World Health Organization

Republic of Iraq
Ministry of Health
Expanded program of immunization

Acute Flaccid Paralysis Field Manual

For Communicable Diseases Surveillance Staff

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Content

Abbreviations

AFP	Acute flaccid paralysis
DoH	Directorate of Health
EPI	Expanded Program on Immunization
MoH	**Ministry of Health**
IPV	Inject able polio vaccine
NIDs	National immunization days
NPL	**National Polio Lab**
OPV	Oral polio vaccine
ORI	Outbreak response immunization
PEI	**Polio eradication initiative**
PCR	Polymerase chain reaction
PEI	Polio eradication initiative
STC	Short terms consultant
VAPP	Vaccine associated paralytic poliomyelitis
WHO	World Health Organization.

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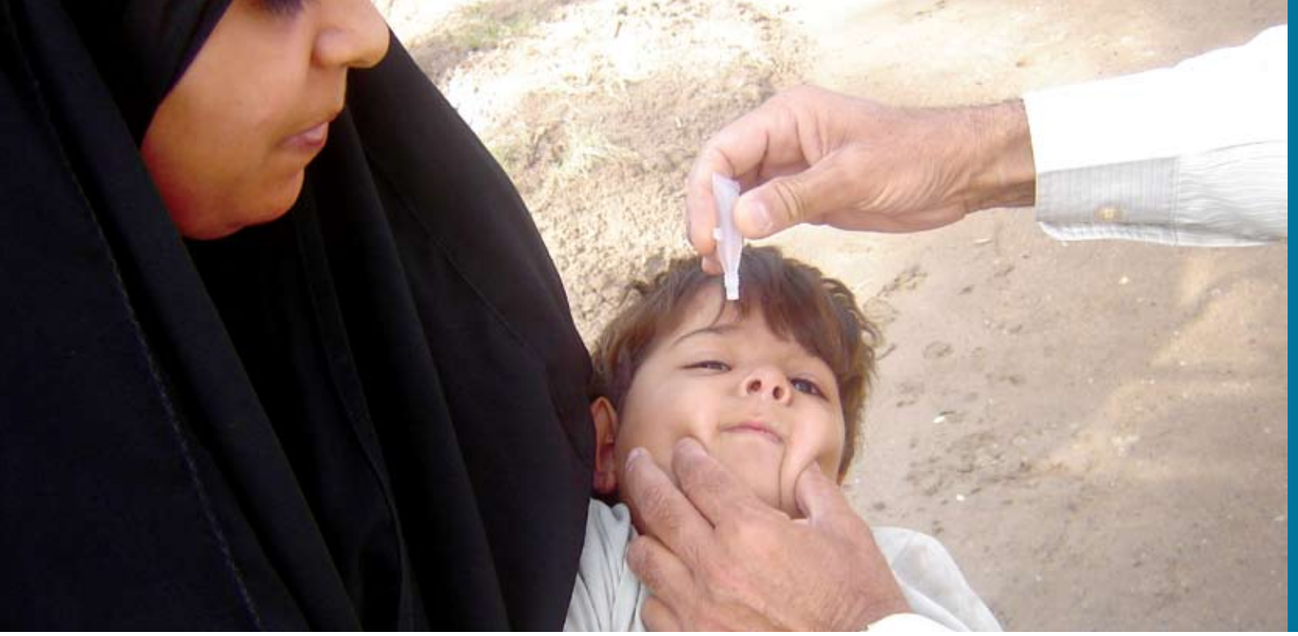

INTRODUCTION

Dear colleagues,

At the beginning, I would like to congratulate every Iraqi Public Health professional who helped in maintaining Iraq POLIO-free since January 2000.

I am also honored to place between your hands this valuable manual, which a group of experienced Iraqis' and WHO staff. adapted to Iraq's situation using WHO standards and Egypt and Sudan examples.

As you know, the World Health Assembly in 1988 launched the Global Polio Eradication Initiative to free the entire world of the scourge of poliomyelitis. Member countries of the World Health Organization have made progress and are on track towards certifying a world free of poliomyelitis. I am sure that this manual will be a powerful tool in maintaining POLIO-free status, in spite of various challenges and uncertainties encountered under the present situation.

Firstly, as the immediate response to the outbreak of poliomyelitis in 1999, Iraqi Ministry of Health with the assistance of WHO and UNICEF, conducted two rounds of eminently successful vaccinations of eligible population through National Immunization Days (NIDs) in October and November 1999. It was possible to interrupt transmission of the virus in a remarkably short time.

This gave all of us great satisfaction and raised the confidence of all involved in the Program.

Since then, successive rounds of immunization through house to house NIDs were carried out. As a result of these intensive and combined efforts, over 95% vaccination coverage of children under 5 years of age were achieved. One indicator of the NIDs success, is that no case of poliomyelitis due to wild poliovirus has been reported in Iraq since January 28th, 2000. This indeed has been a great achievement considering the many difficult conditions the Program is being conducted under.

Concurrent with NIDs and supplementary rounds of vaccinations, surveillance of Acute Flaccid Paralysis (AFP) and confirmatory laboratory investigations of suspect cases were effectively carried out during the last 6 years.
During 2004 & 2005, standard surveillance indicators were reached and maintained at the national and provincial levels, although further improvement is required in Anbar province.

This manual will enable all surveillance staff to augment their activities in silent districts during the years to come. At national level, adequate stool specimens were collected from more than 90% of AFP cases, however Anbar province did not attain the required target of 80%.

Upon the request of Ministry of Health; WHO closely followed up the national polio laboratory renovation, furnishing and ensured the availability of all needed equipment, supplies and reagents. The NPL is expected to be fully accredited by June 2006.
WHO will provide all the necessary technical and other support to ensure the timely and complete implementation of all polio-eradication strategies including the AFP surveillance plan of action.

Overall the MoH staff at all levels is commended for their active role in maintaining the poliomyelitis free status and certification surveillance indicators despite the current difficult conditions.

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POLIO ERADICATION INITIATIVE (PEI)

Following the widespread use of poliovirus vaccine in the mid-1950s, the incidence of poliomyelitis declined rapidly in many industrialized and developing countries.

In 1988, the World Health Organization adopted the goal of global eradication of poliomyelitis. This goal is defined as:
- No cases of clinical poliomyelitis associated with wild poliovirus.
- No wild poliovirus found worldwide despite intensive efforts to do so.

Poliomyelitis was selected for eradication because of the following characteristics:

- There is no animal reservoir.
- There is no chronic carrier state.
- Poliovirus survives poorly in the environment.
- Presence of effective vaccine against the disease.

The strategies to achieve this goal are:
- Attaining high routine coverage (>90%) with at least three doses of oral polio vaccine within first year of life.
- Conducting National Immunization Days (NIDs).
- Conducting "mopping-up" immunization when polio is reduced to focal transmission.
- The implementation of surveillance for all possible cases of poliomyelitis.

Afterwards:
- Polio-free certification.
- Laboratory containment of poliovirus.
- Stopping polio immunization.

Benefits of Polio Eradication Initiative:

1. Reduction in morbidity and mortality,
- Poliomyelitis is a leading cause of disability and death.

2. Health systems,
- Enhancing surveillance systems and laboratory network.
- Revitalizing immunization programs.
- Strengthening health system planning, management, and evaluation.

3. Economic (Global): $1.5 billion in savings/year, after polio eradication and stopping immunization.

Other:
- Encouraging the private sector's role in health planning and implementation of health programs.
- Improving culture of prevention and social mobilization.

Substantial progress toward meeting this objective has already been achieved in many WHO regions.

ACUTE POLIOMYELITIS

Poliomyelitis is a highly contagious disease caused by poliovirus.

Poliovirus

Poliovirus is a member of the enterovirus subgroup, family Picornaviridae. Enteroviruses are transient inhabitants of the gastrointestinal tract, and are stable at acid PH. Picornaviruses are small, ether-insensitive with an RNA genome.
There are three poliovirus serotypes (P1, P2, and P3). There is minimal heterotypic immunity between the three serotypes.
Heat, formaldehyde, chlorine, and ultraviolet light rapidly inactivate the poliovirus.

Epidemiology

Reservoir

Humans are the only known reservoir of poliovirus, which is transmitted most frequently by persons with inapparent infections. There is no asymptomatic carrier state except in immune deficient persons.

Transmission

Person-to-person spread of poliovirus via the fecal-oral route, it is the most important route of transmission, although the oral-oral route may account for some cases.

Temporal pattern

Poliovirus infection typically peaks in the summer months in the temperate climates. There is no seasonal pattern in tropical climates.

Communicability

Poliovirus is highly infectious, with seroconversion rates in susceptible household contacts of children nearly 100% and of adults over 90%. Cases are most infectious from 7 to 10 days before and after the onset of symptoms.

Pathogenesis

The mouth is the portal of entry of the virus. Primary multiplication of the virus is at the site of implantation of pharynx and gastrointestinal tract. The virus is usually present in the throat and in the stools before the onset of illness. One week after onset, there is little virus in the throat, but virus continues to be excreted in the stools for several weeks. The virus invades local lymphoid tissue, enters the blood stream, and then may infect cells of the central nervous system. Replication of poliovirus in motor neurons of the anterior horn and brain stem results in cell destruction and causes the typical manifestations of poliomyelitis.

Clinical Features

The incubation period for poliomyelitis is 6-20 days with range from 3 to 35 days. The following clinical pictures may present the disease:

- **Unapparent infection without symptoms**
  Up to 95% of all polio infections are unapparent or sub clinical. Estimates of ratio of unapparent to paralytic illness vary from 50:1 to 1000:1(usually 200:1).

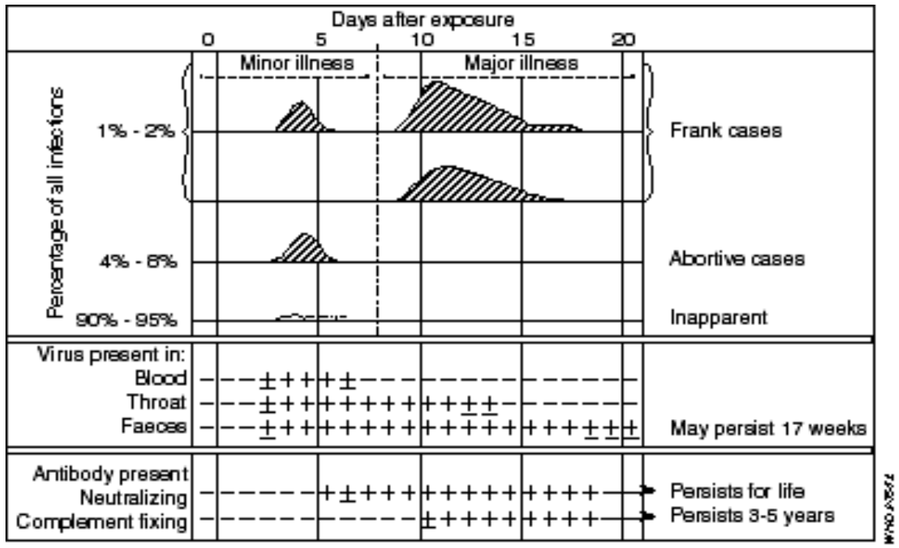
- **Minor illness (abortive poliomyelitis)**
  Approximately 5% of polio infections consist of nonspecific illness without clinical or laboratory evidences of central nervous system invasion and is characterized by complete recovery in less than one week. Three syndromes observed with this form of poliovirus infection, which are upper respiratory tract infection (sore throat and fever), gastrointestinal disturbances (nausea, vomiting, abdominal pain, constipation or, rarely diarrhea), and influenza-like illness. These syndromes are indistinguishable from other viral illnesses.

- **No paralytic poliomyelitis**
  Non-paralytic aseptic meningitis usually following several days after a prodrome similar to that of minor illness occur in 1%-2% of polio infections. These symptoms will last from 2 to 10 days followed by complete recovery.

- **Paralytic poliomyelitis**
  Less than 2% of all polio infections result in a flaccid paralysis. Paralytic symptoms generally begin 1 to 10 days after prodromal symptoms and progress for 2 to 3 days. Generally, no further paralysis occurs after the temperature returns to normal. The prodrome may be biphasic, especially in children, with initial minor symptoms separated by a 1 to 7 days period from more major symptoms. Additional prodromal signs and symptoms can include a loss of superficial reflex initially increased deep tendon reflexes and severe muscle aches and spasms in the limbs or back. The illness progresses to flaccid paralysis with diminished deep tendon reflexes, which reaches plateau without change for days or weeks and is usually asymmetrical. Patients do not experience sensory loss or changes in cognition.

Many persons with paralytic poliomyelitis recover completely and, in most, muscle function returns to some degree. Patients with weakness or paralysis 12 months after onset will usually be left with permanent residua.
Depending on the sites of paralysis, poliomyelitis can be classified as spinal, bulbar, or spino-bulbar disease.
Paralytic poliomyelitis is fatal in 2%-10% of cases. Figure (2) shows types of poliovirus infection in human beings.

Figure (2): Phases of Occurrence of Symptoms in Poliomyelitis Infection.



Laboratory diagnosis:

Viral isolation

Poliovirus may be recovered from stool or pharynx from a person with presumed poliomyelitis.
Stool specimen is inoculated into a cell culture for isolation and identifying which, if any, of the three serotypes of poliovirus is involved. If polioviruses grow in the cell culture, it must be differentiated from other enteroviruses possibly present. Antibodies specific to individual viruses are introduced to block the growth of these viruses
If poliovirus is isolated from a person with acute flaccid paralysis, it must be tested further, to differentiate between wild and vaccine-related viruses, using an ELISA test method or polymerase chain reaction test method (PCR).
Once wild poliovirus has been identified, the genetic make-up of the virus must be determined. The poliovirus sequence is checked against a reference bank of known polioviruses, allowing inferences about the geographical origin of the virus.

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 (2) shows the clinical signs and symptoms and investigations, which are used to differentiate poliomyelitis from other diseases.

Poliovirus vaccines

Inactivated Poliovirus Vaccine

Inactivated (salk) poliovirus vaccine (IPV) was licensed in 1955 and was used extensively from that time until the early 1960s.
This vaccine is produced in monkey kidney (vero) cells and contains all three types of vaccine related poliovirus. It is highly effective in producing immunity to poliovirus, and protection from paralytic poliomyelitis. Ninety percent or more of vaccine recipients develop protective antibody to all three poliovirus types after 2 doses, and at least 99 percent are immune following 3 doses. It contains 2-phenoxyethanol, neomycin, streptomycin, and polymyxin B.

Oral Poliovirus Vaccine (OPV)

Trivalent OPV contains live attenuated strains of all three serotypes of poliovirus.
Live attenuated polioviruses replicate in the intestinal mucosa and lymphoid cells, and in lymph nodes that drain the intestine. Vaccine viruses may spread from the recipient to contacts. Persons coming in contact with fecal material of a vaccinated person may be exposed and infected with vaccine virus.

After complete primary vaccination with three doses of OPV, > 95% of recipients develop long-lasting immunity to all three poliovirus types. Approximately 50% of vaccine recipients develop antibody to all three serotypes after a single dose of OPV. OPV induces immunity of the gastrointestinal tract that provides a substantial degree of resistance to reinfection with poliovirus. It contains neomycin and streptomycin.

SURVEILLANCE

Surveillance is the collection, analysis, interpretation and dissemination of information about a selected health event. Health officials use the information to plan, implement and evaluate health programs and activities.

The purposes of disease surveillance are to:

- Monitor disease trends so that planning can be adjusted to meet new situations.
- Identify, investigate and help control outbreaks or epidemics.
- Identify specific population groups at high risk of illness or death from priority diseases.
- Evaluate the impact of preventive and curative control activities on the incidence and prevalence of priority diseases in the community.
- Confirm current priorities among disease control activities.
- Motivate health workers (feedback, supervision, follow-up).
- Maintain support of government and partner agencies.

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 useful information to show disease trends, detect epidemics, estimate the magnitude of a disease, stimulate research which likely leads to control or preventive measures, identify risk factors, assess the effectiveness of the control measures, or promote and improve clinical practice.

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

Simple and efficient
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 and 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

Acute Flaccid Paralysis (AFP) Surveillance.

It is an essential strategy of PEI, which aims to look for wild poliovirus circulation in the community by investigating all possible polio cases.

The role of AFP surveillance

1. To identify high risk areas or groups
AFP surveillance is surveillance for suspected or possible polio. Its purpose is to detect areas and groups where poliovirus transmission is occurring or likely to occur, and to allow supplementary immunization to be focused where it is needed.

2. To monitor progress
AFP surveillance allows program managers to monitor progress and to determine whether strategies are implemented effectively or not.

3. 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 for three successive years. 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 100000 children <15 years of age should be detected, even in the absence of polio.

4. Utilize data to choose supplementary strategies
If AFP surveillance shows that wild poliovirus circulation is widespread in a country then NID should be implemented, while mopping-up immunization can be used if wild poliovirus circulation is limited to small foci.

The role of the laboratory in AFP surveillance

1. To confirm polio by virus isolation
Isolation and identification of poliovirus from feces is the best current method to confirm the diagnosis of poliomyelitis.

2. To trace the origin of a case
Molecular techniques are available to characterize fully the poliovirus. Maintaining reference bank of the molecular structure of known viruses allows the geographic origin on new isolates to be traced. The laboratory will also determine whether isolated viruses are wild or vaccine-like.

3. To certify that polio has been eradicated
In addition to AFP surveillance, this may include stool surveys of healthy children in high-risk areas and environmental surveillance.

4. To assess vaccine potency and efficacy
The laboratory can perform potency tests on polio vaccine if circumstances indicate possible failure. A laboratory might participate in epidemiological serosurvey if knowledge of the antibody status of the population is important.

Types of AFP surveillance

1. Routine surveillance for AFP, "zero reporting": -
Immediate notification of AFP in children <15 years of age is required. AFP should also be included in the weekly and monthly reporting system. When no case of AFP is detected, reporting units should still send weekly and monthly reports indicating zero cases.

2. Active surveillance for AFP:
Active surveillance is a strategy to actively collect information by visiting health facilities. A designated person should make visits to sites likely to have cases of acute polio, such as hospitals and rehabilitation centers.
An active surveillance is focusing mainly on hospitals because most children with sudden paralysis will be admitted to hospitals or end up in larger hospitals because of referrals.

3. Active AFP case finding:
Looking for AFP cases in the community.

Steps to develop AFP surveillance

1. Define information needs
Two simple databases should be maintained one for case data and one for laboratory data.

2. Develop a case definition for suspected polio
"Suspected polio": Defined as acute, flaccid paralysis in a child aged <15 years including Guillain-Barr`e syndrome; or any paralytic illness in a person of any age when polio is suspected.

3. Identify reporting sites
Identify all potential reporting sites. These include health facilities, rehabilitation centers and any other sites where AFP cases might seek care. Prioritize the reporting units according to their likelihood of seeing AFP cases.

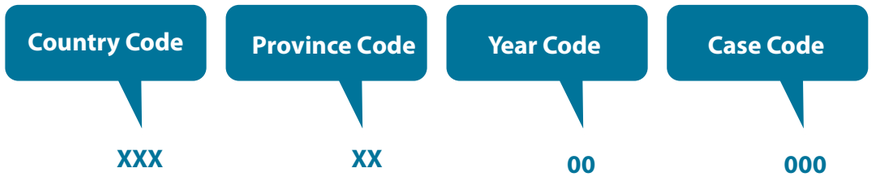
4. Establish a network of collaboration
Virologists, epidemiologists, clinicians, and EPI staff must work effectively as a team.

5. Develop forms
The following forms are needed for AFP surveillance: -
- A form for immediate notification of "acute flaccid paralysis", FORM (1).
- A case investigation form for acute flaccid paralysis, FORM (2).
- A laboratory request reporting form for submission of stool specimen, FORM (3).
- A form for 60-day follow-up examination of AFP case, FORM (4).
- A form for final classification of AFP case, FORM (5).
- A form for AFP case's contacts examination, FORM (6).
- A line listing form for all reported AFP cases, FORM (7).
- A line listing form for AFP cases undergoing "expert review", FORM (8).
- A weekly reporting forms, including "acute flaccid paralysis and polio cases", FORM (9).
- A monthly reporting forms, including "acute flaccid paralysis and polio cases", FORM (10).
- A weekly active surveillance form, FORM (11).
- A form to monitor completeness and timeliness of weekly reports received, FORM (12).

6. Assign EPID numbers

A unique case identification number (EPID) must be assigned for each case. The EPID number consists of the following codes:

- The first three characters specify country code in letters.
- The fourth and fifth characters indicate the province code where the case was residing at the time of paralysis onset. The code of each province is shown below.
- The sixth and seventh digits indicate the year of paralysis onset.
- The two-digit year code is followed by a three-digit number of the case.



Country code for Iraq…….IRQ

Province codes are: -

Anbar	AN	Duhok	DU	Najaf	NJ	Tamim	TA
Babil	BA	Erbil	ER	Ninewah	NI	Theqar	TH
Baghdad	BG	Kerbala	KR	Qadysia	QA	Wasit	WA
Basrah	BS	Missan	MS	Salahdeen	SL		
Diala	DY	Muthana	MU	Sulymania	SU		

Example of EPID number:
Sixth AFP case from Baghdad province detected in year 2004, is (IRQBG04006).

It has been arranged that the national AFP surveillance unit and national polio lab staff give the EPID numbers for AFP cases.

7. Train a team of investigators

A team of investigators at the central, provincial and district levels should be trained. This team will carry out the following tasks:
Conduct immediate investigations of all AFP cases.
Collect stool specimens.
Implement limited outbreak response immunization (ORI).
Conduct a 60-day follow-up examination, looking for residual paralysis.

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, otherwise poliovirus will not survive in the stool. Every investigator should have a cold box and ice packs. Case investigators should receive training on how to collect and send specimens via the reverse cold chain.

9. Hold clinician advocacy meetings to explain the following:

Objectives of the PEI.
The role of clinicians and all health workers in the PEI.
Obligatory immediate notification of all cases of AFP, including Guillain-Barr`e syndrome.
Procedure for reporting AFP cases.
Classification of AFP cases.

10. stablish an expert committee

Members should include an EPI manager, epidemiologist, expert neurologist, a pediatrician, a senior professor from a medical school and a virologist. The responsibilities of the committee are:
Make final classification of all AFP cases (confirmed polio, polio-compatible, and non-polio AFP).
Monitor the quality of AFP surveillance and laboratory performance.
Monitor progress towards polio eradication.
Provide technical advice for the polio eradication initiative.

11. Begin AFP surveillance at major sites

Begin AFP surveillance at high priority sites.

12. Begin weekly or bi-weekly active surveillance.

13. Expand the surveillance system

As soon as active surveillance is working well in provincial and district hospitals, expansion to all health centers should begin so that AFP surveillance can become a part of the routine system. All private physicians should be informed of the requirements to report a case of AFP immediately.

14. Follow-up late or incomplete reports.
Effective AFP surveillance should be timely for proper action. It should be complete to avoid missing any polio case in any place.

15. Begin active case finding
Active case finding helps to determine if cases are being missed in areas with no reported cases of AFP or polio. It is useful also in areas where persons with AFP are unlikely to seek care at designated reporting sites.

16. Monitor and evaluate
The following performance indicators are used to monitor progress of AFP surveillance at the central, provincial and district health facility levels:

AFP surveillance and laboratory performance indicators

First. Non-polio AFP rate in children <15 years of age. (Target > 1/100,000)

$$\text{Non-polio AFP rate} = \frac{\text{number of reported non-polio AFP cases} < 15 \times 100000}{\text{total number of children} < 15 \text{ years of age}}$$

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.

Second. Completeness of weekly and monthly reporting. (Target > 90%)

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

Third. Timeliness of weekly and monthly reporting. (Target > 80%)

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

Fourth. Reported AFP cases investigated ≤ 48 hours of report (Target ≥ 80%)

Fifth. Reported AFP cases with 2 specimens collected ≤ 14 days since onset. (Target ≥ 80%)

Sixth. 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 ≥ 80%)

Seventh. Specimens arriving at national laboratory ≤ 3 days of being sent (Target ≥ 90%)

Eighth. Specimens arriving at laboratory in «good condition ». (Target > 80%).

"Good condition" means that upon arrival:
- There is ice or a temperature indicator (showing < 8°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.

Ninth. Specimens with a turn-around time ≤ 28 days (Target ≥ 80%).
The turn-around time is the time between specimen receipt and reporting of results

Tenth. Stool specimens from which non-polio enterovirus was isolated (Target > 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.
Figures (4, 5, 6, 7 and 8) show some surveillance and laboratory performance indicators in Iraq 1997-2003.

17. Provide feedback
Monthly or quarterly feedback of surveillance information to health staff, and other concerned parties is critical to establishing effective surveillance. Providing feedback information to all designated reporting sites is necessary to verify the accuracy of reports received, encourage complete and timely reporting and to inform concerned parties of program progress. This can be done through written feed back in response to received reports or during meetings, supervisory visits or by telephone. It is important to provide feedback to the reporting site once the report reaches you or at least acknowledge receipt of the report with thanks.

18. Raised awareness about the PEI
To raise the awareness among health officials and the general public about polio eradication and the need for immediate reporting of all AFP cases, the following actions should be undertaken: -
- Make presentations about the PIE at all important health professional meetings such as medical, pediatric, neurology, microbiology, and nursing societies.
- Use mass media and social mobilization to increase awareness of the PEI, the importance of immunization, how to recognize a case of AFP, and the need for immediate response of any case of AFP. Moreover, increase awareness through TV, radio, Newspapers, posters, banners, health education sessions, as well as announcements in mosques, schools, and community meetings.

19. Ensure the following human resources for surveillance activities

- **Surveillance officers for**
  - Case / outbreak investigation.
  - Specimen collection / dispatch.
  - Follow-up examination.
  - Active surveillance, case searches.

- **Data managers**
  - Analysis.
  - Reports and feedback.

- **Supervisors**
  - Complete and timely reporting.
  - Correct reporting procedures.

- **Laboratory staff**
  - Specimens processing.
  - Reporting of results.

How to initiate AFP surveillance

1. Meet with hospital/rehabilitation center directors to:

- Explain immediate, weekly and monthly reporting of AFP cases, including zero reports.
- Explain that case investigation, stool specimen collection and outbreak response immunization will be taken whenever a case of AFP is reported.
- Introduce the staff who will be responsible for case investigation and collection of stool specimens.
- Introduce the 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.
- Meet with pediatricians, 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 regarding:

- Disease control objectives and strategies.
- Standard AFP case definitions.
- Immediate AFP reporting.
- Reporting procedure.

3. Present the PEI during staff and professional meetings.

Send written, official notices of the requirements to report AFP cases to all staff

4. Begin:

- The focal point at each hospital should start sending weekly reports (including zero reports), and immediately report any case of AFP.
- Surveillance officers should start weekly visits.

Surveillance of AFP cases in high risk areas and populations

These areas and populations act as last reservoirs and source of importation of wild poliovirus.

High-risk areas are:

- Sites of holy shrines (Najaf and Karbala).
- Villages located in the borders between provinces, districts and PHCUs catchments areas.
- Areas which have borders with polio endemic countries.
- Areas with poor health infrastructure.
- Areas with poor AFP surveillance.
- Areas with laboratory confirmed polio cases in the last 2-3 years.

High-risk populations are:

- Ethnic or religious minorities.
- Migrant populations.
- Groups with contacts in endemic countries.
- Populations who refuse immunization.
- Internally displaced persons.

The objectives of extra surveillance activities in high-risk areas are:

- To increase detection of AFP cases at health facilities.
- To increase reporting of AFP cases from the community.
- To increase direct detection of polio in the community.

Strategies to increase detection of AFP cases at health facilities:

- Active surveillance at main health facilities, weekly visits to interview staff.
- "Zero reporting" from all health facilities and weekly reporst even if there are no AFP cases.
- Retrospective hospital / clinic record reviews.

Strategies to increase reporting of AFP cases from the community:

- Promote AFP detection during NIDs social mobilization.
- Sensitize "key informants" in the community such as religious leaders, teachers to search for AFP cases and notify surveillance.
- Consider use of 'rewards' for AFP / polio reports.

Strategies to increase direct detection of polio in the community:

Active search during house-to-house 'mop-up' and asking parents about recent AFP cases.
Collection of stool samples from 5-10 contacts in low population areas and report when there is no stool samples from AFP cases.
Environmental sampling.

Ensuring surveillance strategies work in high-risk areas by:

- Establishing a strong system for notification and investigation.
- Ensuring that there are sufficient human and financial resources.
- Taking action immediately.
- Providing appropriate feedback to physicians, parents, and health workers.

Surveillance for detection of poliovirus importation

Importation of wild poliovirus to polio free areas is real risk for PEI. Good routine AFP surveillance with extra surveillance activities is required for early detection of importation.
Monitoring and detection:

- Immediate reporting and investigation of AFP cases (clinical, epidemiological and virological) to determine whether the polio case is imported or not. Also, examine if there is evidence of sustained transmission in case it was imported.
- Enhanced AFP surveillance system through:
  - Increasing clinician awareness about detection and notification of AFP cases, and the possibility of importation of poliovirus.
  - Maintaining active AFP surveillance activities.
  - Investigating high-risk groups (contacts).
  - Doing active AFP case searches.
  - Ensuring zero reporting of AFP cases.

- Provide documentations for interruption of transmission: Interruption of transmission of imported wild poliovirus is accepted when good AFP surveillance system shows absence of wild poliovirus for one year after detection of wild poliovirus importation. The documentations required are:
  - Routine zero-reports submitted by 80% of health facilities.
  - Non-polio AFP rate is ≥1 per 100000 children under 15 years of age.
  - Adequate stool specimens collected from ≥80% of AFP cases.

Acute Flaccid Paralysis Surveillance Functions

1. Detection and notification of AFP cases.
2. Clinical epidemiological and laboratory investigation of AFP cases.
3. Response procedures.
4. Follow – up examination.
5. Classification of AFP cases.
6. Active surveillance and case search.
7. Follow-up on incomplete or late reports.
8. Data collection and consolidation.
9. Data analysis and reporting.
10. Feedback and feed forward.

1. Detection and notification of AFP cases

Notification of AFP Cases is immediate and obligatory. All health facilities, whether governmental or private, have to notify AFP cases immediately. A simple and well-defined notification procedure should be established by each primary health care sector. Notification is immediate by telephone and then written by using, FORM (1).

2. Case investigation: -

A trained designated case investigator should investigate every reported case of AFP within 48 hours of receiving the report.

It is necessary to visit the health worker who reported the case and review the hospital and physician records. 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 investigation.

A visit should be made to the patient and family. If the patient has died, it is still necessary to conduct the investigation and acknowledging the contributions of all persons who helped identify the case.

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:

- Case investigation and laboratory request forms, FORMS (2 and 3) respectively.
- Cold box.
- Frozen ice packs.
- Water resistant felt-tip pen.
- Container labels.
- Leak-proof specimen container with a screw cap.
- Plastic bags.
- Temperature monitor if available.
- Oral polio vaccine.

For each AFP case the investigator should do the following tasks:

- Fill the case notification and immediately forward to AFP surveillance focal at the DoH.
- Fill out case investigation form, FORM (2).
- Examine the case together with attending physician.
- Note detailed address to relocate patient for follow-up examination.
- Advise parents of need to follow-up.
- Initiate stool specimens collection and arrange for transport to laboratory.
- Facilitate access to rehabilitation services. Case investigators should make parents aware of the benefits of early rehabilitation for their child.

Stool specimens collection:

If no more than two months have elapsed since the onset of paralysis, collect two stool specimens from the patient with an interval of 24-48 hours between collections.

When to collect specimens from a case of AFP?

Stool specimens must be collected within 14 days of paralysis onset in order 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. The second stool specimen must be collected after 24 – 48 hours after the first specimen collection.

Collection of a stool specimen:

- Use a screw-top container. Remove the container from the cold box and close the lid of the cold box.
- If possible, collect fresh stool from the child's diaper, or try to get the child to defecate onto paper.
- Collect a volume of stool about the size of two adult thumbnails (8 grams).
- Use paper or a spatula to place the specimen in a clean, leak – proof, screw-capped container.
- The side of the container, not the cap, should be labeled with the name of the case, and the date of collection. Use a water- resistant pen to label specimen container.
- Send specimen via a "reverse cold chain"

  After collection, the specimens must be placed immediately in a refrigerator for shipment, or in a cold box between frozen ice packs at 4-8 °C. The specimens must reach laboratory within 72 hours of collection. If this is not possible, the specimens have to be frozen (at –20 °C) and then shipped frozen, preferably with dry ice or with cold packs that have been frozen at –20 °C. Complete the laboratory request form (FORM, 3) for each case.

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.

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 with ice packs and temperature monitor dropped between the specimens. Place the laboratory forms in an envelope, enclose them in a separate plastic bag, and place them in the cold box. Do not wrap the forms around the specimens. Send the specimens by the fastest, most reliable means of transport available
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).

Reporting laboratory results:
National polio lab has to report the final results to the EPI program manager and national AFP surveillance unit no more than 28 days from the time the specimen is received at the laboratory. Also the laboratory results should be sent to the province which 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 program manager.

Sending isolates for intratypic differentiation
Intratypic differentiation is conducted at regional reference laboratory in Egypt to distinguish wild poliovirus from vaccine virus.
Isolates should be sent for intratypic differentiation when polio is reduced to local transmission, and AFP surveillance is well established.

3. Conduct a limited outbreak response immunization (ORI)
ORI must start immediately, but only after collection of stool specimens. Conducting ORI before stool collection may cause excretion of sabin virus in the stool of vaccinated children. The ORI consists of one round of OPV administered on a house-to-house basis for children between 0-59 months of age, living in the same village or neighborhood as the patient. The doses of OPV administered should be less than 500 doses, regardless of the size of the neighborhood.

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 of parents about the importance of OPV immunization.
- Search for other AFP cases.

The affected area can be scheduled for large scale mopping-up immunization during the low polio season transmission.

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

If more than three months elapsed since the onset of paralysis in a case, ORI should not be conducted. Nevertheless, the case must still be investigated.
Investigation of AFP case's contacts
Investigation of AFP case's contacts for wild poliovirus helps to raise the sensitivity of AFP surveillance and provides the national polio laboratory with more opportunity to isolate poliovirus.
Investigation of contacts for poliovirus is indicated in the following conditions:
- Patient with AFP dies before collection of 2 stool specimens within the first 14 days of onset of paralysis, and reached lab in good condition.
- Patient with AFP is lost before collection of 2 stool specimens within the fist 14 days of onset of paralysis, and reached lab in good condition.
- Hot case is an AFP case characterized by the following:
  - Age is less than 5 years.
  - Presence of fever at onset of paralysis.
  - Paralysis is asymmetrical, un-immunized or inadequately immunized with OPV.
  - The provisional diagnosis of patient with AFP by treating physician is poliomyelitis.

Investigation of contacts is not indicated if more than 2 months have elapsed since the onset of paralysis of an AFP case.
In addition to the usual investigation of an AFP case, 5 contacts are investigated. From each person, one stool specimen is collected and sent to national polio lab in the same manner as that of AFP cases. Stool specimens should be collected before ORI is done. The following points should be considered in selection of contacts for investigation:
- Age: All should be less than 5 years of age, preferably those with the youngest age group. Investigation should be done on the spot if more than 5 children are less than 5 years of age.
- Location: It should be from the same household of an AFP case. If this number is not available in the same house, look for children from neighborhood houses. If not available look in the same street, same village or city.
- Immunization status: It is preferable to collect stool specimens from unvaccinated persons or those with the lowest doses of OPV contacts. No stool specimens should be collected from contacts who received OPV during the last 6 weeks.

The information needed for each contact, is the name of the AFP case for which contacts are investigated and the following data for each contact; (name, age, number of OPV doses received, and date of last OPV dose), FORM (6).

4. Conduct a 60-day follow-up examination.
Approximately 60 days after 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 parent that the information on the case investigation form is correct.
- Ask parent if the paralysis has changed.
- Observe how the child moves limbs or areas of the body that were paralyzed (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 FORM (4) and send the form to AFP surveillance unit in CDC center, MOH.

5. Classify the AFP cases.
"Suspected polio" or AFP is a temporary classification which within twelve weeks of paralysis onset, the expert committee should reclassify the case as confirmed polio, polio-compatible, or discarded, use FORM (5).

AFP cases are classified according to clinical or virological schemes. Virological scheme is used when there is a good surveillance. The criteria for good surveillance are:

- Non-polio AFP rates ≥ 1/100000 children less than 15 years of age.
- Adequate stool specimens are collected on ≥ 60% of AFP cases.
- Specimens are processed in a WHO-accredited laboratory.

The clinical and virological classification schemes are shown in figure (3). Virological classification scheme is used in Iraq since the year 2000.

6. Active surveillance: -

Weekly active surveillance consists of weekly search in hospitals and rehabilitation centers for cases of AFP, and verification that all cases were reported and investigated. This responsibility should be clearly delegated to a trained responsible person in each district. An active surveillance form, FORM (9), should be completed each week, and sent to national AFP surveillance unit in CDC center.

What to do during visits:

- Weekly visits to targeted hospitals should be in the same day of the week and should inquire about the previous week.
- Contact key people, such as neurologists, pediatricians, or physical therapists to inquire if they have seen cases of AFP in children less than 15 years of age, since the last active visits.
- Check inpatient and outpatient records to search for any preliminary or final diagnosis of polio, Guillain-Barr`e syndrome, transverse myelitis, traumatic neuritis, or other causes of AFP. Patient's records should be checked in pediatric, neurology, physical therapy, and medical records departments of the hospital.
- If an AFP case is found, investigate, collect stool specimens, plan for follow-up, and implement outbreak response immunization.

Active case search

To find cases, health officials should contact key persons, such as community leaders, school teachers, day care center directors, social workers, leaders of women organizations, mothers, traditional healers, and religious leaders to inquire about recently paralyzed children in the community. If an AFP is found, the same above measures has to be taken. Active case finding should be done in salient districts for two or more years and in high-risk population and areas.

7. Follow-up late or incomplete reports

Completeness and timeliness of weekly reports can be closely monitored using the "report monitoring form", form (12). Late or incomplete reports are followed-up (by visits, telephone, fax, message), and efforts must be made to identify reasons for under-reporting and address immediately any problems.

8. Data collection and consolidation

Data collected during case investigation, laboratory testing, and follow-up examination from all AFP cases, should be consolidated and analyzed at district, provincial and national levels.

9. Data analysis and reporting

Various methods of monitoring progress are necessary at the central and provincial and district health facility levels. Monitoring includes: -

- Line listing, FORM (7): It is useful to monitor the progress of each case investigation, to verify that the case investigation is complete. To analyze data and to calculate performance indicators:
- Analyze by year, month, age, and immunization history. Make the following graphs: -

Y-axis	X-axis
Number of confirmed polio cases	by year
Number of confirmed polio cases	by month
Number of confirmed polio cases	by age group (0-4, 5-15, 15+)
Number of confirmed polio cases	by immunization history
Number of AFP cases	by Age group (0-4, 5-15, 15+)

The following tables and graphs are needed at the National, Province and district levels:

- A graph of confirmed polio cases by year indicates the progress made towards 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 at 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 less than 15 years of age.
- Spot mapping: All confirmed polio cases should be plotted on a map according to their place of residence at the time of paralysis onset in order to show where poliovirus is still circulating. Spot map identifies high-risk areas to be targeted with special strategies during NIDs and moping-up immunization. All compatible cases should be mapped to indicate where surveillance failures are occurring.
- Performance indicators: Ten performance indicators are used to monitor the quality of disease surveillance and laboratory performance.

10. Provide feedback and feed forward

Monthly or quarterly feedback of surveillance information to senior management, health staff, and other concerned parties is critical to establish effective surveillance. Providing feedback information to all designated reporting sites is necessary to:
Report progress and problems.
Verify that data are correct.
Motivate health agents.
Compare states, provinces, and districts.
Exchange ideas.

اللوحات الحائطية الخاصة بفعاليات الرصد الوبائي الاسبوعي الفعال لرصد الامراض المشمولة بالبرنامج الموسع للتحصين :

١-نسبة المواقع التي بلغت البلاغ الاسبوعي .Completeness

٢-نسبة المواقع التي بلغت في الوقت المحدد من كل اسبوع Time lines.

٣-تحليل بيانات البلاغ الاسبوعي (الاحصائية الاسبوعية الخاصة بفعاليات الرصد الفعال) ومتابعتها.

٤-التاكد من مصداقية الاحصائية الاسبوعية للرصد الفعال .

٥-متابعة المؤسسات المتاخرة عن القيام باعطاء الاستمارة الاسبوعية الخاصة بالرصد الاسبوعي الفعال، خاصة اذا كانت النسبة اقل من ٨٠٪ واذا كانت قد تكررت لاسابيع متتالية .

٦-عمل قائمة بمواقع الرصد (اسماء المؤسسات الصحية المشمولة بالرصد الوبائي الاسبوعي الفعال).

٧-اضافة المراكز الصحية التدريبية الى قائمة مواقع الرصد.

٨-تحديث الخارطة الوبائية شهريا اعتماد على عدد الحالات المكتشفة.

مهام وواجبات مسؤول الرصد في المحافظة

١-متابعة تنفيذ التعليمات المركزية.

٢-إصدار نشرة شهرية خاصة بالمحافظة تدلل على نشاط المحافظة وإعداد الحالات المكتشفة مع التحليل الوبائي الخاص بها وإيصالها إلى كافة المؤسسات الصحية التابعة لرقعته الجغرافية اضافة الى ارسال نسخه من كل نشاط الى مركز الوزارة شعبة التحصين.

٣- المتابعة الميدانية المستمرة مع نقاط الارتباط في المستشفيات والقطاعات.

٤- إرسال التقارير الدورية إلى المستوى المركزي ضمن السقف الزمني المحدد.

٥- أجراء التحريات الوبائية بما في ذلك التحري الفعال والتحري عن الحالات.

٦- متابعة اخذ النماذج ضمن الشروط المطلوبة.

٧- ضمان أجراء الفحص الستيني لكل الحالات ضمن السقف الزمني المحدد.

٨- متابعة مؤشرات الأداء واتخاذ الإجراءات اللازمة للارتقاء بها .

٩- وضع منهاج تدريبي للعاملين في المؤسسات الصحية والقطاعات.

١٠-وضع برنامج للتوعية بأهمية البرنامج وخصوصا لأطباء الأطفال ومتابعة تنفيذه لضمان استمرارية الإبلاغ عن الحالات.

١١- التغذية الراجعة مع المستشفيات والقطاعات.

١٢- إدامة السجلات ووثائق الأشهاد .

١٣- إعداد تقرير شهري عن مدى سير العمل لمدير برنامج التحصين والمدير العام محددا فيه المشاكل والدعم المطلوب لحلها .

مهام وواجبات ضابط الارتباط في القطاع والمستشفى

١- التوعية المستمرة للأطباء بأهمية الإبلاغ عن حالات الشلل الرخو الحاد .

٢- الإبلاغ الفوري عن أي حالة مكتشفة.

٣- الاحتفاظ بالوثائق الخاصة بالمريض.

٤- متابعة اخذ نماذج البراز ضمن الشروط الصحية .

٥- مراجعة الأقسام بما في ذلك سجلات المستشفى للبحث عن أي حالات محتملة .

Contacts of AFP cases with inadequate stools: All countries are required to conduct stool sampling from contacts of all inadequate AFP cases[1]. Some of the reasons which lead to inadequate stool specimens include:

- Late case notification.
- Death or loss of the AFP case before adequate stool collection.
- Other reasons include: improper collection, inadequate cold chain during collection, storage and transportation, and poor quality due to leakage, desiccation and inadequate amount.

In addition to the above criteria it is recommended to collect contact samples from the following AFP cases:

1. **'Hot' or 'high risk' AFP cases:** The definition of hot/high risk AFP cases may vary by country, however the general definition suggested for the region is as follows:

- The case is considered highly suspected for being polio based on clinical characteristics as seen by a clinician, or based on the data available for the case. For example, AFP cases which are young (<5 years), have incomplete vaccination history and the following three clinical cardinal signs of poliomyelitis should be classified as Hot cases:
  1. fever at onset of paralysis
  2. asymmetric paralysis
  3. rapid progression of paralysis (within 3 days).

  OR
- There is epidemiological evidence that the case has been in contact with or living in an area with possible or recent viral circulation. This includes being from a high risk group or being in a high risk areas.

2. **AFP cases from areas with limited accessibility or hard to reach districts even without reported virus isolation.** This would increase the sensitivity of the AFP surveillance and allows the program to make use of windows of opportunity to detect any possible virus circulation in these areas.

3. Finally, contacts may be collected when there is any suspicion by the program regarding the collection process or handling of the index AFP stool specimens.

Procedure:

AFP cases eligible for contact sampling should be identified as soon as possible to facilitate timely collection which should be done at the lowest possible level (district level). Contact sampling should be done immediately upon identification of an eligible AFP case. The following procedure should be followed in selection of contacts:

> A contact is defined as a child less than 15 years of age who had been in direct contact with the index AFP case with one week prior to the onset of paralysis and/or within two weeks after onset of paralysis.

1. Collect one sample from at least 3 contacts.
2. Selection priority should be given to the following contacts:
- Young contacts who are less than 5 years of age are preferred.
- Close contacts of the index case (siblings, household, playmates and young relatives) who come in frequent contact with the cases during the above mentioned time period are preferred. If these are too few, sampling from children in the neighborhood or vicinity is acceptable.

3. If the case traveled to areas during the above mentioned period, contacts should ideally be taken from both of these areas (3 contacts from each area).

4. Collection, storage and transportation of the stool specimens are dealt with in the same method as AFP case stool specimen collection and should be adequately supervised to ensure quality and timeliness.

5. A "Contact Stool Collection" specific form should be filled for each contact selected. This form is sent to the laboratory along with the specimen and a copy is maintained in the AFP surveillance file of the index case after the data is entered. Each specimen should be labeled clearly as a contact of a case with a specific ID code. An example of the ID code for contacts could be as follows:
Country/Province Code/District Code/Year Code/Index case #- C1
Example: PAK/PB/31/05/001-C1

6. Data collection, management and monitoring is another integral part of this system to ensure quality and timeliness. Data related items are discussed in details in the last section of this document.

Interpretation:
Isolation of wild poliovirus from a contact is evidence of wild poliovirus transmissions in the district. When this occurs, particularly in a previously polio-free district, the index AFP cases would be confirmed as a wild polio case.

Intervention and response:
Once wild poliovirus is identified in an area (district), appropriate and timely response should follow including: rapid and thorough investigation of the cases, strengthening of the AFP surveillance in the area, and implementing immediate and appropriate immunization activities. Existing guidelines, such as EMRO's "Preparedness for an Effective Response to Wild Poliovirus Importation", can further assist in these interventions.

System monitoring: data management and quality of contact sampling

Laboratories involved in processing of stool specimens already enter the available information about contact that is received with the specimens into the LABIFA. However, the surveillance side of the national polio eradication program will start to enter complete information on each contact into a separate data (rec) file in the EFPIFA program with the updated version containing the contact sampling programs or import this information from the LABIFA to conduct the necessary analysis and monitoring.

The new system will assist in entering, managing and monitoring the contact stool sampling system and relate the information to the index AFP cases within IFA. Automated programs should be developed to allow periodical monitoring and follow-up of the following indicators:

Process Indicators:

Timeliness of Contact Sampling: The monitoring of this indicator will ensure that the system is conducting contact sampling in a timely manner to allow early detection of any possible virus circulation for immediate response. Areas which do not achieve the minimum target of 80% should be followed-up to identify the gaps and strengthen the system.

Timeliness of contact sampling is % of contact stool specimens collected within **7 days of date of notification** of the index AFP case.

$$= \frac{\text{No. of sampled contacts collected within 7 days of notification of AFP case} \times 100}{\text{Total number of contacts}}$$

Target for indicators: minimum 80%.

Completeness of contact sampling: The monitoring of this indicator will ensure that the system is conducting contact sampling in a complete manner, with at least 3 contacts collected for each eligible index case.

$$= \frac{\text{Eligible AFP cases with at least 3 contacts collected} \times 100}{\text{Total number of eligible AFP cases}}$$

Target: minimum 80%

Quality of performance:

1. Age distribution of contacts to ensure that the majority of cases are below 5 years of age. Programs might define cutoff age for contacts as agreed upon at the national level.
Target: minimum of 80% of contacts are under 5 years of age

2. Average number of contacts per index AFP cases.

3. Other indicators used for analysis of laboratory results of AFP specimens would also be utilized for contacts specimens with the same definition
a- Enterovirus isolation rate is an indicator for the quality of the cold chain during collection and transport of the specimens.
b- Isolation of sabin-like virus can be utilized in detecting the impact of SIA activities in the area.
c- Arrival at the Lab: To ensure quality and timeliness, contacts stool specimens must arrive immediately at the laboratory and no later than 3 days of collection.
d- Stool Conditions: % of contact stool specimens arriving in laboratory in good condition.

Outcome indicators:
The analysis of data from countries implementing this strategy has illustrated the benefit of the system in early identification of new or ongoing virus circulation (Table 1). The yield or benefit of the system can be assessed through different indicators listed below. These indicators are evaluated over a longer period of time (annually or semi-annually basis).

Identification of Newly Infected Districts:

$$= \frac{\text{districts with WPV isolated from contacts only} \times 100}{\text{Total infected districts}}$$

Overall WPV isolation from contact:

$$= \frac{\text{\# of contacts (persons) with WPV isolated from their stool specimen} \times 100}{\text{Total number of contacts (persons) with stool processed}}$$

Proportion of AFP cases confirmed as polio due to WPV isolated from contacts only:

$$= \frac{\text{\# of AFP cases with WPV from contact stool specimen only} \times 100}{\text{Total number of AFP cases confirmed as wild polio}}$$

$$\text{Other} = \frac{\text{\# of eligible AFP cases with WPV isolated from contacts} \times 100}{\text{Total number of eligible index cases with contacts collected}}$$

Find attached: an example of the "Contact Stool Collection" form and the list of core variables from the contact database which are required by EMRO.

Example of Contact Stool Collection Form:

Contact Stool Collection Form						
EPID number of contact (index AFP EPID number – C #)						
Reason for collection	Inadequate	Hot case	Hard-to-reach area	Other		
Name of contact						
Address						
Area						
District						
Province						
Country						
Relation to index case	Household relative	Household non-relative	Out-of-household relative	Neighbor	Playmate/ Schoolmate	Other
Period of Exposure to Index AFP cases	( ) within 30 days prior to onset of paralysis ( ) within 2 weeks after onset of paralysis					
Date of birth or Age in months	___/_____/____ _____ months					
Sex	Male	Female				
Number of routine OPV doses						
Number of SIA OPV doses						
Date of last OPV						
Specimen number (in case of multiple samples from contact)						
Date of stool collection						
Date stool sent to laboratory						
Date stool received at laboratory						
Laboratory serial number						
Stool condition	Good	Poor				
Results: P1	Wild	Sabin	Positive – ITD pending	Negative	Not processed	
P2	Wild	Sabin	Positive – ITD pending	Negative	Not processed	
P3	Wild	Sabin	Positive – ITD pending	Negative	Not processed	
NPEV	Positive	Negative	Not processed			
Date culture results sent from lab to EPI						
Date ITD results sent from lab to EPI						
Comment						

List of Core Variables and Dictionary (Draft, final pending):

EPID:	Index EPID number	
CID:	Contact ID code (serial for each contact)	
Reason:	Reason for collection: Inadequate, hot case, area, other (specify)	
Exposure:	Period of exposure to the index case: 30 days prior to date of onset and/or 2 weeks after onset of paralysis.	
CName:	Full Name	
CDOB:	Date of birth	Age:
Sex		
Relation:	Relation to Index Case (household relative, household non-relative, out-of household relative, neighbor, playmate/schoolmate etc.)	
CAddress:	Full address	
Area:	village or town	
CDistrict		
CProvince		
Country		
COPVR:	Number of OPV routine	
COPVS:	Number of OPV SIA	
DOPVlast:	Date of last OPV	
StColl1:	Stool specimen number# (in cases of multiple samples)	
DStColl1:	Date of stool collection Sp1	
DStLab1:	Date stool specimen sent to laboratory	
DStRec1:	date stool specimen received at the laboratory	
StCond1:	1 good, 2 bad	
St1P1:	1 wild, 2 sabin, 3 pending, 4 negative, 5 not processed.	
St1P2:	1 wild, 2 sabin, 3 pending, 4 negative, 5 not processed.	
St1P3:	1 wild, 2 sabin, 3 pending, 4 negative, 5 not processed.	
St1NPEV:	1 isolated, 2 not isolated.	
DClt1:	date culture results sent to EPI	
DITD1:	date ITD results sent to EPI	
Comment:		

In the case of collection more than one sample from a contact (repeat of sampling due to bad condition of initial specimen, chronic excretors, etc.), the information can be entered into another record for the same contact.

استمارة (١) استمارة الإخبار الفوري لحالات الشلل الرخو الحاد

دائرة صحة محافظة.....

قسم الرعاية الصحية الأولية

قطاع الرعاية الصحية الاولية في.....

الإخبار الفوري لحالات الشلل الرخو الحاد

اسم المريض الرباعي:-

تاريخ الولادة:____/____ /٢٠٠.

تاريخ بدء الشلل:-

المؤسسة الصحية التي يرقد فيها المريض:-

العنـــوان

المحافظة:-

القضاء:-

الحي:-

المحلة:-

الزقاق:-

رقم الدار:-

رقم الهاتف:-

اقرب نقطة دالة:-

اسم المبلغ :- التاريخ:- التوقيع

Form (2): Case Investigation Form for AFP

دائرة صحة قطاع الرعاية الصحية الأولية

EPID#				Date of investigation		Day	Month	Year
Patient's Name				Mother's name				
Adress	Province			district		Mahalla		
	Zukak			House #		Tel. No.		
	Mokhtar`s name			Food ration distributor's name				
Date of birth	Day	Month	Year	If birth date unknown , age in months				
				Sex	Male		Female	
Date the case was first reported to a government/private health office						Day	Month	Year
Name of notification site				Name and specialty of treating/reporting doctor				
Provisional Diagnosis								
Date of onset of paralysis						Day	Month	Year
If the patient died /date of death								
How many days from time of paralysis onset to full installation of paralysis								
Is paralysis acute)?						YesYes	No	Unk
Is paralysis flaccid? (i.e. floppy)?						YesYes	No	Unk
If paralysis is not acute and flaccid, stop investigation. Specify diagnosis, if known								
Was there fever at onset of paralysis?						Yes		Unk
Is the paralysis asymmetrical?							No	Unk
Site of paralysis	Lft. Leg	Yes	No	Unk	Breathing muscles	Yes	No	Unk
	Rt. Leg	Yes	No	Unk	Neck muscles	Yes	No	Unk
	Lft. Arm	Yes	No	Unk	Facial muscle	Yes	No	Unk
	Rt. Arm	Yes	No	Unk	Other specify			
Where was paralysis in arms					Proximal	Distal	Both	Neither	Unk
Where was paralysis in legs?					Proximal	Distal	Both	Neither	Unk
Was there any sensory nerve function loss?							Yes	No	Unk
History of travel (more than 10 KM 30 days) before onset							Yes	No	
If yes Specify the place	governorate				Address				
Date of visit	dd/mm/yy	/ / 200							
Number of routine OPV doses received (exclude zero dose)						Doses		Unk	
Number of OPV doses received during campaigns?						Doses		Unk	
Date of last OPV dose						Day	Month	Year	Unk
History of intramuscular injection before date of onset							Yes	No	unk
Site of intramuscular injection	Rt. GluteiL Region				Lt. GlutaiL Region		Both		
Date of intramuscular injection						Day	Month	Year	Ink
Date of 1st stool specimen collection						Day	Month	Year	Ink
Date of 2nd stool specimen collection						Day	Month	Year	Ink

Clinical and Neurological Examination

Sign or Symptom				
Diarrhea			Yes	No
Nausea			Yes	No
Vomiting			Yes	No
Coryza (cold, runny nose			Yes	No
Tonsillitis			Yes	No
Constipation			Yes	No
Sphincter control			Yes	No
Neck stiffness			Yes	No
Ankle clonus			Yes	No
Babiniski sign			Yes	No
Kernig's sign			Yes	No
Brudzinski sign			Yes	No
Muscle tone/grade			Rt……..	Lt. …….
Reflexes	brisk		Rt……..	Lt. …….
	exaggerated		Rt……..	Lt. …….
	normal		Rt……..	Lt. …….
Cranial nerves examination				

Name of investigator Date / / / signature

FORM (3): LABORATORY REQUEST FORM

دائرة صحة محافظة..... قطاع الرعاية الصحية الاولية في.....

Section (A)

This form must accompany specimens to the central public health laboratory in Baghdad				
EPID Number				
Patient's name		Sex	Male	Female
Address				
District		Province		
		Day	Month	Year
Date of birth				
Date of onset of paralysis				
Date of first stool specimen collection				
Date of second stool specimen collection*				
Date stool specimens sent				
Date of last OPV dose				
Provisional diagnosis of the AFP case				
Send results to				

* If specimens sent on separate days, complete separate form for each specimen.

Section (B) should be completed by a virologist at the laboratory.

	Day	Month	Year
Date specimens received at laboratory			
Condition* of 1st specimen upon receipt at lab	Good	Poor	Unknown
Condition* of 2nd specimen upon receipt at lab	Good	Poor	Unknown
Name of person receiving specimens at laboratory			
Signature			

* Criteria for good condition = adequate volume, no leakage, no desiccation, reverse cold chain was maintained, and adequate documentation.

FORM (4): 60-Day Follow-Up Examination of AFP Case

دائرة صحة محافظة..... قطاع الرعاية الصحية الاولية في.....

EPID#		Recommended date of follow-up	Day	Month	Year
Patient's name					
Was 60-day follow-up examination conducted?				Yes	No
If no, why?	Patient died				
	Patient was lost to follow-up				
	Other specify				
Date of examination			Day	Month	Year
Results of examination			Residual paralysis		
			No residual paralysis		
			Unk		

Name of investigator Specialty Signature
Name of investigator Specialty Signature
Name of investigator Specialty Signature

FORM (5): Final Classification of Case (by Expert Committee)

EPID #		Date of final examination	Day	Month	Year
Patient's name		Province	District		
Final classification of case (check only one)			Confirmed		
			Discarded		
			Compatible		
Based on what criteria? (check all that apply)	Wild poliovirus				
	No wild poliovirus from adequate stool				
	Inadequate stool specimen				
	No stool specimen				
	Residual weakness after 60 days				
	No residual weakness after 60 days				
	Died after polio-compatible illness				
	Lost to follow-up and compatible illness				
If classified as "discarded" specify final diagnosis					
Name of expert committee chairperson					
Signature					

Form (6): AFP case contacts investigation form

جمع نماذج البراز من الأطفال الملامسين للمرضى المصابين بالشلل الرخو الحاد

اسم الطفل المصاب بالشلل الرخو الحاد:-

تاريخ بدء الشلل:-

١- سبب جمع نماذج البراز من الملامسين

٢- وفاة المريض قبل جمع نموذجين من البراز بحالة جيدة منه خلال ١٤ يوم من تاريخ بدء الشلل.

٣- فقدان المريض قبل جمع نموذجين من البراز بحالة جيدة منه خلال ١٤ يوم من تاريخ بدء الشلل.

٤- التشخيص السريري الأولي للمريض من قبل الطبيب المعالج احتمال شلل أطفال.

حالة ساخنة

٢٠ - الأطفال الملامسين الذين تم جمع نماذج براز منهم

ت	الاسم	العمر بالشهر	عدد جرع OPV	تاريخ أخر جرعة	تاريخ جمع النموذج
١					
٢					
٣					
٤					
٥					

مسؤول الرصد الوبائي لحالات الشلل الرخو الحاد في دائرة الصحة

الاسم:-

التوقيع:-

التاريخ:-

FORM (7): LINE LISTING FORM FOR ALL REPORTED AFP CASES

دائرة صحة محافظة.....

قطاع الرعاية الصحية الاولية في.....

EPIDNO	Patient name	District	OPV R (1)	OPV S (2)	Date (3)							Fever at onset (11)	Rapid paralysis (12)	Assym paral (13)	Res of FU (14)	Laboratory Results				Final Class (17)
					DOB (4)	Onset (5)	Not (6)	Inv (7)	S1 (8)	S2 (9)	FU (10)					P (15)	P2 (15)	P3 (15)	E (16)	

(1)= Number of OPV doses given through routine immunization reported by vaccination card or history.
(2)= OPV doses given through supplementary immunization.
(3)= Date of below information.
(4)= Date of birth
(5)= Date of onset of paralysis.
(6)= Date of report.
(7)= Date of case investigation.
(8)= Date of first stool specimen collection.
(9)= Date of second stool specimen collection.
(10)= Date of 60 days examination.
(11)= Presence of fever at onset of paralysis, 1=yes, 2=no and 9=unknown.
(12)= Rapid progression of paralysis, within 4 days, 1=yes, 2=no, 9=unknown.
(13)= Is paralysis asymmetrical? 1=yes, 2=no and 9=unknown.
(14)= Results of 60 days examination, 1=presence of residual paralysis, 2=no residual paralysis, 3=lost to follow-up, 4=died before follow-up.
(15)= Results of poliovirus isolation, 1=wild, 2= sabin-like, 3=pending intratypic differentiation, 4=negative, 5= not processed.
(16)= Enterovirus isolation, 1=positive, 2=négative.
(17)=r results of final classification, 1=confirmed polio, 2= polio compatible, 3=discarded.

Form (8): Line listing of cases undergoing " expert review" using virological scheme

No	ID Number	Age	Onset date	AFP case findings						Stool specimens			Cluster of compatible		Probable clinical diagnosis	Exp comm (compatible or discarded)
				OPV doses	Reason reviewed	Fever at onset	Asym paral.	Max para <4 days	Other investiga.	#	# ad	NPEV(y/n)& typing	Onset location	Cluster (y/n) & results of epidemiological investigation		

NB: Table to be kept and updated by National AFP surveillance officer
AFP Case Findings: Reas Comp=reason AFP case was classified as compatible (i.e. inadequate stools & residual paralysis, lost to follow-up or died
Asym. Para=asymmetrical paralysis; Max. Para. <4 days=maximum paralysis within 4 days of onset.
Other investigations = additional follow-up, case search in area, EMG results, etc.
Cluster of compatibles: Example =2 or more compatibles in either 1 or district or 2 bordering districts within 2 month period.
Cluster investigation = case search in area, routine OPV3 coverage, date last wild virus isolated in area, etc.

* In countries where every AFP case is reviewed by the National Expert Committee, this line list should include only those cases that had inadequate specimens and residual paralysis, lost to follow up or died; for which VAPP is a possible diagnosis
`Notes: AFP Case Findings: Reas Rev = reason AFP case was reviewed by Expert Committee (i.e. inadequate stools and residual paralysis, lost to follow-up or died)
Asym. Para = asymmetrical paralysis; Max Para. < 4 days = maximum paralysis within 4 days of onset.
Other Investigations = additional follow-up, case search in area, EMG results, etc.
Cluster of compatibles: Example = 2 or more compatibles in either 1 district or 2 bordering districts within a 2 month period.
Cluster Investigation = case search in area, routine OPV3 coverage, date last wild virus isolated in area, etc.
Stool Specimens: # ad. = number of adequate specimens, NPEV & typing = nonpolio enterovirus isolated and typing result.

Form (9): weekly report of respiratory and intestinal infectious diseases

دائرة صحة محافظة.....

قسم الرعاية الصحية الأولية

شعبة السيطرة على الأمراض الانتقالية

إلى/مركز السيطرة على الأمراض الانتقالية/ المعوية

م/ الموقف الوبائي الأسبوعي ( )

للفترة من / / إلى / /

توزيع الإصابات حسب الفئات العمرية و الموقف التلقيحي

الفئة العمرية بالشهر	٠-١١			١٢-٥٩			٦٠-١١٩			١٢٠-١٧٩			١٨٠≤			المجموع
	الموقف التلقيحي			الموقف التلقيحي			الموقف التلقيحي			الموقف التلقيحي			الموقف التلقيحي			الموقف التلقيحي
	صفر	١-٢	٢≤	صفر	١-٢	٢≤	صفر	١-٢	٢≤	صفر	١-٢	٢≤	صفر	١-٢	٢≤	
الشلل الرخو																
الحصبة																
الخناق																
السعال الديكي																
سحايا سحائي																
الكزاز الولادي																
الهيضة																
الديز انتري																

توزيع الإصابات حسب القطاعات

القطاع	المجموع
المرض	
الشلل الرخو	
الحصبة	
الخناق	
السعال الديكي	
سحايا سحائي	
الكزاز الولادي	
الهيضة	
الديزانتري	

نسخة منه الى:-

مدير قسم الرعاية الصحية الأولية

دائرة الوقاية الصحية/قسم الرعاية الصحية الأولية/ التحصين

Form (10): Monthly reports of respiratory and intestinal infectious diseases

دائرة صحة محافظة.....

استمارة التقرير الشهري للامراض المعوية و التنفسية لشهر ( ) سنة ( )

الأمراض	الفئة العمرية	اقل من سنة				١-٤				٥-٩				١٠-١٤				١٥-١٩				٢٠-٢٤				٢٥-٤٤				٤٥-٤٩				المجموع			
		ذكر		أنثى		ذكر		أنثى		ذكر		أنثى		ذكر		أنثى		ذكر		أنثى		ذكر		أنثى		ذكر		أنثى		ذكر		أنثى		ذكر		أنثى	
		أ×	و××	أ	و	أ	و	أ	و	أ	و	أ	و	أ	و	أ	و	أ	و	أ	و	أ	و	أ	و	أ	و	أ	و	أ	و	أ	و	أ	و	أ	و
الحصبة																																					
الحصبة الألمانية																																					
النكاف																																					
الخناق																																					
السعال الديكي																																					
سحايا فيروسية																																					
سحايا جرثومية																																					
سحايا سحائي																																					
حمى التايفوئيد																																					
جدري المائي																																					
الشلل الرخو الحاد																																					
الكزاز																																					
الكزاز الولادي																																					

Form (11): weekly active visit form

الاستمارة الأسبوعية للرصد الوبائي الفعال لأمراض البرنامج الموسع للتحصين.

دائرة صحة محافظة..... قطاع الرعاية الصحية الأولية في.....

الأسبوع ( ) الشهر ( ) السنة ( )

Name of investigator and signature	
Name of facility visited	
Date of visit	
Type of facility (hospital , rehabilitation center)	
Director of fever hospital queried (signature)	
Hospital inpatient records searched (yes/no) Hospital outpatient records searched (yes/no)	
Chief of pediatric queried(signature) Pediatric inpatient records searched(yes/no) Pediatric outpatient records searched(yes/no)	
Medical Records Department (signature) inpatient records searched(yes/no) outpatient records searched(yes/no)	
Head of physical therapy queried (signature) Physical therapy records searched(yes/no)	
Intensive respiratory care unite (signature) Inpatient records searched (yes/no)	
Chief of neurology queried(signature) neurology inpatient records searched(yes/no) neurology outpatient records searched(yes/no)	
Total number of AFP cases found since last visit*	
Total number of these AFP cases unreported *	
Total number of (neonatal tetanus) cases found since last active visit Total number of these (neonatal tetanus) cases unreported	
Total number of (measles) cases found since last active visit Total number of these (measles) cases unreported	
Total number of (diphtheria) cases found since last active visit Total number of these (diphtheria) cases unreported	
Total number of (whooping cough) cases found since last active visit Total number of these (whooping cough) cases unreported	

استمارة التحري الوبائي الاسبوعي الفعال للامراض المستهدفة بالبرنامج الموسع للتحصين

دائرة صحة محافظة :-

قطاع الرعاية الصحية الاولية في:-

اسم المستشفى:-

Patient's name	*Disease	Age**	Date of onset	Place residence ((district	Vaccine type***	No. of Doses	Date of last dose

*Disease includes (Measles, Diphtheria, Whooping Cough, German Measles, Mumps, Neonatal Tetanus, Tetanus, AFP & Polio)
**No age limit, patients from all age groups are included in the reporting.
***OPV for AFP & Polio, Measles or/& MMR for Measles, MMR for German measles & Mumps, DPT, DT, Td, for Diphtheria & Tetanus, DPT for Whooping Cough, TT of mothers for Neonatal Tetanus.

رقم الاسبوع الوبائي الدولي( )

FORM (12): Completeness of monthly reporting by district

Place an (x) in corresponding box for the month the report was received													
Name of Sites*	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Total received(x)													
Total expected(y)													
% complete (x/y*100)													

2- Timeliness of monthly reporting by district

Place an (x) in corresponding box if report is (on time) based on established date													
Name of Sites	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Total received(x)													
Total expected(y)													
% Timely (x/y*100)													

* = Name of health facilities included within the weekly active surveillance for EPI targated diseases .

Table (1): Reported polio cases, 1955-2005* Iraq.

Year	Number of polio cases	Year	Number of polio cases
1955	168	1981	420
1956	301	1982	419
1957	282	1983	152
1958	330	1984	203
1959	129	1985	106
1960	139	1986	78
1961	185	1987	41
1962	204	1988	69
1963	226	1989	10
1964	401	1990	56
1965	497	1991	186
1966	138	1992	120
1967	266	1993	75
1968	287	1994	53
1969	238	1995	32
1970	425	1996	20
1972	255	1997	34
1973	252	1998	37
1974	662	1999	87
1975	1046	2000	4
1976	1416	2001	0
1977	771	2002	0
1978	1159	2003	0
1979	1057	2004	0
1980	996	2005	0

* August

Table (2): 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 (2): 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
Sequel 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

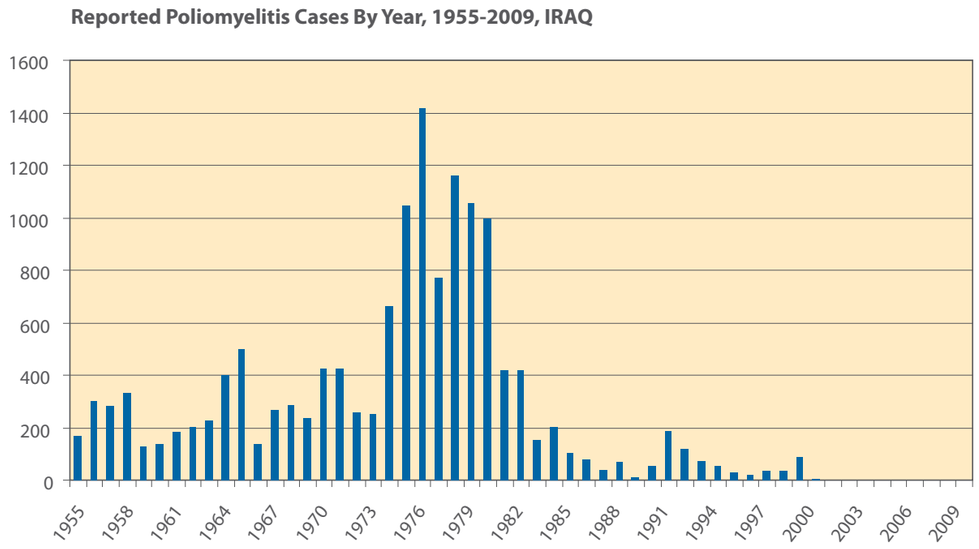


Figure (2): Phases of Occurrence of Symptoms in Poliomyelitis Infection.

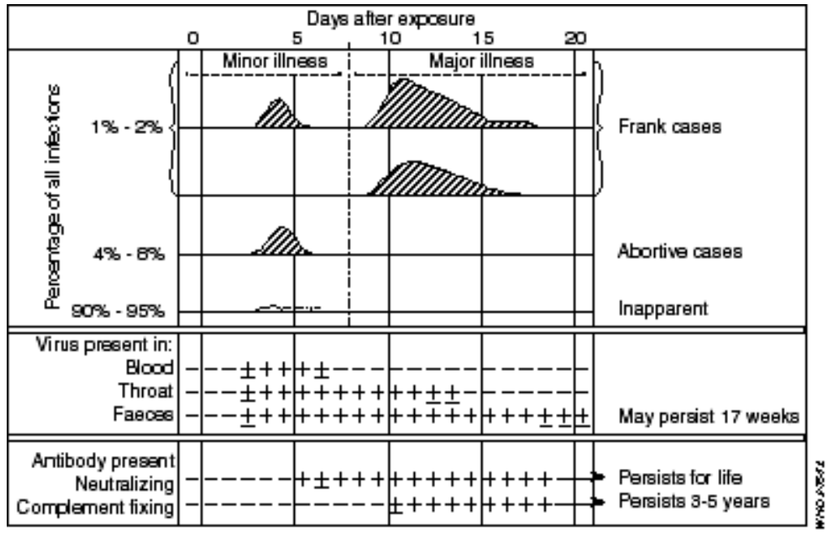


Figure (3): Classification of AFP Cases

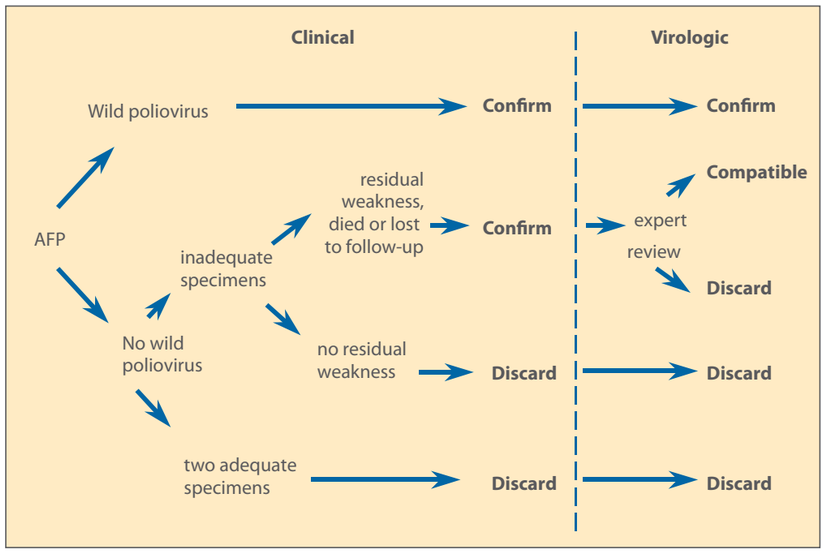


Figure 4: Non-Plio AFP/100000 Children <15 Years By Year, Iraq, Target 1

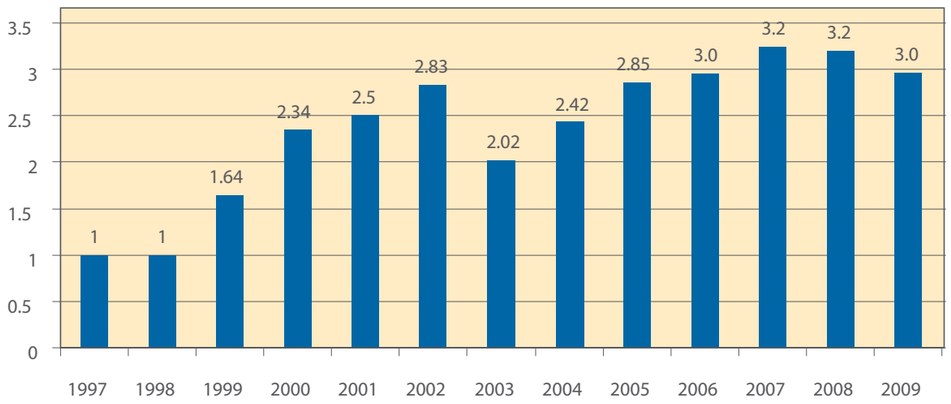


Figure 5: Percents Of AFP Cases With 2 Stool Specimens Collected Within 14 Days Of Onset By Year, Iraq, Target 80%

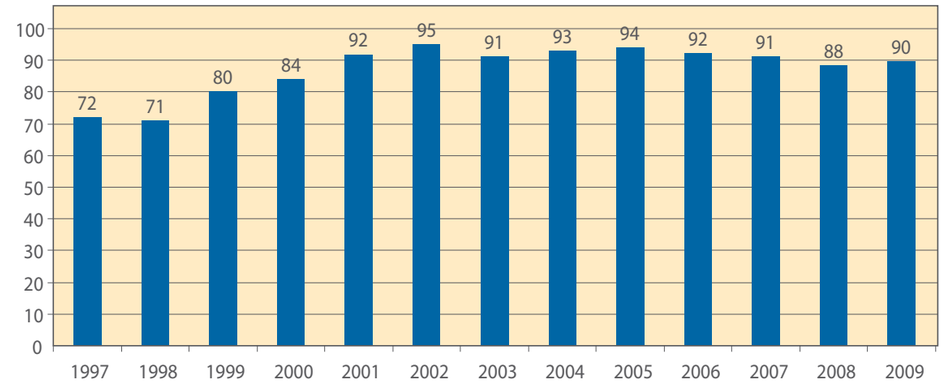


Figure 6: Percents of AFP Cases With Period Between Date of Notification And Date of Investigation <=2, Target 80%

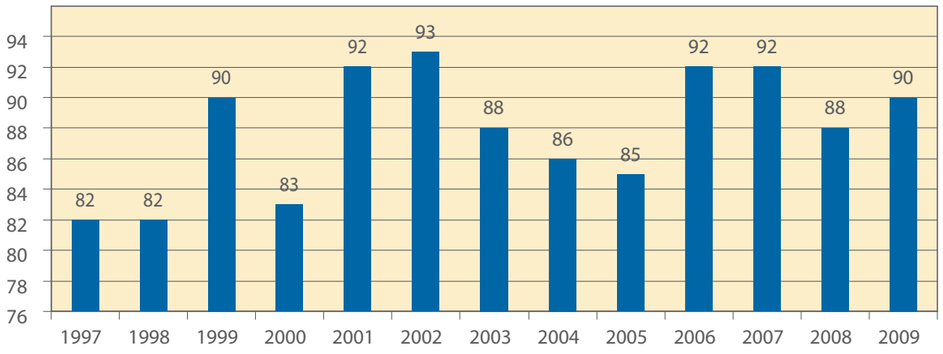


Figure 7: Percents Of Stool Specimens Arriving Lab In Good Condition By Year, Iraq, Target 90%

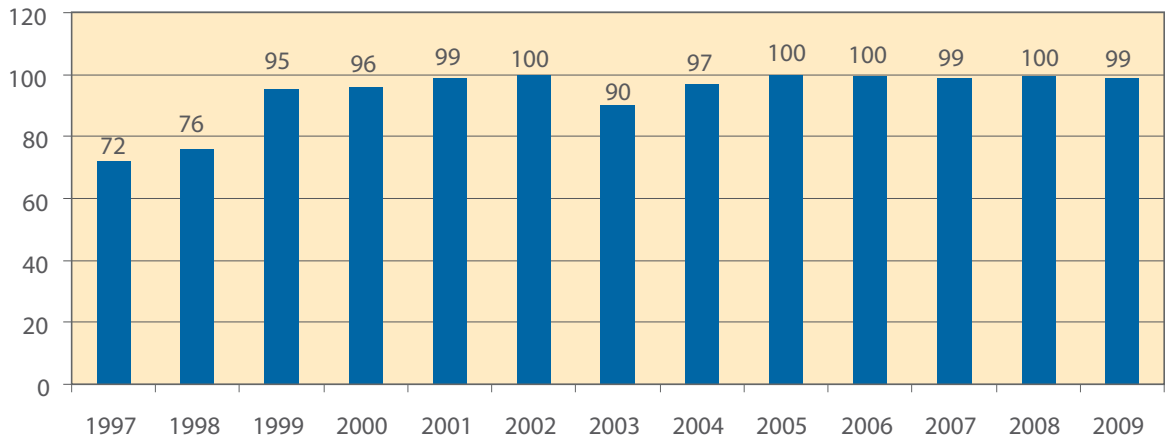


Figure 8: Non-Polio Enteroviruses Isolation Rate By Year, Iraq