
Field Guide

For Supplementary Activities aimed at
achieving polio eradication

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Contents

<i>Abbreviations</i>	v
I. Background	1
II. The epidemiology of polio	8
The polioviruses	8
Communicability	8
Immunity	8
Occurrence	8
Transmission.....	8
Reservoir.....	8
III. Clinical aspects of polio	9
Clinical course.....	9
Differential diagnosis.....	10
IV. Polio vaccines	13
Trivalent oral polio vaccine (OPV)	13
Inactivated or killed polio vaccine (IPV).....	13
Vaccine schedule	13
Dosage and administration	13
Contraindications	14
Vaccine storage and transport.....	14
The vaccine vial monitor.....	14
V. Establishing acute flaccid paralysis (AFP) surveillance to track wild poliovirus circulation	15
What is the role of AFP surveillance?.....	15
What is the role of the laboratory in AFP surveillance?.....	15
Components of AFP surveillance.....	16
Types of polio surveillance	16
Steps to develop AFP surveillance	16
VI. Conducting national immunization days	23
What are national immunization days?	23
When are NIDs conducted?.....	23
What makes NIDs most effective?.....	24
What are other benefits of NIDs?	24
Fifteen keys to planning successful NIDs.....	25
Most common errors or problems associated with NIDs.....	29
Suggested schedule to effectively plan and conduct NIDs	34

VII. Conducting mopping-up immunization.....	50
What is “mopping-up”?	50
At what stage is mopping-up done?	50
What is the purpose of mopping-up?	50
Forecast vaccine for mopping-up.....	50
Planning is similar to NIDs.....	51
Central level planning	51
District-level planning	51
District supervision.....	52
Social mobilization.....	52
Summarize and evaluate.....	48
Most common errors during mopping-up	53
Bibliography	54
Appendix 1: Definitions.....	57
Appendix 2: Classification schemes	59
Appendix 3: Forms	64
Appendix 4: Assigning EPID numbers	70
Appendix 5: Flow diagram of case investigation, stool specimen collection and outbreak response immunization	72
Appendix 6: Case investigation and outbreak response immunization	73
Appendix 7: Collecting and sending stool specimens and reporting results	76
Appendix 8: Steps to initiate AFP surveillance	81
Appendix 9: Sample graphs.....	82
Appendix 10: Sample spot map of confirmed polio cases	83
Appendix 11: Ten indicators of disease surveillance and laboratory performance	84
Appendix 12: Attributes of effective disease surveillance.....	85
Appendix 13: Other interventions and referral strategies during NIDs.....	86
Appendix 14: Logistics and cold chain requirements for NIDs.....	92
Appendix 15: Preparing a NIDs budget.....	107
Appendix 16: Strategies for special populations.....	102
Appendix 17: Monitoring and supervision	111
Appendix 18: Social mobilization for NIDs.....	123
Appendix 19: NIDs guide.....	128
Appendix 20: Vaccine safety.....	141
Appendix 21: Monitoring and evaluating NIDs.....	147
Appendix 22: Calculating the target population and vaccine requirements for mopping-up immunizations.....	149
Appendix 23: Mopping-up tally sheet	150
Appendix 24: Mopping-up work sheet	151
Appendix 25: Summary of mopping-up immunization.....	152
Appendix 26: Comparison of NIDs, ORI and mopping-up.....	153

Abbreviations

AEFI	adverse event following immunization
AFP	acute flaccid paralysis
CDC	US Centers for Disease Control and Prevention
DPT	combined diphtheria, pertussis and tetanus vaccine
EPI	Expanded Programme on Immunization
GBS	Guillain-Barré syndrome
ICC	Inter-agency Coordinating Committee
IPV	inactivated polio vaccine
MOH	ministry of health
NGO	nongovernmental organization
NID	national immunization day
OPV	oral polio vaccine
ORI	outbreak response immunization
PEI	Polio eradication initiative
TT	tetanus toxoid
UNICEF	United Nations Children's Fund
VAPP	vaccine-associated paralytic polio
WHO	World Health Organization

I. Background

In May 1988, the World Health Assembly committed the World Health Organization (WHO) to achieving the goal of global eradication of poliomyelitis by the year 2000. This goal is defined as:

- no cases of clinical poliomyelitis associated with wild poliovirus, and
- no wild poliovirus found worldwide despite intensive efforts to do so.

The three primary strategies for achieving this goal are:

1. The establishment of high levels of national commitment to ensure the availability of adequate personnel and the financial resources to achieve the goal.
2. The administration of polio vaccine in the manner most effective to interrupt transmission of wild poliovirus. This includes:
 - attaining high routine coverage with at least three doses of oral polio vaccine
 - conducting national immunization days (NIDs)
 - conducting “mopping-up” immunization when polio is reduced to focal transmission.
3. The implementation of action-oriented surveillance for all possible cases of poliomyelitis. This includes case investigation, isolation of virus from stool and limited outbreak response immunization.

The polio eradication initiative (PEI) is a global collaborative effort. WHO, UNICEF, Rotary International, the US Centers for Disease Control and Prevention (CDC), and a number of governments and nongovernmental organizations are strongly committed to the initiative. Their generous financial and technical support has been critical in achieving the significant progress made to date.

Experience in the Americas, where polio has been eliminated since August 1991, demonstrates that the recommended strategies are effective and that global eradication of polio is feasible.

The global eradication of poliomyelitis is also cost beneficial. The short-term cost of achieving the goal is outweighed by the long-term financial and humanitarian benefits. Children will no longer be crippled by polio. Costly rehabilitation of polio victims, as well as the purchase and delivery of polio vaccine, will no longer be necessary.

Several indirect benefits are also apparent. The global polio laboratory network can be used in the control of other diseases of public health importance. The PEI increases awareness of preventive health issues among national leaders, and sets a precedent for their participation in other health initiatives. In many countries, the PEI has succeeded in mobilizing resources from outside the health sector. The trained personnel, equipment and infrastructure

resulting from the development of action-oriented surveillance for polio can also help to revitalize or improve national disease surveillance systems.

The PEI aims to achieve its goal in ways that strengthen the Expanded Programme on Immunization (EPI) and enhance its contribution to the development of high quality primary health care. Nevertheless, maximum benefit of the PEI depends on the total eradication of wild polioviruses, and not just the control of clinical disease. In order to achieve this, the initiative requires priority attention, team work and the effective implementation of its strategies.

The purpose of this manual is to provide practical guidelines for implementing the supplementary elements of the strategies described above. These activities must be included in a national plan of action for polio eradication. Other manuals listed in the bibliography provide guidelines for conducting routine immunization activities.

This manual is written primarily as a guide for national EPI managers who, with the assistance of personnel at all levels, will be responsible for planning, implementing, monitoring, and evaluating activities related to polio eradication. Their commitment, competence, hard work and enthusiasm are critical to achieving the goal of polio eradication by the year 2000.

II. The epidemiology of polio

The polioviruses

The polioviruses are three related enteroviruses: types 1, 2 and 3. All three types cause paralysis. The most frequent cause of epidemic polio is poliovirus type 1.

Communicability

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

Immunity

Protective immunity against poliovirus infection develops by immunization or natural infection. Immunity to one poliovirus type does not protect against infection with other poliovirus types. Immunity following natural infection or administration of live oral polio vaccine (OPV) is believed to be lifelong. The duration of protective antibodies after administration of inactivated polio vaccine (IP) is unknown. Infants born to mothers with high antibody levels against poliovirus are protected for the first several weeks of life.

Occurrence

Poliomyelitis occurs worldwide, except in areas where the virus has been eliminated, such as in the Western Hemisphere and most industrialized countries. Incidence is presently highest in developing countries, especially those 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.

Transmission

Transmission is primarily person-to-person via the faecal-oral route, i.e. the poliovirus multiplies in the intestines and is spread through the faeces. 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 one month or more after infection. The most heavy faecal excretion of the virus occurs just prior to the onset of paralysis and during the first two weeks after paralysis occurs.

Reservoir

Poliovirus infects only human beings and there is no animal reservoir. The virus does not survive long in the environment outside the human body. There is no long-term carrier state.

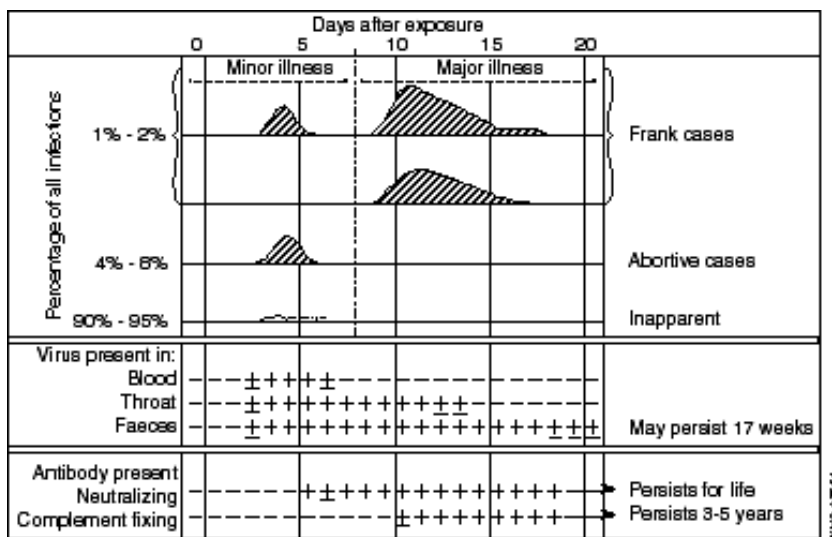
III. Clinical aspects of polio

Clinical course

In 90-95% of infected individuals, poliovirus infection is not apparent. Minor illness will result in 4-8% of infections characterized by low grade fever, sore throat, vomiting, abdominal pain, loss of appetite, and malaise. Recovery is rapid and complete, and there is no paralysis. This form of poliovirus infection is called “abortive poliomyelitis”. It cannot be distinguished from other mild, viral infections.

Paralytic poliomyelitis occurs in approximately 0.5% of infections. The symptoms often occur in two phases, minor and major, sometimes 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. “Spinal paralytic poliomyelitis” affecting the muscles of the legs, arms and/or trunk is the most common form of paralytic poliomyelitis. The affected muscles are floppy and reflexes are diminished. The sense of pain and touch remain normal. The paralysis is usually asymmetric, affecting the legs more often than the arms and the proximal parts of the extremities more often than the distal parts. Residual flaccid paralysis is usually present after 60 days.

Figure 1: Phases of occurrence of symptoms



In severe cases, quadriplegia may develop with paralysis of the trunk, abdominal and thoracic muscles. More rarely, “bulbar polio” occurs, affecting the motor neurons of the cranial nerves. This may result in respiratory insufficiency and difficulty in swallowing, eating and speaking. The risk of death from bulbar polio is high. Poliovirus infection may on rare

occasions cause meningitis or encephalitis, which is clinically indistinguishable from other forms of meningitis or encephalitis.

Certain factors, if present during infection with poliovirus, increase the likelihood of paralysis; these include administration of intramuscular injections, strenuous exercise, pregnancy, tonsillectomy, and injury.

Differential diagnosis

The differential diagnosis of acute flaccid paralysis includes paralytic poliomyelitis, Guillain-Barré syndrome and transverse myelitis; less common etiologies are traumatic neuritis, encephalitis, meningitis and tumors. Distinguishing characteristics of paralytic polio are asymmetric flaccid paralysis, fever at onset, rapid progression of paralysis, residual paralysis after 60 days, and preservation of sensory nerve function.

Table 1: Differential diagnosis of poliomyelitis

	Polio	Guillain-Barré syndrome	Traumatic neuritis	Transverse myelitis
Installation of paralysis	24 to 48 hours onset to full paralysis	from hours to ten days	from hours to four days	from hours to four days
Fever at onset	high, always present at onset of flaccid paralysis, gone the following day	not common	commonly present before, during and after flaccid paralysis	rarely present
Flaccid paralysis	acute, usually asymmetrical, principally proximal	generally acute, symmetrical and distal	asymmetrical, acute and affecting only one limb	acute, lower limbs, symmetrical
Muscle tone	reduced or absent in affected limb	global hypotonia	reduced or absent in affected limb	hypotonia in lower limbs
Deep-tendon reflexes	decreased to absent	globally absent	decreased to absent	absent in lower limbs early hyper-reflexia late
Sensation	severe myalgia, backache, no sensory changes	cramps, tingling, hypoanaesthesia of palms and soles	pain in gluteus, hypothermia	anesthesia of lower limbs with sensory level
Cranial nerve involvement	only when bulbar involvement is present	often present, affecting nerves VII, IX, X, XI, XII	absent	absent
Respiratory insufficiency	only when bulbar involvement is present	in severe cases, enhanced by bacterial pneumonia	absent	sometimes

Table 1: Differential diagnosis of poliomyelitis (*continued*)

	Polio	Guillain-Barré syndrome	Traumatic neuritis	Transverse myelitis
Autonomic signs & symptoms	rare	frequent blood pressure alterations, sweating, blushing and body temperature fluctuations	hypothermia in affected limb	present
Cerebro-spinal fluid	inflammatory	albumin-cytologic dissociation	normal	normal or mild in cells
Bladder dysfunction	absent	transient	never	present
Nerve conduction velocity: third week	abnormal: anterior horn cell disease (normal during the first 2 weeks)	abnormal: slowed conduction, decreased motor amplitudes	abnormal: axonal damage	normal or abnormal, no diagnostic value
EMG at three weeks	abnormal	normal	normal	normal
Sequelae at three months and up to a year	severe, asymmetrical atrophy, skeletal deformities developing later	symmetrical atrophy of distal muscles	moderate atrophy, only in affected lower limb	flaccid diplegia atrophy after years

IV. Polio vaccines

There are two types of polio vaccine: 1) trivalent oral (live, attenuated) polio vaccine (OPV) and 2), inactivated or killed polio vaccine (IPV).

Trivalent oral polio vaccine (OPV)

Trivalent oral polio vaccine consists of live, attenuated polioviruses, and is a safe and effective vaccine.

OPV is the vaccine recommended by WHO for polio eradication

WHO currently recommends a formulation of trivalent OPV with 10^6 , 10^5 , $10^{5.8}$ TCID₅₀ per dose for types 1,2, and 3, respectively, for both routine and supplementary immunization. Three doses of OPV will protect at least 80-85% of immunized children from paralytic disease. Lower levels of immunity, especially for type 3, may occur in developing countries, particularly if OPV is administered during the rainy season.

OPV is given by mouth and its cost is low. The vaccine produces both intestinal and serologic immunity. As a result, children immunized with OPV are unlikely to spread wild polio virus to other children. When administered during a mass campaign, OPV can interrupt wild poliovirus transmission in the community.

A disadvantage of OPV is that, for every 10 million doses administered, approximately 3 children will experience vaccine-associated paralytic polio.

Inactivated or killed polio vaccine (IPV)

Inactivated polio vaccine prevents paralytic polio by producing sufficient antibodies in the serum to prevent the poliovirus from entering the nervous system. IPV poses no risk of vaccine-associated paralysis. However, compared to OPV, it produces lower levels of intestinal immunity. Consequently, a person immunized with IPV is more likely to spread wild polio virus to other children, compared to a person immunized with OPV. IPV is more expensive than OPV, must be injected by trained personnel, and requires additional equipment and supplies.

Vaccine schedule

WHO currently recommends that children receive four doses of OPV before one year of age. In endemic countries, a dose should be given at birth or as close to birth as possible. This is called the “birth dose”, or “zero dose”. The other three doses should be given at least four weeks apart and usually at the same time as DPT. If the zero dose is not given, then a fourth dose of OPV should be given at least one month after the third one, for example at the time of measles immunization.

Dosage and administration

One dose of OPV from most manufacturers consists of 2 drops of vaccine administered directly into the mouth.

Contraindications

Children with congenital immune deficiencies, or who are iatrogenically immuno-compromised (e.g. cancer patients) should receive IPV. Otherwise there are no contraindications for administration of OPV. If OPV is given to a child with diarrhoea, the dose should be repeated one month later.

Vaccine storage and transport

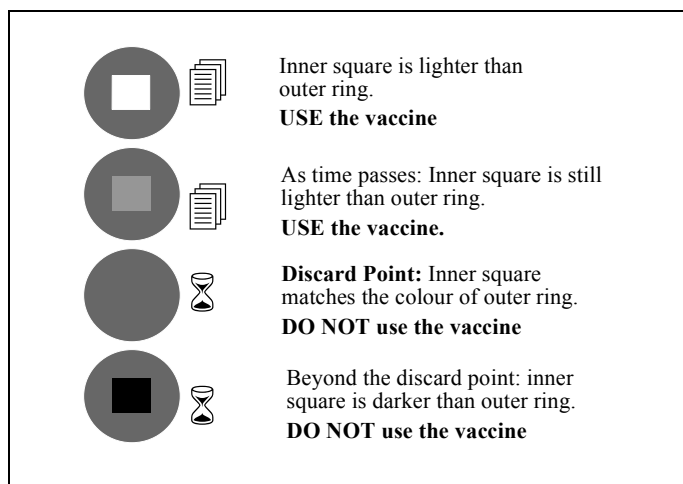
OPV is the least stable of the EPI vaccines. It can lose potency if exposed to temperatures above 8°C. Storage at temperatures below -15°C halts deterioration in vaccine potency. OPV should preferably be kept in a freezer (below -15°C) at central and regional levels. OPV can be kept in a refrigerator (between 0°C and 8°C) at district and health centre levels, except when distribution is not imminent, in which case it should be stored in a freezer (below -15°C), if possible.

The shelf life (i.e. expiry date) indicated on the OPV vaccine vials is valid for storage in freezers (below -15°C). OPV can however be kept up to 12 months in refrigerators (between 0°C and 8°C). Repeated freezing and thawing does not affect the titre of the vaccine.

The vaccine vial monitor

Since the beginning of 1996, all vials of Oral Polio Vaccine procured through UNICEF come with a Vaccine Vial Monitor (VVM). This heat sensitive label gradually and irreversibly changes colour as the vaccine is exposed to heat. It warns the health worker when a vial of OPV should be discarded because the vaccine is likely to have been degraded by exposure to heat.

Figure 2: Vaccine vial monitor colour changes



For more information on the use of the VVMs please refer to WHO/EPI Publications:

- *Vaccine Vial Monitor and Opened Vial Policy, Questions and Answers (WHO/EPI/LHIS/96.1)*
- *Vaccine Vial Monitor, Training Guideline (WHO/EPI/LHIS/96.04)*: A complete “VVM information package” with training aids is also available upon request from the WHO/GPV Documentation Centre.

V. Establishing acute flaccid paralysis (AFP) surveillance to track wild poliovirus circulation

What is the role of AFP surveillance?

To identify high risk areas or groups

AFP surveillance is surveillance for suspected or possible polio. Its purpose is to detect reliably areas where poliovirus transmission is occurring or likely to occur, and to allow supplementary immunization to be focused where it is needed. As the number of polio cases approaches zero, the ability to detect and respond rapidly to every case of AFP becomes critical. To ensure that every case of polio will be detected intensive surveillance for AFP should be conducted.

To monitor progress

AFP surveillance allows programme managers to monitor progress and to determine whether strategies are implemented effectively.

To certify a country polio-free

Certifying a country as polio-free requires that there are no reports of new cases of poliomyelitis caused by wild poliovirus. It also requires evidence that a country can detect a case of paralytic polio should it occur. As an indicator of a country's ability to detect polio, at least 1 case of AFP per 100,000 children <15 years of age should be detected, even in the absence of polio. The AFP rate in children <15 years of age is an indicator of the sensitivity of the surveillance system.

What is the role of the laboratory in AFP surveillance?

To confirm polio by virus isolation

Isolation and identification of poliovirus from the faeces is the best current method to confirm the diagnosis of poliomyelitis. WHO, in collaboration with several other institutions, has developed a global network of laboratories to provide this service.

To trace the origin of a case

Molecular techniques are available to characterize fully the poliovirus. Maintaining a reference bank of the molecular structure of known viruses allows the geographic origin of new isolates to be traced. When countries are polio-free or almost polio-free, it is necessary to determine whether the virus was imported or indigenous. The laboratory will also determine whether isolated viruses are wild or vaccine-like.

To coordinate services

The global laboratory network is a 3-tiered system. Each tier provides different services, all of which are essential and must be coordinated. The network also coordinates the flow of

specimens, reagents and information between different levels of laboratories and between laboratories and programmes.

To certify that polio has been eradicated

The laboratory network will play a key role in certification of polio eradication by verifying the absence of wild poliovirus circulation. In addition to AFP surveillance, this may include stool surveys of health children in high risk areas and environmental surveillance.

To assess vaccine potency and efficacy

The laboratory network can perform potency tests on polio vaccine if circumstances indicate possible failure. In selected situations, a laboratory might participate in epidemiologic sero-surveys if knowledge of the antibody status of the population or a given cohort is important.

Components of AFP surveillance

AFP surveillance consists of:

- detecting, reporting and investigating suspected cases
- collecting data from reporting sites
- analysing data and using them for action
- reporting findings
- providing feedback (information) to all levels and interested parties

For definitions of some surveillance terms refer to Appendix 1. For general information on routine disease surveillance, refer to “Improving Routine Systems for Surveillance of Infectious Diseases Including EPI Target Diseases: Guidelines for National Programme Managers”, WHO/EPI/TRAM/93.1

Types of polio surveillance

Routine surveillance for AFP, zero reporting

To have a sensitive and responsive surveillance system of suspected polio, immediate notification of AFP in children aged <15 years of age should be required. AFP should also be included in the monthly reporting system. When no case of AFP is detected, reporting units should still send a monthly report indicating zero cases. This is called “zero reporting”.

Active surveillance for AFP at major sites

To improve completeness, timeliness and sensitivity of AFP surveillance, a designated person in the Ministry of Health should make weekly visits to sites likely to have cases of acute polio, such as major hospitals and rehabilitation centres. Visits should be made particularly to paediatric and neurology wards to inquire about cases of AFP, including Guillain-Barré syndrome. A search of all inpatient and outpatient medical records should also be conducted for review of preliminary and final diagnoses.

Steps to develop AFP surveillance

Step 1. Define information needs

Because polio is targeted for eradication, high quality surveillance data is essential. However, to avoid overburdening the surveillance system, only the minimum data should be collected. Appendix 2c lists the minimum information needed from each case of polio. This minimum

information will allow one to generate the analyses necessary to guide programme activities and calculate standard performance indicators (Appendix 11). Two simple data bases should be maintained: one for case data and one for laboratory data. These data bases can then be linked to make a complete line listing using a case identification number (“EPID number”). The line listing can be on paper or computerized with a simple software programme such as EPI-INFO.

Step 2. Develop a case definition for suspected polio

“*Suspected polio*”: A case of suspected polio is defined as acute, flaccid paralysis in a child aged <15 years including Guillain-Barré syndrome; or any paralytic illness in a person of any age when polio is suspected.

Each suspected case must be immediately reported and investigated by a designated, trained investigator.

If an immediate and obvious cause, such as injury, is identified for a suspected case of polio, the case investigator will discard the case and stop investigating it for polio (although the patient must still receive proper treatment and rehabilitation).

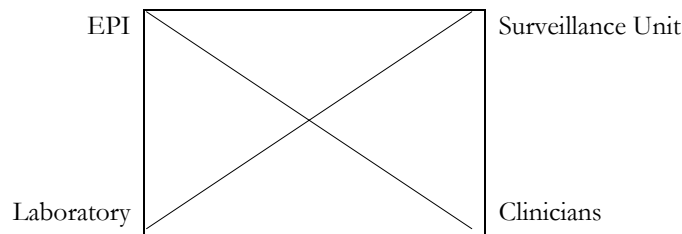
“Suspected polio” is a temporary classification, and within twelve weeks of onset of paralysis, the case should be reclassified by the expert committee as “confirmed”, “polio-compatible” or “discarded” (See Appendices 1, 2, 3b, and 5).

Step 3. Identify reporting sites

Identify all potential reporting sites or units. These include health facilities, rehabilitation centres and any other sites where AFP cases might seek care or rehabilitation. Prioritize the reporting units according to their likelihood of seeing AFP cases. For example, hospitals with large paediatric wards in major cities are high priority reporting sites. AFP surveillance should first be established in high priority sites.

Step 4. Establish a network of collaboration

To achieve a high quality surveillance for polio, virologists, epidemiologists, clinicians, and national EPI staff must work effectively as a team. The national EPI manager should therefore establish a network of close collaboration among four units - the laboratory, the surveillance unit, clinicians, and EPI. To maintain effective collaboration, it is essential that persons are clearly designated to perform specific tasks in each unit and at each level, and that their responsibilities are clearly specified and agreed upon.



Frequent communication by EPI staff with the other units is critical to solve any problems and maintain collaboration. This can be accomplished through visits, phone calls, letters, feedback bulletins, conferences, and professional meetings to keep all units informed, communicating, motivated and working to achieve the goals of the polio eradication initiative.

EPI staff should meet at least once every month with the directors of other units, and visit occasionally with the staff of each unit - i.e. laboratory technicians processing specimens in the laboratory, personnel managing data in the surveillance unit, and clinicians in paediatric or neurology wards of hospitals likely to see cases of AFP.

Step 5. Develop or modify forms

Eight forms are necessary. In some countries, these forms already exist. In others, they should be created or revised:

- a form for immediately notifiable diseases or conditions including “acute flaccid paralysis”
- a monthly reporting form, including “acute flaccid paralysis”
- a form or graph to monitor completeness and timeliness of monthly reports received (Appendix 3a)
- a case investigation form for acute flaccid paralysis (Appendix 3b)
- a line listing form (Appendix 3c)
- a weekly active surveillance form (Appendix 3d)
- a laboratory request reporting form for submission of stool specimens (Appendix 3e)
- a monthly/quarterly laboratory results form (Appendix 3f).

Step 6. Assign EPID numbers

To link epidemiological and laboratory data on each case, a unique case identification number (EPID number) must be assigned for each case. The system of assigning EPID numbers should be standardized throughout the country. See Appendix 4 for an example of how to assign EPID numbers.

The EPI manager, laboratory and surveillance unit should agree on who will assign EPID numbers and how they will be assigned for each reported case of AFP. This responsibility is usually delegated to health personnel at the district or provincial level.

Step 7. Train a team of investigators

Train a team of investigators at the central, provincial and/or district level depending on the size and population of the country and the resources available. This team will:

- conduct immediate investigations of all AFP cases
- collect stool specimens
- implement limited outbreak response immunization (ORI)
- conduct a 60-day follow-up examination for residual paralysis.

For information on training in these four key areas, refer to Appendices 5-7.

Step 8. Develop a reverse cold chain

To isolate poliovirus, stool specimens should be maintained at 4-8°C or stored at -20°C from the moment of collection until processing in the laboratory, a process referred to as a “reverse cold chain”. If a reverse cold chain is not properly maintained, poliovirus will not survive in the stool.

To develop a reverse cold chain, every case investigator should have immediate access to a cold box and ice packs. This equipment should be designated for use only with stool

specimens. There should also be a means to freeze the ice packs. Access to a refrigerator (4–8°C) or a deep freezer (-20°C) may also be necessary if specimens cannot be sent immediately. Case investigators should receive training on how to collect and send specimens via the reverse cold chain. Refer to Appendices 6 and 7 on case investigation, and transport of stool specimens via the reverse cold chain.

Step 9. Hold clinician advocacy meetings and send an official written notice

Hold clinicians advocacy meetings and send to all health workers an official written notice, signed by the Minister of Health or appropriate official to explain the following:

- objectives of the polio eradication initiative (PEI)
- important role of the clinicians and all health worker in the PEI
- obligatory immediate notification of all cases of AFP, including Guillain-Barré syndrome
- procedures for reporting AFP.

Important Note. Unless clearly explained, clinicians tend to report only AFP cases believed to be polio and exclude cases diagnosed as Guillain-Barré syndrome (GBS) or other non-polio AFP. Therefore, the Ministry of Health should hold clinician advocacy meetings to explain clearly the PEI strategies and emphasize that all cases of AFP, including Guillain-Barré syndrome, must be reported immediately for public health reasons. The case definition for suspect polio is not for clinical use but to develop highly sensitive surveillance for polio. All suspect cases will be subsequently reclassified either as polio or non-polio. Surveillance personnel should search actively for unreported cases of GBS to determine whether clinicians are reporting all cases of AFP.

Step 10. Establish an expert committee

The national EPI manager should establish a polio eradication expert committee. Members should include the EPI manager, an epidemiologist, an expert neurologist, a paediatrician, a senior professor from a medical school and a virologist. The responsibilities of the committee are to meet on a monthly or quarterly basis to:

- make the final classification of all AFP cases (refer to Appendix 2 for a flow chart of case classification, and to Appendix 3b, Part III for the final classification reporting form)
- monitor the quality of AFP surveillance and laboratory performance
- monitor progress towards polio eradication
- provide technical advice for the polio eradication initiative

Step 11. Begin AFP surveillance at major sites

Begin AFP surveillance at high priority reporting sites. In most countries, these will be major hospitals and rehabilitation centres in large cities. Begin immediate and monthly reporting, and insist on zero reports when no cases are detected. Conduct case investigations (including stool specimen collection) and outbreak response immunization. See Appendix 8 on how to initiate AFP surveillance.

Once AFP reporting begins, each reported AFP case should be followed by IMMEDIATE ACTION - i.e. case investigation and limited outbreak response activities. If not, staff at reporting sites will lose their motivation to detect and report all cases immediately.

Step 12. Begin weekly or bi-weekly active surveillance

Begin weekly (or bi-weekly) active surveillance at high priority sites. Weekly active surveillance consists of weekly searches in major hospitals and rehabilitation centres for cases of acute flaccid paralysis, and verification that all cases were reported and investigated. When conducting active surveillance, the following sources or persons should be consulted:

- Key people, such as neurologists, pediatricians, or physical therapists to inquire whether they have seen cases of acute, flaccid paralysis since the last active surveillance visit.
- In-patient and outpatient records to search for any preliminary or final diagnoses of polio, Guillain-Barré syndrome, transverse myelitis, traumatic neuritis, or other causes of acute, flaccid paralysis. Patient records should be checked in the paediatric, neurology, physical therapy, and medical records department of the hospital.

The responsibility for conducting weekly active surveillance should be clearly delegated to a trained, responsible person in each major city and, as the system is expanded, to a trained, responsible person in each province and district. An active surveillance form should be completed (Appendix 3d) each week and periodically reviewed by a supervisor to ensure that active surveillance is done routinely, thoroughly and correctly.

Step 13. Expand the surveillance system

As soon as AFP reporting, case investigation, stool specimen collection, limited outbreak response immunization, and weekly, active surveillance are working well in the major hospitals and rehabilitation centres, expand the system.

First, expand to **provincial hospitals** then to **district hospitals**, then include all health centres so that AFP surveillance becomes part of the routine system.

It may not be feasible to include submission of “zero reports” by all private physicians in the monthly reporting system. However, it may be possible to include selected private paediatricians and neurologists. All private physicians should, nevertheless, be informed of the requirement to report any case of AFP *immediately*.

Step 14. Follow-up late or incomplete reports

The EPI manager, in consultation with the surveillance unit, should agree on a deadline after which monthly reports are considered late. Many countries choose the 15th of the following month.

Completeness and timeliness of monthly reports can be closely monitored using the “report monitoring form” (Appendix 3a). Late or incomplete reports are followed-up by a visit, telephone call, or fax to the reporting site. The responsibility for follow-up must be clearly designated, usually to the surveillance unit personnel. During visits, efforts must be made to identify reasons for under-reporting and address immediately any problems.

Providing feedback to provinces and districts on reporting performance usually helps improve deficiencies in completeness and timeliness, particularly if it includes a comparison with the other provinces and districts.

Step 15. Begin active case finding

Active case finding consists of searches for AFP cases, in addition to the usual active surveillance at major reporting sites. Active case finding helps to determine if cases are being missed in areas with no reported cases of AFP or polio, and is also useful in areas where persons with AFP are unlikely to seek care at designated reporting sites.

To find cases, health officials should contact key persons, such as community leaders, school teachers, day care centre directors, social workers, leaders of women's organizations, mothers, traditional healers, and religious leaders to inquire about recently paralysed children in the community.

Step 16. Monitor and evaluate

Various methods of monitoring progress are necessary at the central and provincial level, and should also be taught and encouraged at the district and health facility level. Monitoring includes:

1. Line listing

Line listing is a simple list of the essential information on all reported AFP cases. Line listing is useful to monitor the progress of each case investigation, to verify that the case investigation is complete, to analyse data and to calculate performance indicators. See Appendix 3c for a sample line listing form.

2. Analysis by year, month, age, and immunization history

Make the following graphs or pie charts and display them prominently so that all staff and supervisors can review them.

See Appendix 9 for samples of graphs and charts.

y - axis

Number of confirmed polio cases
Number of confirmed polio cases
Number of confirmed polio cases
Number of confirmed polio cases
Number of AFP cases

by
by
by
by
by

x - axis

year
month
age group (0-4, 5-15, 15+)
immunization history
age group (0-4, 5-14, 15+)

A graph of confirmed polio cases by year indicates the progress made toward eradicating polio. The graph of confirmed polio cases by month indicates the season of high and low polio transmission, and is useful for planning NIDs and mopping-up immunization. The age distribution of confirmed polio cases is used to determine the age group at risk to target during NIDs, outbreak response immunization and mopping-up immunization. The immunization history of confirmed polio cases is used to evaluate vaccine efficacy and identify cold chain problems. A graph of AFP cases by age group indicates whether AFP cases are being reported for *all* children under 15 years (not just children under 5 years)

3. Spot mapping

All confirmed cases plotted should be on a map according to their place of residence at the time of onset to show where poliovirus is still circulating. Spot maps identify high risk areas to be targeted with special strategies during NIDs and mopping-up immunization. Similarly, all compatible cases should be mapped to indicate where surveillance failures are occurring (and/or where poliovirus might be circulating). See Appendix 10 for sample spot maps.

4. Performance indicators

Ten performance indicators are used to monitor the quality of disease surveillance and laboratory performance. Monitoring performance indicators is critical to stimulate improvement, identify problematic areas, and maintain good performance. Refer to Appendix 11 on how to calculate the ten performance indicators and to Appendix 12 for attributes of high quality disease surveillance.

Step 17. Provide feedback

Monthly or quarterly feedback of surveillance information to health staff, and other concerned parties is critical to establishing effective surveillance. Feedback can be provided through several media such as newspapers, journals, faxes, letters, reports and bulletins, as well as during supervisory visits. Providing feedback information to all designated reporting sites is necessary to verify the accuracy of reports received, to encourage complete and timely reporting, and to inform concerned parties of program progress.

Feedback should include information on the:

- number of reported cases of AFP
- number of confirmed polio cases, by month and by geographic location
- performance indicators for the entire country
- comparison of performance indicators by province.

Step 18. Raise awareness about the PEI

Raise awareness among health officials and the general public about polio eradication and the need for immediate reporting of all AFP cases.

- Make presentations about the polio eradication initiative at all important health professional meetings such as medical, paediatric, neurology, microbiology, and nursing societies.
- Use mass media and social mobilization to increase awareness of the polio eradication initiative, the importance of immunization, how to recognize a case of acute flaccid paralysis and the need for immediate reporting of any case of AFP. Increase awareness through TV, radio, newspapers, posters, banners, health education sessions, as well as announcements in mosques, temples, churches, schools and community meetings.
- Involve various agencies or organizations interested in the polio eradication initiative. For example, in many countries, Rotary Clubs and UNICEF are excellent at raising awareness and mobilizing the community to support the PEI.

VI. Conducting national immunization days

What are national immunization days?

During national immunization days (NIDs), doses of OPV are given to all children in a defined age group, usually children 0 to 59 months of age, in as short a period of time as possible (preferably 1-2 days), regardless of their immunization status. NIDs are conducted as two rounds of mass immunization, the second round occurring approximately four to six weeks after the first. The doses of OPV administered during NIDs are considered EXTRA doses which supplement and do NOT replace the doses received during routine immunization services.

The planning and execution of NIDs is a major public health event receiving much publicity and involving many participants in the public and private sectors. The logistics, coordination, and social mobilization of NIDs should be carefully planned well in advance for excellent implementation.

The primary objective of NIDs is to eradicate poliovirus

By giving oral polio vaccine at the same time to *all children over a short period of time* in a *large geographic area*, transmission of poliovirus is interrupted. To be effective, NIDs must achieve high coverage with OPV. Therefore, special efforts are necessary to reach children who are often missed by the routine immunization programme. For those already immunized, NIDs boost both serum and intestinal immunity against poliovirus.

Additional vaccines or vitamin A might be offered during NIDs in countries which already have experience in conducting NIDs with OPV along. Likewise, a referral strategy can also be implemented during NIDs in which women and children are screened during the second round of NIDs and those eligible to receive other antigens are referred to a local health centre.

However, offering additional vaccines or including a referral strategy during NIDs must not interfere with the primary objective - the eradication of polio. (See Appendix 13 for a more detailed discussion).

When are NIDs conducted?

Although polio can occur throughout the year, in endemic countries transmission is usually seasonal with distinct “high” and “low” seasons. For example, in tropical climates, the highest transmission usually occurs during the rainy season; and, in temperate climates, during summer and early autumn.

NIDs are conducted during the *low* season of poliovirus transmission

Most countries conduct NIDs annually for at least three years and until polio is reduced to focal transmission, at which time “mopping-up immunization” begins.

What makes NIDs most effective?

NIDs are most effective when:

- *children at high risk* for poliovirus infection and/or missed by the routine immunization programme receive an extra dose of OPV during each round
- *high coverage* is achieved during both rounds
- OPV is given over a *short time* period of only a few days
- they are conducted:
 - during the low season of poliovirus transmission and
 - in as large a geographic area as possible

What are other benefits of NIDs?

NIDs increase the community's awareness of immunization and health in general.

During NIDs, children and women can be referred to routine immunization services.

NIDs often involve community and national leaders, which sets a precedent for their active participation in other important health initiatives.

During NIDs, health workers often receive extra training and supervision; this can increase their motivation and improve their skills.

NIDs often strengthen the management of the cold chain.

This chapter of the guide provides:

- fifteen keys to conducting successful NIDs
- most common errors when planning or conducting NIDs
- a suggested schedule of the necessary activities to implement NIDs
- a suggested chronogram describing activities for optimal planning of NIDs

The following appendices provide additional information for planning NIDs:

- Appendix 14. Logistics and cold chain
- Appendix 15. Preparing a budget for NIDs
- Appendix 16. Strategies for “special” (high risk/hard-to-reach) populations
- Appendix 17. Monitoring and supervision
- Appendix 18. Social mobilization
- Appendix 19. Sample NIDs guide for districts and posts
- Appendix 20. Vaccine safety

Fifteen keys to planning successful NIDs

1. Ensure high level commitment and consensus

- among national authorities and major partner agencies
- commitment that NIDs will be done and consensus on how they will be done
- establish/verify existence of an Inter-Agency Coordinating Committee (ICC).

2. Ensure strong leadership

The NIDs coordinator should:

- have strong leadership and managerial skills
- be given adequate authority to plan and implement NIDs
- work closely with the national EPI manager to ensure consistent policies and enhancement of the routine programme.

3. Ensure adequate financial resources

- prepare and submit a realistic budget to the appropriate national authorities and partner agencies
- include vaccines, supplies/equipment, transport, training, social mobilization, personnel (per diem), administration and communications costs in the budget
- verify the method and lead time to access funds.

4. Start planning in advance

- minimize last minute frenzy!
- choose appropriate dates
 - during the low season of poliovirus transmission
 - not during events that would distract from NIDs (unless doing them simultaneously would enhance NIDs)
- hold an ICC meeting.

5. Involve other sectors

- from the beginning involve other government departments, the private sector, nongovernmental organizations, the religious sector, schools and communities
- fully acknowledge their involvement before, during and after NIDs!
- involvement will differ by country but might include:
 - providing cold boxes, thermos flasks or space in refrigerators and/or freezers
 - preparing meals for volunteers
 - making posters and banners
 - making house-to-house visits for social mobilization
 - providing transport (Note: sufficient transport for NIDs is rarely available within the MOH alone).

6. Correctly calculate and characterize the target population

- make standard and consistent calculations at all levels to calculate target populations and vaccine needs.
- the central level should specify which formula and which census data should be used
- always overestimate rather than underestimate needs
- identify “special populations” (high risk or hard-to-reach)
- use maps (to visualize distances and locations of posts, special populations, transportation routes and storage points).

7. Establish structure and designate responsibilities

- each administrative level should have a NIDs coordinator, a logistics committee and a social mobilization committee
- an established structure will permit a “cascade effect” for communications, planning, distribution of supplies, training, supervision and social mobilization.

8. Develop a standard schedule (who, what, when, where)

- the central level should develop a schedule
- a standard schedule allows for systematic, complete planning at each level
- the peripheral level can add to it for local activities/preparations.

9. Ensure good logistics

- good logistics is one of the two major cornerstones for successful NIDs
- Objective: For each round, every post/team should have at least:
 - 3-4 workers
 - a vaccine carrier, thermos or flask
 - 1 kilogram of ice or 4 frozen ice packs per day
 - 6-8 vials containing 20 doses of OPV per 100 children
 - 3 immunization tally sheets
 - a banner to mark the post site
 - posters/brochures indicating date of next round
- follow the standard schedule
- complete task list and logistics forms at each level
- make simple and consistent calculations at all levels
- ensure adequate cold space at all levels especially in provinces and districts
- make a distribution plan
- identify and notify ice makers in advance
- use maps
- identify enough transport for planning, transport of supplies, special strategies, supervision. Options include other ministries, private sector, NGOs, military
- understand different logistics requirements for urban versus rural planning.

10. Ensure good social mobilization

- good social mobilization is one of the two major cornerstones for successful NIDs
- seek advice first from those with experience (e.g. UNICEF, Rotary)
- develop a plan for social mobilization.
- develop simple key messages
- plan the opening ceremony WELL (high level officials and media present)
- seek participation of public figures in advance to ensure their availability
- during NIDs, provide regular feedback to the press whose role is to mobilize the population and motivate the workers/volunteers
- develop motivational materials (e.g. banners, posters, brochures, t-shirts, letters from schools to parents)
- develop media/press messages
- develop broadcaster's guide
- coordinate social mobilization committees at different levels (who is responsible for what)
- remember to include social mobilization materials in the distribution plan
- implement local social mobilization activities (i.e. local level should not rely solely on the national level for social mobilization)
- concentrate social mobilization more in urban areas because urban populations are more difficult to motivate to attend immunization campaigns.

11. If other antigens are included, this will require:

similar principles of planning, plus:

- increased social mobilization (different target groups)
- increased training and supervision
- increased logistics:
 - procure and distribute enough vaccine
 - allocate more cold space at all levels
 - procure and distribute enough disposable syringes/needles
 - ensure SAFE injections (i.e. training/supervision)
 - ensure SAFE disposal of syringes/needles by burning.

12. Make special efforts for “special populations”

- identify special populations (high-risk or hard-to-reach)
- avoid stigmatization
- designate a person or sub-committee at each level to be responsible for “special” strategies
- plan the implementation of special strategies several days before NIDs or continue several days afterwards
- in remote or hard-to-reach populations, take the opportunity to give other antigens.

13. Supervise at each level (by cascade)

- supervisors should understand and be involved in the planning process
- good supervisors are problem seekers and solvers
- good supervisors are reliable. **They keep their promises!**
- during visits, a supervisor should:
 - use a checklist
 - carry extra supplies
 - check task lists and logistics forms
 - motivate and encourage
- concentrate most supervision with best supervisors in problematic and priority areas
- two to five days before NIDs, supervisors or designated personnel should go house-to-house “spot checking” (e.g. every fifth household) in high-risk areas to assess social mobilization (i.e. do people know about NIDs - when and where) and take corrective action if necessary
- conduct on-going supervision during NIDs.

14. Ensure efficiency and good services at post

- implement training cascade on “how to plan and run an immunization post”
- develop a simple NIDs guide for districts and posts
- provide incentives for clients and workers (e.g. meals for workers, balloons for children)
- be pro-active during NIDs! Use local volunteers, parents and children to seek out eligible children
- avoid long lines
 - <250 children per post
 - proper distribution of posts
 - clear designation of responsibilities
 - enough volunteers to begin vaccinating EARLY before crowds develop
 - enough space
 - crowd control
 - designated entry and exit and one-way flow
 - immunization on a first come - first served basis
 - clients required to stand in line only once for all services
 - very simple tally sheets (do not record name and details of each child).

15. Plan to evaluate and use findings for future NIDs

- after NIDs, use summarized tally sheets to estimate coverage and wastage in all districts, provinces and at the central level
- meet at all levels for qualitative evaluation of NIDs and lessons learned
- calculate or estimate costs at each level
- implement effective AFP surveillance to measure the impact of NIDs!

Most common errors or problems associated with NIDs

- preparations begin too late, vaccine ordered too late
- unclear designation of responsibilities
- inadequate awareness (social mobilization) of NIDs
- inadequate distribution of supplies to post teams
- inadequate transport
- inadequate involvement of other sectors
- long lines for whatever reason at immunization posts
- recording too much information on each child
- posts not open early enough, late enough or during lunch hours to be accessible to working parent/s (especially in urban and peri-urban areas)
- inadequate feedback to peripheral levels on success of previous NIDs
- subsequent rounds of NIDs become “too routine”.

Table 2: Suggested schedule of NIDs activities

When	Activity	Person/committee responsible
At least 8 months before NIDs	Obtain commitment from high levels	Ministry of Health/EPI manager
	Choose dates	Ministry of Health/EPI manager
	Define and calculate target populations	Ministry of Health/EPI manager
	Calculate national vaccine needs for NIDs	Ministry of Health/EPI manager
	Prepare a preliminary budget	Ministry of Health/EPI manager
	Appoint a national NIDs coordinator	Ministry of Health/EPI manager
8 months before NIDs	Establish national coordinating, social mobilization and technical committees	National NIDs coordinator
	Develop and post schedule of tasks and activities	National NIDs coordinator
	Develop logistics forms (spreadsheets) for each level	National NIDs coordinating committee
	Develop task lists for each level	National NIDs coordinating committee

Table 2: Suggested schedule of NIDs activities *(continued)*

When	Activity	Person/committee responsible
7 months before NIDs	Meeting with provincial health officers	National NIDs coordinating committee
	Establish provincial coordinating and social mobilization committees	Provincial NIDs coordinator
	Prepare a meeting with district health officers	Provincial NIDs coordinating committee
	Develop a plan for social mobilization	National social mobilization committee
6 months before NIDs	Order vaccine	National NIDs coordinator Provincial coordinating & social mobilization committee
	Meet with district health officers	District NIDs coordinator
	Establish district coordinating and social mobilization committees	National, provincial, district coordinating committees
	Begin completing logistics spreadsheets	National coordinating committee
	Develop and field test NIDs guide	National social mobilization committee
	Calculate amounts/costs of social mobilization materials using spreadsheet	
5 months before NIDs	Meet with district NIDs coordinator to complete logistics spreadsheet	Provincial coordinating committee
	Recalculate more precise budget	
	Print NIDs guide	National NIDs coordinator
	Develop a broadcaster's guide	National coordinating committee National social mobilization committee
4 months before NIDs	Distribute NIDs guide to the provinces	National coordinating committee
	Distribute NIDs guide to the districts	Provincial coordinating committee
	Print broadcaster's guide	National social mobilization committee
	Develop social mobilization materials	National and provincial social mobilization committee
	Confirm participation of heads of state and other public figures	National social mobilization committee

Table 2: Suggested schedule of NIDs activities *(continued)*

When	Activity	Person/committee responsible
3 months before NIDs	Develop and print a supervisory checklist	National coordinating committee
	Develop and print tally sheets	National coordinating committee
	Appoint and meet with post coordinators/distribute NIDs guide	District NIDs coordinator
	Define strategies for sparse and special populations	District coordinating and social mobilization committee
	Prepare training on how to run an immunization post	National coordinating committee
	Distribute broadcaster's guide	National social mobilization committee
	Develop radio/TV announcements and press articles	National social mobilization committee
	Develop immunization post banners and street banners	To be decided by social mobilization committees
	Plan to evaluate and monitor NIDs	National coordinating committee
	8 weeks before NIDs	Establish community NIDs committee
Train provincial level		National coordinating committee
Finalize strategies for sparse and special populations		District coordinating and social mobilization committees
7 weeks before NIDs	Prepare training for district level	Those persons trained at the provincial level
	Prepare opening ceremony	National social mobilization committee
6 weeks before NIDs	Train district level	Those persons trained at the provincial level
	Verify availability of transport	National, provincial, district coordinating committee
	Finalize logistics spreadsheets at all levels	National, provincial, district coordinating committee

Table 2: Suggested schedule of NIDs activities *(continued)*

When	Activity	Person/committee responsible
5 weeks before NIDs	Make supervisory visits to provinces	National coordination committee
	Invite post coordinators to training session	District coordinating committee
4 weeks before NIDs	Train post coordinators	Those trained at district level
	Transfer vaccine from central level to provinces	National or provincial coordination committees
3 weeks before NIDs	Verify that all media announcements are prepared and sent out	National mobilization promotion committee
	Make supervisory visits to selected provinces	National coordination committee
	Train volunteers and meet with community NIDs committee	Post coordinators
	Make supervisory visits to all districts	Provincial coordinating committee
2 weeks before NIDs	Confirm preparations for opening ceremony	National mobilization promotion committee
	Transfer vaccine from provinces to districts	Provincial or district coordinating committee
	Make supervisory visits to all post coordinators	District coordinating committee
	Begin implementing strategies for special populations	District coordinating and social mobilization committee
	Prepare post materials	Community NIDs committee
	Begin local social mobilization	Community NIDs committee and volunteers
	Begin newspaper, radio and TV announcements	National social mobilization committee
1 week before NIDs	Make supervisory visit to selected districts	Provincial coordinating committee
	Make supervisory visits to selected post coordinators	District coordinating committees
	Intensify social mobilization activities	Central, district, village social mobilization committees
	Conduct pre-NID “spot check”	National, provincial, district social mobilization committees
	Give advance notification to ice maker	

Table 2: Suggested schedule of NIDs activities *(continued)*

When	Activity	Person/committee responsible
1-2 days before NIDs	Purchase ice or freeze ice packs	Community NIDs committee
	Transfer vaccine from districts to posts or vaccinating teams	Community NIDs committee
	Prepare post	Community NIDs committee
	Solve any last minute problems	Coordinating committees at all levels
	Make final preparations for opening ceremony	National social mobilization committee
NIDs!!	Conduct opening ceremony	National social mobilization committee
	Start immunizing	Post coordinator and volunteers
	Make house-to-house visits to mobilize population to visit post	Local volunteers
	Involve parents and children	Parents and children attending NIDs
	Implement strategies for sparse and special populations	District coordinating and social promotion committees
	Make mid-day calculation and react accordingly	Post, district, provincial and national NIDs coordinators
	Supervise and assist at posts	NIDs committee members at all levels, important officials, celebrities
1 day after NIDs	Meet with all post coordinators	District NIDs coordinator
	Return completed tally sheets and supplies to district	Post coordinator
	Clean up immunization post site	Post volunteers
First week after NIDs	Inform health centres of number of referrals	Post coordinator
	Calculate vaccine coverage and wastage by district	District NIDs coordinator
	Submit results to province	District NIDs coordinator
	Hold meeting with all district NIDs coordinators	Provincial NIDs coordinator
	Calculate vaccine coverage and wastage by province	Provincial NIDs coordinator
	Begin preparing for second round of NIDs	All levels, all committees

Table 2: Suggested schedule of NIDs activities (*continued*)

When	Activity	Person/committee responsible
2 nd week after NIDs	Submit results to central level	Provincial NIDs coordinator
	Hold meeting with all provincial NIDs coordinators	National NIDs coordinator
	Calculate national coverage and vaccine wastage	National NIDs coordinator
During month after NIDs	Respond to all reports or queries of adverse events	NIDs coordinators at all levels
	Calculate expenditures	National NIDs coordinator
	Consider coverage survey, if indicated	National NIDs coordination committee

Suggested schedule to effectively plan and conduct NIDs

The following consists of suggested guidelines for the chronology of events which should occur to plan and conduct successful NIDs. Because conditions vary by country, these guidelines should be adapted to the national situation.

Start small to gain experience

In countries with limited infrastructure or experience in conducting mass immunization campaigns, a pilot immunization day or sub-national immunization days can be implemented to gain experience before conducting national immunization days. The pilot activity should include immunization posts in both rural and urban areas to gain experience in both settings.

At least eight months before NIDs

1. Obtain national commitment

The Ministry of Health should obtain high level commitment from national authorities and major partner agencies to participate in and support NIDs.

2. Choose dates

The EPI manager should choose the dates of NIDs at least eight months in advance for logistics planning and to have enough time for vaccine procurement.

Remember: NIDs consist of 2 rounds, 4 to 6 weeks apart, during the low season of poliovirus transmission. NIDs should not compete with major religious, political, sporting or cultural events, unless this could be an advantage in increasing participation in NIDs. NIDs should be on a day of the week most convenient for the population (e.g. market day, after church on Sundays, before or after the mosque on Fridays) and when volunteers will be most available.

3. Define and calculate the target population

In most countries, the target population for NIDs is children under 5 years of age. Refer to Appendix 14a for a detailed explanation on how to calculate the target population. One of the following two formulas is most frequently used:

Formula 1: Target population = total population in the administrative area x percentage in target age group

Formula 2: Target population = number of live births in population x 5

4. Calculate vaccine needs

The EPI manager should calculate the number of doses of OPV needed for two rounds of NIDs. Refer to Appendix 14b for a detailed explanation on calculating vaccine requirements. Vaccine for NIDs should be ordered as soon as possible.

To order vaccine well in advance, it is usually necessary to make the initial calculation of vaccine requirements “top-down” - i.e. from the central level for the entire country. Later on, when provincial and district levels have made calculations using spreadsheets (appendices 14p and 14q), more precise vaccine needs for each province and district should be calculated “bottom-up” - i.e. from the more peripheral levels and forwarded to more central levels.

Formula: Doses needed = target population x wastage multiplier x 2 rounds

5. Prepare a preliminary budget

The EPI manager should prepare a preliminary budget for the following items:

- vaccine
- equipment and supplies
- transport (vehicles, fuel, drivers)
- training
- social mobilization
- personnel
- administration

The EPI manager should verify that adequate resources are available for NIDs and identify the source of the funds, as well as the proper procedures and lead time to access them

A more refined budget should be calculated five months before NIDs when more precise information is available.

6. Appoint a national NIDs coordinator

The appointed national NIDs coordinator should be a senior official in the Ministry of Health, with EPI experience and good leadership and managerial skills. The NIDs coordinator should be given enough authority to successfully plan and conduct NIDs. The national NIDs coordinator is sometimes the national EPI manager. If this is not the case, there should be close collaboration between the national NIDs coordinator and the EPI manager to ensure that NIDs enhance the routine immunization programme.

Eight months before NIDs

1. Establish three committees

The national NIDs coordinator should establish three committees of approximately six persons each. These are: a national coordinating committee, a social mobilization committee and a technical committee.

Responsibilities of the national coordinating committee:

- administration of NIDs - i.e. management of funds, personnel, and communications
- logistics
- supervision
- training.

Responsibilities of the national social mobilization committee:

- mobilizing leaders, celebrities, donors and private industry to promote NIDs
- mobilizing communities to participate in planning and conducting NIDs
- promoting NIDs through the mass media
- developing and disseminating promotional materials
- preparing the opening ceremony.

Responsibilities of the technical committee:

- reviewing all social mobilization, training and media material for technical content
- providing any needed technical advice for NIDs

2. Develop and post the schedule of tasks and activities

The schedule of necessary tasks and activities for planning and implementing NIDs should be posted in a visible place on the wall of every office at every level involved in planning and conducting NIDs.

The schedule should describe:

- the specific activities or tasks
- the date for completion of each activity/task
- the person or committee responsible for accomplishing each activity/task.

Appropriate modifications and details can be added to this schedule by staff at each level.

3. Develop logistics forms

The national coordinating committee should develop three logistics forms (spreadsheets) for the central, provincial and district level. Refer to Appendices 14o-q for sample logistics forms.

4. Develop task lists

The national coordinating committee should develop four task lists for the central, provincial, district, and immunization post level. Refer to Appendices 17a-d for sample task lists.

Seven months before NIDs

1. Meet with provincial health officials

The national coordinating committee should hold a meeting with provincial health officials to:

- explain the objectives of NIDs
- appoint a provincial NIDs coordinator in each province and define his/her responsibilities

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- explain that a coordinating committee and a social mobilization committee should be established in each province and define their responsibilities
 - distribute and explain the schedule of tasks and activities (the provincial NIDs coordinator should post the schedule in a visible place on the wall of the health office)
 - distribute one provincial logistics form (Appendix 14p) to each provincial officer and explain how to complete it
 - distribute enough district logistics forms for each district (Appendix 14q)

2. Prepare a meeting with district health officials

The provincial coordinating committee should plan a meeting with district health officers, notify them well in advance of the date, and ask each one to bring the following information on their respective districts to the meeting:

- a list of communities (communes, wards, village blocks, etc.)
- the most recent and reliable census data, including the most peripheral level possible (i.e. community or commune)
- a map of the district
- the quantity/type, location and functional status of cold chain equipment in the district (i.e. refrigerators, cold boxes, and vaccine carriers).

The provincial NIDs coordinator should bring to the meeting:

- the provincial logistics form
- district logistics forms (quantity adequate to supply at least one for each district)
- district task lists (quantity adequate to supply at least one for each district)
- census data to the most peripheral level
- a map of the province (state governorate)

3. Develop a plan for social mobilization

The national social mobilization committee should develop a general plan for social mobilization. Refer to Appendix 18 for guidelines on planning social mobilization.

Advance action for the national social mobilization committee:

- **While developing the plan, seek the advice of agencies with experience in social mobilization, such as UNICEF and Rotary Club, and consult with key media executives.**
- **Make initial requests for participation in NIDs by Heads of State or other important public figures far in advance of the event to ensure their availability.**

Six months before NIDs

1. Order vaccine

Order vaccine according to estimates or ensure that it has already been ordered.

2. Meet with district health officials

The provincial NIDs coordinator and a representative from the national coordinating and social mobilization committee should hold a meeting with all district health officers. During the meeting, the following should be accomplished:

- Explain the objective of NIDs
- Designate a district coordinator for NIDs and define his/her responsibilities
- Explain that a district coordinating committee and social mobilization committee must be established in each district with clearly defined responsibilities
- Distribute and explain the schedule of task and activities. The district NIDs coordinator should make a large poster of the schedule and post it on a wall in a visible place at the health office
- Distribute the district logistics form and explain how to complete it (Appendix 14q). Complete as much as possible of the district and provincial logistics forms during the meeting, particularly:
 - target populations
 - doses of OPV required
 - number of immunization posts
 - cold chain requirements for NIDs
 - number of ice or ice packs required

Remember:

- **The method of calculations should be simple.**
- **District, provincial, and central level calculations must be consistent with each other. Therefore, the method chosen for calculating the target population should officially be provided by the national level for all administrative levels.**
- **Always overestimate rather than underestimate the target population.**

3. Develop a NIDs guide

The national coordination committee should develop a simple NIDs guide to be used by the district level health officials and coordinators of health posts. See Appendix 19 for a sample NIDs guide that can be adapted for the country.

The NIDs guide should include the following items:

- the purpose of NIDs
- schedule of activities for planning and implementing NIDs
- the dates and location of NIDs
- how to calculate the target population
- how to calculate the amount of vaccine needed
- how to define a strategy, including activities for special populations

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- how to calculate the number of posts
 - guidelines on social mobilization
 - the key messages
 - local social mobilization activities
 - training on preparation and management of an immunization post
 - role of the coordinator
 - role of the screeners
 - role of the immunizers
 - role of the record-keepers
 - diagram of an immunization post
 - characteristics of an effective immunization post
 - other pertinent information
 - sample tally sheets
 - sample referral forms (if referral strategy is chosen).

4. Calculate amounts and cost of social mobilization materials

The national social mobilization committee should determine the type and quantity of social mobilization materials to be developed (e.g. banners, posters, brochures, T-shirts, etc.), and ascertain production prices. Refer to the spreadsheet in Appendix 18a for calculating quantities and costs of mobilization materials. The cost of special social mobilization activities such as the opening ceremony should also be estimated. These prices should be incorporated into a more precise budget calculation the following month.

Five months before NIDs

1. Meet again with the district NIDs coordinator

The provincial coordinating committee should meet again with the district NIDs coordinator to complete the provincial and district logistics spreadsheets and to ensure that calculations made at both levels are consistent. These data can then be sent to the central level to finalize central level logistics spreadsheets.

2. Recalculate a more precise budget

The national NIDs coordinator should revise the budget calculations with more precise figures once they are available. Refer to Appendix 15 for guidelines on budget calculations.

Verify once again that resources are adequate and reconfirm the method and lead time to procure them. Inform the appropriate authorities and accountants of the exact dates when specified amounts of money will be needed.

3. Print the NIDs guide

The national coordinating committee should send the NIDs guide to be printed.

4. Develop a broadcaster's guide

The national social mobilization committee should develop a simple broadcaster's guide or handout. See Appendix 18b for a list of items to be included. The national social mobilization committee should also make a list of all radio stations, television stations, and newspapers that will receive a copy of the guide.

Four months before NIDs

1. Distribute NIDs guide

Following printing of the NIDs guide, the national social mobilization committee should distribute quantities adequate for all provinces and districts. The provincial social mobilization committee should, in turn, distribute enough NIDs guides to the district NIDs coordinators (i.e. several guides per district and at least one guide per post coordinator).

2. Print broadcasters' guide

The national social mobilization committee should send the broadcasters' guide for printing.

3. Develop promotional materials

The national and provincial social mobilization committee should create innovative brochures, letters, posters and other promotional materials according to the social mobilization plan. Send these to be printed according to the quantities previously calculated (see spreadsheet for social mobilization materials in Appendix 18a). Design any other promotional or incentive materials such as T-shirts, caps, and balloons. Place an order for these materials.

4. Confirm participation of important public figures

The national social mobilization committee should confirm the participation of heads of state and other important figures in NIDs, particularly for the opening ceremony.

Three months before NIDs

1. Develop and print a supervisory checklist

The national coordinating committee should develop a supervisory checklist. Refer to Appendix 17e for a sample checklist.

2. Develop and print tally sheets and referral forms

The national coordinating committee should develop tally sheets (and possibly referral forms, if a referral strategy will be implemented) for use at the immunization post. Refer to the forms in the sample NIDs guide in Appendix 19.

Note: Since doses administered during NIDs are considered EXTRA doses, there is no need to record them on immunization cards.

3. Appoint and meet with post coordinators

The district NIDs coordinator should designate post coordinators (one per post), and hold a meeting with them to:

- explain NIDs objectives, dates, target age groups, and number of posts
- explain the need to establish a community NIDs committee to plan logistics and social mobilization
- distribute and explain the schedule of tasks and activities
- distribute and explain the NIDs guide
- distribute and explain the task list
- verify that all calculations regarding target populations, number and location of posts, vaccine needs, cold chain needs and ice are correct
- explain that at least one trained health worker and three volunteers are needed for each immunization post, to work before and during NIDs (the trained health worker and volunteers should come from the local area)

-
- determine the location of each immunization post and mark the location on a district map (immunization posts should be situated in highly visible locations with adequate space for crowds)
 - assess the possibilities of community participation including:
 - conducting house-to-house visits to promote NIDs
 - collecting vaccine from the district
 - providing private thermoses for vaccine
 - preparing meals for volunteers
 - making posters and banners
 - identify any foreseeable problems or challenges
 - decided on a date, time and place for the next meeting.

4. Define strategies for sparse and special populations

The district coordinating and social mobilization committees should define strategies for sparsely populated areas, communities with less than 200 children in the target age group, and high risk or hard-to-reach populations. These are considered “special” populations which require special strategies before and during NIDs. (See Appendix 16). A health officer and/or subcommittee at the central level and in each province and district will be designated responsible for organizing and supervising special strategies.

5. Prepare training on how to run an immunization post

Members of the national coordinating and social mobilization should prepare to train one or two members of the coordinating and social mobilization committees at the provincial level. The training will then be repeated at each level. The training should demonstrate preparation and management of an immunization post for NIDs and training for the next level of personnel. For more information, refer to the sample NIDs guide (Appendix 19).

6. Distribute the broadcaster’s guide

Following printing, the national social mobilization committee should distribute the broadcaster’s guide to all those on the list.

7. Develop radio/TV announcements and press articles

The national social mobilization committee should work with major newspapers, radio stations and TV stations to prepare announcements and articles.

8. Develop banners for streets and immunization posts

A large banner should identify each immunization post and banners announcing NIDs should be prominently displayed in the community or on the streets. The social mobilization committees at all levels should designate responsibility for the design and products of posters and street banners.

Note: In some countries, all banners are made at the central level and distributed nationwide. In a few countries, private industry has paid such banners and in others each community has been responsible for creating its own banners.

9. Plan to monitor and evaluate NIDs

Make plans to monitor and evaluate NIDs to improve future NIDs, to identify special populations at risk for poliovirus transmission, and to assess the impact of NIDs on poliovirus transmission. See Appendix 21 on monitoring and evaluation.

Eight weeks before NIDs

1. Establish a community NIDs committee

The post coordinator should establish a community NIDs committee to help plan, coordinate, recruit local volunteers and conduct social mobilization activities.

2. Train provincial level

The national coordinating committee should conduct a training session for at least one member from each of the provincial coordinating and social mobilization committees. The training should focus on management of an immunization post and similar training. The national level should distribute any materials needed to conduct the district training and the participants should also develop training materials for this purpose during the session. (See Appendix 19). The trainers should take this opportunity to verify that provincial task lists are being completed on time.

3. Finalize strategies for sparse and special populations

The district coordinating and social mobilization committees should work with the health officer responsible for special strategies to finalize these strategies (See Appendix 16).

Seven weeks before NIDs

1. Prepare training session for district level

Those trained at the provincial level should make the following preparations for a training session at the district level:

- finish developing or collecting all teaching materials
- inform districts of the date and place of the training session the following week
- invite one member of each district committee (coordinating and social mobilization)
- ask participants to bring the district task lists, logistics forms and maps.

2. Prepare opening ceremony

The national social mobilization committee should plan the opening ceremony. This will require:

- selecting a venue
- reconfirming that the Head of State, Ministers, and other important public figures will give the first drops of OPV, make speeches and visit several posts during NIDs
- informing media representatives of the date, time and place of the ceremony
- preparing the appropriate materials and the site for the ceremony (e.g. microphone, chairs, decorations, platform, etc.)
- preparing the necessary speeches.

Six weeks before NIDs

1. Train district level

Those trained at the provincial level on how to run an immunization post should in turn train the district level. During the training session, verify that district task lists are being completed on time.

2. Verify the availability of transport

Transport needs for planning and conducting NIDs usually exceed availability. Coordinating committees at all levels should therefore seek additional transport from the private sector, nongovernmental organizations, or other governmental departments in advance.

For supervisors

The national coordinating committee should verify that transport is available to visit the provinces 5 and 3 weeks in advance of the NIDs. The provincial coordinating committee should verify that transport is available for district visits 3 weeks and 1 week in advance of NIDs. The districts should verify that transport is available to visit post coordinators 2 and 1 week in advance of NIDs.

For transporting vaccine

Four weeks before NIDs, vaccine should be transported from the central level to the provinces. Two weeks before NIDs, vaccine should be transported from the provincial level to the district. One day before NIDs, vaccine should be transported from the district level to each post. It is necessary to determine how vaccine will be transported - whether it will be collected by staff from the more peripheral level or delivered by the more central level. This should be indicated on the logistics form and on the task lists.

For mobile teams to reach sparse and special populations

If mobile teams will be used for small communities or special populations, transport for each team should be identified well in advance. Extra social mobilization activities in special populations may also require additional transport.

For supervisory teams on the day of NIDs

On the day of NIDs, supervisory teams should visit several posts to assist, monitor, supervise, and solve any problems. All supervisory teams should carry with them extra forms, vaccine and other supplies.

3. Finalize logistics spreadsheets at all levels

Coordinating committees at all levels should finalize the logistics forms and ensure that calculations at each level are consistent with each other.

Five weeks before NIDs

1. Make supervisory visits to provinces

Members of the national coordinating committee and the social mobilization committee should make supervisory visits to the provinces. During the visit, they should:

- complete the supervisory checklist
- distribute supervisory checklists to provincial NIDs committees so they can make supervisory visits to districts
- distribute funds for ice purchase (if necessary)
- verify that vaccine will be collected or delivered from the central level to the provincial level the following week
- resolve any current or foreseeable problems

<p>Supervisors at all levels should always carry with them extra supplies such as vaccine (when appropriate), forms, and social mobilization materials.</p>
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2. Invite post coordinators to training session

Trained district-level personnel should inform post coordinators of the date and place of the training session the next week.

Four weeks before NIDs

1. Train post coordinators

Trained district-level personnel should train all post coordinators in their district. During training sessions, verify that task lists are being completed on time.

2. Transfer supplies from central level to provinces

Vaccine, social mobilization materials, tally sheets, and referral forms (if a referral strategy is implemented) should be transferred from the national level to each province. Personnel responsible for vaccine transport should be designated in advance (see logistics spreadsheets in Appendix 140-q and task lists in Appendix 17 a-d).

3. Verify that all media announcements are prepared and distributed

The national social mobilization committee should verify that press releases and public service announcements are well prepared, (accurate and effective), and confirm that the mass media is ready to publicize them.

Three weeks before NIDs

1. Make supervisory visits to selected provinces

Provinces with difficulties, questionable logistics or inadequate social mobilization preparations should receive a supervisory visit from the central level to help identify and resolve any problems. The central level should also deliver any needed supplies during the visit.

2. Train volunteers and meet with community NIDs committee

Post coordinators should train the post volunteers. They should also meet with the community NIDs committee to share pertinent information learned during the training session and to finalize all community social mobilization activities. During these meetings, private cold boxes, thermoses or flasks should be identified for use during NIDs. One cold box, thermos or flask plus at least one reserve is necessary for each post or vaccinating team. The post coordinator should also discuss with the committee the need for ice or ice packs, decide which will be used (ice packs or ice), identify the source of ice and how it will be funded (e.g. the community, district health office, or central level).

3. Make supervisory visits to all districts

Members of the provincial coordinating committee should make supervisory visits to the districts. During the visit, they should:

- complete the supervisory checklist
- distribute supervisory checklists to be completed when the district makes supervisory visits to post coordinators
- distribute funds for ice purchase if necessary
- verify that vaccine will be collected/delivered from the provincial level to the district
- resolve any current or foreseeable problems

4. Confirm preparations for the opening ceremony

The national social mobilization committee will reconfirm the participation of public figures and the media in the opening ceremony. It should also verify that the site, essential materials, and speeches are well-prepared.

Two weeks before NIDs

1. Transfer vaccine from provinces to districts

Vaccine, social mobilization materials, tally sheets, and referral forms should be collected by each district or delivered by the province to each district. The responsibility for transport of vaccine should be clearly designated beforehand (see logistics spreadsheets in Appendix 14o-q and task lists in Appendix 17a-d).

2. Make supervisory visits to all post coordinators

District level staff should make supervisory visits to all post coordinators to verify that volunteers are trained, the task lists are being completed on time, and that any problems are being resolved.

3. Begin implementing strategies for special populations

The district NIDs committee and local NIDs committees should begin implementing strategies for special (high risk and hard-to-reach areas) populations according to the plan.

4. Prepare post materials

The community NIDs committee should collect and prepare all essential materials for the immunization post (e.g. tables, chairs, loudspeaker, banners).

5. Begin local social mobilization

The community NIDs committee and local volunteers should begin:

- making house-to-house visits
- distributing social mobilization materials such as brochures, letters, and posters
- announcing NIDs at all political, community, social religious, and school meetings.

6. Begin newspaper, TV, radio announcements

The national social mobilization committee should begin newspaper, radio and TV announcements.

One week before NIDs

1. Make supervisory visits to selected districts

The provincial coordinating committee should make supervisory visits to districts with questionable logistics or social mobilization activities.

2. Make supervisory visits to selected post coordinators

The district coordinating committee should visit selected post coordinators where there are particular problems, doubts, or inadequacies.

3. Intensify social mobilization activities

The national, provincial and district social mobilization committees and community NIDs committees should intensify all social mobilization activities.

4. Conduct pre-NIDs “spot check” to assess social mobilization

To assess social mobilization activities, members of the district, provincial or national social mobilization committees may wish to conduct a simple pre-NID house-to-house survey or “spot check” in high-risk or priority areas. This would consist of house-to-house visits (e.g. every 5th or 10th household) to ask if parents know about NIDs, the dates, who should attend and the location of the nearest immunization post. The results of this simple survey or spot check should be tabulated immediately and on-site so that any needed corrective measures can be taken in time. See Appendix 17f for methods and a sample questionnaire form.

One to two days before NIDs

1. Prepare to immunize

- The community NIDs committee should:
- purchase ice or ensure that ice packs are being frozen
- collect vaccine from the district
- make final preparations for the immunization post

2. Resolve last minute problems

Coordinating committees at all levels should be ready to solve any last minute problems or issues.

3. Prepare for opening ceremony

The national social mobilization committee should make final preparations for the opening ceremony.

NIDs

4. Conduct opening ceremony

The national social mobilization committee should conduct the opening ceremony.

5. Start immunizing

- volunteers and the post coordinator should arrive early and set up the post
- volunteers should begin immunizing
- the post coordinator should circulate to oversee all post activities and to solve or correct any problems

6. Be diligent in making house-to-house visits!

Volunteers should make announcements in the community and go house-to-house looking for children to be immunized.

Making the extra effort makes the difference!! The extra effort during NIDs to proactively and diligently seek out eligible children in and around their homes is often one of the most effective means of attaining very high coverage, and reaching children who are usually hard-to-reach.

7. Involve parents and children

Parents and children attending NIDs should also be encouraged to seek out eligible children in the community and send them to the post.

8. Implement strategies for sparse and special populations

The district coordinating and social mobilization committees should implement the planned strategies to reach sparse populations, communities with < 200 target children and special populations. The strategies might include mobile teams, extra posts, additional volunteers, more intense social mobilization and house-to-house visits, or increased supervision. See Appendix 16. Note that these activities might start days in advance of NIDs.

9. Make a mid-day calculation and react accordingly

At mid-day, when volunteers break for lunch, add up the total number of doses distributed. Divide this sum by the target population to estimate mid-day coverage. By mid-day, coverage should be well over 40%. If it is not, extra or intensified strategies should be

conducted in the afternoon, such as intensified house-to-house visits. It may be necessary to immunize house-to-house using mobile teams.

10. Provide feedback to the press

Countries with a communications infrastructure often send progress reports at mid-day to the mass media. This requires that all posts send mid-day results immediately to their district where they are grouped and forwarded to the provincial level. Here all the district results are grouped and forwarded to a designated central reporting point.

11. Supervise and assist activities at posts and with teams

Members of logistics and social mobilization committees at all levels should visit several immunization posts each to observe the NIDs, monitor activities, and assist in any way necessary. They should carry extra supplies such as vaccine, forms and other materials. Celebrities and important officials should be encouraged to make appearances at posts to attract attention and increase attendance.

One day after NIDs

1. Meet with all post coordinators

The district NIDs coordinator should hold a meeting with all post coordinators to evaluate NIDs and discuss ways to improve them.

2. Return tally sheets and supplies to district

The post coordinators should return to the district all tally sheets, vaccine carriers and remaining vaccine. If cold store capacity is insufficient at the district, then vaccine should be returned to the province.

3. Clean up immunization post site

NIDs volunteers should clean up the immunization post site and ensure safe disposal (preferably by burning) of any syringes or needles used.

During the week after NIDs

1. Inform health centres of referrals

If a referral strategy was used, the post coordinator should inform health centres of the number of referrals made to their health centres during NIDs

2. Calculate coverage and vaccine wastage by district

After receiving all tally sheets, the district NIDs coordinators should estimate immunization coverage during NIDs in each district, the number of doses consumed and the number returned to the district.

Formula for immunization coverage:

$$\text{Coverage} = \frac{\text{Number of target-aged children immunized in district}}{\text{Number of target-aged children in district}} \times 100\%$$

Note: Do not include in the calculation children outside the target age group who were immunized.

Formula for vaccine wastage:

$$\text{Vaccine wastage} = \frac{(\text{doses consumed} - \text{doses administered})}{\text{Total doses consumed}} \times 100\%$$

3. Submit results to province

The district NIDs coordinators should submit the following information to the province:

- district coverage
- the numerators and denominators used in calculating coverage
- the number of doses consumed
- the number of doses returned
- location that received the returned doses (district or province)
- estimated vaccine wastage.

4. Meet with all district NIDs coordinators

The province NIDs coordinators should hold a meeting with all district NIDs coordinators in their respective provinces to evaluate NIDs and discuss ways to improve the next NIDs.

5. Calculate coverage and vaccine wastage by province

The provincial NIDs coordinators should combine district results to estimate vaccine wastage and immunization coverage of NIDs in their respective provinces

Formula for immunization coverage:

$$\text{Coverage} = \frac{\text{Number of target-aged children immunized in province}}{\text{number of target-aged children in province}} \times 100\%$$

Note: Do not include in the calculation children outside the target who were immunized.

6. Begin preparations for the second round

If this is the first round of NIDs, all levels should start preparing immediately for the second round.

Using the new figures for vaccine wastage, calculate a new vaccine wastage multiplier with one of the following formula:

Formula for wastage multiplier:

$$\text{Wastage multiplier} = \frac{\text{total doses consumed}}{\text{total doses administered}} \quad \text{or} \quad 1 + \frac{(\text{wastage})}{(1 - \text{wastage})}$$

Example: If wastage was 15%, then:

$$\text{the wastage multiplier} = 1 + \frac{(0.15)}{(1 - 0.15)} = 1.176 = 1.2$$

To calculate vaccine requirements for the next round of NIDs, use the same formula for calculating vaccine needs (Appendix 14b). However, instead of using a wastage multiplier of 1.3, use the recently calculated new multiplier.

Calculations for the second round of needs should take into account the amount of vaccine already stored from the previous round in the provinces or districts.

During the second week after NIDs

1. Submit results to central level

The provincial NIDs coordinator should submit to the central level:

- provincial coverage results
- the numerators and denominators used in calculating coverage
- the number of doses consumed
- the number of doses returned
- location that received the returned doses (district or province)
- vaccine wastage.

2. Meet with all provincial NIDs coordinators

The national NIDs coordinator should hold a meeting with all provincial NIDs coordinators to evaluate NIDs and discuss ways to improve them.

3. Calculate national coverage and vaccine wastage during NIDs

Formula for national coverage:

$$\text{Coverage} = \frac{\text{Number of target-aged children immunized in country}}{\text{Number of target-aged children in country}} \times 100\%$$

During the month after NIDs

1. Response to queries about vaccine safety & adverse events

NIDs coordinators and EPI personnel at all levels should respond immediately to any reports, queries or rumours about vaccine safety or adverse events following immunization. See Appendix 20 on vaccine safety and how to respond to reports or rumors of adverse events.

2. Calculate expenditures

The NIDs coordinator should sum up all the expenditures for NIDs. This will help in calculations for future rounds of NIDs.

3. Consider conducting coverage survey in areas of persistent transmission

WHO does not generally recommend conducting a survey following every NIDs. However, a survey might be considered in areas where poliovirus transmission is persisting despite high reported coverage for NIDs to determine the reason.

If a survey is conducted, its objective should be to estimate coverage and determine why any targeted children were missed during NIDs. This information is useful for the next round of NIDs.

VII. Conducting mopping-up immunization

What is “mopping-up”?

Mopping-up consists of two rounds, four to six weeks apart, of intensive house-to-house immunization with OPV in high-risk districts. All children in a specified age group (usually 0 to 59 months) are immunized during the mopping-up regardless of their immunization status. Each round is completed in as short a time period as possible.

High risk districts are those where the poliovirus is still circulating or is likely to circulate. This includes districts where polio cases occurred in the last 36 months and which have:

- low immunization coverage
- transient populations
- densely populated urban and/or peri-urban areas and poor sanitation
- poor access to health care.

At what stage is mopping-up done?

Mopping-up immunization is conducted when polio has been reduced from an endemic disease (i.e. occurring throughout the country) to a disease that occurs only in focal areas. It is usually implemented during the low season of polio transmission.

Exception: In countries where poliovirus is thought to have been eliminated or almost eliminated, mopping-up immunization might be conducted immediately after a case is confirmed as polio, regardless of the season.

What is the purpose of mopping-up?

Mopping-up immunization is used to interrupt poliovirus transmission in focal areas. It is the final stage before completely eliminating poliovirus. Even after poliovirus is eliminated, mopping-up immunization is continued for several years in areas where the virus is likely to be imported.

Forecast vaccine for mopping-up

Vaccine for mopping-up immunization should be included in the forecast of national vaccine needs (See Appendix 22).

Planning is similar to NIDs

The same principle used for planning NIDs are used to plan mopping-up immunization, with some key exceptions:

- most of the detailed planning is done at the district level
- mopping-up immunization is conducted on a house-to-house basis, whereas, during most NIDs the majority of children are immunized at fixed sites
- mopping-up immunization is conducted in selected high-risk districts, whereas NIDs are conducted nationwide.

Central level planning

- Careful advance planning of mopping-up immunization is essential. Although much of the detailed planning is done at the district level, a national mopping-up coordinator should be designated and a national mopping-up committee established. The coordinator and members of the committee should have experience conducting NIDs or mass immunization campaigns.
- the dates for each round
- the duration of each round (usually 1-7 days)
- the target age-group
- the districts to be mopped-up
- the amount of vaccine needed (see Appendix 22)
- responsibilities at central, provincial, district levels
- the appropriate forms (see Appendices 23-24)
- the resources needed (vaccine, transport)
- the brochures and posters needed

District-level planning

In districts where mopping-up will be conducted, a district mopping-up committee should be established and a coordinator designated. The committee should prepare and implement mopping-up activities according to the national plan, utilizing local health personnel and volunteers as much as possible. The district committee should obtain the following information for planning:

- a map of the area to be mopped-up
- condition of the roads and terrain
- census data
- estimated number of households

Using census data, the district committee should calculate the target population and vaccine needs (Appendix 22) as well as cold chain requirements (Appendices 14a-q). Taking into account the number of households, terrain, distance between houses, and road conditions, the district committee should:

- determine the average number of children to be immunized per day
- determine the number of immunizers (volunteers) required. In urban areas, one immunizer can usually immunize 50 to 100 children per day. In rural areas, the number will vary according to terrain and distance between houses.

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- determine the number of supervisors required
 - determine the number of vehicles or other types of transport required (e.g. motorcycles, bicycles or animals)
 - distribute necessary supplies to volunteers such as pencils, chalk to mark houses and tally sheets (see Appendix 23)
 - distribute a mopping-up work sheet to each supervisor (see Appendix 24)
 - train local volunteers
 - identify a local source of ice and organize the freezing of large quantities overnight for use in the vaccine carriers the following day
 - identify sources to supply adequate numbers of vaccine carriers or thermoses
 - ensure that vaccine is maintained in a cold chain
 - develop a strategy for house-to-house immunization including:
 - coordination and supervision of vaccinators
 - how to indicate houses where children have already been immunized
 - what to do when no one is home at the time of the visit

To reach some target populations, mopping-up immunization might be conducted during evenings or weekends. During the house-to-house visits, an active search must be made for cases of acute flaccid paralysis with date of onset within the last 24 months. These cases should be noted on the mopping-up work sheet (Appendix 24).

Because of possible personnel fatigue and logistical considerations in hilly areas, many immunizers should be assigned to cover these areas in the early morning hours. This will ensure rapid coverage and permit the immunizers to descend as the morning progresses. The less hilly areas can then be completed in the afternoon. In very warm climates, provision of drinking water for the immunizers must be taken into consideration.

District supervision

Ideally, there should be one supervisor for every 10 to 15 immunizers. However, it may not be logistically possible or cost-effective in some rural areas, but it is essential to have highly motivated and reliable immunizers. The role of the supervisor is to ensure that:

- all areas and houses are visited
- all target children are immunized
- vaccine is conserved and administered properly
- vaccinators are working in a coordinated fashion
- progress and problems are communicated to the district coordinator and coordinating committee

To be most effective, the supervisor should go house-to-house with the immunizers and must be familiar with the areas to be covered.

Social mobilization

The district mopping-up committee must mobilize communities to assist in mopping-up immunization by providing local volunteers and the necessary resources. This would include cold chain equipment to freeze ice packs or store vaccine. The committee must inform the community of the dates, time of day, and target age groups. Local community leaders must

be mobilized to promote mopping-up immunization, announcing it at all gatherings and mobilizing community participation.

The national mopping-up committee should develop key messages for mopping-up immunization such as:

“Children in this district are at risk for polio, a disease which can result in death, or cripple a child for life.”

“To be protected against polio, all children 0 to 59 months of age must receive drops of polio vaccine regardless of prior immunization status.”

“An immunizer will be visiting your home on (date) and (time) Please try to be at home with your children so that they can receive vaccine at this time.”

Summarize and evaluate

After mopping-up immunization, the national committee should hold a meeting with district coordinators to summarize and evaluate their results (see Appendix 24). Reasons for low coverage in some districts should be defined so that improvements can be made during the next mopping-up immunization.

Most common problems during mopping-up

- insufficient ice making
- lack of adequate transportation
- poor knowledge of the area by supervisor(s)
- poor communication with the community on the need for mopping-up
- lack of sufficient numbers of immunizers
- lack of sufficient supplies, including vaccine
- poor selection of days for conducting mopping-up
- poor weather conditions and lack of protective clothing for volunteers
- poor training of personnel (vaccinators/supervisors)
- poor distribution of personnel
- inadequate decentralization of planning/operations
- insufficient budget
- poor community support or lack of volunteer support.

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Appendix 1: Definitions

Active surveillance: As the name implies, active surveillance *seeks out* information. A health official will visit or telephone certain health facilities or offices in search of cases.

Aggregate surveillance: The surveillance of a disease or health event by collecting summary data on groups of cases (e.g. in many general practice surveillance schemes clinicians are asked to report the number of cases of a specified diseases seen over a period of time).

Case-based surveillance: The surveillance of a disease by collecting specific data on each case (e.g. reporting of details on each case of AFP)

Cluster: The occurrence of an unusual number of cases in person, place or time.

Community surveillance: Surveillance where the starting point is a health event occurring in the community and reported by a community worker or actively sought by investigators. This may be particularly useful during an outbreak and where syndromic case definitions can be used.

Facility-based surveillance: Surveillance where the starting point for a report is a patient with a particular disease or syndrome who visits a health facility (hospital or health center).

Feedback: The regular process of sending analyses and surveillance reports on the surveillance data back through all levels of the surveillance system so that all participants can be informed of trends and performance.

Immediately notifiable diseases: Those health events that should be reported “immediately” or within hours of detection. Usually these are public health emergencies and require *immediate* action (e.g. cholera, cerebrospinal meningitis, yellow fever, plague and haemorrhagic fevers).

Weekly reporting: Those health events that should be reported on a weekly basis. Usually these require prompt action, but which are not as urgent as those on the immediately notifiable disease list.

Monthly reporting: Those health events that should be reported on a monthly basis. These health events usually include selected diseases of public health importance.

Notifiable disease: A disease that must be reported to the authorities by law or ministerial decree.

Passive surveillance: Passive surveillance receives data from designated reporting sites without actively seeking them.

Periodicity: The presence of a repeating pattern of excess cases. The repeater can be in years, months or weeks.

Reporting completeness: Proportion of all expected reports that were actually received (usually stated as “% completeness as of a certain date”).

Reporting timeliness: Proportion of all expected reports that were received by a certain due date.

Routine disease surveillance: The ongoing collection of information on health events and usually includes number of health events by district by month. It sometimes also includes health events by age group and/or immunization status.

Sensitivity: The ability to detect a disease, an epidemic or other changes in disease occurrence. It is the proportion of persons with disease who are correctly identified by a screening test or case definition as having disease.

Sentinel surveillance: The ongoing collection of information on health events from a limited number of reporting sites. Although these data are not representative of the entire country, they indicate trends and facilitate monitoring of severe diseases. More detailed data is often collected from sentinel surveillance sites than is possible from routine surveillance sites.

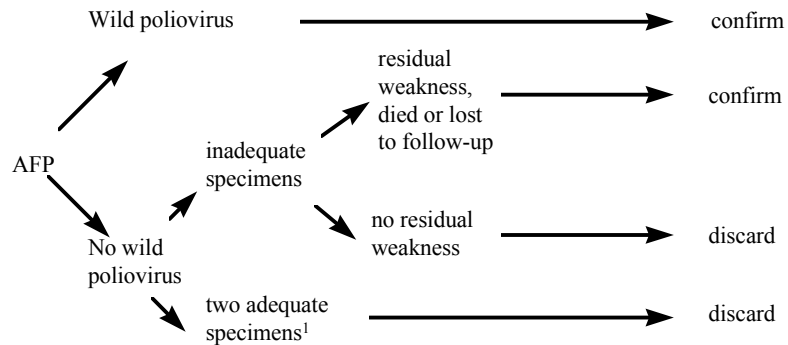
Specificity: The proportion of persons without disease who are currently identified by a screening test or case definition as not having disease.

Spot map: A map that indicates the location of each case of a disease by showing places that are potentially relevant to the health event being investigated, such as where the case lived, worked, or became ill.

Zero reporting: When no cases are detected, a report of zero is submitted by each reporting unit. Zero reporting is often required for diseases in the weekly and monthly reporting system.

Appendix 2: Classification schemes

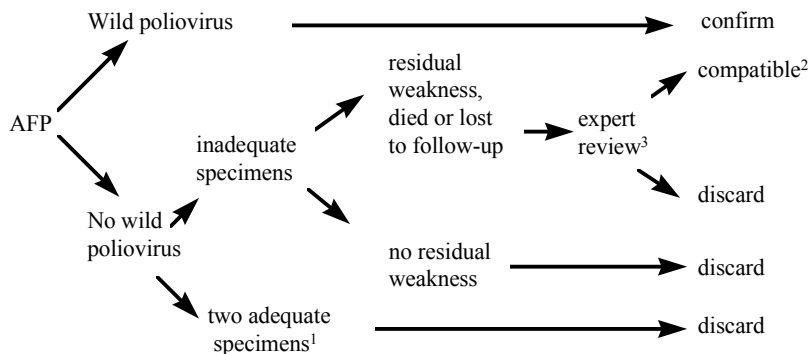
Appendix 2a. Clinical classification scheme



Change to virologic classification scheme when:

- Non-polio AFP rate $\geq 1/100,000$ children under 15 years
- Two adequate specimens collected from $\geq 60\%$ of AFP cases
- All specimens processed in a WHO-accredited laboratory

Appendix 2b. Virologic classification scheme



¹ Two adequate specimens = 2 specimens collected from the case, at least 24 hours apart and within 14 days of paralysis onset; each specimen must be of adequate volume (8-10 grams) and arrive in the laboratory in “good” condition. Good condition = no desiccation, no leakage, adequate documentation and evidence that the reverse cold chain was maintained.

² “Compatible” cases represent a surveillance failure and should be scrutinized for clustering in space and time.

³ Cases undergoing expert review and subsequently classified as “discarded” or “compatible” should be line listed using Annex 2d.

Appendix 2c. Code sheet for the AFP case data base and specimen data base to be linked together by an ID number (often called the EPID number)

Case variables	Suggested variable name	Attributes	Codes
ID code (“EPID #”)	IDCODE	alpha, 12 characters	
District name	DISTRICT	alpha, 20 characters	
Province name	PROVINCE	alpha, 20 characters	
Date of birth	DOB	date (dd/mm/yy)	
Date of paralysis onset	DONSET	date (dd/mm/yy)	
Date of notification	DNOT	date (dd/mm/yy)	
Date of case investigation	DOI	date (dd/mm/yy)	
Total polio vaccine doses received	DOSES	numeric, 2 digits	99=unknown
Fever at onset of paralysis	FEVER	numeric, 1 digit	1=yes 2=no 9=unknown
Progression of paralysis within 4 days	PROGRESS	numeric, 1 digit	1=yes 2=no 9=unknown
Asymmetric paralysis	ASYM	numeric, 1 digit	1=yes 2=no 9=unknown
Date of follow-up	DFUP	date (dd/mm/yy)	
Findings at follow-up	FUP	numeric, 1 digit	1=residual weakness 2=no residual weakness 3=lost to follow-up 4=died before follow-up
Classification	CLASS	numeric, 1 digit	1=confirmed 2=compatible 3=discarded 4=vaccine associated

Appendix 2c (continued)

Specimen variables	Name	Attributes	Codes
ID number (“EPID #”)	IDCODE	alpha, 12 digits	
Specimen number	SPECNO	numeric, 1 digit	1=first specimen 2=second specimen
Date of paralysis onset	DONSETL	date (dd/mm/yy)	
Date of last oral polio vaccine	DLOPV	date (dd/mm/yy)	
Date of stool collection	DSTCOLL	date (dd/mm/yy)	
Date stool sent to lab	DSTSENT	date (dd/mm/yy)	
Date stool received in lab	DSTLAB	date (dd/mm/yy)	
Condition of stool	STCOND	numeric, 1 digit	1=good 2=poor 9=unknown
Date final culture results sent from lab to EPI	DCRES	date (dd/mm/yy)	
Date intra-typic differentiation results sent from lab to EPI	DIRES	date (dd/mm/yy)	
Polio type 1 isolated?	P1	numeric, 1 digit	1=yes, wild 2=yes, vaccine 3=yes, pending intra-typic differentiation 4=yes, both (wild/vaccine) 5=no P1 virus isolated 6=specimen not processed
Polio type 2 isolated?	P2	numeric, 1 digit	1=yes, wild 2=yes, vaccine 3=yes, pending intra-typic differentiation 4=yes, both (wild/vaccine) 5=no P2 virus isolated 6=specimen not processed
Polio type 3 isolated?	P3	numeric, 1 digit	1=yes, wild 2=yes, vaccine 3=yes, pending intra-typic differentiation 4=yes, both (wild/vaccine) 5=no P3 virus isolated 6=specimen not processed
Non-polio enterovirus isolated?	ENTERO	numeric, 1 digit	1=ye 2=no 3=specimen not processed

Appendix 2d: Line list of cases undergoing “expert review” using virologic scheme

Paste in 005Ap2d.xls, reduced

Appendix 3: Forms

Appendix 3a: Completeness of monthly reporting by district

Paste in 006Ap3a

Appendix 3b: Case investigation form for acute flaccid paralysis, Part I

Paste in Part I: 007Ap.xls, reduced 90%

Appendix 3b: *(continued)* Parts II-III

Paste in Parts II-III: 007Ap3b.xls, reduced

**Appendix 3c: Line listing form for all reported cases of
acute flaccid paralysis**

Paste in 008Ap.xls

Appendix 3d: Weekly, active surveillance monitoring form

Paste in 009Ap3d.xls

Appendix 3e: Laboratory request and report form
(to accompany stool specimens to laboratory)

Paste in 010Ap3e.xls

Appendix 4: Assigning EPID numbers

Every country should establish a standard way of assigning EPID numbers for AFP case and specimen data so that these data can be linked. The following is an example of one way to assign these numbers:

- The first three characters specify the official country code in letters. The following page lists all country codes.
- The fourth, fifth and sixth characters indicate the province (or state or governorate) code where the case was residing at the time of paralysis onset.
- The seventh, eighth and ninth characters indicate the district (or county) code where the case was residing at the time of paralysis onset.
- The district code is followed by two digits that indicate the year of paralysis onset
- The two digit year code is followed by a three digit number of the case

<i>(Country code)</i>		<i>(Province code)</i>		<i>(District code)</i>		<i>(Year)</i>		<i>(Case number)</i>
XXX	-	XXX	-	XXX	-	96	-	001

Example of EPID numbers: CAM - PUR - KAN - 95 - 004

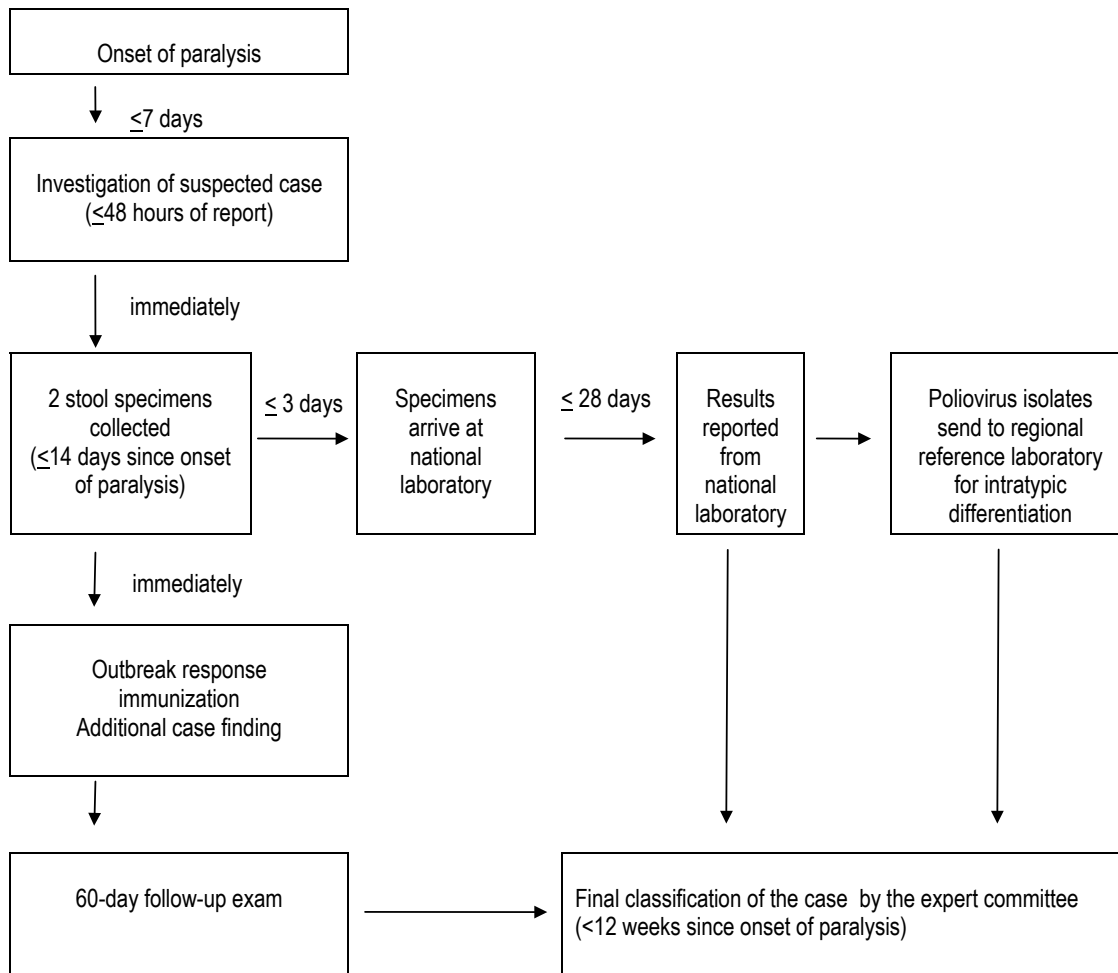
This is an EPID number for the fourth *case* in 1995 from Kandieng district in Pursat province in the Kingdom of Cambodia.

Note: Occasionally, a stool specimen from a case of acute flaccid paralysis may arrive at the laboratory without having been reported to the surveillance or EPI unit. The laboratory will know this because an EPID number was not assigned to it. In this situation, the laboratory should immediately notify EPI of the case: (i) to verify whether the specimen should be cultured, (ii) to assign an EPID number and (iii) to investigate the case.

Appendix 4a: Country codes for EPID numbers

Country	Code	Country	Code	Country	Code	Country	Code	Country	Code	Country	Code
Algeria	ALG	Anguilla	ANU	Afghanistan	AFG	Albania	ALB	Bangladesh	BAN	American Samoa	AMS
Angola	ANG	Antigua and Barbuda	ANI	Bahrain	BAA	Armenia	ARM	Bhutan	BHU	Samoa	
Benin	BEN	Barbuda		Cyprus	CYP	Austria	AUT	Democratic Republic of	KRD	Australia	AUS
Botswana	BOT	Argentina	ARG	Djibouti	DJI	Azerbaijan	AZE	People's Republic of		Brunei	BRU
Burkina Faso	BFA	Bahamas	BAH	Egypt	EGY	Belgium	BEL	Korea		Darussalam	
Burundi	BUU	Barbados	BAR	Iran, Islamic Republic of	IRA	Bosnia and Herzegovina	BIH	India	IND	Cambodia	CAM
Cameroon	CAE	Belize	BLZ	Republic of Iraq	IRQ	Bulgaria	BUL	Indonesia	INO	China	CHN
Cape Verde	CAV	Bermuda	BER	Jordan	JOR	Belarus	BLR	Maldives	MAV	Cook Islands	COK
Central African Republic	CAF	Bolivia	BOL	Kuwait	KUW	Croatia	CRO	Mongolia	MOG	Democratic Fiji	FIJ
Chad	CHA	Brazil	BRA	Lebanon	LEB	Czech Republic	CZH	Myanmar	MMR	French Polynesia	FRP
Chad	CHA	British Virgin Islands	VIB	Libyan Arab Jamahiriya	LYA	Denmark	LIY	Nepal	NEP	Guam	GUM
Comoros	COM	Canada	CAN	Morocco	MOR	Estonia	EST	Sri Lanka	SRL	Hong Kong	HOK
Congo	CNG	Cayman Islands	CAY	Oman	OMA	Finland	FIN	Thailand	THA	Japan	JPN
Equatorial Guinea	EQG	Chile	CHI	Pakistan	PAK	France	FRA			Kiribati	KIR
Ethiopia	ETH	Colombia	COL	Palestine	PAL	Georgia	GEO			Lao People's Dem Rep	LAO
Gabon	GAB	Costa Rica	COR	Qatar	QAT	Germany	DEU				
Gambia	GAM	Cuba	CUB	Republic of Yemen	YEM	Greece	GRE			Macao	MAC
Ghana	GHA	Dominica	DOM	Saudi Arabia	SAA	Hungary	HUN			Malaysia	MAA
Guinea	GUI	Dominican Republic	DOR	Somalia	SOM	Iceland	ICE			Marshall Islands	MSI
Guinea-Bissau	GUB	Ecuador	ECU	Sudan	SUD	Ireland	IRE			Micronesia	MIC
Ivory Coast	IVC	El Salvador	ELS	Syrian Arab Republic	SYR	Israel	ISR			New Caledonia	NEC
Kenya	KEN	French Guiana	FRG	Tunisia	TUN	Italy	ITA			New Zealand	NEZ
Lesotho	LES	Grenada	GRA	United Arab Emirates	UAE	Kazakhstan	KAZ			Niue	NIU
Liberia	LIB	Guadeloupe	GUA			Kyrgyzstan	KGZ			Northern Mariana Islands	NMI
Madagascar	MAD	Guatemala	GUT			Latvia	LVA				
Malawi	MAL	Haiti	HAI			Lithuania	LTU			Palau	PLA
Mali	MAI	Honduras	HON			Luxembourg	LUX			Papua New Guinea	PNG
Mauritania	MAU	Jamaica	JAM			Macedonia	FYM				
Mauritius	MAS	Martinique	MAR			Malta	MAT			Philippines	PHL
Mozambique	MOZ	Mexico	MEX			Moldova	MOL			Republic of Korea	KOR
Namibia	NAM	Montserrat	MOT			Monaco	MON				
Niger	NIG	Netherlands	NEA			Netherlands	NET			Samoa	SMA
Nigeria	NIE	Antilles				Norway	NOR			Singapore	SIN
Réunion	REU	Nicaragua	NIC			Poland	POL			Socialist Republic of Vietnam	VTN
Rwanda	RWA	Panama	PAN			Portugal	POR			Solomon Islands	SOL
St Helena	SAH	Paraguay	PAR			Romania	ROM			Tokelau	TOK
Sao Tomé and Príncipe	STP	Peru	PER			Russian Federation	RUS			Tonga	TON
Senegal	SEN	Puerto Rico	PUR			San Marino	SMR			Tuvalu	TUV
Seychelles	SEY	St. Christopher and Nevis	SCN			Slovakia	SVK			Vanuatu	VAN
Sierra Leone	SIL	St. Vincent	SAV			Slovenia	SVN			Wallis and Futuna	WAF
South Africa	SOA	Suriname	SUR			Spain	SPA				
Swaziland	SWZ	Trinidad and Tobago	TRT			Sweden	SWE				
Togo	TOG	Turks and Caicos Islands	TCA			Switzerland	SWI				
Uganda	UGA	United States of America	USA			Tajikistan	TJK				
United Republic of Tanzania	TAN	Uruguay	URU			Turkey	TUR				
Zaire	ZAI	Venezuela	VEN			Turkmenistan	TKM				
Zambia	ZAM	Virgin Islands (US)	VUS			Ukraine	UKR				
Zimbabwe	ZIM					Uzbekistan	UZB				
						United Kingdom of Great Britain and Northern Ireland	UNK				
						Yugoslavia	YUG				

Appendix 5: Flow diagram of case investigation, stool specimen collection and outbreak response immunization



Appendix 6:

Case investigation and outbreak response immunization

Prepare in advance

Case investigators must prepare all supplies for case investigations in advance so that, when a case of AFP is reported, the investigation can be conducted without delay. Supplies to be prepared are:

- cold box
- *frozen* ice packs
- laboratory request and report form
- water-resistant felt-tip pen (to complete form and label the container)
- container labels
- leak-proof specimen container with a screw cap
- absorbent material
- plastic bags
- temperature monitor (if available)
- oral polio vaccine.

Remember to maintain ice packs *frozen* for immediate use.

When there is a report of AFP, investigate immediately:

Every reported case of acute flaccid paralysis is a public health emergency to be investigated by a trained, designated case investigator within 48 hours of receiving the report.

First, the case investigator must contact the local health authorities to inform them of the investigation within their jurisdiction. Second, it is necessary to visit the health worker who reported the case and review the hospital and physician records. Third, a visit should be made to the patient and family. If the patient has died, it is still necessary to conduct the investigation, acknowledging the contributions of all persons who helped identify and report the case.

Collect stool specimens immediately

If no more than six weeks have elapsed since the onset of paralysis, collect two stool specimens from the patient with an interval of 24-48 hours between collections (see Appendix 7).

Search for other cases

In the community where the AFP case resides, meet with key people such as health workers, traditional healers, community or religious leaders, and school teachers. Ask them if other

children have been paralysed. Also make house-to-house visits in the immediate neighbourhood of the patient to search for additional cases.

Conduct limited outbreak response immunization (ORI)

Limited outbreak response immunization must start immediately, but only *after* collection of stool specimens. Conducting ORI before collecting stool specimens may cause contamination of stools with vaccine virus, making it more difficult to determine the cause of the paralysis.

The ORI consists of *one* round of oral polio vaccine (OPV) administered on a house-to-house basis for children 0-59 months of age, living in the same village or neighbourhood as the patient. The number of doses of OPV administered should be less than 500 doses, regardless of the size of the neighbourhood.

The ORI is restricted to only one round and less than 500 doses because its effectiveness in stopping transmission is limited. However, ORI is still important to raise immunization coverage in the area for other poliovirus types, to increase awareness and search for other cases. The affected area can be scheduled for larger-scale mopping-up immunization during the low polio season.

Those responsible for case investigations and outbreak response immunization must be informed *ahead of time* where and how vaccine for ORI can be obtained rapidly and easily. *Avoid disrupting the local routine vaccine supply.*

Search for more cases - talk with parents and leaders

During outbreak response activities, ask parents if they are aware of other cases. House-to-house visits during ORI can also be used to teach parents and leaders about the importance of immunization and the polio eradication initiative.

Note: If more than three months have elapsed since the onset of paralysis in a case, ORI should not be conducted. Nevertheless, the case must still be investigated.

Facilitate access to rehabilitation services

Case investigators should make parents aware of the benefits of early rehabilitation for their child and encourage them to seek available services, if possible. Case investigators must know *beforehand* which institutions offer rehabilitation services in the country, and how to access these services.

If professional rehabilitation services are not accessible to a child, show the parents how to perform rehabilitation exercises with the child in the home (see document WHO/EPI/POLIO/RHB/91.1 “Guidelines for the Prevention of Deformities in Polio”).

Conduct a 60-day follow-up examination

Approximately 60 days, i.e. 8-9 weeks, following the onset of paralysis, all surviving patients must be examined again for residual paralysis. The presence of residual paralysis at this time is further evidence that the cause of paralysis is poliovirus.

To conduct the follow-up examination, the investigator must:

- verify with the parent that the information on the case investigation form is correct
- ask the parent if the paralysis has changed

-
- observe how the child moves limbs or areas of the body that were paralysed (look for areas of muscle atrophy and, if possible, watch the child walk)
 - verify whether the paralysis is flaccid (i.e. floppy)
 - verify that sensation is normal
 - complete Part II of Appendix 3b and send the form to EPI, according to established local procedures.

Classify the case within twelve weeks of onset of paralysis

Within twelve weeks of onset of paralysis, all suspected cases must be classified as confirmed polio, polio-compatible or discarded (i.e. non-polio) by the expert committee. See Appendix 2 for case classification schemes. Complete Part III of Appendix 3b and submit the form to EPI.

Appendix 7:

Collecting and sending stool specimens and reporting results

When to collect specimens from a case of AFP

Stool specimens must be collected within 14 days of onset of paralysis to have the greatest chance of isolating the virus. Try to collect the first specimen at the time of the case investigation. If the patient is not able to produce a specimen, leave a cup, cold box and frozen ice packs with the family so that they can collect it from the patient later. Fix a time and place to return and collect a second specimen 24 to 28 hours after the first specimen collection.

How to collect a stool specimen:

Preferred method

1. Use a screw-top container. Remove the container from the cold box and close the lid of the cold box.
2. If possible, collect fresh stool from the child's diapers, or try to get the child to defecate onto paper.
3. Collect a volume of stool about the size of two adult thumb nails (8 grams). This amount of stool will allow duplicate testing, if necessary.
4. Use paper or a spatula to place the specimen in a clean, leak-proof, screw-capped container.
5. The *side* of the container, *not the cap*, should be labeled with the name, identification number of the case (the EPID number), and the date of collection. Use a water-resistant, felt-tip pen to label specimen containers.

Less preferred method

If faeces cannot be readily obtained, as may be the case with outpatients or those investigated under field conditions, the rectal tube provides an alternative, but less preferable method of collection. This method has the disadvantage that the smaller volume of faeces obtained may not permit the storage of a backup original sample in the laboratory. It has also been shown in one study that a lower virus isolation rate is obtained from rectal tube specimens. A rectal tube should be used as follows:

1. Open the screw-top container and check the tube. The rounded end with the small side holes is the end which should be inserted into the rectum.
2. Gently lay the child on his/her back and raise the legs to expose the anus.
3. Remove the tube from the container and, **without squeezing the walls of the tube**, insert it gently into the rectum.

-
4. Insert more than half the tube's length.
 5. Squeeze the walls of the tube to ensure that the faeces in the tube are not sucked out again, and withdraw the tube from the rectum.
 6. When the tube is withdrawn, if there is no stool inside it, try to insert it gently **once more only**. Do not insert the tube more than twice.
 7. Place the tube back in its container and replace the cap.
 8. If the use of the rectal tube stimulates defaecation, also collect this stool in addition to the stool already collected by the rectal tube.
 9. Wash your hands.

Send specimens via a “reverse cold chain”

After collection, the specimens must be placed immediately in a refrigerator or, for shipment, in a cold box at 4-8°C between frozen ice packs. Aim for the specimens to arrive at the laboratory within 72 hours of collection. If this is not possible, the specimens must be frozen (at -20°C) and then shipped frozen, preferably with dry ice or with cold packs that have also been frozen at -20°C. This process of keeping the specimen refrigerated or frozen is called a “reverse cold chain”. If a reverse cold chain is not properly maintained *at all times* during transport, polioviruses will not survive in the stool specimen.

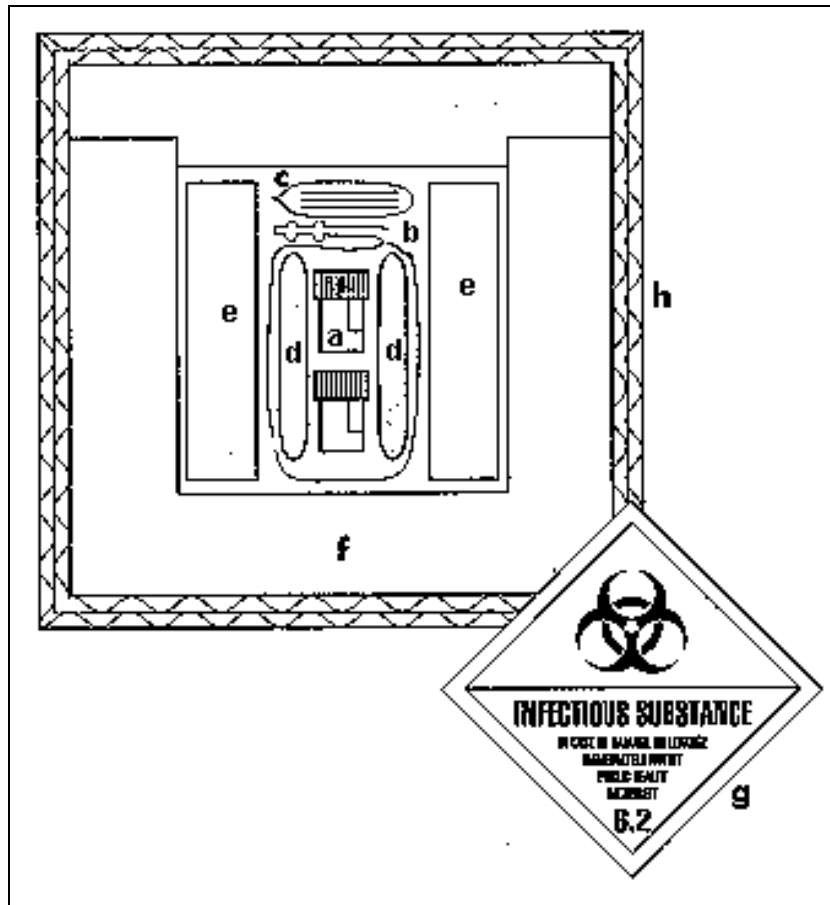
Do not mix cold boxes!

Avoid *storing* specimens in refrigerators or cold boxes that are used for vaccines or other medicines. If this is unavoidable, be sure to seal the specimens in 2-3 layers of plastic bags and carefully separate them from the vaccines or other medicines. Likewise, for *transporting* specimens, a separate cold box or carrier should be used and labeled clearly that it is for this purpose. Do not use vaccine carriers that are used for vaccine to *transport* stool specimens. If contamination is suspected, refrigerators, cold boxes, vaccine carriers and ice packs can be disinfected with a solution of 1 part bleach to 10 parts water.

Complete laboratory request form

Complete the laboratory request form for each case (referring to appendix 3 for a sample form). Assign to each case an EPID number (referring to appendix 4 on assigning EPID numbers).

Shipping materials for specimens



- (a) 30-60 ml faeces container with external screw cap.
- (b) Sealed polyethylene bag to hold faeces containers.
- (c) Sealed polyethylene bag to hold report form.
- (d) Absorbent material (cotton wool absorbs 8-10 times its own weight).
- (e) Icepacks obtainable from national EPI.
- (f) High density (30-35 kgs/m³) polystyrene (small bubbles and firm when squeezed).
- (g) Infectious substance label.
- (h) Outer carton of double-ply corrugated cardboard or plastic.

Send the specimens

When arrangements have been made for shipment, wrap the specimen containers in absorbent material, seal them in a plastic bag and place them in a cold box (designated for shipping specimens) with ice packs. If using the yellow polyurethane disposable type of cold box, be careful not to damage the fragile lid. Newspaper can be placed on top to prevent movement inside, and an activated temperature monitor dropped between the specimens. Close the lid, but do not tape it shut until it is ready to be sent as it will probably be reopened at the airport, if it is being shipped by air. Place the laboratory forms in an envelope, enclose them in a separate plastic bag, and place them in the cold box for shipment. Do not wrap the forms around the specimens.

Send the specimens by the fastest, most reliable means of transport available

Remember: specimens must arrive at the laboratory within 72 hours of collection, or they should be frozen at -20°C, and then shipped frozen (to arrive within 72 hours of being sent).

Inform the receiving laboratory in advance!

It is *very important* to inform the receiving laboratory of the date and time the specimens will arrive. Arrange for someone from the laboratory to receive the specimen(s).

If sending by air, investigate procedures in advance!

If specimens will be sent by air, investigate airline schedules and contact shippers *before the need arises* so that all shipping regulations are known and the most direct flight selected. If the laboratory is not within the country, check the international regulations for shipping biological specimens. Many airlines require immediate payment for shipment - verify *in advance* the cost of shipment, conditions of payment etc. In some countries, a credit arrangement can be made with the airline.

Take the packed cold box to the airport no less than three hours before the flight. Bring some tape to seal the box after it is inspected by customs agents. Bring a previous airway bill if one exists, plus an official letter from WHO authorizing the shipment of the specimens. Show the previous airway bill to the customs agent and request that the same procedure be followed. Be sure to retain the correct copies of the airway bill. Arrange for someone to be at the receiving end to pick up the specimens upon arrival. Avoid sending specimens to arrive on holidays or weekends.

Designate a responsible person for each step of the shipping procedure and do a “test run” so that any unforeseen problems can be resolved.

Processing the stool specimen

The receiving laboratory must maintain correct records for each sample, *using the EPID numbers*. The epidemiological data (from the surveillance system) and the laboratory data for each case will be linked by this number.

Reporting laboratory results

Laboratories need to set a “turn-around time” of 28 days as a goal for processing specimens - i.e. the final result is reported to the EPI programme manager no more than 28 days from the time the specimen is received at the laboratory. The EPI programme manager then sends these results to WHO on a monthly or quarterly basis (see appendix 3f for a sample monthly/quarterly reporting form). Be sure to send laboratory results promptly to the health worker or the institution that reported the case.

Monthly meetings

Issues or problems with the laboratory/EPI/epidemiology unit interface should be discussed at monthly meetings arranged by the EPI programme manager.

Sending isolates for intratypic differentiation

Intratypic differentiation is conducted at regional reference laboratories to distinguish wild poliovirus from vaccine virus.

Isolates should be sent for intratypic differentiation when polio is reduced to focal transmission and AFP surveillance is well-established. Intratypic differentiation is not necessary on every specimen when polio is highly endemic in a country.

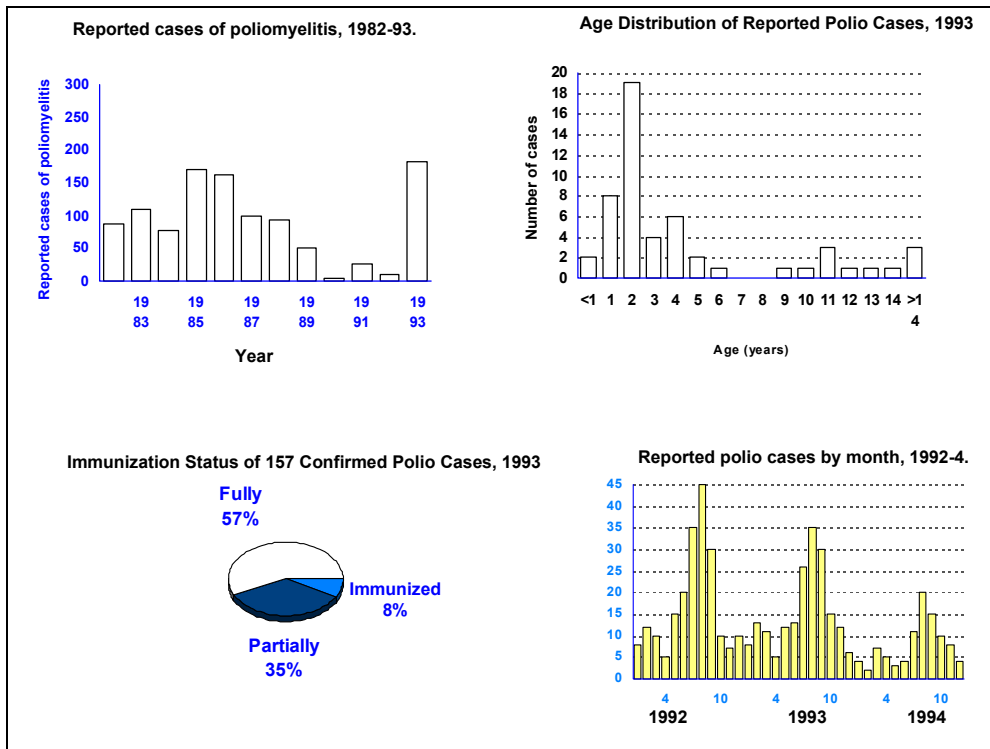
Appendix 8:

Steps to initiate AFP surveillance

How to initiate AFP surveillance


1. Meet with hospital/rehabilitation centre directors to:
 - explain immediate and monthly reporting, including zero reports
 - explain that case investigation, stool specimen collection and outbreak response immunization will occur whenever a case of AFP is reported
 - introduce the Ministry of Health (MOH) staff who will be responsible for case investigation and collection of stool specimens
 - introduce MOH staff who will visit the hospital on a weekly basis to conduct “active surveillance”
 - designate a focal point at the hospital for AFP reporting
 - obtain assistance from the director to inform hospital staff of the polio eradication initiative and define their role (notices, posters, meetings, etc.); present the polio eradication initiative at the hospital’s next staff meeting
 - meet with paediatricians, neurologists and other health workers who are likely to see polio cases
 - meet with key personnel involved with hospital records
 - introduce the reporting forms.
2. Meet with the hospital focal point to explain the entire process in detail and his/her responsibilities.
3. Present the polio eradication initiative during staff and professional meetings. Send written, official notices to all staff of the requirements to report all AFP.
4. Deliver the appropriate reporting forms to the focal point at the hospital.
5. Begin!
 - The focal point at each hospital should start sending monthly reports (including zero reports), and immediately report any case of AFP.
 - MOH staff should start weekly, active surveillance (see appendix 1 for definition)
 - Case investigators should conduct case investigations, collect stool specimens and implement outbreak response immunization whenever a case is reported.

Appendix 9: Sample graphs



Appendix 10: Sample spot map of confirmed polio cases

Insert map 011Ap10.MAP



1 dot = 1 case

Appendix 11:

Ten indicators of disease surveillance and laboratory performance

1. **Non-polio AFP rate in children <15 years of age. (Target $\geq 1/100,000$)**

$$\text{Non-polio AFP rate} = \frac{\text{number of reported non-polio AFP rates < 15 years of age}}{\text{total number of children < 15 years of age}}$$

The non-polio AFP rate is an indicator of surveillance “sensitivity”. If it is $< 1/100\,000$ then the surveillance system is probably missing cases of AFP.

2. **Completeness of monthly reporting. (Target $\geq 90\%$)**

$$\% \text{ complete} = \frac{\text{number of monthly reports received}}{\text{number of monthly reports expected}} \times 100\%$$

3. **Timeliness of monthly reporting. (Target $\geq 80\%$)**

$$\% \text{ Timely} = \frac{\text{number of reports received before a specified deadline}}{\text{number of monthly reports expected}} \times 100\%$$

4. **Reported AFP cases investigated ≤ 48 hours of report (Target $\geq 80\%$)**

5. **Reported AFP cases with 2 specimens collected ≤ 14 days since onset. (Target $\geq 80\%$)**

6. **Reported AFP cases with a follow-up exam at least 60 days after paralysis onset to verify the presence of residual paralysis or weakness. (Target $\geq 80\%$)**

7. **Specimens arriving at national laboratory ≤ 3 days of being sent (Target $\geq 80\%$)**

8. **Specimens arriving at laboratory in «good condition». (Target $> 80\%$).**

“Good condition” means that upon arrival :

- there is ice or a temperature indicator (showing $< 8^{\circ}\text{C}$) in the container
- the specimen volume is adequate (>8 grams)
- there is no evidence of leakage or desiccation
- appropriate documentation (laboratory request/reporting form) is completed.

9. **Specimens with a turn-around time ≤ 28 days (Target $\geq 80\%$).**

The turn-around time is the time between specimen receipt and reporting of results

10. **Stool specimens from which non-polio enterovirus was isolated (Target $\geq 10\%$).**

This is an indicator of the quality of the reverse cold chain and how well the laboratory is able to perform in the routine isolation of enteroviruses.

Appendix 12 :

Attributes of effective disease surveillance

Complete

Effective disease surveillance is complete. That is, reports are received and screened from all reporting units.

Timely

Effective disease surveillance provides information when it is due.

Useful

Effective disease surveillance collects information which is useful to follow disease trends, detect epidemics, estimate the magnitude of a disease, stimulate research which is likely to lead to control or prevention measures, identify risk factors, assess the effectiveness of control measures, or promote improved clinical practices.

Representative

Effective disease surveillance accurately describes the frequency of a disease, its geographical distribution, and the population affected.

Simple and efficient

Surveillance systems that collect too much information or overwhelm health workers with useless or complicated paperwork are not efficient. The result is poor quality data, incomplete and untimely reporting and minimal use of the data.

Conversely, when a surveillance system collects a manageable amount of data which is simple and useful for making decisions or monitoring progress, the system becomes more efficient and acceptable to all involved.

Flexible

Effective disease surveillance adapts to changing needs or operating conditions without a substantial increase in personnel needs, time or cost.

Hierarchical

In an effective surveillance system, the data flows in a hierarchical manner from the most peripheral level to the most central level. In this way, health officers at each level receive data about the area under their jurisdiction which can be analyzed and used to guide local disease control activities.

For more information on assessing the quality of disease surveillance, refer to : Morbidity and Mortality Weekly Report. Guidelines for evaluating surveillance systems. 1988 ;37[S5]1-17.

Appendix 13 :

Other interventions and referral strategies during NIDs

1. General considerations :

The primary objective of NIDs is to attain high coverage with OPV in order to interrupt circulation of wild poliovirus. Nevertheless, NIDs offer excellent opportunities to administer additional vaccines and interventions, such as measles vaccines, tetanus toxoid, vitamin A and/or iodine.

The principle objective of NIDs, which is to eradicate polio, must not be compromised by the inclusion of additional interventions.

Some countries have a history of conducting «catch-up» campaigns to immunize children who are not up-to-date with their immunization series. Other countries conduct periodic campaigns or “pulses” as part of their routine immunization services.

However, NIDs are a strategy for administering EXTRA doses of OPV, thereby leading to disease eradication ; they are NOT a strategy for routine immunization through campaigns.

Operational and epidemiological issues should be carefully considered when deciding whether and how to include additional interventions. For example, strategic targeting of tetanus toxoid in high-risk populations has been shown to be more effective for eliminating neonatal tetanus than its non-selective use.

Moreover, offering several interventions during NIDs, each with a different strategy and target group, may overwhelm the logistics system, as well as the volunteers and health workers and result in unsatisfactory coverage for all the interventions. In most situations, NIDs should be kept as simple as possible during the first few rounds by offering OPV only. As health workers, volunteers and NIDs committees at all levels gain experience **and achieve high coverage with OPV**, additional interventions can be added progressively during future NIDs. If operationally and epidemiologically appropriate.

The principles of planning NIDs with several interventions are similar to those when only OPV is offered. However, the following issues should be carefully considered :

- excellent and early preparation is even more essential
- target groups (both age and geographic location) for each intervention must be clearly defined
- more vaccine (and vitamin A or iodine where appropriate) must be procured in advance and distributed
- more cold chain space must be allocated at each level

-
- an adequate supply of auto-destruct or disposable syringes and needles must be distributed to each post and vaccinating team
 - health workers must be adequately trained and supervised to ensure safe injection practices and to prevent needle-stick injuries
 - more volunteers and trained health workers are necessary
 - supervision and training needs increase
 - the amount and complexity of social mobilization increases

2. General recommendations

Designate health officers to manage target populations

At the national, provincial and district levels, an officer should be designated responsible for the target populations where additional antigens will be used. This is to ensure that appropriate attention is paid to planning and logistics for the additional interventions.

Collaborate with the routine programme

The national NIDs coordinator should work closely with the EPI manager to ensure that NIDs strengthen the routine immunization programmes. This will include collaboration to :

- ensure consistent policies with the routine programme
- retrain health workers where needed
- distribute, redistribute or repair cold chain equipment
- ensure safe injection practices
- retrain or use existing practices for logistics and supervision

Auto-destruct syringes are best

If injectable vaccines will be offered, WHO recommends the use of auto-destruct syringes during NIDs. If auto-destruct syringes are not affordable, then disposable syringes can be used with rigorous supervision (and « burn boxes » should be provided) to ensure safe disposal by burning.

If adequate quantities of disposable or auto-destruct syringes are not available and well distributed, then injections must not be given during NIDs.

Do not recap needles

Needle stick injuries occur most often in health workers when they attempt to recap used needles. To decrease this risk, needles must not be recapped after use. Needles should remain uncapped and placed immediately into a designated container and disposed of by burning, preferably in a burn box.

3. Specific considerations

Measles

NIDs provide excellent opportunities to reach children with measles vaccine who were missed by the routine system, and/or those who failed to seroconvert during previous measles immunizations. Offering measles vaccines during NIDs may also make the campaign more attractive for the public if they perceive measles as a greater threat to their children than polio.

If measles vaccine is offered during NIDs, priority should be given to :

-
- reaching previously unreached children with the first dose of measles vaccine, and
 - immunizing children at high risk for measles, such as those living in densely populated urban areas.

The decision to administer measles vaccine during NIDs either in targeted geographic areas only or non-selectively should include considerations of cost, impact on disease control and logistics.

The target age group for measles vaccine during NIDs depends on the age group more affected by measles. In developing countries, most measles cases occur in infants and young children. Thus, during NIDs, the vaccine is usually given to all children 9-23 months of age. If a high percentage of measles cases occur in infants less than 9 months, the lower age limit may be decreased to 6 months. In countries with effective measles immunization programmes, measles often occurs among older children and young adults. In this case, the target age group may be extended to include older children.

During NIDs, measles vaccine is often administered to all children in the defined target group regardless of immunization status. This strategy helps to minimize problems of missing vaccination cards and long lines to check cards at the immunization post. Measles vaccines should be offered during only one of the rounds of NIDs. If a second round using measles vaccines is desirable, it should be conducted 4-6 months later.

Special strategies are needed to reach under-immunized or unimmunized children eligible for measles vaccines, particularly in urban areas. The choice of strategy will depend on the reasons they are hard to reach. The implementation of special strategies during NIDs to reach these populations may last several days. See Appendix 16 which discusses strategies to immunize high-risk or hard-to-reach populations.

The measles vaccine requires a cold chain, trained health workers to give subcutaneous injections, and an adequate distribution of syringes and needles. There are no contraindications for measles vaccine.

Formula for calculating the number of measles vaccine vials:

Number of measles vaccine vials = (Target population x 1.3) / vial size

Tetanus toxoid (TT) :

If TT is offered during NIDs, it should be offered to women 14-44 years of age in high-risk districts only. These are districts in urban and rural areas with any one of the following conditions :

- a report neonatal tetanus (NT) rate of > 1/1000 live births
- < 80% for two or more doses of TT or PAB (percentage of children protected at birth against NT)
- districts with unreliable data (i.e. incomplete reporting, absence of reporting or low access to treatment facilities).

See Appendix 16 for a discussions of strategies for immunizing high risk populations. Implementing strategies to reach these population may require several days.

Offering TT during NIDs will require more complex social mobilization aimed at a different target group. Women should be alerted in advance to bring their immunization card to NIDs.

To avoid unnecessary TT doses, each woman must be screened on the basis of her card and verbal history regarding the number of doses already received (Table 1).

Those who have already received 5 doses of TT at the proper minimum intervals do not need TT. Women without immunization card receiving TT during NIDs should receive a card with all TT doses recorded on it. Tetanus toxoid can be administered at any stage of pregnancy and has no contraindications.

Table 1. Minimal intervals between doses of tetanus toxoid and the duration of protection		
Dose of TT	When to administer TT¹	Duration of protection
(TT1)	At first contact or as early as possible	No protection
(TT2)	At least 4 weeks after TT1	3 years ²
(TT3)	At least 6 months after TT2	5 years
(TT4)	At least 1 year after TT3	10 years
(TT5)	At least 1 year after TT4	Throughout child bearing years (at least 30 years)

¹ There is no maximum interval between TT doses.

² Protection begins 15 days after the date of the dose.

Care must be taken to avoid freezing TT or its efficacy will be reduced.

Offering TT during NIDs will require an adequate supply and distribution of syringes and needles, as well as a cold chain. It will also require more health workers trained to administer safe intramuscular injections. In general, three workers can immunize approximately 150 women per day at fixed sites. One volunteer should complete the tally sheet and mark immunization cards; one volunteer or health worker should fill syringes; and one trained health worker should administer the tetanus toxoid.

Social mobilization efforts should promptly address rumours that TT is an anti-fertility injection. Giving TT to a woman celebrity or important official at the opening ceremony or on posters and brochures can help dispel rumours. In some areas, there is a demand for TT by men. Offering TT to men in selected communities can also help dispel rumours and minimize wastage of TT.

When calculating TT needs for NIDs, a wastage factor of 1.3 can be used initially. The wastage factor can then be adjusted during subsequent campaigns according to wastage data from previous campaigns.

Formula for calculating the number of TT vials needed

Number of TT vials needed = (total population x 22% x 1.3)/vial size

Vitamin A

WHO recommends vitamin A supplementation for children 6 months of age or older in vitamin A deficient areas of the world. Because it is given by mouth and does not require a

cold chain, vitamin A supplementation is the simplest additional intervention to offer during NIDs,

The target age group for vitamin A during NIDs is 6 to 59 months (Table 2). However, a child who received vitamin A supplementation during the four months before NIDs should not receive it during NIDs.

Age	Dose	Frequency
6 - 11 months	100,000 IU (30 mg)	Once every 4 - 6 months
12 - 59 months	200,000 IU (60 mg)	Once every 4 - 6 months

Vitamin A comes in the form of capsules or liquid. The administration of the liquid form requires a dispenser or pump (unit cost of pump = US\$2). If capsules will be used during NIDs, they should be cut open and administered by squeezing the drops of vitamin A into the mouth to eliminate the risk of the child choking on the capsule.

To eliminate the risk of choking, do not give whole capsules of vitamin A to children during NIDs. Instead, cut open the capsule and squeeze the liquid contents into the child's mouth.

Vitamin A must be kept out of direct sunlight and must not be frozen.

To avoid confusion, only 100,000 IU capsules should be distributed for NIDs. Children 6 to 11 months should receive drops from one capsule. Children 12 to 59 months or age should receive drops from two capsules.

There are no contraindications for giving vitamin A. On rare occasions, a child may experience a headache, loss of appetite, vomiting, or a bulging fontanel the day following vitamin A supplementation. These symptoms are mild and temporary, and require no treatment.

When calculating the vitamin A needs during NIDs, a wastage factor of 1.1 is recommended.

Formula for calculating vitamin A needs:

Number of 100,000 IU capsules for children 12-59 months of age = number of target-aged children 12-59 months x 1.1 x 2

Number of 100,000 IU capsules for children 6-11 months of age = number of target children 6-11 months x 1.1

For more information, refer to document WHO/EPI/TRAM/93.6. "How to Give Vitamin A Supplements : A Guide for Health Workers".

Referral strategies during NIDs

During the first round of NIDs, women and children can be asked to bring their immunization cards to the second round of NIDs. During the second round, immunization cards can be checked to identify eligible women or children for immunization. This will

require a person at the post who is trained to read and correctly interpret immunization cards. A referral form (see Appendix 19b) will then be completed and given to persons eligible for immunizations, along with an explanation of when and where to go.

Each referral will be indicated on the tally sheet (Appendix 19a). During the week following NIDs, the nearby health centres should be informed of the number of women and children referred for each antigen so that health staff can prepare.

If a referral strategy is implemented during NIDs, it should not interfere with the primary objective of NIDs, which is to eradicate polio. It is, therefore, important to avoid long lines of people awaiting immunization while cards are being checked. Long waiting periods will discourage attendance at future NIDs.

If long waiting lines develop, the referral strategy should be dropped.

Including a referral strategy during NIDs has the potential to enhance the routine immunization programme, if the routine programme is informed of the number of referrals and is prepared to deal with a sudden increase in clients after NIDs.

Health centres should be informed of the number of referrals made to them and for which antigens.

Appendix 14 :

Logistics and cold chain requirements for NIDs

Logistics for national immunization days involves :

- calculating resource requirements, including vaccines
- determining how and when resources can be obtained, stored, and distributed.

The resource requirements addressed in planning should include :

- vaccine supply, storage, and distribution requirements
- other supplies, including syringes and needles (if required), recording forms, reporting forms, and training materials
- personnel requirements
- transport
- social mobilization materials

The aim of good logistics for NIDs is to ensure that for each round, every immunization post or team has :

- 3 to 4 workers
- a vaccine carrier, thermos or flask
- 1 kilogram of ice or 4 ice packs for each day of NIDs
- 12 to 18 vials (20 doses per vial) of OPV depending on the expected work load
- 3 immunization tally sheets for recording immunizations
- a banner to mark the post site
- posters indicating the date of the next round of NIDs and the next routine EPI session
- a means of traveling to the site(s) of the post

Spreadsheets can be used to calculate the resources required for each level, from national to district level. The purpose of this section of the guide is to provide EPI managers, NIDs coordinators and NIDs logistics committees with information on how to plan logistics for NIDs, and how to calculate and record requirements using spreadsheets (Appendices 14 o-q).

Appendix 14a : Calculating the size of the target population

The most important step in calculating resource requirements is to determine the size of the target population.

During NIDs, the recommended target population to receive OPV is all children under five years of age (0-59 months).

There is no single formula for calculating the size of the target population as methods vary, depending on the country and the information available. Whatever method is adopted should be simple and used uniformly in all administrative areas.

Method 1 :

Target population = total population in the administrative area x percentage in target group

For example, for country X where children under 5 years comprise 17% of the total population, and the total population is estimated at 10,000,000 people, the calculation is : $10,000,000 \times 0.17 = 1,700,000$ children under five years

Census figures or projections, if available, usually provide the best total population statistics.

If these figures are not recent or not considered reliable, they can be increased by a certain percentage to provide a margin of error.

If there are differing population figures for a given administrative area, always use the highest figure.

In most developing countries, 15%-20% of the total population are children 0 to 59 months of age, whereas in industrialized countries the proportion is usually less. A decision as to which percentage to use depends on the information available, such as previous census figures, projections, or birth rates.

Method 2 :

Target population < five years = annual number of live births in population x 5

If the reported number of live births is considered low or unreliable, it should be increased to ensure that resources will be adequate,

Remember :

The method chosen for calculating the target population should be :

- simple to use
- officially provided by the national level for all administrative levels

Always overestimate rather than underestimate the target population.

Appendix 14b : Calculating vaccine requirements

Oral Poliovirus Vaccine (OPV)

The formula for calculating OPV requirements for NIDs is :

Number of OPV doses = target population x 2 rounds x wastage multiplier

If NIDs are being conducted for the first time, a wastage/reserve multiplier of 1.3 (which is approximately 25% wastage/reserve) should be used for OPV, to ensure that adequate vaccine is available. For subsequent NIDs, the wastage multiplier can be adjusted (usually downwards) based on wastage calculations from previous NIDs.

During NIDs, 20 dose vials should be used. To estimate the number of vials required, divide the number of doses needed by 20 and round up.

Examples of OPV requirement calculations, depending on the method of calculating the target population :

Example 1 :

Total population in a province/district, 123,233
Target population (0-59 months) 17% of total population
OPV wastage multiplier = 1.3
Number of rounds = 2
Vial size : 20-dose vials
 $123,223 \times 0.17 \times 1.3 \times 2 = 54,465$ doses of OPV (2 rounds)
 $54,465 / 20 = 2728.25 = 2729$ vials needed

Example 2 :

Total annual live births in a district = 367
Target age group : 0-59 months (0 - 5 years)
OPV wastage multiplier = 1.3
Number of rounds = 2
Vial size : 20-dose vials
 $367 \times 5 \times 1.3 \times 2 = 4771$ doses of OPV for two rounds
 $4771 / 20 = 238.55 = 239$ vials needed

Other vaccines and vitamin A

If a decision is made to offer vitamin A, measles vaccine and tetanus toxoid in selected areas, the formula to calculate their requirements is similar to that for OPV :

Number of doses = target population x number of rounds x wastage multiplier

The recommended wastage multipliers are 1.3 for measles and tetanus toxoid vaccines, and 1.1 for vitamin A capsules.

Appendix 14c : Calculating cold chain space requirements

General guidelines for calculating vaccine storage requirements are :

- the amount of cold chain space required for OPV for one round of NIDs is between 20 and 25 litres per 100,000 total population
- every 1000 doses of OPV requires 1 litre of storage space
- every 500 doses of other vaccines requires 1 litre of storage space
- storage space at the most peripheral level is usually sufficient
- the most serious problems of inadequate space occur at the regional, provincial or district level
- temporary arrangements, such as the use of cold boxes for vaccine storage, must be made for NIDs in those areas with insufficient refrigerator or freezer space.

The following two steps can verify whether there is sufficient storage space for NIDs :

Step 1. Calculate total cold chain space available

Obtain an inventory of the functional cold chain equipment available. Then refer to the table in Appendix 14l called “Capacity of Cold Chain Equipment“. Using this table, determine the total cold space supplied by the cold chain equipment available.

Step 2. Subtract space used for routine immunization

To calculate the amount of cold chain space available for NIDs, subtract the estimated amount of space used for routine immunization services from the total space available.

Example :

Step 1: A certain province has a SIBIR V240 GE whose vaccine storage capacity is 98 litres, (30 in the freezer and 68 in the body of the refrigerator).

Step 2: If the freezer is full of ice packs, and the body of the refrigerator is half full of vaccine for routine EPI, the space available for NIDs is roughly 34 litres. Therefore, approximately 34,000 doses of OPV can be stored in this refrigerator. NIDs.

Problems with inadequate cold space most commonly occur at intermediate levels - i.e., the provinces or districts. When this occurs the following are some alternatives :

- “borrowing” cold space temporarily from the private sector or NGO
- strategic timing of vaccine delivery, i.e. deliver the vaccine for NIDs at a time when the routine vaccine supply was not recently delivered (this will temporarily leave more cold space for NIDs)
- use a “fast chain” in which vaccine delivered to a certain level with inadequate space is immediately picked up and delivered to a more peripheral level that has adequate space (e.g. if the provincial level has inadequate space, the vaccine arriving at the province can be immediately picked up and delivered to the districts).

Appendix 14d : Calculating requirements for syringes/needles

If injectables are to be given during NIDs, auto-destruct syringe/needle combinations should be used. Disposable syringes/needles are second best. Re-usable syringes and needles are not recommended during NIDs.

If injections will be given during NIDs, syringes/needles must be :

- **adequately supplied**
- **properly distributed**
- **correctly used by trained health workers**
- **completely disposed of in a safe manner**

Use the following formula to calculate syringe and needle requirements for each antigen:

Syringe/needle requirement = target population x number of rounds x wastage multiplier

The total requirement is determined by adding together the syringe/needle requirements for each antigen.

Immunization posts administering injectable vaccines must receive adequate numbers of incinerator boxes to destroy the syringes/needles (at least 1 box per 100 syringes/needles).

Appendix 14e : Calculating requirements for vaccine carriers

- **Each immunization post or team will need one vaccine carrier or flask**
- **Each vaccine carrier or flask will require 4 frozen ice packs or 1 kilogram of ice per day of immunization**

Experience has shown that because of the large number of immunization posts or teams needed for NIDs, many posts will have to use flasks or small cold boxes provided by volunteers. Although these flasks are not as well insulated as vaccine carriers, they are adequate for use during NIDs.

It is important to ensure the availability of the carriers and flasks on the day before NIDs, the day of NIDs, and the day following NIDs. It is also wise to have one or two extra flasks or small cold boxes.

Appendix 14f : Calculating ice pack or ice requirements

During NIDs, each immunization post or team will require four frozen ice packs or 1 kilogram of ice per day. The number of days includes the duration of NIDs plus the day the vaccine is delivered to the post and the day it is returned to the district.

Using ice packs during NIDs is often not feasible since each vaccine carrier requires four ice packs in use and four reserve ice packs being refrozen for replacement.

Formula for ice packs :

Ice packs needed = number of posts/teams x 4 ice packs x 2 (replacement set)

Formula for calculating ice requirements :

Ice requirements for 2 rounds of NIDs = Number of posts/teams x number of days per round x 2 rounds x 1 kilogram of ice

Identify the source of ice well before NIDs, and to warn the ice makers well in advance of the amount needed for NIDs.

Appendix 14g : Calculating the number of immunization posts required

In general, there should be an average of one immunization post or team for every 200-250 children under five years of age.

In areas where antigens in addition to OPV are offered, there should be an average of one post or team for every 150 children under five years of age.

Extra posts should be placed in high-risk or hard-to-reach areas.

Formula for the number of immunization posts :

Total number of immunization posts = (Target population / 250) + (extra posts for special or sparse populations)

Appendix 14h : Calculating personnel requirements

Ideally each immunization post or team will have at least four workers, although it is possible for posts to function with three workers if necessary. At least one of the team members at the post should be a trained health worker, the others can be local volunteers.

Formula for personnel :

Workers required = Number of immunization posts or teams x 4

If other antigens, in addition to OPV, are offered, staff requirements (particularly trained staff) increase. Each post or team should have at least 5 workers, and at least 2 of them should be trained health workers.

Appendix 14i : Calculating social mobilization requirements

There are several social mobilization requirements including banners, posters pamphlets, broadcast guides, and T-shirts. The distribution of these materials must be included in the logistics plan. A discussion of social mobilization for NIDs and a spreadsheet to calculate social mobilization requirements are included in appendix 18.

Appendix 14j : Transport

Transport requirements must be addressed both for the preparation and distribution phase of NIDs as well as during NIDs.

Because transport requirements vary dramatically by country and even within countries, there is no simple formula for calculation.

It is highly unlikely that the health sector alone will have sufficient transport for the NIDs. Therefore, other sources of transport must be explored, including other government departments, nongovernmental organizations, and the private sector. Remember to include funds for fuel in the budget.

Appendix 14k : Distribution of resources

Each level must plan how to distribute resources to the next level, and ultimately to all immunization posts

A written plan, in spreadsheet form, should be made at national level and provincial level, and incorporated in logistics spreadsheets at district level.

The distribution plan must include :

- a schedule for distribution
- transport for distribution

Supplies including recording and reporting forms, social mobilization materials and training materials should be sent well before NIDs

Note:

- vaccine should not be distributed to districts more than 4 weeks before NIDs
- vaccine should not be distributed to immunization posts more than 1-2 days before NIDs

Appendix 14l : Special populations

Special populations are those that are hard to reach, and/or high risk and include the urban poor, mobile populations, ethnic minorities, and populations in remote areas.

For NIDs, additional effort and planning are necessary to reach special populations, including :

- more intense social mobilization (particularly in urban areas)
- additional training for volunteers
- extra transport (particularly in remote areas)
- more personnel
- more supervision

See appendix 16 for more discussion on strategies for special populations.

Appendix 14m : Returning unused supplies

Following the first and second rounds of NIDs, remaining supplies, especially vaccine, should be returned to the district or provincial level. This will allow personnel to :

- ensure that vaccine is properly stored
- count the remaining vaccine and supplies
- calculate the vaccine wastage rate
- for the next round of NIDs, adjust the amount and distribution of supplies, if necessary
- shift vaccine from one area to another if there are shortages for the next round.

A specific plan must be made to ensure the return of remaining supplies.

Summary

Excellent logistics planned well in advance are critical to the success of NIDs.

The major steps in ensuring good logistics are to :

- Order vaccine well in advance (at least 6 months before NIDs).
- Make the best possible estimate of the size of the target population. If in doubt, overestimate it.
- Use spreadsheets to calculate requirements for the national level, for each province, and for each district, based on the estimated target population.
- Make a written distribution plan detailing when and how supplies will be delivered to or collected by more peripheral levels.
- Pay particular attention to logistics planning for special populations, or areas targeted for additional antigens. Designate someone at the national level, and in each province and district to oversee the special strategies.
- After NIDs, ensure that the remaining vaccine is returned to the district or provincial level, so that an accurate estimate of requirements for future rounds can be made.

Appendix 14n : Vaccine storage capacity of cold chain equipment

Description	Manufacturer	Model	Capacity (l)	
			Refrig.	Freezer
Absorption refrigerators :				
Refrigerators and ice pack freezer, absorption type	Electrolux	RCW 42 EG (P)	24	
Refrigerators and ice pack freezer, absorption type	Electrolux	RCW 42 EK (P)	24	--
Refrigerator and freezer, absorption type	Sibir	V 240 KE	68	30
Refrigerator and freezer, absorption type	Sibir	V 240 G	68	30
Refrigerator/ice pack freezer, compression type	Sun Frost	RFVB	30	0
Solar refrigerators				
Photovoltaic solar refrigerator/ice pack freezer	Electrolux	RCW 422 DC	14*	--*
Photovoltaic solar refrigerator/ice pack freezer	BP Solar	VR 50	38	0
Photovoltaic solar refrigerator/ice pack freezer	Polar Products	RR-2	80	20
Photovoltaic solar refrigerator/ice pack freezer	FNMA	FNMA 75	27	0
Photovoltaic solar refrigerator/ice pack freezer	Solar Energie-Tech	KT 180-24	56	0
Photovoltaic solar refrigerator/ice pack freezer	Sun Frost	RFV-4	15	0
Photovoltaic solar refrigerator/ice pack freezer	Norcoast Refrig.	SSE.60	25	0
Photovoltaic solar refrigerator/ice pack freezer	Dulas Engineering	Dulas VC-150	56	0
Photovoltaic solar refrigerator/ice pack freezer	Unitechnical Mobil	Tropic	30	0
Photovoltaic solar refrigerator/ice pack freezer	Naps Norway	CFS 49 IS	30	0
Solar thermal vaccine refrigerator/ice pack freezer	Comess Soudure		38	0
Compression refrigerators :				
Ice lined refrigerator, compression type	Electrolux	TCW 1151	200*	--*
Freezer, compression type	Vestfrost A/S	SB 300	0	188
Refrigerator and icepack freezer, compression type	Electrolux	RCW 42 AC	12	12
Refrigerator and freezer, compression type	Polar Products	E-3	30	13
Icelined refrigerator, compression type	Vestfrost A/S	MK 142	84	--
Icelined refrigerator/icepack freezer, compression type	Electrolux	TCW 1990	60	1
Freezer, chest, low energy, compression type	Electrolux	TC 883 T	0	229
Icelined refrigerator or freezer, compression type	LEC Refrigeration	VC 139	180*	--*0
Icelined refrigerator, compression type	Vestfrost A/S	MK 202	129	0
Icelined refrigerator, compression type	Vestfrost A/S	MK 302	204	0
Freezer, low energy, compression type	Caravell Group	364-109	0	256
Icelined refrigerator, compression type	Vestfrost A/S	MK/MF 4010	40	0
Freezer, compression type, low energy	Vestfrost A/S	SB 202	0	190

*Capacity figure applies for either refrigerator or freezer space (but not both simultaneously).

Appendix 14n (continued)

Cold box, vaccine carriers	Manufacturer	Model	Vaccine capacity (litres)
Long range vaccine cold box	Electrolux	RCW 25,991.1510.01	20.7
Short range vaccine cold box	Hinardi Djajahardja	CB/INO/B3/90	16.2
Short range vaccine cold box	Hinardi Djajahardja	CB/INO/C2/90	6.5
Vaccine carrier	The Thermos Company	3504/UN	1.8
Vaccine carrier	Polyfoam Chemical Co.	EPI/PF/1.5	1.4
Short range vaccine cold box	Hinardi Djajahardja	CB/INO/D1/90	4
Long range vaccine cold box	Zamrock Fibreglass Corporation	9.75	
Vaccine cold box, short range	Igloo Corporation	2417x31,72qt., legend	20
Vaccine packaging, class A	Savopak Oy	25.2	
Vaccine packaging, class B	Valscius	Thermal Pack	110
Vaccine packaging, class A	Sarnatech	Sarnacel 2.0532.20	16.2
Vaccine carrier	Beijing Light Industrial Products IA		1.3
Point-of-use vaccine carrier	Beijing Light Industrial Products II		0.4
Cold Box	Polyfoam Chemical Corp	2	11.5
Long range vaccine cold box	Savopak Oy	KR 48	20.9
Vaccine packaging, Class A	Normco Incorporated	TC 291	32
Vaccine carrier	Polyfoam Chemical Corporation		3.4
Vaccine carrier	Quattro Elle Spa		3.0
Vaccine carrier/Point-of-use	Electrolux	RCW 2	0.6
Vaccine packaging, Class B	Transcare Packaging	49 x 44 x 44	49.0
Vaccine carrier/Point-of-use	True Pack Ltd	TP.001	0.528
Short range vaccine cold box	Blow Kings	55	8.6
Vaccine packaging, Class A	True Pack Ltd	True Pack 1200	12.5
Vaccine packaging, Class A	True Pack Ltd	True Pack 2400	24.3
Long range vaccine cold box	Electrolux	RCW 12 (992 7701 01)	8.9
Vaccine carrier	Polyfoam Chemical Corp	0.7 liters	0.7
Long range vaccine cold box	Polyfoam Chemical Corp	3	23.2
Vaccine carrier	Inalsa Ltd	IVC-3	1.6
Vaccine day carrier	Inalsa Ltd	IVC-4	0.85
Small vaccine carrier	Blow Kings	VDC-24	0.9
Cold box	Electrolux	RCW 6	4.4
Vaccine carrier	Polyfoam Chemical Corp	Backpack Model	1.6
Vaccine cold box	Inalsa Ltd	ICB-7	25.6
Small cold box, short range	Igloo Corporation	Tag Along 24,168-901x12	4.4
Vaccine carrier, Tag Along, 10	Igloo Corporation	88-901x8	1.8
Vaccine cold box	Inalsa Ltd	ICB-5	5
Long range vaccine cold box	Blow Kings	CB/20/5U	20
Vaccine carrier, 1.3 litre	Blow Kings	VC/42/MOD/2	1.4
Short range vaccine cold box	Blow Kings	CB/5/2A	7.2
Vaccine carrier	Losani S.A.		0.7
Short range vaccine cold box	Polyfoam Packers Corp	390	9.2
Vaccine carrier (colour: blue)	Nylex Corporation Ltd	1.5	
Cold box, long range	Coleman Company, Inc	Steel Belted Sample Manager	15

Appendix 14o: Logistics spreadsheet for central level

Paste in 012-Ap14.xls

Appendix 14p: Logistics spreadsheet for provincial level

Paste in 013-Ap14p.xls

Appendix 14p: *(continued)*

Paste in 014Ap14p.xls

Appendix 14q: Logistics spreadsheet for district level

Paste in 014-Ap14q.xls

Appendix 15:

Preparing a NIDs budget

The following items are usually included in most NIDs budget calculations:

Administrative costs

- Communications
- Office supplies
- Photocopying/printing services

Cold chain costs

- Cold boxes/vaccine carriers
- Ice packs/ice

Personnel

- Salaries for personnel hired specifically for NIDs (if applicable)
- Meals/incentives for volunteers
- Per diem for supervision, attending planning sessions

Post materials

- Markers/Pens/Banners

Social mobilization

- Development/printing of broadcaster's manual
- Development/printing of brochures, posters, letters
- Making of street banners
- Public service announcements (newspaper, radio, television)
- Opening ceremony
- Loudspeakers
- Incentives for children attending NIDs (e.g. balloons)

Training

- Per diem for provincial-level training
- Per diem for district-level training
- Training materials (posters, markers, etc.)
- Development/printing of guide
- Printing of logistics forms, checklists, tally sheets, referral forms

Transport

- Planning/training sessions
- Supervisory visits
- Distribution of supplies
- Social mobilization

Vaccine (and possibly other interventions)

- OPV
- Other interventions such as vitamin A or other antigens (if applicable)
- Syringes/needles (if applicable)
- Materials for syringe/needle disposal (if applicable)

Appendix 16.

Strategies for special populations

One of the keys to the success of NIDs is reaching special populations frequently missed by routine immunization.

"Special populations" are those populations that are considered to be high risk for certain diseases, or hard-to-reach for immunization, such as:

- populations with low immunization coverage
- populations living in areas of civil unrest
- populations with a disproportionate share of the disease burden in the country
- densely populated and peri-urban areas
- areas with poor sanitation
- populations with poor access to health care
- migrant workers and other transient populations
- refugees and internally displaced persons
- any marginalized populations or minority groups
- remote or sparse populations

A health officer or sub-committee should be designated at the national, provincial and district level to plan and oversee additional strategies for special populations.

Understand why: The choice of strategies to reach special populations will depend on understanding why that population is at high risk or hard to reach. Then innovative, appropriate strategies should be developed, carefully planned and implemented.

Use non-traditional channels: Special populations are often marginalized populations with limited access to official health services and may be unresponsive to national authority structures. To reach them, it is often necessary to work with "non-official" sectors, leaders or groups at the local level.

Use maps: Special strategies should include the use of detailed maps of the special areas.

Start early or continue afterwards: Special strategies often require more time, effort and personnel. Plan to start special strategies a few weeks before NIDs or allow them to continue for a few weeks after NIDs.

Ensure local social mobilization activities: Do not rely solely on national social mobilization activities. Local social mobilization activities are critical.

Spot check: Before NIDs, supervisors should spot check high risk areas to verify that parents know about NIDs.

Put the best supervisors in the most difficult areas: Actively supervise activities for special populations. Use the best supervisors in the most difficult areas.

Provide ongoing supervision during NIDs: Active supervision should be conducted not only before NIDs, but also *during* NIDs.

Provide other antigens or vitamin A: Consider providing other antigens or vitamin A to special populations if it will not hamper the success of NIDs or overwhelm the logistics system.

Especially in remote populations

- pay special attention to, and provide extra resources for logistics
- establish dates when an immunizing team will visit the area **AND KEEP THESE DATES!**

Keep your promises!

Especially in high risk urban areas

- pay special attention to and provide extra resources for social mobilization
- make spot checks before NIDs to ensure that mothers know about NIDs
- place extra posts in key areas (visible and convenient)
- actively supervise during NIDs
- develop mechanism to rapidly redistribute supplies and staff during NIDs in the event of long waiting lines
- conduct ongoing social mobilization during NIDs.

Examples of special strategies include:

- negotiate "days of tranquillity" or "corridors of peace"
- involve local leaders of the special population in the planning, social mobilization and implementation of NIDs
- understand and remove barriers which keep special populations from bringing their children for immunization (these might be cultural, educational, logistical, political or religious barriers)
- ensure that at least one volunteer working at the post or on the vaccinating team is from the minority group and speaks the language
- ensure that all volunteers are local
- make more house-to-house visits before and during NIDs
- ensure that house-to-house visits are made by local volunteers of the same special population
- use mobile teams for house-to-house immunization during NIDs
- use "mobile-fixed sites" during NIDs (these are mobile teams that set up an immunization post at a fixed site for a few hours, then move the post to a new site)
- place extra posts in highly visible and/or highly convenient sites
- place extra posts in strategic sites such as at train and bus stations or stopping points on major waterways to reach transient populations
- authorize transportation authorities to send all transiting people on boats, buses or trains to immunization posts during NIDs

-
- place extra local, highly motivated volunteers in areas with special populations
 - intensify local mobilization efforts (this may require more house-to-house visits, more involvement of local leaders, or special efforts to dispel false rumors)
 - enumerate the target population in selected high risk urban areas (but only if this activity is not perceived as a threat by the target population)
 - if at least 40% are not immunized by mid-day during NIDs, conduct intensive house-to-house visits to send children to the post or immunize children at home.

Expect problems! Do not panic!

Appendix 17:

Monitoring and supervision

From the central level

Supervisors from the central level coordinating committee should make supervisory visits five weeks before NIDs to all provinces, and three weeks in advance to selected provinces. Selected provinces would be those with particular difficulties or questionable preparations for logistics or social promotion.

From the provincial level

Similarly, supervisors from the provincial coordinating committee should make supervisory visits three weeks before NIDs to all districts and one week in advance to selected districts.

From the district level

Supervisors from the district coordinating committee should make supervisory visits two weeks before NIDs to all post coordinators or mobile team coordinators, and one week in advance to selected post coordinators.

From all levels

Additional supervisory visits from the central, provincial or district level may be needed as the situation dictates.

During NIDs, supervisors from all levels should actively visit posts and immunizing teams to monitor, assist and help solve any problems.

During each supervisory visit, the supervisor should

- complete a supervisory checklist
- verify that the logistics form is complete and that there are no changes
- verify that the task list is being completed on time
- inquire about strategies for special populations, preparations to implement these strategies, and any problems or questions
- inquire whether transport needs are being met (i.e. vaccine transport and transport of personnel for supervision and social mobilization activities)
- identify any constraints and work with NIDs committee members and the local community to overcome the constraints
- answer any questions.

High risk and hard-to-reach populations, particularly in urban areas, should receive more intense supervision with the best supervisors.

Effective supervisors

- understand and are involved in the planning of NIDs
- know how to complete task lists and logistics forms
- understand how personnel at each level have been trained
- have a mode of transport
- bring extra and essential supplies with them during visits, such as forms, social promotion materials, guides, (vaccine when appropriate) and any needed funds for activities
- are thorough
- are systematic
- are familiar with the area being supervised
- use a supervisory check list as a tool to be thorough and systematic (See Appendix 17e for a sample check list);
- are **reliable**
- are helpful
- motivate and encourage local staff.

Pre-NIDs spot check (house-to-house visits)

In high risk and hard-to-reach populations, particularly in urban areas, it is often useful to conduct a simple pre-NIDs survey or informal “spot check” (See Appendix 17f for a sample form). This consists of visiting several households in a high risk neighborhood 2-5 days before NIDs to verify if parents know about NIDs, the dates, the target population and the location.

If the survey indicates that social mobilization efforts are inadequate or ineffective, they must be intensified or changed immediately during the final day(s) before NIDs.

The pre-NIDs survey or spot check will also be useful for planning the next round of NIDs, since it will provide information on the ways that parents learned about NIDs.

Appendix 17a: Task list for NIDs - central level

Objective	Target date for completion	Date completed
Establish national coordinating committee	8 months before NIDs	___/___/___
Establish national social promotion committee	8 months before NIDs	___/___/___
Establish technical committee	8 months before NIDs	___/___/___
Post schedule of activities	8 months before NIDs	___/___/___
Develop logistics forms (Appendices 14m-o)	8 months before NIDs	___/___/___
Develop task lists (Appendices 17a-d)	8 months before NIDs	___/___/___
Meet with provincial health officials	7 months before NIDs	___/___/___
Develop plan for social promotion (Appendix 18)	7 months before NIDs	___/___/___
Develop and field test NIDs guide	6 months before NIDs	___/___/___
Calculate amounts & cost for social mobilization activities (Appendix 18a)	6 months before NIDs	___/___/___
Recalculate a more precise budget (Appendix 15a)	5 months before NIDs	___/___/___
Print NIDs guide (Appendix 19)	5 months before NIDs	___/___/___
Develop broadcasters' guide (Appendix 18b)	5 months before NIDs	___/___/___
Distribute NIDs guides to provinces	4 months before NIDs	___/___/___
Print broadcasters' guide	4 months before NIDs	___/___/___
Develop promotional materials	4 months before NIDs	___/___/___
Confirm participation of important public figures in NIDs particularly the opening ceremony	4 months before NIDs	___/___/___
Develop & print supervisory checklists (Appendix 17e)	3 months before NIDs	___/___/___
Develop and print tally sheets and referral forms (Appendix 19 a & b)	3 months before NIDs	___/___/___
Prepare training on how to run an immunization post or manage an immunization team (Appendix 19)	3 months before NIDs	___/___/___
Distribute broadcasters' guide	3 months before NIDs	___/___/___
Develop radio/TV announcements and press articles	3 months before NIDs	___/___/___
Develop street and post banners	3 months before NIDs	___/___/___
Develop plan for evaluation of NIDs (Appendix 21)	3 months before NIDs	___/___/___
Training provincial level	8 weeks before NIDs	___/___/___
Prepare opening ceremony	7 weeks before NIDs	___/___/___
Verify availability of transport for supervision, social promotion, vaccine	6 weeks before NIDs	___/___/___
Finalize logistics spreadsheets and ensure consistency of calculations	6 weeks before NIDs	___/___/___
Make supervisory visits to provinces	5 weeks before NIDs	___/___/___
Transfer vaccine from central level to provinces	4 weeks before NIDs	___/___/___
Verify that all media announcements are prepared	4 weeks before NIDs	___/___/___
Make supervisory visits to selected provinces	3 weeks before NIDs	___/___/___
Confirm preparations for opening ceremony	3 weeks before NIDs	___/___/___
Begin newspaper, TV, radio announcements	2 weeks before NIDs	___/___/___
Intensify all social promotion activities	1 week before NIDs	___/___/___

continued

Appendix 17a *(continued)*

Objective	Target date for completion	Date completed
Possibly conduct a pre-NIDs survey	2-4 days before NIDs	___/___/___
Prepare site for opening ceremony	1-2 days before NIDs	___/___/___
Prepare supervisory teams for NIDs	1-2 days before NIDs	___/___/___
Conduct opening ceremony	NIDs!!!	
Visit/supervise posts and vaccinating teams	NIDs!!!	
Make mid-day announcements	NIDs!!!	
Start preparing for second round (if appropriate)	1 st week after NIDs	___/___/___
Calculate immunization coverage and vaccine wastage	2 nd week after NIDs	___/___/___
Meet with all provincial NIDs coordinators	2 nd week after NIDs	___/___/___
Calculate expenditures	During month after NIDs	___/___/___
Conduct coverage survey if applicable	During month after NIDs	___/___/___

Appendix 17b. Task list for NIDs - provincial level

Objective	Target date for completion	Date completed
Meet with central level	7 months before NIDs	___/___/___
Establish provincial coordinating committee	7 months before NIDs	___/___/___
Establish provincial social promotion committee	7 months before NIDs	___/___/___
Prepare meeting with district health officials	7 months before NIDs	___/___/___
Hold meeting with district health officials	6 months before NIDs	___/___/___
Meet again with district health officials and complete logistics forms	5 months before NIDs	___/___/___
Distribute NIDs guide to district	4 months before NIDs	___/___/___
Develop promotion materials	4 months before NIDs	___/___/___
Develop post and street banners (if appropriate)	3 months before NIDs	___/___/___
Attend training on how to manage an immunization post	8 weeks before NIDs	___/___/___
Prepare for training for district level	7 weeks before NIDs	___/___/___
Invite district level to attend	7 weeks before NIDs	___/___/___
Train district level	6 weeks before NIDs	___/___/___
Verify availability of transport for social promotion, supervision, vaccine transport	6 weeks before NIDs	___/___/___
Finalize logistics spreadsheets and ensure consistency	6 weeks before NIDs	___/___/___
Transfer vaccine, tally sheets, referral forms, and social promotion materials from central level to provinces	4 weeks before NIDs	___/___/___
Make supervisory visits to districts	3 weeks before NIDs	___/___/___
Transfer vaccine, tally sheets, referral forms, and social promotion materials from provinces to districts	2 weeks before NIDs	___/___/___
Make supervisory visits to selected districts	1 week before NIDs	___/___/___
Intensify all social promotion activities	1 week before NIDs	___/___/___
Conduct pre-NIDs spot check	2-4 days before NIDs	___/___/___
Make supervisory visits to assist posts & teams	NIDs!!!!	___/___/___
Make a mid-day calculation for province and send results to central level	NIDs!!!!	___/___/___
Hold meeting with district NIDs coordinators	1 st week after NIDs	___/___/___
Estimate immunization coverage and wastage	1 st week after NIDs	___/___/___
Submit results to central level	2 nd week after NIDs	___/___/___
Attend meeting of provincial NIDs coordinators at central level	2 nd week after NIDs	___/___/___
Respond to all reports/rumors of adverse events	During month after NIDs	___/___/___
Prepare for second round (if applicable)	During month after NIDs	___/___/___

Appendix 17c. Task list for NIDs - district level

Objective	Target date for completion	Date completed
Prepare materials for meeting at province: census data, map, list of communities, inventory of cold chain equipment in district	7 months before NIDs	___/___/___
Attend meeting at province	6 months before NIDs	___/___/___
Start completing logistics forms	6 months before NIDs	___/___/___
Establish NIDs coordinating committee	6 months before NIDs	___/___/___
Establish NIDs social promotion committee	6 months before NIDs	___/___/___
Meet with provinces to complete logistics forms	5 months before NIDs	___/___/___
Meet with post coordinators	3 months before NIDs	___/___/___
Distribute schedule and task list	3 months before NIDs	___/___/___
Distribute NIDs guides to post coordinators	3 months before NIDs	___/___/___
Verify accuracy of district calculations	3 months before NIDs	___/___/___
Define strategies for sparse/special populations	3 months before NIDs	___/___/___
Develop post and street banners (if appropriate)	3 months before NIDs	___/___/___
Finalize strategies for sparse/special populations	8 weeks before NIDs	___/___/___
Attend training session	6 weeks before NIDs	___/___/___
Verify transport for social promotion, supervision, & vaccine	6 weeks before NIDs	___/___/___
Finalize logistics forms	6 weeks before NIDs	___/___/___
Invite post coordinators to training session	5 weeks before NIDs	___/___/___
Train post coordinators	4 weeks before NIDs	___/___/___
Transfer vaccine, forms, social promotion materials from province to district	2 weeks before NIDs	___/___/___
Make supervisory visits to post coordinators	2 weeks before NIDs	___/___/___
Begin strategies for special populations	2 weeks before NIDs	___/___/___
Begin social mobilization	2 weeks before NIDs	___/___/___
Visit selected post coordinators	1 week before NIDs	___/___/___
Intensify social mobilization activities	1 week before NIDs	___/___/___
Conduct pre-NIDs spot checks	1 week before NIDs	___/___/___
Implement strategies for special populations	NIDs!!!!	___/___/___
Make mid-day calculation of coverage for district and send results to province	NIDs!!!!	___/___/___
Make supervisory visits to assist posts and teams	NIDs!!!!	___/___/___
Meet with all post coordinators in district	1 days after NIDs	___/___/___
Estimate vaccine coverage & wastage in district	1st week after NIDs	___/___/___
Attend meeting at province	1st week after NIDs	___/___/___
Submit results to province	1st week after NIDs	___/___/___
Respond to all reports/rumors of adverse events	1st week after NIDs	___/___/___
Prepare for second round (if applicable)	1st week after NIDs	___/___/___

Appendix 17d: Task list for NIDs - post or vaccinating team coordinator

Objective	Target date for completion	Date completed
Attend meeting at district	3 months before NIDs	___/___/___
Develop street and post banners (if appropriate)	3 months before NIDs	___/___/___
Establish community NIDs committee	8 weeks before NIDs	___/___/___
Recruit local volunteers	8 weeks before NIDs	___/___/___
Identify means to transfer vaccine from district to post or vaccinating team	6 weeks before NIDs	___/___/___
Attend training at district	4 weeks before NIDs	___/___/___
Train volunteers, designate tasks	3 weeks before NIDs	___/___/___
Meet with community NIDs committee	3 weeks before NIDs	___/___/___
Identify one private cold box (plus at least one reserve) per post or team	3 week before NIDs	___/___/___
Identify source of ice (or ice packs) and the funds to pay for ice	3 week before NIDs	___/___/___
Confirm means of transferring vaccine and other supplies	3 weeks before NIDs	___/___/___
Begin social mobilization activities (display posters, distribute brochures, announce NIDs at meetings, begin making house-to-house visits)	2 weeks before NIDs	___/___/___
Begin strategies for special populations (if applicable)	2 weeks before NIDs	___/___/___
Collect/prepare post materials	2 weeks before NIDs	___/___/___
Intensify social promotion activities	1 week before NIDs	___/___/___
Purchase ice	1-2 days before NIDs	___/___/___
Transfer vaccine, tally sheets, referral forms from district to post or team	1-2 days before NIDs	___/___/___
Prepare post	1-2 days before NIDs	___/___/___
Start immunizing!	NIDs!!!!	___/___/___
Implement strategies for special populations (if applicable)	NIDs!!!!	___/___/___
Make mid-day calculation of coverage and send results to district	NIDs!!!!	___/___/___
Make house-to-house visits	NIDs!!!!	___/___/___
Clean post site	1st day after NIDs	___/___/___
Total tally sheet	1st day after NIDs	___/___/___
Attend meeting of all post coordinators in district	1st day after NIDs	___/___/___
Submit completed tally sheets and supplies to district	1st day after NIDs	___/___/___
Inform health centers of the number of referrals (if referral strategy used)	1st week after NIDs	___/___/___
Start preparing for second round (if applicable)	1st week after NIDs	___/___/___

Appendix 17e. Supervisory checklist

Date of visit:		Site of visit:					
Visit to which level (circle response):		Province / District / Post					
Name of NIDs coordinator (at the level visited):							
Logistics:							
Is there a NIDs coordination committee?						Yes / No	
Is the checklist up-to-date?						Yes / No	
Is the logistics form complete?						Yes / No	
Is additional cold chain equipment needed from a more central source?						Yes / No	
If yes, specify type and number?				Type		Number	
				Refrigerator			
				Cold box			
				Vaccine carrier			
				Ice packs			
				Other, specify			
Is transport to collect vaccine confirmed?						Yes / No	
If yes, by what means?		Car	Motor-cycle	Bicycle	Animal	Foot	Other
Is transport confirmed to make supervisory visits?						Yes / No	
Is transport confirmed for mobile teams (if applicable)?						Yes / No	
Total amount of ice needed at this level for one round of NIDs?						Kilos: _____	
Local sources of ice identified?						Yes / No	
Total cost of ice?						Cost _____	
Source of funding for ice? (circle all that apply)		Local	District	Province	Central	Private sector	Other
What is the ratio of target population post			1 post per ____ target population				
Has this level been trained?						Yes / No	
Has this level trained the next level?						Yes / No	
Are enough NIDs guides distributed?						Yes / No	

continued

Appendix 17e (continued)

Social mobilization	
Is there a social mobilization committee?	Yes / No
Are local social mobilization strategies adequate?	Yes / No
Are there special populations?	Yes / No
If yes, are special strategies for high risk or hard-to-reach populations adequate and appropriate?	Yes / No
Are strategies being implemented according to plan?	Yes / No
Have brochures, posters and other promotional materials been distributed to this level?	Yes / No
Ask 5 health workers at this level the following 2 questions:	
What are the dates of NIDs	# of correct responses ___ of 5
What is the target age group for NIDs	# of correct responses ___ of 5
Ask 5 members of the general public the following 3 questions:	
What are the dates of NIDs	# of correct responses ___ of 5
What is the target age group for NIDs?	# of correct responses ___ of 5
Where are vaccines given during NIDs?	# of correct responses ___ of 5
Problems identified during this visit:	
Recommended actions to solve remaining problems (specify who, what, when, where):	
Name of supervisor:	
Signature of supervisor:	

Appendix 17f. Simple Pre-NIDs Spot Check (or house-to-house visits)

The following questionnaire can be used by supervisors to conduct a spot check. The survey is useful to assess whether social mobilization efforts are effective, particularly in high risk or hard-to-reach populations. The spot check should be conducted 2-5 days before NIDs, with enough time to rectify the situation, if necessary.

Household #:	Number of children < 5 years of age in household:	
Attendance at previous NIDs (if applicable):		
Attendance of all target-aged children at previous NIDs during both rounds (circle “yes”, “no”, or “unknown”)	(child 1)	Yes / No / Unknown
	(child 2)	Yes / No / Unknown
	(child 3)	Yes / No / Unknown
	(child 4)	Yes / No / Unknown
	(child 5)	Yes / No / Unknown
If any child of target age did not attend, why not? (non-prompted question, check all that apply)	No time	
	Unaware of need to go	
	Post too far	
	Too crowded	
	Dislike immunizations	
	Fear of immunizations	
	Unimportant	
	Child not with parent	
	Don't know	
No response		
Other*		
Awareness of upcoming NIDs		
What dates? (Check all that apply)	First NID date known	
	Second NID date known	
	Neither date known	
What age groups? (Check one response)	Children 0-59 months of age	
	Children (target group incorrect)	
	Unknown	
How did mother in household learn about previous year's NIDs? (Check all that apply)	Health worker or volunteer	
	Radio	
	Television	
	Microphone	
	Poster	
	Banner	
	Neighbour	
Other*		
Does the parent remember a recent visit by someone informing him/her of NIDs?	Yes / No / Unknown	

*Specify on the back of this page

**Appendix 17g: Observation check list for independent
observers during NIDs**

Insert 015-Ap17g.xls

Appendix 17h: Summary of NIDs costs

Insert 016-Ap17h.xls

Appendix 18: Social mobilization for NIDs

A social mobilization plan should be developed approximately seven months in advance of NIDs which describes specific activities and tasks, as well as the dates and persons responsible.

All cost estimates should be obtained six months in advance to provide a basis for precise budget calculations to be made 5 months in advance of NIDs.

The following activities should be included in the plan:

Seek advice:

Visit agencies (such as UNICEF) and other persons or groups who have experience conducting social mobilization in your country. Seek their advice and help.

Develop key messages:

The national social mobilization committee should develop the following simple key messages for social mobilization in language(s) that the entire population can easily understand:

- "Polio is a dangerous disease that kills or cripples children for life."
- "Polio can be easily avoided by a safe vaccine which is given by drops in the mouth."
- "To eradicate polio from[NAME OF COUNTRY].... national immunization days will be conducted on ...[DATE OF 1ST ROUND]... and[DATE OF 2ND ROUND]... "
- "During each round of NIDs, every child 0 to 59 months of age should go to a nearby immunization post to receive a dose of polio vaccine. These are extra doses of polio vaccine which every child should receive even if completely immunized.

Seek the participation of key people and groups

National, provincial and district social mobilization committees should contact the following persons/groups/ministries at their level, and invite these groups or individuals to participate in specific promotional activities:

- leaders
- celebrities
- political parties
- women's groups
- nongovernmental organizations
- ministries of communications, education, transportation, well-being of women and children.

-
- the ministry of defense: in some countries, the military is a good source of transportation and personnel, whereas, in others, military participation is not appropriate. Nevertheless, in all countries, the ministry of defense should be well-informed of NIDs.
 - private industry: in several countries, the private sector has donated transportation, meals, T-shirts, caps, balloons, and banners. Major restaurant chains have also donated their facilities as immunization posts during NIDs.

When making initial contact with key persons or groups, suggest specific ways to participate, such as:

- promoting NIDs at key meetings, cultural, and sporting events;
- promoting NIDs on a poster (by a key public figure)
- conducting interviews with the media;
- giving the first drops during NIDs;
- speaking or attending the opening ceremony;
- making an appearance at several immunization posts;
- providing transport for promotional activities.

In some countries, written agreements specifying the type and duration of involvement are signed between the ministry of health and organizations or industries participating in NIDs. This helps to prevent any misunderstandings, false expectations, or false promises by any parties involved.

Distribute written/graphic materials

Posters, brochures, letters, post banners and street banners should be designed, prepared, ordered, and distributed. In addition, a distribution plan should be developed which clearly specifies who will distribute what material, where and on what dates.

Distribute a broadcaster's guide to the media

Develop and print a simple broadcaster's guide or handout for the media which includes standard key information about NIDs. Appendix 18 b suggests the items to include

Use the mass media

Develop strategies for radio, TV and newspaper. Work closely with media executives to plan dates, time, frequency, and content of public service announcements and press releases. Provide the press with information during NIDs.

Conduct an opening ceremony

The opening ceremony for NIDs is a very visible, high level event because the heads of state, other important officials and public figures as well as the press will be present. It is, therefore, very important that the opening ceremony be planned in advance and conducted extremely well by the national social mobilization committee.

During the ceremony, speeches will be made, the Head of State or other high level official should give the first drops for NIDs, and all participating groups should be acknowledged. The media should be there to photograph and broadcast the event.

Key public figures should be contacted well in advance of NIDs to increase their likelihood of participation

Coordinate with provinces and districts

It is important that the central level social mobilization committee communicate and coordinate with the provincial and district committees to avoid duplication of efforts or confusion. The committees should agree on which materials or activities will be planned at each level. Local levels should not rely on the central level for all social mobilization. There should always be local social mobilization activities.

Encourage community participation

The district social promotion committee should identify ways that communities can participate to promote NIDs. In many countries, communities will provide street and post banners, meals for workers, and transport to collect and return vaccine. Local communities might provide volunteers to help prepare the post, work at the post, and make house-to-house visits before and during the NIDs. Those attending NIDs (parents and children) can participate by finding other eligible children in the community.

Appendix 18a: Sample social mobilization spreadsheet

Insert 017-Ap18a

Appendix 18b: The broadcaster's guide

The following items should be included in a broadcasters' guide or handout:

- general information about the global polio eradication initiative
- the meaning of eradication
- a simple explanation of the disease caused by polio
- current status of polio in country
- what NIDs are
- the objectives of NIDs
- the key messages for NIDs:
 - polio is a dangerous disease that kills or cripples children for life
 - polio can be easily avoided by a safe vaccine which is given by drops in the mouth
 - to eradicate polio from[NAME OF COUNTRY].... national immunization days will be conducted on ...[DATE OF 1ST ROUND]... and ...[DATE OF 2ND ROUND]...
 - During each round of NIDs, every child 0 to 59 months of age should go to a nearby immunization post to receive a dose of polio vaccine. These are *extra* doses of polio vaccine which every child should receive even if completely immunized.
- the following facts:
 - even children who are up-to-date with their immunizations or fully immunized should receive OPV
 - there are no reasons not to receive OPV. Sick children should also receive a dose of OPV during NIDs
 - doses of OPV received during NIDs are considered extra doses; and children should continue to receive all routine immunizations
 - the dose of OPV during NIDs does **not** replace routine immunization.
 - collaborators and supporters of NIDs

Note: Some ministries of health have developed a general broadcasters' guide for various health activities throughout the year.

Appendix 19: NIDs guide

The NIDs guide is provided for district and post coordinators and should include the following items:

- the objective of NIDs
- date and place of NIDs
- schedule of activities for planning and implementing NIDs
- defining a strategy
- calculating the target population
- calculating the amount of vaccine needed
- calculating the number of posts
- social mobilization activities
 - the key messages
 - local social mobilization activities
- training on how to prepare and manage an immunization post
- description of roles
 - coordinator
 - screeners
 - immunizes
 - record-keepers
- diagram of an effective immunization post
- characteristics of an effective immunization post
- other pertinent information
- tally sheets
- referral forms
- check lists

The following is an example of a typical NIDs guide for district-level personnel and post coordinators. It can be adapted to the specific situation in each country.

What are national immunization days?

"national immunization days", or NIDs are days when every child under five years of age residing in [COUNTRY] receives TWO *extra* doses of oral polio vaccine four to six weeks apart, regardless of prior immunization status. During NIDs, it is particularly important to immunize children who are often missed by routine immunization services.

What is the purpose of NIDs?

The purpose of NIDs is to eradicate polio

When will NIDs be conducted?

NIDs will be conducted on [Dates of first round] and [Dates of second round].

Where will NIDs be conducted?

Immunization posts will be set up throughout the country. In selected areas, special strategies will be used to immunize children. These selected areas will be high risk, hard-to-reach and low density populations.

During the two weeks prior to NIDs, the community will be well informed of where and when to go for NIDs. This will be done through radio, TV and newspaper announcements, banners, posters, house-to-house visits, community meetings and announcements.

Calculating the target population

The target population is all children 0-59 months of age in the catchment area. One of the following two formulas is used to calculate the target population:

[**Note:** Place only one of the following two formulas in the guide.]

Formula 1:

Target population = Total population in area x proportion of children 0-59 months of age

[**Note:** In most developing countries, 15-20% of total population is between 0-59 months of age.]

Formula 2:

Target population = Total number of children born in one year x 5

[**Note:** If census figures are not reliable then increase them by 10-15%. It is always better to overestimate than underestimate the target population to avoid running out of vaccine during NIDs.]

Calculating the amount of vaccine needed

The first time NIDs are conducted, a wastage/reserve factor of 1.3 (reflecting approximately 25% wastage/reserve) is used to ensure that enough vaccine will be available with some reserve stock.

Afterwards, the true wastage factor can be calculated from the previous round of NIDs. The true wastage is usually less than 25%.

Formula:

Total doses of vaccine needed = Target population x 1.3

Number of vials needed = Doses of vaccine / dose per vial

(Always round *up* to the nearest whole number)

Defining the strategies

In general, immunization posts are placed throughout the country during NIDs. However, special strategies are also needed in:

- communities with fewer than 200 target children;
- areas with sparse populations
- communities which are hard-to-reach for immunizations for any reason;
- communities which are at high risk for acquiring polio for any reason.

The special strategies chosen should be based on the reasons a special population is hard-to-reach or high risk. These might be cultural, educational, logistical, political, or religious. Special strategies include mobile teams, house-to-house immunizations, extra immunization posts, extra supervisors, extra local volunteers, intensified social promotion, more house-to-house visits, increased involvement of local leaders from the special populations.

Calculating the number of posts needed

One post is needed for every 200 to 250 children in the target age group of 0-59 months. In addition to this, extra posts should be placed in areas with special populations.

Formula:

Total number of posts needed = (Extra posts for special populations) + (Target population / 250)

Social Mobilization***Key messages***

All social mobilization activities at all levels should use the same key messages about NIDs. The key messages announce that NIDs will take place, the purpose, date, target population, and place where children can be immunized. The key messages should be simple and clear in language(s) that the general population can easily understand.

The following are suggested standard key messages for NIDs:

- Polio is a dangerous disease that kills or cripples children for life.
- Polio can be easily avoided by a safe vaccine which is given by drops in the mouth.
- To eradicate polio from [NAME OF COUNTRY] national immunization days will be conducted on [DATE OF 1ST ROUND] and [DATE OF 2ND ROUND].
- During each round of NIDs, every child 0 to 59 months of age should go to a nearby immunization post to receive a dose of oral polio vaccine. These are extra doses which every child should receive even if completely immunized.

Local social mobilization activities

Planning of social mobilization activities in the district and communities should start 2 months before NIDs. Intense social mobilization activities start 2 weeks before NIDs. These are:

-
- making house-to-house visits
 - announcing NIDs at all community meetings
 - mobilizing leaders to convince the community to attend
 - hanging posters and banners in the community
 - distributing brochures to all households.

In general, urban areas usually require more intense social mobilization than rural areas.

Training on how to prepare and manage an immunization post

Six weeks before NIDs, the district level should receive training from the provincial level on how to prepare and run an immunization post. Four weeks before NIDs, the post coordinator will receive training from the district-level. At least three volunteers per post should be recruited one to two months before NIDs. Three weeks before NIDs, volunteers should receive training from the post coordinator. Training should always include:

- objectives of NIDs
- dates of NIDs
- target age group
- schedule of activities
- check lists
- logistics at the district and post level
- social mobilization at the district and post level
- how to make a banner (if it will be made at this level)
- how to prepare and run an immunization post
- how to take care of the vaccine
- how to give drops in a child's mouth
- how to fill out the tally sheets
- how to fill out a referral form
- how to teach the same topics at the next level
- a role-play exercise on running the immunization post, including setting up the post, screening, giving drops, and completing referral forms and tally sheets.
- preparations to teach the same course at the district level. This includes the preparation of any training materials.
- a role-play exercise of a teaching session.

How to manage an immunization post

All personnel at the post are asked to bring on the day of the NIDs a pen, a lunch, appropriate clothes for the weather, and a thermos or flask (if they have one).

A health worker is the **coordinator** of the post, and therefore responsible for all activities of the post. The coordinator should clearly designate tasks for the volunteers. At least one volunteer is **screeener** for the correct age (0-59 months), at least one is **immunizes**, and at least one is **record-keeper and referral agent** (if a referral strategy is adopted). Other

volunteers will make house-to-house visits before NIDs and on the day of NIDs to find eligible children and send or bring them to the immunization post.

Role of the coordinator (health worker):

- supervise the volunteers;
- ensure efficient flow through the post;
- maintain order around the immunization post;
- answer questions of people who are waiting;
- mobilize volunteers to make house-to-house visits to find eligible children;
- mobilize those attending the immunization post to seek out other eligible children;
- implement any specific strategies for special populations.

Role of the screeners (volunteers):

- welcome the parent and child;
- verify that the child is within the target age group.

Note 1: Sometimes the parent does not know the age or birth date of the child. In this case, use other ways to estimate the child's age. For example, there may be important historical events which the parent can remember in relation to the child's birth date. In some countries, there is an animal symbol for each year and the parent may know the symbol of the year the child was born. Include these instructions in the NIDs guide.

Note 2: It is generally not recommended to register names before or during NIDs as this is usually time-consuming, produces few benefits, creates bottle-necks and can be threatening in some settings.

Role of the immunizers (volunteers)

- ensure that vaccine is kept in a flask or vaccine carrier with ice.
- administer the vaccine;

How to administer drops of OPV:

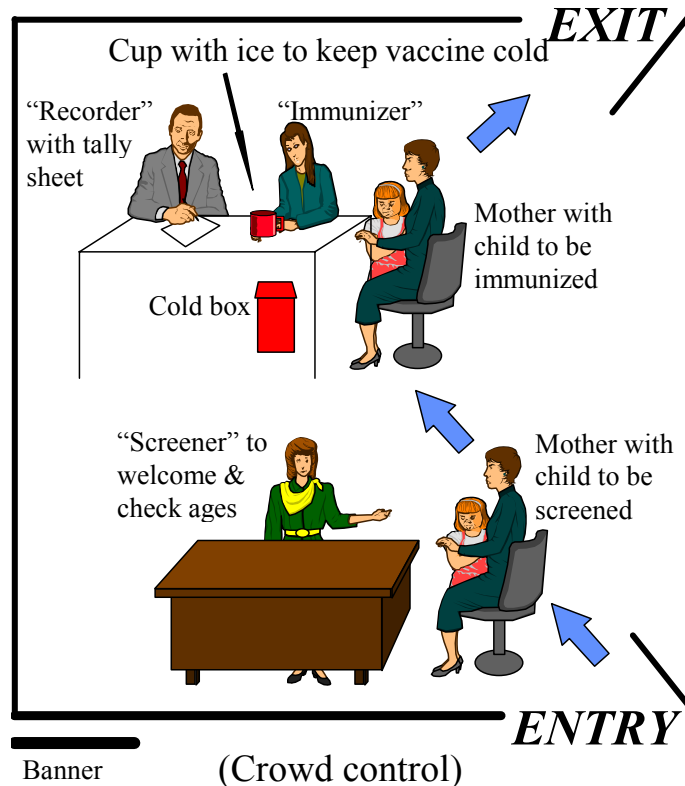
- Let the mother or health worker hold the child firmly. A child of less than two years of age can be held on its back.
- Open the child's mouth by squeezing the cheeks gently.
- Put two drops of polio vaccine into the child's mouth.
- If the child spits out the vaccine, then give the vaccine again.
- If the dropper touches the child's mouth, replace the dropper for the next child.

Role of the record-keepers (volunteers)

- Record on the tally sheet each dose of vaccine given to the child. Do not record doses on the child's immunization card during NIDs, since this is too time consuming during NIDs.
- **During the first round of NIDs**, if a referral strategy is adopted for NIDs or if other vaccines will be given, remind the mother to bring her immunization card and that of her child to next round of NIDs. Give her a brochure (if one was prepared), and the child a balloon or other treat (if planned).

- **During the second round of NIDs**, if a referral strategy was adopted, check the child's and mother's immunization card. Refer any eligible child or mother to the nearest health center with a referral slip. Record the number of women and children referred on the tally sheet.

Diagram of an immunization post



Characteristics of a well functioning immunization post

Efficient flow through the post

Design the immunization post for efficient flow and avoid "bottle-necks", excess crowding, waiting or confusion. Ways to avoid excess crowding or inefficient flow include:

- planning the proper number of target children per post (i.e. approximately 250);
- even distribution of posts in the community;
- enough space at the immunization post;
- an adequate number of volunteers to help run the post;
- good crowd control;
- immunization on a "first-come, first served" basis.

One-way flow through the post and designated entry and exit. This will prevent people backtracking through the crowd after immunization. Backtracking creates confusion and is unpleasant for all concerned.

Clients stand in line only once

If other vaccines (or vitamin A) in addition to OPV are being given, people should stand in line only once to receive all vaccines and vitamin A. In other words, a parent should not stand in a separate line for each vaccine.

Remember: If there is excessive waiting, confusion or crowding at the post, a parent is unlikely to return for another round of NIDs. Therefore, make the experience at the post as pleasant and efficient as possible.

Clients and volunteers receive small incentives

Provide small incentives such as T-shirts, caps, or special pens for volunteers, balloons for children who are immunized and simple brochures about polio and other vaccine-preventable diseases for mothers. In some countries, a prize or official acknowledgement is given to the district(s) or province(s) with the best immunization coverage for NIDs.

Other reminders:

There are no contraindications for OPV. Even children with diarrhea, cough, fever or malnutrition can receive OPV.

Doses of OPV received during NIDs are considered **extra** doses. They are not counted as one of the doses of OPV received during routine immunizations sessions.

All children should still receive routine immunizations.

Normally, doses of OPV are given four weeks apart. During NIDs, health workers or volunteers may encounter children who had a dose of OPV less than four weeks ago. These children should still receive a dose of OPV during NIDs. Any child scheduled to be immunized within four weeks of NIDs should still keep this appointment.

Note: The guide should include the necessary tally sheets. Choose the appropriate tally sheet from Appendix 19a that can be adapted to the country situation.

Appendix 19a: NIDs tally sheet (OPV only)

Insert 018-Ap19a.doc

Appendix 19a: NIDs tally sheet (OPV and referrals)

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Appendix 19a: NIDs tally sheet (OPV, referrals, vitamin A)

Insert 018-Ap19a.doc

Appendix 19a: NIDs tally sheet (OPV, referrals, vitamin A and measles)

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**Appendix 19a: NIDs tally sheet (OPV, referrals, vitamin A,
measles and tetanus toxoid)**

Insert 018-Ap19a.doc

Appendix 19b. Referral form for NIDs

Date: _____ / _____ / _____ day month year
Name of mother: _____
Name of person being referred: _____
Vaccines needed: BCG OPV DPT HBV Measles Tetanus toxoid
Referred from: _____ (Name of vaccination post)
Referred to: _____ (Name of health center)

Notes on referral during NIDs:

During the first round of NIDs, women and children can be asked to bring their immunization cards to the second round of NIDs. During the second round, immunization cards can be checked to identify eligible women or children for immunization. A referral form should be completed and given to the person eligible for immunizations, along with an explanation of when and where to go.

Each person referred should be indicated on the tally sheet. During the week following NIDs, it is important to inform the health center of the number of women and children referred for each antigen, so that health staff are prepared.

If checking immunization cards results in long waiting periods during NIDs, the referral strategy should be dropped.

Appendix 20:

Vaccine safety

The goal of immunization is to protect the individual and the public from vaccine-preventable diseases. Although modern vaccines are safe, no vaccine is entirely without risk. Most vaccine-induced reactions are mild and temporary. In rare instances, reactions following immunizations can result in serious illnesses.

Reactions can result from:

1. Programmatic error - i.e. an error in handling, reconstituting or administering the vaccine

This is the most frequent cause of adverse events. Examples of this include using contaminated syringes or needles, reconstituting vaccine with something other than the diluent (e.g. insulin or muscle relaxant), using the wrong dose of BCG, administering TT, Td or DPT which has been frozen or poorly mixed, or injecting vaccine at the wrong site.

2. Nature of the vaccine or individual response to the vaccine

Examples of adverse events associated with the vaccine or individual response are: lymphadenitis following BCG administration, fever or febrile convulsions following measles or whole-cell pertussis immunization, and paralysis following administration of oral polio vaccine. Table 1 shows the frequency of adverse events for various vaccines.

3. Coincidence

Medical incidents that occur after immunization can be purely coincidental. There is no association between the immunization and the medical incident following the immunization. Sometimes illness appears to be more frequent following immunization, due to parental concern or more intense observation for illness following immunization.

4. Unknown cause

With continued research, unknown causes will hopefully be classified in one of the above three categories.

A medical incident occurring after an immunization that is believed to be caused by the immunization is called an "adverse event following immunization" (AEFI). The association of an adverse event with a specific vaccine is suggested if there is an unusual clustering of medical incidents in vaccinees in a limited time interval following immunization, or if vaccinees experience the event at a rate significantly higher than that in a similar age group who were not recently immunized.

Most AEFIs are mild and transient; the most frequent being fever and local inflammation following DPT. "Serious AEFIs" are extremely rare and are defined as those events which result in death or hospitalization. A "mild AEFI" is defined simply as one which is not

serious. Serious AEFIs occur at rates that are a small fraction of the rate of complications caused by the diseases themselves.

Adverse events following immunization can undermine an immunization programme by causing parents and the community to lose confidence in the benefits of immunization. Therefore, it is important that immunization programmes monitor serious adverse events following immunization and that appropriate actions are taken to correct any programmatic errors. For more information, refer to WHO/EPI/TRAM/93.2 Rev.1: Surveillance of Adverse Events Following Immunization: Field Guide for Managers of Immunization Programmes.

Safety of oral polio vaccine and its use during NIDs

The Polio Eradication Initiative currently uses trivalent oral polio vaccine (OPV) as an integral part of its strategy to eradicate poliovirus from the world. Concerns have been raised anew about the safety of oral polio vaccine for two reasons. First, children are receiving multiple doses of OPV through routine immunization services and NIDs. Second, as cases of polio become rare in countries nearing eradication, any adverse event associated with the vaccine becomes less acceptable.

Oral polio vaccine is a safe and effective vaccine and has no contraindications. The only known adverse event associated with administration of OPV is "vaccine-associated paralytic poliomyelitis" (VAPP).

A WHO-collaborative study in 8 countries found that the number of cases of VAPP was one case per 3.3 million OPV doses distributed or administered and is corroborated by other studies. The risk appears highest following the first dose of OPV (1 case/700,000 of first doses distributed compared with 1 case/6.9 million subsequent doses). Data from the Americas indicate that supplemental doses of OPV administered during national immunization days do not increase the risk of VAPP.

Key communication points with the public on OPV

1. OPV is a safe and effective vaccine, and has no contraindications. All children can be immunized with OPV regardless of fever, cough, diarrhea, malnutrition or any other illness.
2. After three doses of OPV, approximately 85% of children are protected from death, paralysis or lameness caused by infection with poliovirus.
3. Most children immunized with three doses of OPV will not spread the wild poliovirus to other unprotected individuals.
4. It is far more risky not to immunize! In the absence of immunization, between 1 and 5 of every 1000 susceptible children will become lame or paralyzed in countries where poliovirus is still circulating.
5. Although OPV is safe and effective, there is a very small risk that immunization with OPV can cause paralysis in a child receiving OPV or in children exposed to a recently immunized child (with OPV). The possibility of this occurring is once for every 3.3 million OPV doses administered. Supplemental doses of OPV administered during national immunization days do not increase this possibility.

Sample questions and answers for a press interview

Are childhood vaccines safe?

Currently available vaccines are very safe and effective in preventing dangerous diseases.

Can side effects sometimes occur?

It is normal for some recently immunized children to experience a mild reaction, such as redness, tenderness, or swelling at the injection site, or a moderate fever during the week following immunization.

Serious side effects from immunizations are extremely rare.

Children are much more likely to acquire a dangerous complication from a disease if they are not protected by immunization, than they are to experience a serious side effect from a vaccine. In other words, it is very risky not to immunize; and the benefits of immunization are much greater than the small possibility of any serious side effects.

What about oral polio vaccine? Is it safe?

Oral polio vaccine is a very safe and effective vaccine for all children. After receiving three doses of OPV, most children are protected against death or the permanent crippling effects of polio.

Why do children receive polio vaccine during national immunization days even if they are already fully immunized? Is this risky?

Our country is cooperating in a global initiative to eradicate polio from the world forever. In order to accomplish this, all children should receive immunizations through routine immunization services and should receive drops of oral polio vaccine during national immunization days (also called NIDs). When all children receive drops of polio vaccine at the same time, the circulation of the poliovirus is interrupted, driving it out of the community. If properly conducted, NIDs will lead to the eradication of polio.

During NIDs, children who are not fully immunized will become protected against polio after they have received at least three doses of oral polio vaccine. Fully immunized children receiving extra doses of polio vaccine during national immunization days will also benefit because their immunity will be boosted, giving extra protection.

We heard that a child can become paralysed from the oral polio vaccine. Is this true?

Although OPV is safe and effective, in extremely rare instances, paralysis can occur in a child recently immunized with OPV or in another child exposed to a recently immunized child (with OPV). The possibility of this occurring is very low - that is, once for every 3.3 million doses of OPV given. The risk of paralysis caused by the vaccine decreases with every dose administered. The risk of getting polio if your child is not immunized is at least 100 times greater than the risk of getting paralysis from the vaccine.

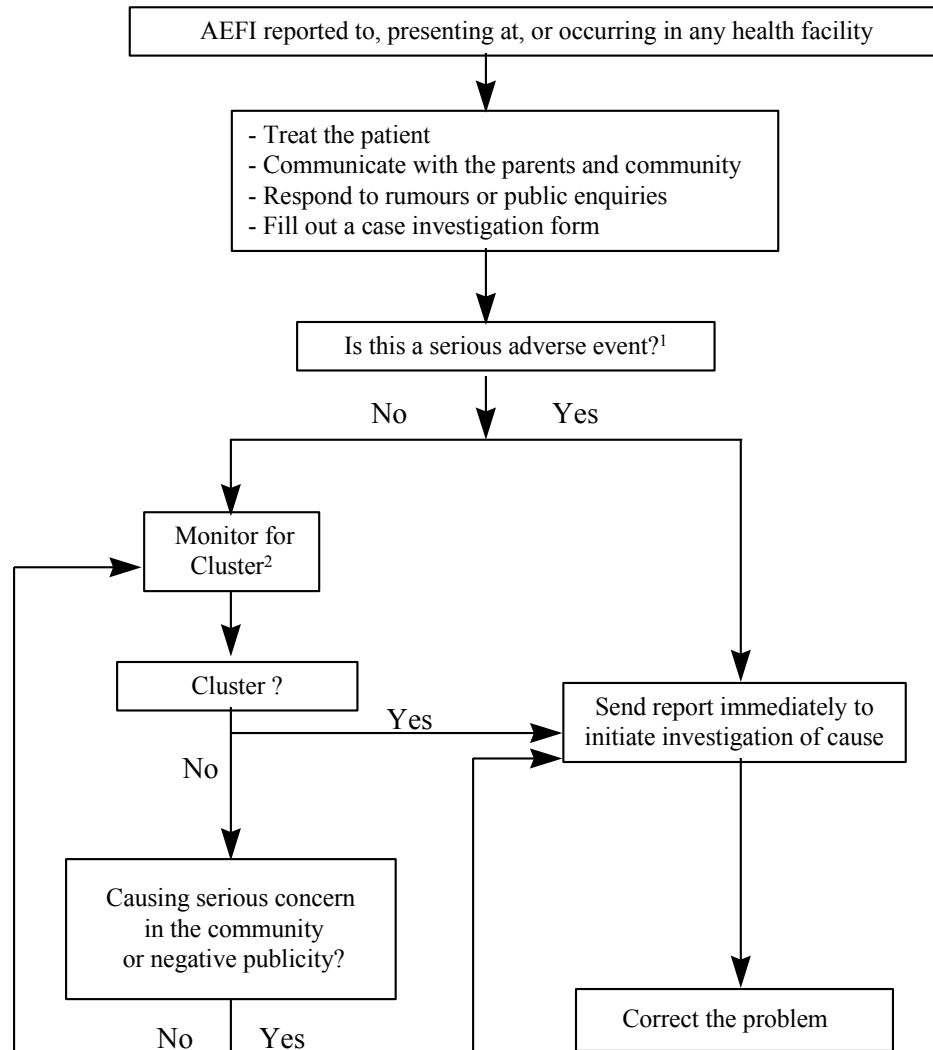
Appendix 20a: Known adverse events associated with EPI vaccines

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Appendix 20a: *(continued)*

Insert 019-Ap20.doc

Appendix 20b: Taking action by peripheral level health worker for adverse events following immunizations (AEFIs)



¹ Defined as **serious** if it results in a) death or b) hospitalization.

² A **cluster** is defined as an AEFIs which occur with unusual frequency, by vaccine, by type of reaction, or by locality/facility. A more precise definition may be decided upon by national programme managers.

Appendix 21: Monitoring and evaluating NIDs

Monitoring and evaluating NIDs are important to:

- Identify specific problems in planning or implementing NIDs so that the next round can be improved accordingly;
- Identify specific populations that have less than adequate coverage and are at risk for poliovirus transmission;
- Based on the success of the campaign, predict the likelihood of interrupting poliovirus transmission.

1. Process evaluation

After each round of NIDs, supervisors and coordinators at each level should make a qualitative assessment of the preparations and implementation of NIDs. NIDs committees, coordinators and supervisors at each level should meet to discuss the findings. These findings should be used to improve subsequent rounds.

Evaluation of preparations: The supervisory checklist (Appendix 17e) provides a sample format of some of the relevant information on the adequacy of preparations. The supervisory checklist should be developed by the national coordinating committee well before NIDs (e.g. three months in advance) so that supervisory visits can be made at all levels prior to NIDs using the checklist.

Evaluation of implementation: For a qualitative evaluation of the conduct of NIDs, supervisors should visit during NIDs several immunization posts in a variety of districts and provinces to assess adherence to guidelines, adequacy of logistics and cold chain, adequacy of social mobilization, effectiveness of any special strategies, efficiency and quality of services at the immunization post, and accuracy of record-keeping. See Appendix 17g for a sample checklist.

2. Immunization coverage

Administrative method:

Using information from tally sheets, an administrative estimate of immunization coverage should be calculated in each district and province with the following formula:

$$\text{Administrative estimate of coverage} = \frac{\text{Doses administered to target age group}}{\text{Population in target age group}}$$

These data can reveal areas with low coverage that should be targeted during subsequent NIDs. For an accurate estimate using this formula, the estimated number of target children (denominator) for each area must be firmly established at the national level before NIDs begin. Managers should pay special attention to areas with coverage greater than 100%. This may indicate that estimates of the target population are low due to migration of children from other areas or that children older than the target age group were immunized and included in the numerator.

Estimates of coverage should be made nationally as well as for each province and district. At administrative units smaller than districts, only the number of doses should be reported to more central levels.

Each provincial NIDs coordinator should submit to the national NIDs coordinator:

- provincial coverage estimates
- the numerators and denominators used in calculating coverage
- the number of doses consumed and the number remaining
- location to which the remaining doses of vaccine were returned.

Surveys: Special surveys are not generally recommended after NIDs. However, they may be useful in areas with persistent transmission despite reported high coverage. The objective of any survey following NIDs should be to: 1) estimate the coverage obtained in the target age group, and; 2) determine reasons why children were not immunized. The latter will be useful for planning future rounds of NIDs.

3. Costs

The national NIDs coordinate should record and monitor expenses during the entire planning and implementation of NIDs. As with other types of information, district and provincial NIDs coordinators should record expenses and submit them to more central levels. This might include expenses for social mobilization, transport, cold chain equipment, ice, incentives, and per diem. See Appendix 17h for a sample form for recording costs.

4. Incidence

The best measure of the impact of NIDs is to monitor the incidence of polio over time by implementing effective AFP surveillance

Polio cases that occur following NIDs should be analysed by asking the following questions:

- Are polio cases occurring in unimmunized or inadequately immunized children who were missed by the routine immunization programme?
- Are polio cases occurring in unimmunized or inadequately immunized children who were missed by NIDs?
- Are the polio cases occurring in any pattern of clustering in age, geographic areas or population (migrants, ethnic minorities, urban poor)?

Appendix 22: Calculating the target population and vaccine requirements for mopping-up immunizations

Either of the following two formulas can be used when forecasting vaccine needs for mopping up:

Number of OPV doses = population of high risk districts x proportion in target-age group x wastage factor x 2 rounds

Number of OPV = Number of live births high risk districts x 5 years x 1.3 wastage factor x 2 rounds

Example 1:

Population in all high risk districts = 892,356
Percentage of population 0-59 months of age = 19%
Wastage factor = 1.3
Number of rounds = 2
Vial size: 20-dose
 $892,356 \times 0.19 \times 1.3 \times 2 = 440,824$ doses needed
 $440,824 \text{ doses} / 20 = 22041$ vials needed

Example 2:

Number of live births in all high-risk districts = 353,654
Target population: 0-59 months (0-5 years)
Wastage factor = 1.3
Number of rounds = 2
Vial size: 10-dose
 $353,654 \times 5 \times 1.3 \times 2 = 4,597,502$ doses needed
 $4,597,502 / 10 = 459751$ vials needed

For calculating other requirements, refer to Appendix 14.

Appendix 23: Mopping-up tally sheet

insert 020-Ap23.xls

Appendix 24: Mopping-up work sheet

Insert 021-Ap24.xls

Appendix 26: Comparison of NIDs, ORI and mopping-up

Comparison of mop-up with ORI

Both outbreak response immunization (ORI) and mop-up immunization consist of house-to-house immunization with OPV of all children 0-59 months of age regardless of immunization status. However, there are some distinct differences:

Mopping-up	ORI
Extensive	Limited to < 500 doses
Conducted as two rounds	Conducted as one round
Conducted during low season of polio, regardless of the season of transmission*	Conducted whenever there is a suspected case of polio
Conducted when polio is reduced to focal transmission	Conducted whenever there is a probable case of polio

***Exception:** In countries which have eliminated or almost eliminated polio, extensive mopping-up immunization is often conducted immediately after a case of polio is detected, regardless of season.

Comparison of mopping-up immunization with NIDs

Both mopping-up and NIDs consist of extensive immunization campaigns in two rounds, 4-6 weeks apart, during the low season of poliovirus transmission. However, there are some distinct differences:

Mopping-up	NIDs
Conducted when polio is reduced to focal transmission	Conducted when polio is widespread or endemic
Conducted in focal areas of poliovirus transmission	Conducted nation-wide or in as wide a geographic area as possible
Conducted primarily on a house-to-house basis	Conducted primarily at fixed sites (although house-to-house or "mobile-fixed sites" are often used in special populations)
