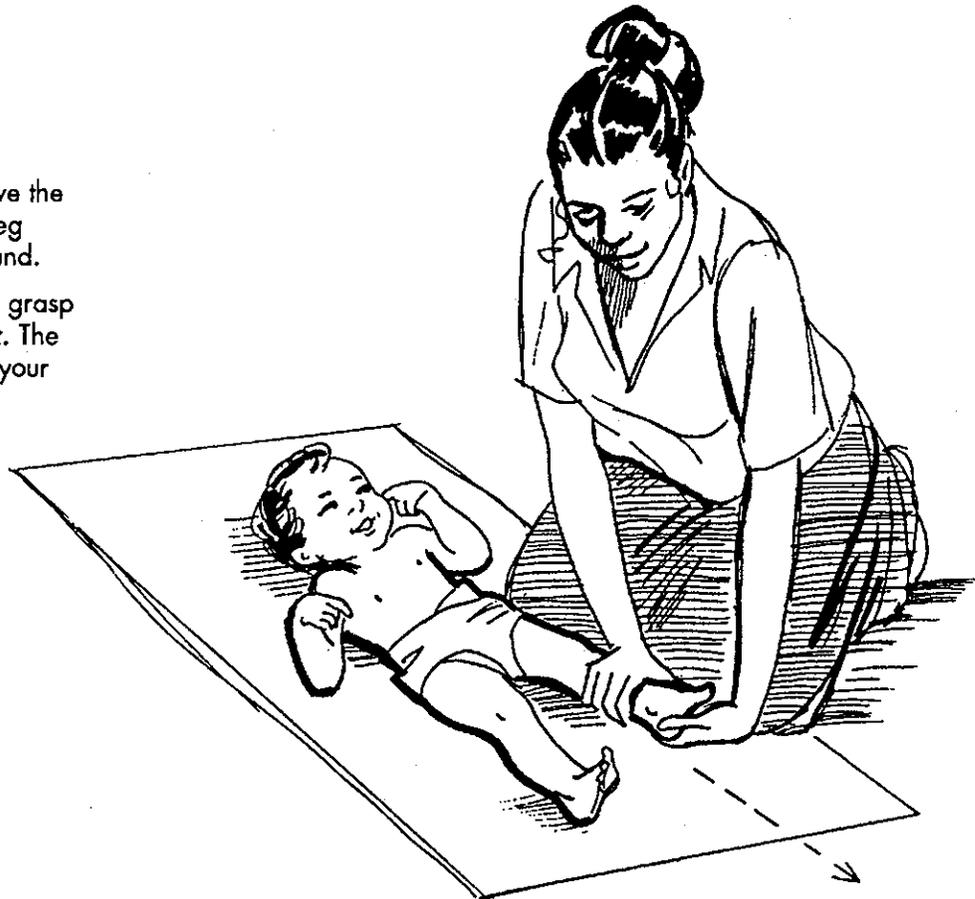
This exercise stretches the muscles which pull the foot down and in.

There are two movements for this exercise. First pull the heel (the back of the foot), then move the front of the foot upward.

Begin with the child's legs straight.

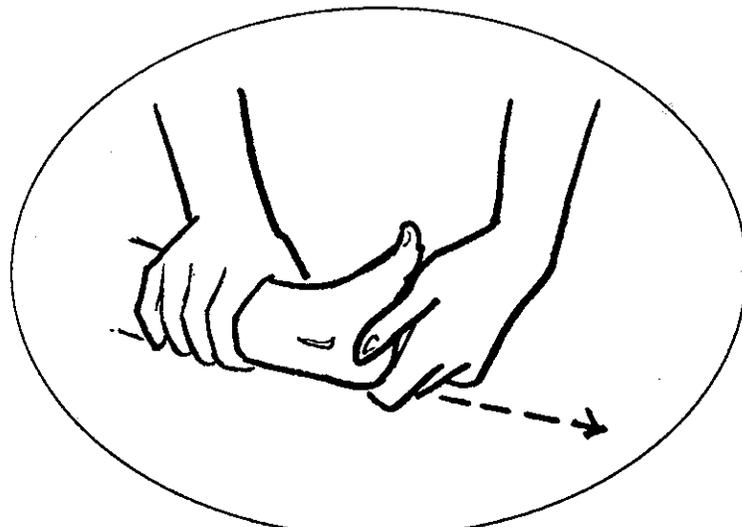
Put one hand just above the child's ankle to hold the leg straight down on the ground.

With your other hand, grasp the heel of the child's foot. The heel should rest between your thumb and fingers.



Gently pull the heel as if you were trying to make the leg longer.

Keep pulling with your thumb and fingers, and then begin to move the palm of your hand up to the child's foot.

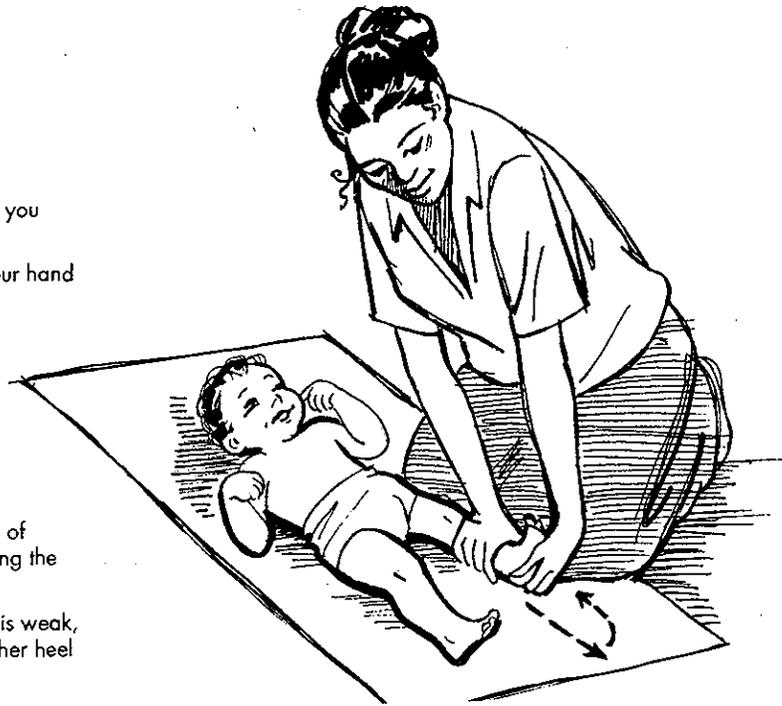


Hold the foot up while you count from 1 to 5.

Release the push of your hand and then the pull.

Repeat the movements of pulling the heel and moving the foot up 6 times.

If the child's other leg is weak, do this exercise for the other heel and foot.



Exercise 7. Lift the child's arm up over the head.

This exercise stretches the muscles which pull the arm down. Begin with the child's arm straight beside the trunk.

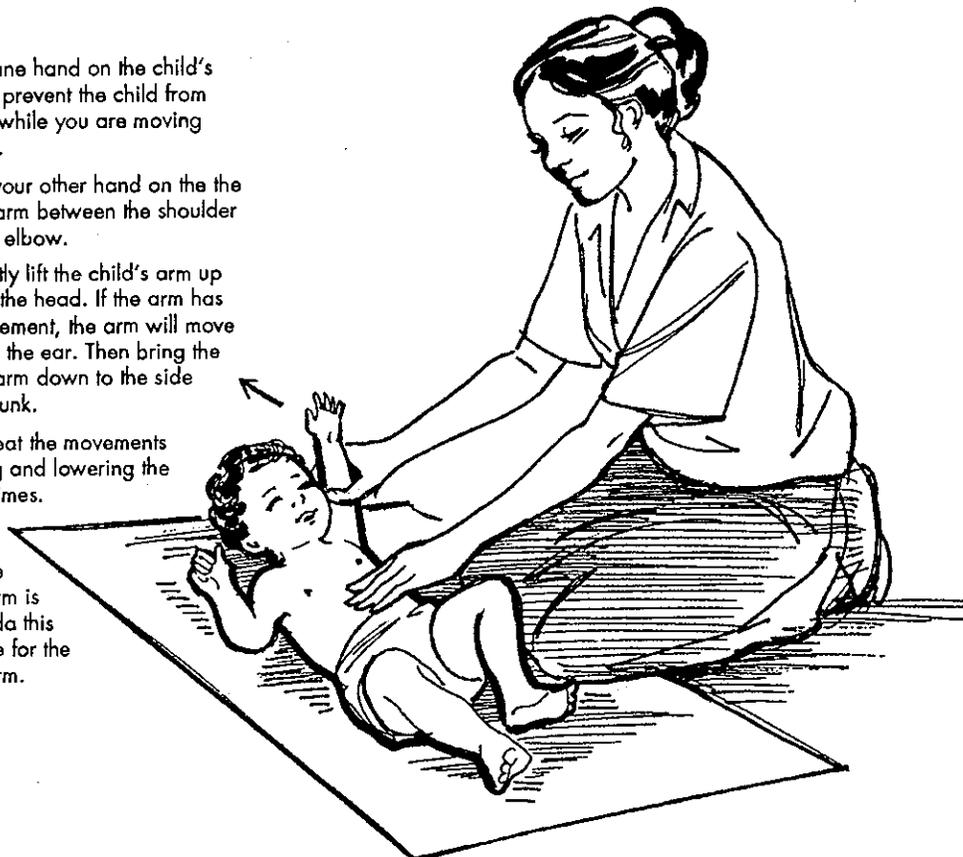
Put one hand on the child's trunk to prevent the child from turning while you are moving the arm.

Put your other hand on the child's arm between the shoulder and the elbow.

Gently lift the child's arm up toward the head. If the arm has full movement, the arm will move up near the ear. Then bring the child's arm down to the side of the trunk.

Repeat the movements of lifting and lowering the arm 6 times.

If the other arm is weak, do this exercise for the other arm.



Exercise 8. Move the child's arm away from the body by moving it to the side.

This exercise stretches the muscles which pull the arm down close to the trunk.

Begin with the child's arm straight beside the trunk, palm of the hand turned up.

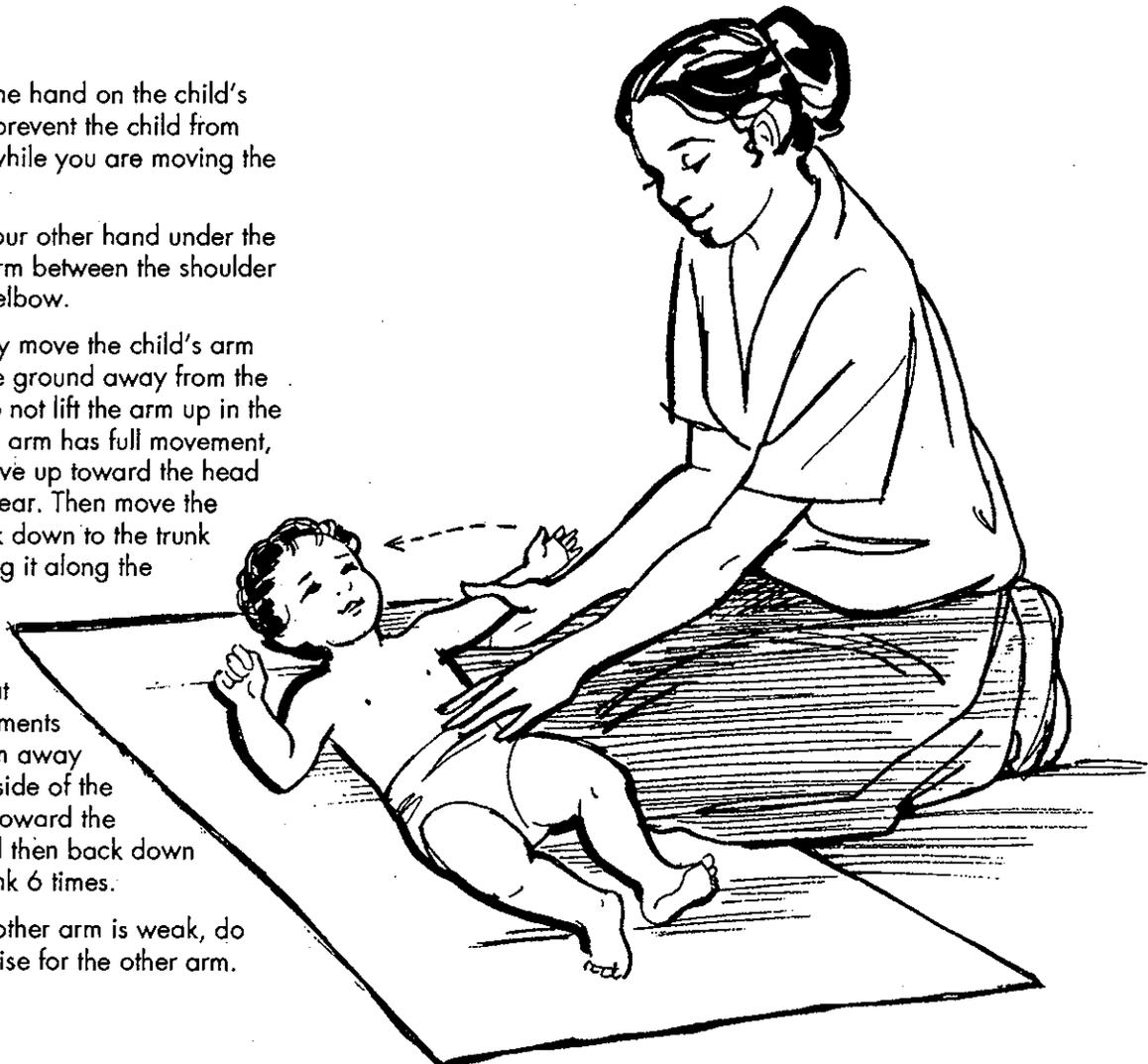
Put one hand on the child's trunk to prevent the child from turning while you are moving the arm.

Put your other hand under the child's arm between the shoulder and the elbow.

Gently move the child's arm along the ground away from the trunk. Do not lift the arm up in the air. If the arm has full movement, it will move up toward the head near the ear. Then move the arm back down to the trunk by moving it along the ground.

Repeat the movements of the arm away from the side of the trunk up toward the head and then back down to the trunk 6 times.

If the other arm is weak, do this exercise for the other arm.



Exercise 9. Straighten the elbow...and bend the elbow.

Straightening the elbow stretches the muscles which bend the elbow.

Bending the elbow stretches the muscles which straighten the elbow.

Begin with the child's upper arm beside the trunk.

Put one hand on the child's arm near the shoulder to prevent the upper part of the arm from moving.

With your other hand, gently straighten and bend the child's elbow.

When you straighten the elbow, the palm of the child's hand should be turned up so that the back of the child's hand touches the ground when the elbow is straight. Most children who have weakness in the arm have more difficulty straightening the elbow than bending it. Do the movement gently and straighten the elbow as much as possible.



When you bend the elbow the child's hand will touch the shoulder.

Repeat the movements of bending and straightening the elbow 6 times.

If the child's other arm is weak, do this exercise for the other arm.



Exercise 10. Turn the child's forearm so that the palm of the hand and the fingers are turned toward the child's face...and then away from the face.

Turning the child's forearm stretches the muscles which cause the forearm and hand to turn.

Begin with the child's upper arm beside the trunk, elbow bent to a right angle.

Put one hand on the child's upper arm to prevent it from moving.

With your other hand, hold the child's forearm near the wrist. Do not put your hand on the child's hand.

Use your fingers and thumb to gently turn the child's forearm so that the palm of the hand and the fingers turn toward the child's face...



and then away from the face.

Repeat the turning movements 6 times in each direction.

If the child's other arm is weak, do this exercise for the other arm.



Exercise 11. Move the child's wrist so that the hand bends forward...and then backward.

This exercise stretches the muscles which move the hand forward and backward.

Begin with the child's upper arm near the trunk, elbow bent to a right angle.

Put one hand on the child's forearm, between the elbow and the wrist, to prevent this part of the arm from moving.

Use the fingers of your other hand to move the child's hand. Do not move the child's fingers.

Gently move the child's hand so that the palm of the hand bends forward...



and then backward.

Repeat the movements of the hand 6 times in each direction.

If the child's other arm and hand are weak, do this exercise for the other arm and hand.



Annex 3:

Code List for Districts and Surveillance Sites
(Thanas, Municipalities, City Corporations)

District Code	District Name	Thana/Municipality/ City Corporation Code	Thana/Municipality/ City Corporation Code
1	CHITTAGONG	1	Boalkhali
1	CHITTAGONG	2	Miresarai
1	CHITTAGONG	3	Chittagong City Corporation
1	CHITTAGONG	4	Rangunia
1	CHITTAGONG	5	Raozan
1	CHITTAGONG	6	Patiya
1	CHITTAGONG	7	Sitakunda
1	CHITTAGONG	8	Satkania
1	CHITTAGONG	9	Fatikchari
1	CHITTAGONG	10	Hathazari
1	CHITTAGONG	11	Sandwip
1	CHITTAGONG	12	Anowra
1	CHITTAGONG	13	Banshkali
1	CHITTAGONG	14	Chandanaish
1	CHITTAGONG	15	Lohagara-CHITTAGONG
2	COX'S BAZAR	16	COX_Sadar
2	COX'S BAZAR	17	Ukhia
2	COX'S BAZAR	18	Ramu
2	COX'S BAZAR	19	Cox's Bazar Muni
2	COX'S BAZAR	20	Chakaria
2	COX'S BAZAR	21	Kutubdia
2	COX'S BAZAR	22	Moheskhali
2	COX'S BAZAR	23	Teknaf
3	KHAGRACHARI	24	KHG_Sadar
3	KHAGRACHARI	25	Dighinala
3	KHAGRACHARI	26	Mahalchari
3	KHAGRACHARI	27	Panchari
3	KHAGRACHARI	28	Matiranga
3	KHAGRACHARI	29	Ramgarh
3	KHAGRACHARI	30	Laxmichari
3	KHAGRACHARI	31	Manikchari
3	KHAGRACHARI	32	Khagrachari Muni
4	RANGAMATI	33	Baghaichari
4	RANGAMATI	34	Barkal
4	RANGAMATI	35	Kawkhali
4	RANGAMATI	36	Juraichari
4	RANGAMATI	37	Langadu
4	RANGAMATI	38	Nomerchar
4	RANGAMATI	39	RAN_Sadar
4	RANGAMATI	40	Biliachari
4	RANGAMATI	41	Kaptai
4	RANGAMATI	42	Rajsthali
4	RANGAMATI	43	Rangamati Muni
5	BANDARBAN	44	BAN_Sadar
5	BANDARBAN	45	Rawangachari
5	BANDARBAN	46	Ruma
5	BANDARBAN	47	Thanchi
5	BANDARBAN	48	Lama
5	BANDARBAN	49	Alikadam
5	BANDARBAN	50	Naikhonchari
5	BANDARBAN	51	Bandarban Muni

District Code	District Name	Thana/Municipality/ City Corporation Code	Thana/Municipality/ City Corporation Name
6	COMILLA	52	Muradnagar
6	COMILLA	53	Chowdagram
6	COMILLA	54	Devidwar
6	COMILLA	55	Comilla Muni
6	COMILLA	56	Chandina
6	COMILLA	57	Daudkandi
6	COMILLA	58	Barura
6	COMILLA	59	COM_Sadar
6	COMILLA	60	Homna
6	COMILLA	61	Brahmanpara
6	COMILLA	62	Burichang
6	COMILLA	63	Laksham Muni
6	COMILLA	64	Nangalkot
6	COMILLA	65	Laksham
7	B BHARIA	66	Akhaura
7	B BHARIA	67	Sarail
7	B BHARIA	68	Nabinagar
7	B BHARIA	69	Kasba
7	B BHARIA	70	B.Baria Mun.
7	B BHARIA	71	BRA_Sadar
7	B BHARIA	72	Bancharampur
7	B BHARIA	73	Nasirnagar
8	CHANDPUR	74	CHD_Sadar
8	CHANDPUR	75	Faridganj
8	CHANDPUR	76	Hajiganj Muni
8	CHANDPUR	77	Kachua-CHANDPUR
8	CHANDPUR	78	Matlab
8	CHANDPUR	79	Shahrasti
8	CHANDPUR	80	Haimchar
8	CHANDPUR	81	Chandpur Muni
8	CHANDPUR	82	Hajiganj
9	SYLHET	83	Balaganj
9	SYLHET	84	Biswanath
9	SYLHET	85	SYL_Sadar
9	SYLHET	86	Beani Bazar
9	SYLHET	87	Companiganj-SYLHET
9	SYLHET	88	Fenchuganj
9	SYLHET	89	Golapganj
9	SYLHET	90	Goainghat
9	SYLHET	91	Jaintiapur
9	SYLHET	92	Zakiganj
9	SYLHET	93	Kanaighat
9	SYLHET	94	Sylhet Muni
10	SUNAMGANG	95	SUN_Sadar
10	SUNAMGANG	96	Biswamvarpur
10	SUNAMGANG	97	Chatak
10	SUNAMGANG	98	Derai
10	SUNAMGANG	99	Dharmapasha
10	SUNAMGANG	100	Dowarabazar
10	SUNAMGANG	101	Jagannathpur
10	SUNAMGANG	102	Jamalganj
10	SUNAMGANG	103	Sulla
10	SUNAMGANG	104	Tahirpur
10	SUNAMGANG	105	Sunamganj Muni

District Code	District Name	Thana/Municipality/ City Corporation Code	Thana/Municipality/ City Corporation Name
11	MOULVI BAZAR	106	MOL_Sadar
11	MOULVI BAZAR	107	Barlekha
11	MOULVI BAZAR	108	Kulaura
11	MOULVI BAZAR	109	Rainagar
11	MOULVI BAZAR	110	Kamalganj
11	MOULVI BAZAR	111	Srimangal
11	MOULVI BAZAR	112	Moulvibazar Muni
11	MOULVI BAZAR	113	Sreemangal Muni
12	HABIGANG	114	HAB_Sadar
12	HABIGANG	115	Nabiganj
12	HABIGANG	116	Azmiriganj
12	HABIGANG	117	Baniachong
12	HABIGANG	118	Lakhai
12	HABIGANG	119	Bahubal
12	HABIGANG	120	Chunarughat
12	HABIGANG	121	Madhabpur
12	HABIGANG	122	Habiganj Muni
13	NOAKHALI	123	NOA_Sadar
13	NOAKHALI	124	Senbag
13	NOAKHALI	125	Chatkhil
13	NOAKHALI	126	Noakhali Muni
13	NOAKHALI	127	Begumganj
13	NOAKHALI	128	Companiganj-No
13	NOAKHALI	129	Hatia
13	NOAKHALI	130	Begumganj Muni
14	FENI	131	Sonagazi
14	FENI	132	Dagan Bhuiyan
14	FENI	133	Chagalnaiya
14	FENI	134	Parshuram
14	FENI	135	Feni Muni
14	FENI	136	FEN_Sadar
15	LAKSHAMPUR	137	LAK_Sadar
15	LAKSHAMPUR	138	Raipur
15	LAKSHAMPUR	139	Ramganj
15	LAKSHAMPUR	140	Ramgati
15	LAKSHAMPUR	141	Lakshmipur Muni
16	DHAKA	142	Dhamrai
16	DHAKA	143	Savar
16	DHAKA	144	Keraniganj
16	DHAKA	145	DAC_Nawabganj
16	DHAKA	146	Dohar
16	DHAKA	147	Dhaka City Corporation
17	MANIKGANJ	148	MAN_Sadar
17	MANIKGANJ	149	Ghiore
17	MANIKGANJ	150	Saturia
17	MANIKGANJ	151	Singair
17	MANIKGANJ	152	Shivalaya
17	MANIKGANJ	153	Harirampur
17	MANIKGANJ	154	Daulatpur-MANIKGANJ
17	MANIKGANJ	155	Manikganj Muni
18	NARSINGDHI	156	Monohardi
18	NARSINGDHI	157	Shibpur
18	NARSINGDHI	158	NSG_Sadar
18	NARSINGDHI	159	Belabo

District Code	District Name	Thana/Municipality/ City Corporation Code	Thana/Municipality/ City Corporation Name
18	NARSINGDHI	160	Palash
18	NARSINGDHI	161	Raipura
18	NARSINGDHI	162	Narsingdi Muni
19	NARAYANGANJ	163	NAR_Sadar
19	NARAYANGANJ	164	Araihazar
19	NARAYANGANJ	165	Sonargaon
19	NARAYANGANJ	166	Bandar
19	NARAYANGANJ	167	Rupganj
19	NARAYANGANJ	168	Narayanganj Muni
20	MUNSHIGANJ	169	Serajdikhan
20	MUNSHIGANJ	170	Tongibari
20	MUNSHIGANJ	171	Sreenagar
20	MUNSHIGANJ	172	MUN_Sadar
20	MUNSHIGANJ	173	Lohajong
20	MUNSHIGANJ	174	Munshiganj Muni
20	MUNSHIGANJ	175	Gozaria
21	GAZIPUR	176	GAZ_Sadar
21	GAZIPUR	177	Sreepur-GAZIPUR.
21	GAZIPUR	178	Kaliakair
21	GAZIPUR	179	Kapasia
21	GAZIPUR	180	Kaliganj-GAZIPUR
21	GAZIPUR	181	Gazipur Muni
21	GAZIPUR	182	Tongi Muni
22	TANGAIL	183	Kalihati
22	TANGAIL	184	Ghatail
22	TANGAIL	185	Bhuapur
22	TANGAIL	186	Delduar
22	TANGAIL	187	Tangail Muni
22	TANGAIL	188	TAN_Sadar
22	TANGAIL	189	Basail
22	TANGAIL	190	Madhupur
22	TANGAIL	191	Mirzapur
22	TANGAIL	192	Nagarpur
22	TANGAIL	193	Gopalpur
22	TANGAIL	194	Shakhipur
22	TANGAIL	195	Gopalpur Muni
23	FARIDPUR	196	FAR_Sadar
23	FARIDPUR	197	Bhanga
23	FARIDPUR	198	Nagarkanda
23	FARIDPUR	199	Sadarpur
23	FARIDPUR	200	Faridpur Muni
23	FARIDPUR	201	Alfadanga
23	FARIDPUR	202	Madhukhali
23	FARIDPUR	203	Boalmari
23	FARIDPUR	204	Char Bhadrasan
24	RAJBARI	205	RJB_Sadar
24	RAJBARI	206	Baliakanda
24	RAJBARI	207	Goalundo
24	RAJBARI	208	Pangsa
24	RAJBARI	209	Rajbari Muni
25	MADARIPUR	210	MAD_Sadar
25	MADARIPUR	211	Kalkini
25	MADARIPUR	212	Rajoir
25	MADARIPUR	213	Shibchar
25	MADARIPUR	214	Madaripur Muni

District Code	District Name	Thana/Municipality/ City Corporation Code	Thana/Municipality/ City Corporation Name
26	SARIATPUR	215	Bhedarganj
26	SARIATPUR	216	Damodya
26	SARIATPUR	217	Gosairhat
26	SARIATPUR	218	Naria
26	SARIATPUR	219	SAR_Sadar
26	SARIATPUR	220	Zanjira
26	SARIATPUR	221	Shariatpur Muni
27	GOPALGANJ	222	GOP_Sadar
27	GOPALGANJ	223	Kasiani
27	GOPALGANJ	224	Kotalipara
27	GOPALGANJ	225	Muksedpur
27	GOPALGANJ	226	Tungipara
27	GOPALGANJ	227	Gopalganj Muni
28	MYMENSINGH	228	MYM_Sadar
28	MYMENSINGH	229	Trishal
28	MYMENSINGH	230	Muktagacha
28	MYMENSINGH	231	Gaffargaon
28	MYMENSINGH	232	Gouripur
28	MYMENSINGH	233	Nandail
28	MYMENSINGH	234	Mymensingh Muni
28	MYMENSINGH	235	Haluaghat
28	MYMENSINGH	236	Iswarganj
28	MYMENSINGH	237	Phulpur
28	MYMENSINGH	238	Bhaluka
28	MYMENSINGH	239	Fulbaria
28	MYMENSINGH	240	Muktagacha Muni
28	MYMENSINGH	241	Gouripur Muni
28	MYMENSINGH	242	Dhobaura
29	KISHOREGANG	243	Pakundia
29	KISHOREGANG	244	KIS_Sadar
29	KISHOREGANG	245	Karimganj
29	KISHOREGANG	246	Kishorganaj Muni
29	KISHOREGANG	247	Ashtagram
29	KISHOREGANG	248	Mithamain
29	KISHOREGANG	249	Bajitpur
29	KISHOREGANG	250	Bhairab
29	KISHOREGANG	251	Hossainpur
29	KISHOREGANG	252	Itna
29	KISHOREGANG	253	Katiadi
29	KISHOREGANG	254	Nikhli
29	KISHOREGANG	255	Tarail
29	KISHOREGANG	256	Kuliarchar
29	KISHOREGANG	257	Bhairab Muni
29	KISHOREGANG	258	Bajitpur Muni
30	NETROKONA	259	NET_Sadar
30	NETROKONA	260	Purbadhala
30	NETROKONA	261	Atpara
30	NETROKONA	262	Barhatta
30	NETROKONA	263	Durgapur NETROKONA
30	NETROKONA	264	Kaliajuri
30	NETROKONA	265	Kalmakanda
30	NETROKONA	266	Kendua
30	NETROKONA	267	Madan
30	NETROKONA	268	Mohanganj

District Code	District Name	Thana/Municipality/ City Corporation Code	Thana/Municipality City Corporation Name
30	NETROKONA	269	Netrakona Muni
30	NETROKONA	270	Mohongonj Muni
31	JAMALPUR	271	JAM Sadar
31	JAMALPUR	272	Melandah
31	JAMALPUR	273	Dewanganj
31	JAMALPUR	274	Jamalpur Muni
31	JAMALPUR	275	Islampur
31	JAMALPUR	276	Sarishabari
31	JAMALPUR	277	Bakshiganj
31	JAMALPUR	278	Madarganj
32	SHERPUR	279	SER Sadar
32	SHERPUR	280	Nalitabari
32	SHERPUR	281	Sherpur Muni
32	SHERPUR	282	Jhenaigati
32	SHERPUR	283	Nakhla
32	SHERPUR	284	Sreebordi
33	KHULNA	285	Paikgacha
33	KHULNA	286	Koira
33	KHULNA	287	Dacope
33	KHULNA	288	Batiaghata
33	KHULNA	289	Dumuria
33	KHULNA	290	Phultala
33	KHULNA	291	Daulatpur-KHULNA
33	KHULNA	292	Rupsha
33	KHULNA	293	Terokhada
33	KHULNA	294	Khulna City Corporation
34	BAGERHAT	295	BAG Sadar
34	BAGERHAT	296	Chitalmari
34	BAGERHAT	297	Fakirhat
34	BAGERHAT	298	Kachua-BAGERHA
34	BAGERHAT	299	Mollahat
34	BAGERHAT	300	Morrelganj
34	BAGERHAT	301	Rampal
34	BAGERHAT	302	Mongla
34	BAGERHAT	303	Sharankhola
34	BAGERHAT	304	Bagerhat Muni
34	BAGERHAT	305	Mongla Muni
35	SATKHIRA	306	Satkhira Muni
35	SATKHIRA	307	Assasuni
35	SATKHIRA	308	Debhatta
35	SATKHIRA	309	Kalarooa
35	SATKHIRA	310	Kaliganj_SATKHIRA
35	SATKHIRA	311	SAT Sadar
35	SATKHIRA	312	Shayamnagar
35	SATKHIRA	313	Tala
36	JESSORE	314	JES Sadar
36	JESSORE	315	Jhikargacha
36	JESSORE	316	Abhoynagar
36	JESSORE	317	Bagherpara
36	JESSORE	318	Chougacha
36	JESSORE	319	Sarsha
36	JESSORE	320	Manirampur
36	JESSORE	321	Keshabpur
36	JESSORE	322	Jessore Muni

District Code	District Name	Thana/Municipality/ City Corporation Code	Thana/Municipality City Corporation Name
37	NARAIL	323	NRL_Sadar
37	NARAIL	324	Kalia
37	NARAIL	325	Lohagara_Narai
37	NARAIL	326	Narail Muni
37	NARAIL	327	Kalia Muni
38	MAGURA	328	MAG_Sadar
38	MAGURA	329	Mohammadpur
38	MAGURA	330	Salikha
38	MAGURA	331	Sreepur-MAGURA
38	MAGURA	332	Magura Muni
39	JHENAIDAH	333	JHE_Sadar
39	JHENAIDAH	334	Harinakunda
39	JHENAIDAH	335	Kaliganj_JHENAIDAH
39	JHENAIDAH	336	Kotchandpur
39	JHENAIDAH	337	Moheshpur
39	JHENAIDAH	338	Sailakupa
39	JHENAIDAH	339	Jhenaidah Muni
39	JHENAIDAH	340	Kotchandpur Muni
39	JHENAIDAH	341	Mohespur Muni
40	KUSHTIA	342	Kushtia Muni
40	KUSHTIA	343	Bheramara
40	KUSHTIA	344	Daulatpur-KUSHTIA
40	KUSHTIA	345	Khoksa
40	KUSHTIA	346	Kumarkhali
40	KUSHTIA	347	KUS_Sadar
40	KUSHTIA	348	Mirpur
40	KUSHTIA	349	Bheramara Muni
40	KUSHTIA	350	Kumarkhali Muni
41	CHAUDANGA	351	Alamdanga
41	CHAUDANGA	352	CHU_Sadar
41	CHAUDANGA	353	Damurhuda
41	CHAUDANGA	354	Jibannagar
41	CHAUDANGA	355	Chudanga Muni
41	CHAUDANGA	356	Alandanga Muni
42	MEHERPUR	357	MER_Sadar
42	MEHERPUR	358	Gangni
42	MEHERPUR	359	Meherpur Muni
43	BARISAL	360	Bakerganj
43	BARISAL	361	BAR_Sadar
43	BARISAL	362	Babuganj
43	BARISAL	363	Wazirpur
43	BARISAL	364	Agailjhara
43	BARISAL	365	Gaurnadi
43	BARISAL	366	Muladi
43	BARISAL	367	Hizla
43	BARISAL	368	Mehediganj
43	BARISAL	369	Barisal Muni
43	BARISAL	370	Banaripara
44	PATUAKHALI	371	Kalapara
44	PATUAKHALI	372	Mirzaganj
44	PATUAKHALI	373	PAT_Sadar
44	PATUAKHALI	374	Bawphal
44	PATUAKHALI	375	Galachipa
44	PATUAKHALI	376	Dasmina
44	PATUAKHALI	377	Patuakhali Muni

District Code	District Name	Thana/Municipality/ City Corporation Code	Thana/Municipality City Corporation Name
45	BHOLA	378	BHO_Sadar
45	BHOLA	379	Burhanuddin
45	BHOLA	380	Charfession
45	BHOLA	381	Daulatkhan
45	BHOLA	382	Lalmohan
45	BHOLA	383	Manpura
45	BHOLA	384	Tajumuddin
45	BHOLA	385	Bhola Muni
46	PEROJPUR	386	PER_Sadar
46	PEROJPUR	387	Bhandaria
46	PEROJPUR	388	Kaukhali
46	PEROJPUR	389	Mathbaria
46	PEROJPUR	390	Nazirpur
46	PEROJPUR	391	Swarupkathi
46	PEROJPUR	392	Perojpur Muni
47	JHALAKATI	393	JHA_Sadar
47	JHALAKATI	394	Kathalia
47	JHALAKATI	395	Nalchity
47	JHALAKATI	396	Rajapur
47	JHALAKATI	397	Jhalakathi Muni
47	JHALAKATI	398	Nalchiti Muni
48	BARGUNA	399	BRG_Sadar
48	BARGUNA	400	Amtali
48	BARGUNA	401	Bamna
48	BARGUNA	402	Betagi
48	BARGUNA	403	Patharghata
48	BARGUNA	404	Barguna Muni
49	RAJSHAHI	405	Paba
49	RAJSHAHI	406	Puthia
49	RAJSHAHI	407	Charghat
49	RAJSHAHI	408	Bagmara
49	RAJSHAHI	409	Godagari
49	RAJSHAHI	410	Durgapur_RAJSHAHI
49	RAJSHAHI	411	Mohanpur
49	RAJSHAHI	412	Tanore
49	RAJSHAHI	413	Bagha
49	RAJSHAHI	414	Rajshahi City Corporation
50	NOWABGANJ	415	NAW_Sadar
50	NOWABGANJ	416	Bholahat
50	NOWABGANJ	417	Gomastapur
50	NOWABGANJ	418	Nachole
50	NOWABGANJ	419	NAB_Shibganj
50	NOWABGANJ	420	Nowabgonj Muni
51	NATORE	421	Bagatipara
51	NATORE	422	Baraigram
51	NATORE	423	Gurudaspur
51	NATORE	424	Lalpur
51	NATORE	425	NAT_Sadar
51	NATORE	426	Singra
51	NATORE	427	Natore Muni
52	NOAGOAN	428	NAO_Sadar
52	NOAGOAN	429	Raninagar
52	NOAGOAN	430	Atrai
52	NOAGOAN	431	Manda

District Code	District Name	Thana/Municipality/ City Corporation Code	Thana/Municipality City Corporation Name
52	NOAGOAN	432	Noagaon Muni
52	NOAGOAN	433	Badalgachi
52	NOAGOAN	434	Dhamoirhat
52	NOAGOAN	435	Mahadevpur
52	NOAGOAN	436	Niamatpur
52	NOAGOAN	437	Patnitola
52	NOAGOAN	438	Porsha
52	NOAGOAN	439	Shapahar
53	PABNA	440	Iswardi
53	PABNA	441	Santhia
53	PABNA	442	Atghoria
53	PABNA	443	Bera
53	PABNA	444	Chatmohar
53	PABNA	445	Sujanagar
53	PABNA	446	Faridpur
53	PABNA	447	Pabna Muni
53	PABNA	448	PAB Sadar
53	PABNA	449	Bangora
53	PABNA	450	Iswardi Muni
54	SIRAJGANJ	451	Sirajgoaj Muni
54	SIRAJGANJ	452	Kamarkandi
54	SIRAJGANJ	453	Raiganj
54	SIRAJGANJ	454	Shahzadpur
54	SIRAJGANJ	455	Ullapara
54	SIRAJGANJ	456	SRJ Sadar
54	SIRAJGANJ	457	Belkuchi
54	SIRAJGANJ	458	Chowhali
54	SIRAJGANJ	459	Kazipur
54	SIRAJGANJ	460	Tarash
55	BOGRA	461	BOG Sadar
55	BOGRA	462	Gabtali
55	BOGRA	463	Kahaloo
55	BOGRA	464	Sherpur
55	BOGRA	465	Sariakandi
55	BOGRA	466	Adamdighi
55	BOGRA	467	BOG Shibganj
55	BOGRA	468	Dubchachia
55	BOGRA	469	Sonatala
55	BOGRA	470	Bogra Muni
55	BOGRA	471	Dhunat
55	BOGRA	472	Nandigram
55	BOGRA	473	Sherpur-BOGRA Muni
56	JOYPURHAT	474	JOY Sadar
56	JOYPURHAT	475	Khetlal
56	JOYPURHAT	476	Panchabibi
56	JOYPURHAT	477	Kalai
56	JOYPURHAT	478	Akkelpur
56	JOYPURHAT	479	Joypurhat Muni
57	RANGPUR	480	Gangachara
57	RANGPUR	481	Taraganj
57	RANGPUR	482	Rangpur Muni
57	RANGPUR	483	RANG Sadar
57	RANGPUR	484	Pirgacha
57	RANGPUR	485	Kaunia

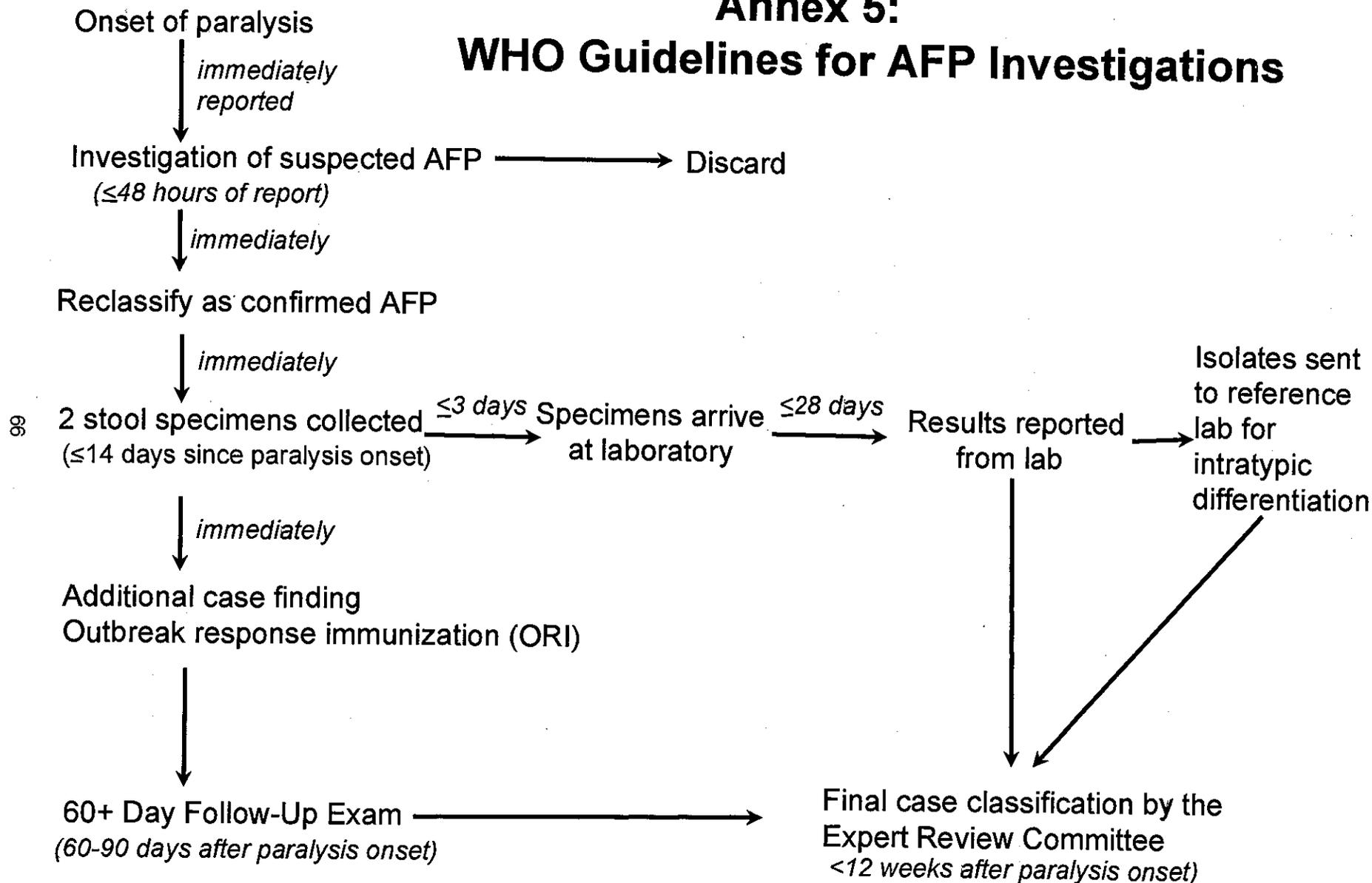
District Code	District Name	Thana/Municipality/ City Corporation Code	Thana/Municipality City Corporation Name
57	RANGPUR	486	Mithapukur
57	RANGPUR	487	Badarganj
57	RANGPUR	488	Pirganj - RANGPUR
58	GAIBANDHA	489	Fulchari
58	GAIBANDHA	490	GAI_Sadar
58	GAIBANDHA	491	Gobindaganj
58	GAIBANDHA	492	Palashbari
58	GAIBANDHA	493	Sadullapur
58	GAIBANDHA	494	Sughata
58	GAIBANDHA	495	Sundarganj
58	GAIBANDHA	496	Gaibandha Muni.
59	NILPHAMARI	497	NIL_Sadar
59	NILPHAMARI	498	Domar
59	NILPHAMARI	499	Dimla
59	NILPHAMARI	500	Jaldhaka
59	NILPHAMARI	501	Kishoreganj
59	NILPHAMARI	502	Saidpur Muni
59	NILPHAMARI	503	Nilphamari Muni
59	NILPHAMARI	504	Saidpur
60	KURIGRAM	505	Fhulbari
60	KURIGRAM	506	Ulipur
60	KURIGRAM	507	KUR_Sadar
60	KURIGRAM	508	Bhurangamari
60	KURIGRAM	509	Char Rajibpur
60	KURIGRAM	510	Chilmari
60	KURIGRAM	511	Nageswari
60	KURIGRAM	512	Rajarhat
60	KURIGRAM	513	Rowmari
60	KURIGRAM	514	Kurigram Muni
61	LALMONIRHAT	515	LAL_Sadar
61	LALMONIRHAT	516	Aditmari
61	LALMONIRHAT	517	Hatibandha
61	LALMONIRHAT	518	Kailganj
61	LALMONIRHAT	519	Patgram
61	LALMONIRHAT	520	Lalmonirhat Muni
62	DINAJPUR	521	Hakimpur
62	DINAJPUR	522	Birole
62	DINAJPUR	523	Chiribandar
62	DINAJPUR	524	Parbatipur
62	DINAJPUR	525	Birganj
62	DINAJPUR	526	DIN_Sadar
62	DINAJPUR	527	Birampur
62	DINAJPUR	528	Fulbari
62	DINAJPUR	529	Ghoraghat
62	DINAJPUR	530	Kaharole
62	DINAJPUR	531	Khansama
62	DINAJPUR	532	DIN_Nawabganj
62	DINAJPUR	533	Bochaganj
62	DINAJPUR	534	Dinajpur Muni
62	DINAJPUR	535	Fulbari Muni
62	DINAJPUR	536	Parbatipur Muni
63	THAKURGOAN	537	Pirganj - Thak
63	THAKURGOAN	538	THA_Sadar
63	THAKURGOAN	539	Baliadangi

District Code	District Name	Thana/Municipality/ City Corporation Code	Thana/Municipality City Corporation Name
63	THAKURGOAN	540	Thakurgaon Muni
63	THAKURGOAN	541	Haripur
63	THAKURGOAN	542	Ranishankail
64	PANCHAGHAR	543	PAN_Sadar
64	PANCHAGHAR	544	Atwari
64	PANCHAGHAR	545	Boda
64	PANCHAGHAR	546	Debiganj
64	PANCHAGHAR	547	Tetulia
64	PANCHAGHAR	548	Panchaghar Muni

Annex 4: Performance Indicators for AFP Surveillance

1. AFP rate in children <15 years old: $\geq 1/100,000$
2. Completeness of monthly reporting: $\geq 90\%$
3. Timeliness of monthly reporting: $\geq 80\%$
4. Suspected AFP cases investigated within 48 hours of report: $\geq 80\%$
5. Confirmed AFP cases with 2 stool specimens collected ≤ 14 days since paralysis onset: $\geq 80\%$
6. Confirmed AFP cases receiving a follow-up exam 60 days or more after paralysis onset: $\geq 80\%$
7. Stool specimens arriving at national laboratory ≤ 3 days since collection: $\geq 80\%$
8. Stool specimens arriving at laboratory in "good" condition: $\geq 90\%$
"good":
 1. Presence of unmelted ice or temperature $< 8^{\circ}\text{C}$ inside container
 2. Adequate volume (≥ 8 grams or size of $\frac{1}{2}$ thumb)
 3. No evidence of leakage
 4. No evidence of desiccation
9. Stool specimens with a laboratory result ≤ 28 days after receiving specimen: $\geq 80\%$
10. Stool specimens from which non-polio enterovirus was isolated: $\geq 10\%$

Annex 5: WHO Guidelines for AFP Investigations



SUSPECTED AFP, NT, and ND* IMMEDIATE NOTIFICATION FORM

<i>Reporting Site Information</i>	
1. Reporting Site: _____	
2. Person reporting: _____	
3. Date of Report: ___/___/___	
<i>Case Information</i>	
1. Type of case (mark one): AFP _____ NT _____ ND _____	
2. Name of Suspected Case: _____	
3. Age: ___ years ___ months ___ days	4. Sex: male ___ female ___
5. Date of Onset of Paralysis or Body Stiffness: ___/___/___	
6. Has the case died? YES ___ NO ___ IF YES, Date of death ___/___/___	
7. Is the case now in the hospital? YES ___ NO ___ If YES, which hospital? _____	
8. Father's Name: _____	
9. Address: _____	
*ND: neonatal death occurring when baby is 3-28 days old	

INVESTIGATION FORM FOR ACUTE FLACCID PARALYSIS (AFP)
PLEASE COMPLETE EVERY ITEM!

BACKGROUND INFORMATION

DATE FOCAL PERSON WAS NOTIFIED: ___/___/___ PERSON NOTIFYING FOCAL PERSON: _____
DATE OF INVESTIGATION: ___/___/___ Designation/Address: _____

PATIENT IDENTIFICATION

CASE ID NUMBER: BAN - _____
District code Thana/Mun code Year Case #

District: _____ Thana/City Corp: _____
Union/Municipality/Zone: _____ Village/Ward: _____
Case name: _____ Father's name: _____
DATE OF BIRTH: ___/___/___ Sex: M ___ F ___

CLINICAL INFORMATION

1. Is or was paralysis present? YES ___ NO ___
2. DATE OF PARALYSIS ONSET: ___/___/___
3. Is the paralysis flaccid (floppy)? YES ___ NO ___
4. Was paralysis a result of injury? YES ___ NO ___
5. Was paralysis present from birth? YES ___ NO ___

(If the answer to no. 1 or 3 is NO, or the answer to no. 4 or 5 is YES, the suspected AFP case is NOT confirmed AFP:
Do not complete the rest of this form, and specify diagnosis if known: _____)

SIGNS/SYMPTOMS

- | | <u>3. SITE OF PARALYSIS</u> | |
|---|-----------------------------|--------------|
| 1. Fever at paralysis onset: YES ___ NO ___ UNKNOWN ___ | Right Arm ___ | Left Arm ___ |
| 2. Muscular pain: YES ___ NO ___ UNKNOWN ___ | Right Leg ___ | Left Leg ___ |
| | Neck ___ | Face ___ |
| | Other: _____ | |
| 4. Did paralysis occur within 5 days of onset of weakness? YES ___ NO ___ | | |
| 5. Did paralysis begin distally and ascend proximally? YES ___ NO ___ UNKNOWN ___ | | |
| 6. Is sensation present in the site of paralysis? YES ___ NO ___ UNKNOWN ___ | | |
| 7. Was the patient seen at a health facility? YES ___ NO ___ UNKNOWN ___ | | |

If yes, which? _____ Date of Visit/Admission: ___/___/___ Medical Record #: _____

VACCINATION HISTORY

	# Doses by Card	# Doses by History	Total # doses
1. No. of OPV doses received through NIDs:	N/A	___	___
2. No. of OPV doses received through routine EPI:	___	___	___
3. Date of last OPV dose (routine or NID):	___/___/___	___/___/___	

TRAVEL HISTORY

Did patient travel outside his/her village during the 30 days prior to paralysis onset? YES ___ NO ___ UNKNOWN ___
If yes, dates of travel: ___/___/___ to ___/___/___
Name of village/ward: _____ Union/Municipality/Zone: _____
Thana/City Corp: _____ District: _____
Street or House Address if known: _____

How to complete the Investigation Form for Acute Flaccid Paralysis (AFP)

Section 1: BACKGROUND INFORMATION

DATE FOCAL PERSON WAS NOTIFIED: Enter the date the disease surveillance focal person received notification of the suspected AFP case. *All dates must be written using the Roman (English) calendar.*

PERSON NOTIFYING FOCAL PERSON: Enter the name of the person who delivered the information to the thana level.

DESIGNATION/ADDRESS: Enter the designation and address of the person notifying the DSFP (e.g., HA, FWV, HI, FWV, Teacher, Imam, Union council member, etc.).

DATE OF INVESTIGATION: Enter the date the suspected AFP case was visited by the LSO.

Section 2: PATIENT IDENTIFICATION

CASE ID NUMBER: Enter the code numbers as instructed in the manual: refer to your district code number and thana/municipality/city corporation code number in Annex 3. All Case ID numbers in Bangladesh begin with BAN

DISTRICT: Enter the district in which the case was residing when infected

THANA/CITY CORP: Enter the thana or city corporation name (whichever applies) in which the case was residing when infected

UNION/ZONE/MUNICIPALITY: Enter the name of the Union, Municipality, or City Corporation Zone (whichever applies) in which the case was residing when infected

VILLAGE/WARD: Enter the name of the village (if rural) or ward (if city corporation) in which the case was residing when infected

CASE NAME: Enter the full name of the suspected AFP case (**print CLEARLY**)

FATHER'S NAME: Enter the full name of the father of the suspected AFP case (**print CLEARLY**)

DATE OF BIRTH: Enter the day, month, and year of birth of the suspected AFP case

SEX: indicate whether the suspected AFP case is male or female

Section 3: CLINICAL INFORMATION

1. IS OR WAS PARALYSIS PRESENT? Verify that the child has discernable muscle groups which are or were paralyzed. If the child has recovered but the mother insists that paralysis was present, check YES.

2. **DATE OF PARALYSIS ONSET:** Determine the day, month, and year that the suspected AFP case became paralyzed; you may need to review a calendar or recall significant holidays, etc. with the mother to get this information. Do not list the date of fever onset or the date in which the suspected AFP case first became ill, which would be expected to occur several days before paralysis onset. If paralysis was never present, then write "NOT PARALYZED" next to this item.

3. **IS THE PARALYSIS FLACCID (FLOPPY)?** Observe the child and determine if the paralysis is flaccid (floppy) as opposed to spastic or rigid. To determine if the paralysis is spastic, move the affected limb and feel for increasing resistance to movement. If unable to perform the exam or if the child has partially recovered, ask the mother if the paralysis was floppy as opposed to stiff or rigid. If the paralysis is spastic or rigid, check "NO" for this question.

4. **WAS PARALYSIS A RESULT OF INJURY?** Ask the mother if the child suffered any traumatic injury immediately before the onset of paralysis and assess if this injury may explain the paralysis. For example, breaking an arm would not likely result in paralysis of a leg.

5. **WAS PARALYSIS PRESENT FROM BIRTH?** Ask the mother if the child has been unable to move the affected limb since birth.

NOTE: If the suspected AFP case does not have paralysis or if the paralysis is NOT flaccid, then the suspected AFP case does not meet the AFP case definition and is automatically discarded. If AFP is present but is due to traumatic injury or a congenital (birth-related) defect or injury, the suspected AFP case is NOT a confirmed AFP case and should be discarded. Finally, if the evolution from weakness to paralysis was longer than 14 days, the paralysis was not acute in onset and the case should be discarded. In this case, note the time interval from weakness onset to full paralysis in the margin of the form and write "Not Acute". For all unconfirmed (discarded) AFP cases, you should enter your suspected diagnosis.

Section 4: SIGNS/SYMPTOMS

1. **FEVER:** Ask the mother if the probable polio case had fever at the time of paralysis onset. Check UNKNOWN if she cannot remember.

2. **MUSCULAR PAIN:** Examine the child and observe if palpation of affected muscles or moving the affected limb cause pain; ask the mother if she believes the child's paralyzed limb has caused him/her pain. If either the physical examination or history suggests pain, check "YES".

3. **SITE OF PARALYSIS:** Examine the child and place a check mark next to the muscle groups indicated. Place a checkmark next to the facial or neck muscles if they are involved. If other muscle groups are involved, write in the space next to "Other".

4. **DID PARALYSIS OCCUR WITHIN 5 DAYS OF ONSET OF WEAKNESS?** Rapid evolution from weakness to paralysis is highly suggestive of polio as the etiology, although rarely some cases may take as long as 14 days for full paralysis to evolve. Ask the mother if the paralysis was "sudden" in its appearance or if there was a slow progression from weakness to inability to move. If the time from weakness to full paralysis was 5 days or less, check "YES"; if longer than 5 days, check "NO".

5. DID PARALYSIS BEGIN DISTALLY AND ASCEND PROXIMALLY? Ask the mother if paralysis began first at the hands or feet and then progressed proximally to the forearm and arm or leg and thigh. Check "YES" if the paralysis moved up the limbs, otherwise answer "NO". Check UNKNOWN if the mother is unable to remember.

6. IS SENSATION PRESENT IN THE SITE OF PARALYSIS? Pinch the skin of the paralyzed limb(s) and observe the child's face to see if it hurts. If in ANY of the paralyzed limbs the child appears to feel the pinch, check "YES".

7. WAS THE PATIENT SEEN AT A HEALTH FACILITY? Ask the mother if she brought the child to a health facility, including a doctor's chamber, Union health facility (Family Welfare Clinic), Thana Health Complex, or hospital (but not pharmacy) and check "YES" if appropriate. If yes, visit the facility to corroborate the data given by the mother and to obtain the medical record number and date of visit or admission. If the suspected AFP case was detected by Facility-Based Disease Surveillance, note this in the margin of the investigation form.

Section 5: VACCINATION HISTORY

1. NO. OPV DOSES RECEIVED THROUGH NIDS: You should prompt the mother's memory by asking separately about the first NID in 1995, the second NID which occurred just after the non-cooperation movement and before the elections in 1996, and the last NID which occurred in December 1996 and January, 1997, and add up the number of doses. Since NID doses of OPV were not recorded on vaccination cards, this information is by history only.

2. NO. OPV DOSES RECEIVED THROUGH ROUTINE EPI: Inspect the immunization card if available and also ask the mother how many doses of oral polio vaccine the child was given through the **routine** EPI programme, that is, apart from the NIDs. Enter the number by card and the number by history in the designated columns. The TOTAL will usually be the greater of the two. If the total is greater than either of the two, explain why in the margin of the form.

3. DATE OF LAST OPV DOSE (ROUTINE OR NID): Determine when the child received the most recent dose of OPV. If it was through the NIDs, then the column under history should be filled up; if it was through vaccination services, fill up the column under "By Card" if the information was obtained from the vaccination card and/or under "By History" if the information was obtained by the mother's memory. Only one of the columns needs to be filled up.

Section 6: TRAVEL HISTORY

DID PATIENT TRAVEL OUTSIDE HIS/HER VILLAGE DURING THE 30 DAYS PRIOR TO PARALYSIS ONSET? Ask the mother if the child had traveled away from home during the 30 days before he/she developed paralysis. Determine the dates (arrival and departure) in which the probable polio case-patient was away from home, and identify the village or ward (if city corporation); union, municipality, or zone (if city corporation); thana or city corporation; and district. If possible indicate the street and house address where the case-patient visited.

NOTE: if the patient traveled during the 30 days prior to paralysis onset, you must contact the DSFP corresponding to the area visited so that additional case finding may be conducted.

Section 7: ADDITIONAL CASE FINDING AND OUTBREAK RESPONSE IMMUNIZATION (ORI)

1. WAS ADDITIONAL CASE FINDING DONE? Mark YES if the investigator looked for additional cases on the community of the case patient. WERE ANY ADDITIONAL AFP CASES IDENTIFIED? Indicate if any additional AFP cases were identified. If YES, give the number.

2. WAS OUTBREAK RESPONSE IMMUNIZATION DONE? Indicate if ORI was done, and if so, the number of doses of OPV administered.

Section 8: STOOL SPECIMEN COLLECTION

Enter the dates of stool specimen collection (English dates) and the dates each specimen was sent to the National Polio Laboratory, Institute of Public Health, in Dhaka. Laboratory staff will enter the date received.

The following guidelines should be observed when collecting, storing and transporting the specimens:

- collect 2 specimens 24-48 hours apart.
- each specimen should be approximately 8 gms, or ½ the size of an adult's thumb.
- each specimen should be put in a separate clean screw-topped container (use any small, dry, clean, leakproof, capped container).
- on each container write: case identification number, name of the patient, address, date of paralysis and date specimen was collected.
- store samples in a refrigerator or cold box (0-8°C), preferably one which is not used to store vaccines.
- when both specimens have been collected, deliver the specimens and the *Investigation Form for Acute Flaccid Paralysis (AFP)* as quickly as possible to the National Polio Laboratory in Dhaka by 'reverse cold chain' as described in the field guide.

After the initial investigation and collection of stool samples, thank the mother and tell her that you will return in approximately 2 months to re-evaluate the child (i.e., conduct a 60+ Day Follow-up Exam).

Section 9: CLINICAL INVESTIGATOR

The person conducting the investigation of the suspected AFP case (usually the Local Surveillance Officer [LSO]), his/her designation, address, and phone number should be entered.

Please enter any additional comments about the case you feel may be important for the Expert Review committee to consider in determining the final case classification.

Appendix 6:

Directorate General of Health Services
Expanded Programme on Immunization
Bangladesh

60+ DAY FOLLOW-UP EXAMINATION FORM
PLEASE COMPLETE EVERY ITEM!

PATIENT IDENTIFICATION

CASE ID NUMBER: BAN - ____ - ____ - ____ - ____
District code Thana/Mun code Year Case #

District: _____

Thana/City Corp: _____

Union/Municipality/Zone: _____

Village/Ward: _____

Case name: _____

Father's name: _____

DATE OF BIRTH: ____/____/____ Sex: M ____ F ____

BACKGROUND INFORMATION

DATE OF PARALYSIS ONSET: ____/____/____ Date of original investigation: ____/____/____

FOLLOW-UP DATA

1. Was a 60+ Day Follow-Up Exam performed? YES ____ NO ____

If NO, 2. Why wasn't a 60+ Day follow-up examination done? (Circle one)

A. Patient died B. Lost to follow-up C. Other: _____

If YES, give the date of the 60+ Day Follow-Up Examination: ____/____/____

- 3. Is paralysis or weakness still present? YES ____ NO ____
- 4. Is the paralysis/weakness asymmetric? YES ____ NO ____
- 5. Is it flaccid (floppy)? YES ____ NO ____
- 6. Is there normal sensation? YES ____ NO ____

7. SITE OF PARALYSIS OR WEAKNESS and MUSCLE WASTING AT FOLLOW-UP EXAMINATION

	Weakness or Paralysis	Muscle Wasting		Weakness or Paralysis	Muscle Wasting
Right Arm	_____	_____	Left Arm	_____	_____
Right Leg	_____	_____	Left Leg	_____	_____
Neck	_____	_____	Face	_____	_____
Other: _____	_____	_____			

INVESTIGATOR

Name: _____ Designation: _____

Address: _____ Phone: _____

Additional Comments:

Please send copy of form to DSC and to EPI HQ, Mohakali, Dhaka.

How to complete the 60+ Day Follow Up Examination Form

Note: This form should be completed within 90 days of paralysis onset

Section 1: PATIENT IDENTIFICATION

Complete as in the *Investigation Form for Acute Flaccid Paralysis (AFP)*.

Section 2: BACKGROUND INFORMATION

Enter the date of paralysis onset and date of original investigation from your records.

Section 3: FOLLOW-UP DATA

1. WAS A 60+ DAY FOLLOW-UP EXAMINATION PERFORMED? If you did not perform a follow-up examination 60-90 days after onset of paralysis, check "NO";

If NO,

2. WHY WASN'T FOLLOW-UP EXAMINATION DONE? If a Follow Up Exam was not conducted, state why (circle the appropriate response). Lost to follow-up means someone looked for the case and he/she could not be located.

IF YES, check "YES" and give the date of the follow-up examination.

3. IS PARALYSIS OR WEAKNESS STILL PRESENT? Check "YES" if the child has *any residual weakness or paralysis*; check "NO" if *full strength* has returned.
4. IS THE PARALYSIS/WEAKNESS ASYMMETRIC? Check "YES" if the level or extent of weakness or paralysis is unequal on the right and left.
5. IS IT FLACCID (FLOPPY)? Check "YES" if the limb remains floppy (even if minimal strength has returned).
6. IS THERE NORMAL SENSATION? As before, pinch the affected area and observe the child's face to determine if sensation is present. Check "YES" if it is.
7. SITE OF PARALYSIS OR WEAKNESS AND MUSCLE WASTING AT FOLLOW-UP EXAMINATION: Re-examine the case patient and determine if weakness or paralysis is still present in the affected limb(s); assess the child for muscle wasting.

Section 4: INVESTIGATOR

The investigating official should give his/her name, designation, address, and phone number, and provide any additional information he/she thinks the expert review committee might find useful in the final classification of the case.

NEONATAL TETANUS/NEONATAL DEATH CASE INVESTIGATION FORM

DATE FOCAL POINT WAS NOTIFIED: ___/___/___ PERSON NOTIFYING FOCAL POINT: _____
DATE OF INVESTIGATION: ___/___/___ Designation/Address: _____

I. PATIENT IDENTIFICATION

INDEX CASE? YES ___ NO ___

District: _____

Thana/City Corp: _____

Union/Municipality/Zone: _____

Village/Ward: _____

Case name: _____

Father's name: _____

DATE OF BIRTH: ___/___/___ Sex: M ___ F ___

II. CLINICAL INFORMATION

1. What was the baby's age when he/she became sick? _____ DAYS
2. Was the baby able to suck milk and cry during the first 2 days of life? YES ___ NO ___
3. Did the baby's entire body become stiff when sick? YES ___ NO ___
4. Was the baby able to suck milk while sick? YES ___ NO ___
5. Did the baby have convulsions after becoming stiff? YES ___ NO ___
6. Did the baby have fever when stiff? YES ___ NO ___
7. Did the baby die? YES ___ NO ___ IF YES, DATE OF DEATH: ___/___/___

If the baby did not become ill between 3-28 days of life, or if the answers to either #2 or #3 are "NO", or if the answer to #4 is YES, the baby does not satisfy the case definition for NT. Do *not* complete the rest of this form; give suspected diagnosis: _____

III. INFANT CARE

1. Where was the baby born? Hospital/clinic: _____ Home _____ Other ___ (Where: _____)
2. Who cut the umbilical cord? Doctor ___ Nurse _____ FWV ___ Dai ___ Relative/Friend ___ Other ___
(Who: _____)
3. What was used to cut the cord? Wood ___ Shaving blade ___ Sterile blade ___ Other ___ (What: _____)
4. Was a delivery kit used to deliver the baby? YES ___ NO ___

IV. MOTHER'S VACCINATION HISTORY

1. Was mother ever vaccinated against tetanus? YES ___ NO ___

IF YES,

No. doses
by historyNo. doses
by cardTotal
no. doses

2. No. of valid TT doses received: _____

3. Date of last valid TT dose: ___/___/___

V. CASE RESPONSE

1. Was a case response conducted? YES ___ NO ___
IF YES, 2a. Were any additional NT cases (alive or dead) in the past 6 months identified? YES ___ NO ___
2b. IF YES, How many? _____
- 3a. Was the mother given TT vaccine after the death of her baby? YES ___ NO ___
3b. IF NO, why not? _____

Fill up the worksheet on the back of the form, and then complete the following:

4. How many total women 15-49 years old were screened? _____
5. How many total women 15-49 years old were eligible for TT1 + TT2? _____
6. How many additional women were vaccinated with TT? _____

INVESTIGATOR: _____ DESIGNATION: _____ DATE: ___/___/___

Please send copy of completed investigation form to DSC and EPI HQ, Mohakali, Dhaka

Worksheet for Neonatal Tetanus Case Response

Instructions: Visit as many households as you need until you find 20 women 15-49 years old who are eligible for TT; explain that a baby of one of their neighbors died from neonatal tetanus, and that they should be vaccinated so that both they and their babies can also be protected from this disease. After finishing 20 doses of vaccine, continue to visit up to 20 total households if possible, and inform the other eligible women to attend the next routine EPI session. Be sure to tell any woman receiving her first dose of TT that she must receive a second dose in one month to be protected.

Household	Total number of women 15-49 years old	Total number of women eligible for TT	Number of women eligible for					Total number of women vaccinated with TT
			TT1	TT2	TT3	TT4	TT5	
INDEX								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
TOTALS								

Number of valid TT doses received	Next eligible TT dose	When eligible
None	TT1	Immediately
TT1	TT2	1 month or more after TT1
TT2	TT3	6 months or more after TT2
TT3	TT4	1 year or more after TT3
TT4	TT5	1 year or more after TT4
TT5	None	Fully protected

How to complete the NT/ND Case Investigation Form

Section 1: BACKGROUND INFORMATION and PATIENT IDENTIFICATION

Complete as in the *Investigation Form for Acute Flaccid Paralysis (AFP)*. Check "YES" for INDEX CASE if this case was the first case investigated before conducting the outbreak response. If the case was identified as part of an outbreak response, check "NO" and complete all sections except section

Section 2: CLINICAL INFORMATION

1. WHAT WAS THE BABY'S AGE WHEN HE/SHE BECAME SICK? Determine the age of the baby when it became sick, using the date of birth as day number 1.
2. WAS THE INFANT ABLE TO SUCK MILK AND CRY DURING THE FIRST 2 DAYS OF LIFE? Check YES if the baby was able to breast-feed normally and cried during the first 2 days of its life.
3. DID THE BABY'S ENTIRE BODY BECOME STIFF WHEN SICK? Check YES if there was muscular rigidity throughout the baby's body.
4. WAS THE BABY ABLE TO SUCK MILK WHILE SICK? This is another way of asking about the presence of trismus (lockjaw). Check NO if the baby was not able to breast-feed normally at any point during the illness and before dying.
5. DID THE BABY HAVE CONVULSIONS AFTER BECOMING STIFF? Ask if the baby had convulsions AFTER its body became stiff (i.e., AFTER developing muscular rigidity); if the mother specifies that the convulsions occurred before the infant became stiff, check "NO"
6. DID THE BABY HAVE FEVER WHEN STIFF? Check YES if there was documented fever or if the baby was hot to the touch after becoming stiff.
7. DID THE BABY DIE? Check YES if the baby died as a *result of the illness*, and give the DATE OF DEATH.

If the baby does not meet the case definition of NT, i.e., if onset of illness was not between 3 and 28 days of life, or if the baby could suck milk or was not stiff (rigid), then the baby does not meet the case definition of neonatal tetanus. The rest of the form does not require completion (except for the investigator's name, and the suspected diagnosis should be completed. If for some reason the investigator believes strongly that this is a case of NT, he or she may complete the remainder of the form.

Section 3: INFANT CARE

1. WHERE WAS THE BABY BORN? "HOSPITAL CLINIC" includes any type of health facility, including a doctor's office; "HOME" includes the mother's home or someone else's home; if other is checked, be sure to enter where the baby was delivered.

2. WHO CUT THE UMBILICAL CORD? "DOCTOR" includes a doctor with a medical degree, NOT a "community doctor"; "NURSE" includes a nurse or nurse-midwife; "FWV" refers to Family Welfare Visitor; "DAI" is a Traditional Birth Attendant (trained or untrained); "RELATIVE/FRIEND" refers to an untrained family or community member; if "OTHER" is checked, please indicate WHO (i.e., what type of person) delivered the baby.

3. WHAT WAS USED TO CUT THE CORD? Check which type of instrument was used to cut the umbilical cord. "WOOD" refers to a bamboo or other wooden splinter; "SHAVING BLADE" refers to a razor commonly used for shaving; "STERILE BLADE" refers to a sterile razor blade made especially for surgical procedures, such as the one included in delivery kits (If a delivery kit was used for the delivery, you must still ask what was used to cut the umbilical cord; it is possible that the sterile blade included in the kit was not used to cut the cord. Please indicate if some "OTHER" instrument was used to cut the cord and enter the instrument used.

4. WAS A DELIVERY KIT USED TO DELIVER THE BABY? Indicate if a standard delivery kit was obtained and used to deliver the baby.

Section 4: MOTHER'S VACCINATION HISTORY

1. WAS MOTHER EVER VACCINATED AGAINST TETANUS? Indicate if the mother ever received TT (NOT DPT).

2. TOTAL VALID TT DOSES RECEIVED - Indicate the number of valid TT doses received by the mother in her lifetime, both according to vaccination card (if available) and by verbal history. Indicate the total number of valid doses, which will usually be the greater of the two. If the total is greater than either of the two, explain why in the margin of the form. A valid TT dose is a dose received after the woman became eligible for another dose of TT according to the TT 5-dose schedule (see eligibility table).

3. DATE OF LAST VALID TT DOSE: Indicate the date in which the mother received the most recent valid dose of TT, both according to the vaccination card and by verbal history.

Section 5: OUTBREAK RESPONSE- Complete this section only for the INDEX CASE of an outbreak investigation. *This section should not be completed for NT cases identified during an outbreak response.*

1. WAS A CASE RESPONSE CONDUCTED? Check "YES" if the case-household was visited; check NO if the investigation was conducted in the hospital and there was no case response in the community.

2A. WERE THERE ANY ADDITIONAL NT CASES (ALIVE OR DEAD) IN THE PAST 6 MONTHS IDENTIFIED? How many babies (living or dead) developed NT during the past 6 months? To answer this question, ask two questions to key informants, community doctors, homeopaths, healers, imams, or area mothers:

1. Do they know of any women who had a baby that died in the first month of life?
2. Do they know of any living child <6 months old who developed complete body stiffness during the first month of life?

If the answer to either of these questions is "YES", complete a new *NT/ND Case Investigation Form* and determine if the neonate meets the case definition of NT.

2B. IF YES, HOW MANY? Enter the total number of *additional* NT cases identified during the outbreak response.

3. WAS THE MOTHER GIVEN TT VACCINE AFTER THE DEATH OF HER BABY? Indicate whether the mother was vaccinated with TT anytime after the death of her baby.

3B. IF NO, WHY NOT? Explain why the mother was not vaccinated.

4. HOW MANY TOTAL WOMEN 15-49 YEARS OLD WERE SCREENED? Enter the total number of women of child bearing age (i.e., 15-49 years old) which were visited/interviewed during the outbreak response, as indicated on the worksheet on the back of the case investigation form;

5. HOW MANY TOTAL WOMEN 15-49 YEARS OLD WERE ELIGIBLE FOR TT1 and TT2? Enter the number of women of child bearing age eligible to receive TT vaccination according to the TT 5-dose schedule as indicated on the worksheet. Remember to count *only* valid doses; refer to the woman's vaccination card; if she does not have a vaccination card, ask her the following questions:

1. How many total doses of TT have you received?
2. What was the time interval between doses?
3. When was the last time you received vaccine?

Valid doses and eligibility for vaccine are determined from the following table:

Number of TT doses received	Next eligible TT dose	When eligible
None	TT1	Immediately
TT1	TT2	1 month or more after TT1
TT2	TT3	6 months or more after TT2
TT3	TT4	1 year or more after TT3
TT4	TT5	1 year or more after TT4
TT5	None	Fully protected

For example, if a 20 year old woman received 3 doses of TT and the last dose was given more than one year ago, she is eligible for her fourth dose of TT. Another example: if a 15 year old girl has received 2 doses of TT and the last one was given 7 months ago, she is eligible for TT3.

6. HOW MANY TOTAL WOMEN WERE VACCINATED WITH TT? Enter the total number of women vaccinated as part of case response immunization.

Instructions on completing the Measles Outbreak Investigation Form

1. Be sure to complete the form for all cases affected in the outbreak; ask if anyone had measles symptoms since 1 month before the first reported case;
2. Enter "case" in the first column for cases;
3. Enter "control" in the first column for controls;
4. Controls should be only children 9 months to 5 years (71 months) old;
5. Include at least twice as many controls as cases in the same age group; if there are 50 cases who are 9 months to 5 years old, you should include at least 100 controls in the same age group;
6. Controls should be taken from the same household as cases (be sure to write the same number in the "House no." column) as well as from households without cases;
7. Include *all* (not some) 9-71 month old children living in a household in the case-control study; all may be cases, all may be controls, or there may be a mix of cases and controls.
8. House numbers may be numbers (1, 2, 3, 4, etc.) rather than specific addresses;
9. Please write if age is in years (y) or months (m);
10. Treated with vitamin A refers to vitamin A supplements given during the outbreak investigation;
11. Complications include
 - pneumonia (cough or difficulty breathing and respiratory rate [RR] >60 for infants <2 months;
RR>50 for infants 2-11 months;
RR>40 for children 12-59 months old
 - diarrhea (≥ 3 watery stools per day);
 - blindness;
 - malnutrition;
 - death

Appendix 9:

List of Abbreviations

AFP	Acute Flaccid Paralysis
AHI	Assistant Health Inspector
AHO	Assistant Health Officer
ARI	Acute Respiratory Infection
BASICS	Basic Support for Institutionalizing Child Survival
BRAC	Bangladesh Rural Advancement Committee
CBA	Child-bearing age (15-49 years old)
CBDS	Community Based Disease Surveillance
CCC	Chittagong City Corporation
CD-VAT	Customs Duty-Value Added Tax
CDD	Control of Diarrheal Disease
CFR	Case fatality rate
CHO	City Health Officer
CO ₂	Carbon Dioxide
CWFP	Concerned Women for Family Planning
DCC	Dhaka City Corporation
DGFP	Directorate General of Family Planning
DGHS	Directorate General of Health Services
DSO	Divisional Surveillance Officer
EIS	Epidemiologic Information System
EPI	Expanded Programme on Immunization
EPID	Epidemiologic Identification (number)
FBDS	Facility Based Disease Surveillance
FPDS	Focal Point for Disease Surveillance
FPAB	Family Planning Association of Bangladesh
FPSTC	Family Planning Services Training Center
FW	Field Worker
FWA	Family Welfare Assistant
FWV	Family Welfare Visitor
GOB	Government of Bangladesh
HA	Health Assistant
HIU	Health Information Unit
HQ	Headquarters
ICD-9	International Classification of Disease - 9th Edition
IEDCR	Institute for Epidemiology, Disease Control and Research
IPH	Institute of Public Health
KCC	Khulna City Corporation
LGRD	Local Government and Rural Development
LSO	Local Surveillance Officer
MDP	Monthly Disease Profile
MODC	Medical Officer for Disease Control
MOHFW	Ministry of Health and Family Welfare
MOMCH	Medical Officer for Maternal-Child Health

List of Abbreviations

ND	Neonatal death
NDIS	National Disease Incidence Survey
NGO	Non-governmental Organization
NID	National Immunization Day
NPL	National Polio Laboratory
NT	Neonatal tetanus
OPV	Oral Polio Vaccine
ORI	Outbreak Response Immunization
ORS	Oral Rehydration Solution
POA	Plan of Action
RCC	Rajshahi City Corporation
THC	Thana Health Complex
THFPO	Thana Health and Family Planning Officer
TNO	Thana Nirbahi Officer
UOO	Urban Operations Officer
USO	Urban Surveillance Officer