POLIO GLOBAL ERADICATION INITIATIVE

Responding to a polio outbreak

GUIDELINE

7 January 2011

EVERY LAST CHILD

Contents

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I THE BACKGROUND

The occurrence of a case of wild polio in a previously polio free area, whether through importation, laboratory accident, or mutation of vaccine virus (VDPV), should be considered a public health emergency, that requires a rapid and high quality response as utmost priority.

The infected and surrounding areas need to be vaccinated in 3 or more house to house campaign rounds and surveillance needs to be boosted.

In October 2005 the Advisory Committee on Polio Eradication decided on the following recommendations:

- Recognizing the significance of large-scale outbreaks associated with imported polioviruses in areas of suboptimal population immunity, the risks these viruses pose to surrounding countries, …., the ACPE recommends that the Director-General of WHO consider declaring as a *'public health emergency of international concern'*:

    - the detection of a circulating poliovirus in any previously polio-free geographical area which (a) has survey confirmed routine childhood polio immunization coverage of < 90% and (b) has not conducted supplementary polio immunization campaigns within the previous 12 months.

    - any poliovirus outbreak which continues to expand geographically more than 60 days after confirmation of the index case.

- The ACPE welcomes rapid notification by WHO of the detection of a circulating poliovirus in a high risk polio-free area and, following the initial assessment, consultation on (a) whether the event constitutes a public health emergency of international concern (per the criteria above), and (b) the response plan.

- Polio-free countries detecting circulating poliovirus should immediately implement the ACPE's standing recommendations, particularly the completion of an expert risk assessment and large scale response plan within 72 hours, immediate initiation of an in-depth epidemiological investigation, and implementation of local control measures according to national guidelines. Further to the September 2005 ACPE Standing Recommendations for Responding to Circulating Polioviruses in Polio-Free Areas, countries should plan to continue large scale mOPV polio campaigns until at least 2 full rounds have been conducted after the last virus is detected. The need for further activities will depend on the epidemiology of the outbreak and risk of further importation.

- WHO, UNICEF and partner agencies should immediately establish the mechanisms needed to fully support countries in implementing the ACPE's standing recommendations, including the capacity to (a) provide technical support for the expert risk assessment and response plan, (b) transfer funds directly to respective country offices to support activities if necessary, (c) order and deliver mOPV within 5 working days, and (d) rapidly deploy sufficient technical assistance to facilitate sub-national micro-planning and implementation.

- Consistent with their stated commitment to global polio eradication, all polio-free countries should maintain high quality surveillance systems, high population immunity (particularly of high risk groups) through routine immunization programmes, and should update their plans for detecting and responding to poliovirus importations in line with the *ACPE Standing Recommendations for Responding to Circulating Polioviruses in Polio-Free Areas*.

- Recognizing the epidemic potential of polioviruses, …, WHO and partner agencies should continue their work to significantly reduce the period from onset of paralysis of an index case to the implementation of the first large scale supplementary immunization response campaign with mOPV.

- Based on emerging evidence demonstrating the capacity of some vaccine-derived polioviruses (VDPVs) to circulate and cause outbreaks of paralytic poliomyelitis, the ACPE recommends that the case definition for poliomyelitis within the International Health Regulations (2005) be updated to include circulating VDPVs.

RESOLUTION ON RESPONDING TO POLIO OUTBREAKS
FIFTY-NINTH WORLD HEALTH ASSEMBLY
26 May 2006

The Fifty-ninth World Health Assembly URGES all poliomyelitis-free Member States to respond rapidly to the detection of circulating polioviruses by:
(1) conducting an initial investigation, activating local responses and when necessary, requesting international expert risk assessment within 72 hours of confirmation of the index case in order to establish an emergency plan of action;

(2) implementing a minimum of three large-scale rounds of immunization using a type specific monovalent oral poliomyelitis vaccine, or another composition of vaccine if appropriate, including, where applicable, house-to-house vaccination, the first round to be conducted within four weeks of confirmation of the index case, with an interval of four weeks between subsequent rounds;

(3) targeting all children aged less than five years in the affected and adjacent geographical areas, or a minimum of two to five million children in large population countries, using independent monitoring to determine whether at least 95% immunization coverage has been reached;

(4) ensuring that at least two full rounds of poliomyelitis immunization are conducted in the targeted area after the most recent detection of poliovirus;

(5) enhancing surveillance for acute flaccid paralysis (AFP) to a level of greater than two cases per 100 000 children aged less than 15 years, for the duration of the outbreak and at least 12 months immediately thereafter;

(6) sustaining high coverage of routine OPV immunization of at least 80% and highly sensitive disease surveillance;

II TIMELINE AND CRITICAL STEPS

With respect to the recommendations above, the following table indicates the key events at international and country level, that need to take place for a response campaign to happen within the required time constraint.

Activity	Level	Day
Global and Regional level		
Confirmation of a case of polio	Laboratory	0
Nomination of focal points at HQ, RO and country level	WHO RO/HQ	1
International team of experts goes to affected country	WHO/UNICEF	2-4
Global Reference Laboratory is requested to prioritise sequencing	WHO RO/HQ	1
Assessment of potential international implications and informing countries concerned	WHO/UNICEF	2-3
Information of partners	WHO/UNICEF	1
Initial estimate of OPV and funding requirements	WHO/UNICEF	2
Teleconferences with appropriate partners	WHO/UNICEF	Every 3 days
Development of appropriate fact sheets and media communication materials.	WHO/UNICEF	2-3
Deployment of international technical support	WHO/UNICEF	From 7 onwards
Sequencing result known and shared with partners	Laboratory	10
Country level		1-2
ICC meeting selects an emergency response team (ERT) which presents an initial response plan within 24 hours, including the coordination structure	MOH/partners	2-3
Information to all provinces urging them to enhance surveillance	ERT	3
Field visit and case investigation	MOH/partners	2-6
ERT presents response plan including a timeline, extend of the mop up, budget, communication/training strategy, logistics, work plan, monitoring plan, cross border activities	ERT	4
Implementation of communication activities for public	MOH/partners	From 6 onwards
Fine tuning of plan on bases of sequencing result	MOH/partners	11
Vaccine/equipment order and request for funding placed	MOH	5
Micro planning in the districts	MOH	9-12
Training and communication materials printed	MOH/partners	6-14
OPV and funds in country	WHO/UNICEF	10
Selection of volunteers	MOH district	14-17
OPV and funds in the district	MOH	14
All equipment /supplies as per plan arrived in district	MOH	14
Training of supervisors and vaccinators	MOH district	19-21
Start of campaign		23

III IMPORTATION AND RE-ESTABLISHED TRANSMISSION

Genetic sequence analysis is used to identify the origins of wild poliovirus isolated from cases of acute flaccid paralysis (AFP), which are then used to identify importation.

III.1 Definitions

- An *importation event* (importation of wild poliovirus) is defined as: the detection of one or more cases due to WPV that genetic analysis shows to be of external origin

- The detection of cases with WPVs not immediately genetically related to each other are considered to be separate importation events

- An *outbreak following importation* is defined as 2 or more genetically related cases

- An *active outbreak or ongoing event* is one for which the last wild poliovirus detected is within the last 6 months.

- A *controlled outbreak or event* is one for which over 6 months have passed without detection of a genetically related case.

- A *prolonged outbreak* is an outbreak for which there is evidence of genetically related virus circulating for 12 months or more.

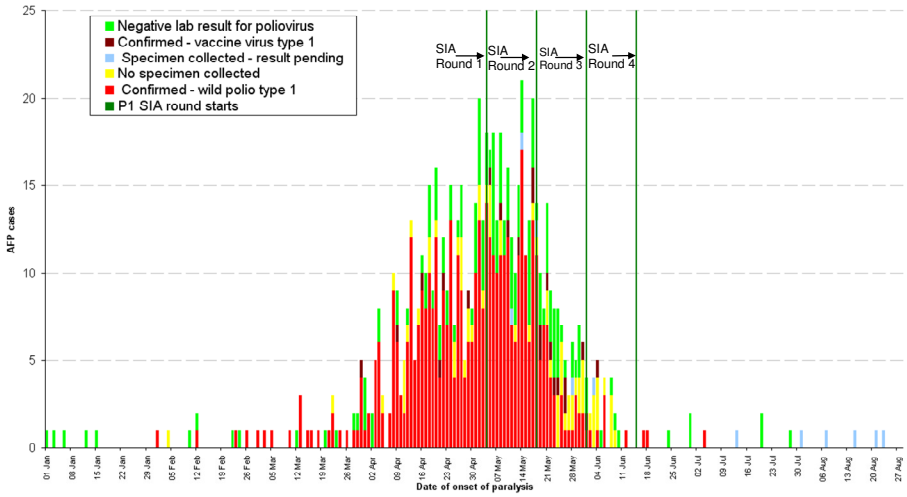
Of the 152 importations/outbreaks identified from 2001 as at end 2009: 53% were of a single case and 76% were serotype P1.

III.2 Country experiences in dealing with importations

Outbreak response time: the time taken to detect and respond to an outbreak has been shown to be one of the most critical factor in limiting the size of an outbreak. Other factors include the magnitude and quality of the SIA and existing routine coverage performance.

	Indonesia	Namibia
First case	13 May 2005	8 May 2006
Last case	20 Feb 2006	26 June 2006
Total cases	305	19
Duration: first to last case	40 weeks	7 weeks

laboratory confirmed polio and pending cases by day of paralysis onset, Tajikistan, 2010



Total 705 AFP Cases (including 456 confirmed wild poliovirus type1)

Source: Weekly AFP reporting to WHO European Region

III.3 Factors and indicators associated with outbreaks following importation

- Low AFP rate
- Poor surveillance programme performance: the virus may not be detected before it has undergone significant spread
- Poor population immunity
  - Proportion of children aged 0-4 years who have received zero doses of OPV
  - Time since last polio SIA
  - Routine immunization coverage <80%
- Speed of response
  - Delay between onset of paralysis of initial case of poliomyelitis to start of SIA
  - Note above graph showing how Tajikistan was able to contain an outbreak of over 400 polio cases with 4 SIA rounds
- Distance from countries with poliomyelitis cases
  - Bordering an endemic country
  - Movement of people from countries with cases (or between states within one country)

IV ORGANIZING AN OUTBREAK RESPONSE CAMPAIGN

IV.1 Choice of monovalent vaccines:

The WHA recommends implementing a minimum of three large-scale rounds of immunization using a type specific monovalent oral poliomyelitis vaccine, either mOPV1 or mOPV3, (see section 3.7 and Annex 1 for details).

IV.2 Choice of SIA strategy: Short Interval Additional Dose Strategy (SIAD)

New outbreaks and importations of wild poliovirus require the achievement of a high level of immunity in a short time to limit the outbreak quickly. It is essential to use a strategy that includes high quality house to house immunization with intensive supervision and independent monitoring. The SIAD (see separate guidelines on SIAD) is a successful approach used by several countries.

The SIAD strategy is an intensified approach to deliver two successive doses (passages) of monovalent Oral Polio Vaccine (mOPV) within a period of a few days (usually less than 2 weeks). If feasible, more than two passages for the same population can be conducted during a short period of time. The objective is to build up population immunity rapidly by taking advantage of the better sero-conversion with mOPV, together with intensive supervision and monitoring to ensure a campaign of the highest possible quality.

IV.3 The mop up coordination and planning structure

A planning structure for any supplementary immunization should include:

- Immediate formation of Task Forces at all levels, state and (sub) district with representatives of the partners (MOH, WHO, UNICEF, Rotary, religious leaders, minority groups and other key partners).
- Regular scheduled meetings should be held with clear objectives, agenda and minutes shared with all participants as well as with partners not regularly participating:
  - a Task Force meeting to discuss the general outline of the campaign, work plan, key responsibilities, progress in the preparations, major obstacles and contingency plans.
  - a weekly between the more technical core group of key partners to ensure smooth implementation of the operational preparations. Technical, logistics and social mobilization working groups should coordinate their activities.
  - the weekly meeting turns into a daily meeting during the last 2 weeks before the SIA. This meeting should not take more than 20 minutes, but is critical to streamline the final preparations

Each meeting should function on basis of a number of standard procedures: agenda, action points from previous meetings, progress, problems encountered, proposed solutions and new action points with clear responsibilities and deadlines.

The meetings should clear obstacles for lower level planning.

- Operations rooms with clearly visible and updated work plan and maps adapted to the specific level:
  - at state level the maps should indicate key surveillance data, SIA and EPI routine indicators, itineraries for vaccine distribution, districts with specific risks, places requiring cross border co-ordination.
  - at district level the maps should indicate the occurrence of wild polio cases, key surveillance data, SIA and EPI routine indicators, itineraries for vaccine distribution, areas with specific risks, places requiring cross border co-ordination.
  - at health centre level the maps should display the occurrence of wild polio cases, specific risk groups, distances, vaccine distribution points, transit points for travellers (bus- and railway stations, airports, police checkpoints, entry and exit points of main roads), other relevant land marks (mosques, temples, churches, schools, markets, etc.), transport itineraries of supervisors and teams and target areas for supervisors and teams

Work plans must be clear, action-oriented, and have sufficient detail.

- Specific work plans for each level, state, district and health centre, which clearly define persons, tasks, responsibilities and deadlines at the various levels. The plans need to be continuously updated and shared with partners (see annex 10.1 for an example of a work plan).
  Work plans that are too vague and too general will rarely be followed up.

IV.4 Adequate balance between responsibilities of different levels

Specific national responsibilities:

- Drafting national plan, dates, budget, etc.
- Facilitate the work of lower levels.
- Monitoring at all levels
- Feed back and information to all levels
- Providing final evaluation

Specific sub national responsibilities

- Micro planning
- Sub national monitoring
- Feedback and information to national and lower levels

IV.5 Timing , target age group and size of a mop up

A mop up following an importation should take place at most 4 weeks after confirmation of a wild polio case or VDPV.

However, some preparations can already be triggered before confirmation on basis of the following considerations:

- positive isolates (before confirmation of wild virus) in a risk area, i.e. an area with known past importations, high risk of importations (joint markets or transport routes with endemic areas), low routine coverage,
- compatibles in the same area and period;
- unexpected clusters of AFP cases

Some surveillance indicators should raise the level of alertness and lead to an initiation of a response even before confirmation of a case of wild polio.

Even if these preparations are limited to a deeper analysis of the situation, looking into the funding situation and other low profile activities, they can be very helpful when the confirmation occurs, without have created panic or responding to the smallest suspicion.

Because in the vast majority of outbreaks polio effects primarily the under 5 populations, transmission can generally be interrupted when targeting that age group. An increase in the targeted age group has serious consequences in terms of financial, operational and vaccine availability constraints and should therefore be decided only when epidemiological data convincingly shows a high proportion of transmission among older age groups (see annex III).

An outbreak response campaign should take place at most 4 weeks after confirmation of a case of wild polio, and target 2-5 million children under 5. The number should increase rapidly if the 4 weeks deadline is not met.

IV.6 Determining the target area for a mop up

With high quality surveillance, a detected wild virus in an area that was free of polio for at least one year has a high likelihood to be an importation. This is critical for the choice of the target area.

Less than 1% of polio infections actually leads to paralysis. A single detected polio case implies, unless it has clear epidemiological links to a reservoir, that polio virus is circulating in the area and explains why mop ups have to be of a large size.

The target area can not be a simple circle around the case, but must be based on:

- recent polio transmission
- inadequate surveillance
- limited access to health services (hard to reach, displaced, etc.)
- low routine/NID coverage as reported by official and unofficial sources
- likely transmission route of the importation: how did the virus get where it was detected and how can it spread (transport lines, population movements, pattern of contacts with existing reservoirs etc). At that point the genetic information is not indispensable to make the analysis.
- main urban areas, which are with a given or even higher coverage than rural areas more at risk of importing and becoming a reservoir because of the frequency of contact between individuals
- the case investigation can give additional information as to what areas to include in the mop up. Introductions do not happen randomly. They depend on contacts that take place in markets, slums and other places where people meet and sanitary conditions are low.
- last but not least common sense. Circulation of wild polio virus implies low immunity in at least part of the population.

The mop up area should be decided on basis of risks (low coverage, weak surveillance, access), population mass, density and movements as well as common sense.

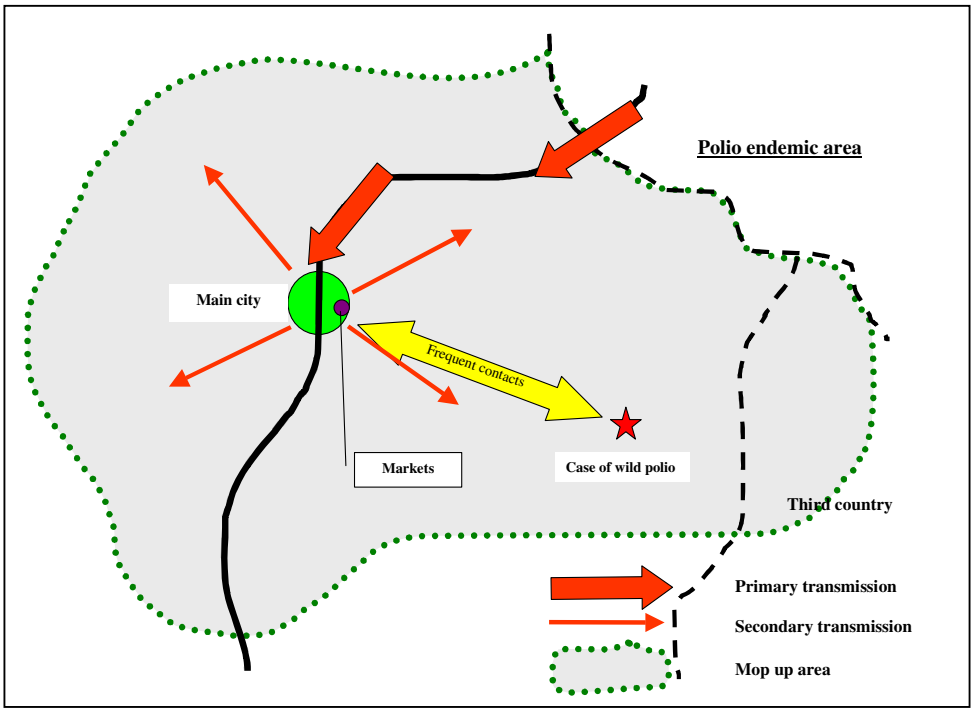


Figure I: Example of the choice of a mop up area

IV.7 House to house immunization

"House to house" immunization is a campaign strategy that differs from immunization at fixed posts in that vaccination teams bring vaccine to each child by immunizing children in their houses, boats, compounds or where ever else they may be living. Experience in many countries has shown that with House to House campaigns up to 20% more children may be immunized compared to fixed site strategies.

Why is house to house necessary?

Through house to house strategy, more children are reached because:

- No one may be available in the household to take the children to the vaccination post,
- There may be lack of interest or motivation to have children vaccinated,
- The parents may fear or mistrust vaccination,
- Children who need to be carried may not be brought to the vaccination site,
- Migrant populations may not be aware about the location of the booths or the need for vaccinating their children.
- Sick children may be missed.

Because of these advantages house to house immunization if the preferred strategy for polio eradication and outbreak control.

IV.8 Strategies for Social Mobilization and Information, Education and Communication

Effective strategies for information, education and communication (IEC) and social mobilization are critical to ensure children remain at home for the house to house strategy.

Activities on IEC and social mobilization will be carried out in coordination with the MOH, UNICEF, WHO, Rotary and NGOs.

Key Strategies:

- Advocacy with policy makers for creating a sense of urgency to ensure the imported virus will not lead to the reestablishment of transmission.
- Mobilization of district political leaders to support polio eradication program
- Focus on interpersonal communication (IPC) for raising awareness in urban slums and rural areas- supplemented by mass media & print material.
- High-risk area approach for programme planning, monitoring, training and social mobilization in selected areas/ districts.
- Continuous miking and messages through mosques and churches during the campaign, preferably linked to the micro plans and team's itineraries.
- Special messages & use of different channels of communication for hard to reach groups.
- IEC materials will be developed with a recognisable 'brand' so that the public will make a quick association with what they are seeing, reading or hearing with the polio programme. Using a uniform colour (YELLOW) & symbols/logos (including the EPI LOGO) improve recognition of campaign material even by illiterates.
- Involvement of private sector health practitioners, Lady / Health Workers and community-influentials for reporting of any suspected cases of polio/ paralysis.
- Integration of routine immunization messages for different levels of communication.
- Consistency in the message.

IEC, in particular miking and messages through mosques and churches, should continue during the house to house phase to ensure everybody is reached.

Messages

The following messages, delivered in the language understood locally, are important

- An importation of wild polio virus represents a threat for all children in the country as well as for the global polio eradication initiative
- Why several rounds
- Supplementary - all children <5 years of age should be vaccinated regardless of prior vaccinations
- The vaccine is SAFE – this message is of critical importance in some areas
- Date and location of the campaign
- Importance of routine immunization

IV.8.1 State-Level Activities

The national IEC department will undertake the following tasks, in coordination with UNICEF, WHO and Rotary:

1. Television:
    - Develop a media plan and book paid airtime for telecast of TV spots/programs on and satellite channels considering national/regional channels, appropriate choice of language

2. Radio:
    - Book paid airtime for broadcast of Radio spots on primary and local radio stations/channels
    - State IEC Bureau will coordinate to ensure that the broadcast plans cover all the targeted districts. To maximize reach and impact, all the relevant primary/local stations/channels should be used.

3. Press:
    - The national IEC department will release at least one half-page press advertisement on the upcoming round in selected local newspapers with high readership.

4. Special IEC Materials:
    - Audiocassettes for the miking activities should be produced and distributed.
    - The national IEC department should coordinate with the task force to ensure timely production and distribution of all the IEC materials (banners/leaflets/posters etc.) to all the districts.

5. IEC Funds Distribution:
    - The national IEC department should ensure that the funds for the district level IEC activities reach at least a week in advance of the start of the polio immunization round.

IV.8.2 District-Level Activities

In coordination with the district administration, the district health department, and other partner agencies, intensive local-level IEC and social mobilisation activities should facilitate greater public participation and acceptance for the polio eradication program.

Towards this, the following will activities will be undertaken:

1. In coordination with local partner agencies, develop a detailed district IEC/Social Mobilization micro plan for before as well as during the campaign.

2. Based on the funding norms, and after making basic provision for conducting the district-level activities enumerated below, funds will be disbursed to all (sub) districts well in advance of the start of the round.

3. The following activities should be coordinated at the district level:
    - District HQ should take responsibility for distribution and actual usage of IEC materials, provided, unless otherwise indicated. These should be distributed to all (sub) districts well in advance of the campaign.

- District HQ should distribute the audiocassettes provided for use in the miking activities. Number of miking units should be adequate to cover the area before and during the campaign.

4. The district task force should prepare and release one local press-advertisement announcing the upcoming round in the local language in the district newspapers.

5. A press briefing/sensitisation meeting can be organised for all district-level journalists, a day or two in advance of the round. The briefing should focus on status of the polio eradication program, and the need for the upcoming house-to-house immunization rounds.

6. Local radio stations and cable-TV operators should be mobilised to place polio announcements in local programs and cable channels.

7. Mobilize local cable-operators and cinema theatres in urban/peri-urban areas to screen polio messages in the local cable-TV network and cinema theatres.

IV.8.3 Sub district Level Activities

Sub district information officers will plan and conduct intensive local-level IEC and community mobilization activities, especially in identified high-risk and resistant pockets, to achieve greater community participation and acceptance of OPV. These messages should be based on local experience. If some religious or ethnic groups, or groups of specific gender or age, are persistently missed, they should be targeted during the IEC.

Towards this, the following should be undertaken:

IEC/Social Mobilization Micro-plans: At least 10 days in advance of the rounds, a sub district level micro-plan will be finalized. The micro plan will especially include the following:

- Listing of high-risk pockets and outreach areas requiring special efforts.
- Detailed route-charts/schedules for miking activities, prioritising high-risk pockets and for the house to house phase linked with the team's itineraries.
- Deployment-chart of all local community moblisers and volunteers, ensuring that all high-risk pockets are covered for community mobilisation activities.
- Listing of influencers such as community/religious leaders and medical practitioners.
- Listing of all prominent fixed-site, like markets, mosques and temples.
- Miking to be carried out by slow-moving vehicles such as cycle-rickshaws/cycles and not from fast moving vehicles. Miking must be conducted in villages prior to the arrival of a vaccination team. Miking must follow the route-charts. Fixed-post miking in mosques/temples/churches to be mobilised for making live announcements at least thrice a day, on all days.
- Facilitate and coordinate the efforts of all local mobilisers and NGO volunteers to maximise impact in high-risk and resistant areas.
- Conduct mobilisation meetings with local influencers such as community/religious leaders (especially women), and local medical practitioners.
- Mobilise local cable-operators in urban/peri-urban areas to screen polio messages in the local cable-TV network.

Distribution of IEC materials: Ensure that IEC materials are distributed well in advance as per the IEC guidelines. Ensure pasting of POSTERS especially in high-risk villages/areas, schools, mosques/temples/churches, prominent places like local markets etc. The materials should be also be distributed to the following groups:

- Reluctant/Resistant families
- Influencers in a village (rural medical practitioners)
- Community mobilisers and NGO volunteers

IV.9 Use and handling of mOPV

Storage and handling of mOPV are the same as for trivalent OPV (tOPV).

A number of steps have to be taken to inform the public and to prevent use of tOPV during the campaign and the use of mOPV during the routine immunization (see annexes):

- Prepare mOPV Question & Answer sheets for information of the media and health staff (these are included in this CD)
- Ensure stocks are rigorously separated. Some countries have actually retrieved tOPV from the health centres for the duration of the campaign.
- Specify mOPV as opposed to tOPV in stock registers

General vaccine handling instructions for vaccinators:

- Protect the carrier and OPV vials from sunlight.
- Open only one vial at a time and keep it outside the carrier.
- If ice rather than icepacks is used, make sure it is wrapped in plastic, to prevent vials from floating in the water and labels detaching.
- Open the lid of the carrier only after finishing the previous vial to take out another vial.
- Use only vaccine wit the VVM in stage 1 & stage 2.

Unused and partially used vials returned from the field can be reused on subsequent days subject to the condition that their VVM is in stage 1 or 2.

IV.10 Micro planning

A micro plan is the operational plan describing all aspects of campaign implementation at district and health centre level. It includes details like how many teams should be deployed and where, how vaccine should be stored and distributed, how social mobilization should be conducted, etc.. The micro plan operationalises and adapts the general rules set out in the macro plan. A good micro plan can only be done at peripheral - district or health centre - level.

IV.10.1Bottom up planning

Requirements for successful micro planning include:

- Delegation of planning responsibility to the appropriate administrative level (e.g., sub district or health centre) where the activities will take place. Include the supervisors in the planning!
- The national standards (number of children/team/day, fuel consumption of vehicles, daily mileage for vehicle users, etc.) should serve as guides, rather than prescriptions, and be adapted to local constraints. The adapted plans should be communicated to the higher levels and help finalise the budget.
- Meetings should be held with village leaders (councillors in urban areas), and influential members of society to gain insights into what will work best as well as involve these people in the planning itself and selection of a member of their community as a team member.
- Plans should be based on local conditions, accessibility, geography, population movements, working hours (when are people at home?) culture, etc. in the catchment area.
- Micro plans must target all children less than 5 years of age, but special attention has to be paid to the groups mentioned in the next paragraph and in the risk areas.

SIA can only be of high quality if micro plans are based on local capabilities and constraints.

IV.10.2Special populations

Evaluations in many countries show that the same population groups are missed by the routine programme as well as by supplemental immunization campaigns.

Missed populations should no be equated with remote populations. The following are examples of populations liable to be missed and requiring special attention:

- religious minority groups, who may be generally underserved and suspicious. Proper information through channels recognised by these groups is the solution.

- difficult to reach populations like nomads, boat people, etc.
- urban slum dwellers
- travellers, who may be on the road or in the train when the campaign takes place
- people with working hours that do not coincide with the team visits (agricultural seasons)
- people living in houses between settlements (the "no man's land")
- people that have lost their faith in the health programme, because of low quality of services provided, lack of explanation, and/or rude behaviour of vaccinators or supervisors
- people of specific socio economic status, that take a special effort to reach. Persons with high socio economic status may disagree with supplemental immunization, because their child has already received routine doses.
- everywhere people are missed, because the target population is underestimated and health staff targeting a certain number of children rather than a geographic area.

These groups must be identified in micro plans and special activities must be implemented to ensure they are immunized.

The best way to prevent missing these groups is to have the micro plan done at sub districts level together with the supervisors and local health workers.

Some population groups are always missed. These groups must be identified and special activities implemented to ensure they are immunized

IV.10.3Vaccination teams

Each team should consist of two persons. In some countries it is critical that one team member be a female. In others it may be necessary to have at least one be member of the religious group that will be immunized.

In terms of tasks the team should consist of:

- one person with experience of administering OPV during previous rounds
- one person from the community where the team will be working. This person should preferably be someone with a certain level of recognition in the community

Plan the number vaccination teams to implement a house-to-house strategy. It may be useful to actually send a few teams to some typical areas before the campaign to test how many children can be immunized.

The number of teams should not be determined only by what a team can do in one day, but include time to revisit houses on the same or following days where necessary. Experience has shown the following standards are feasible:

- urban: plan for an average of 1 team for each 100-200 children to be visited per day. Extra teams may be required in high rise buildings in office areas, where many apartments may be empty.
- rural areas: plan for an average of 1 team for each 60-80 children to be visited per day. Adapt this to local circumstances, allow time for travel and for revisiting houses; some teams may be able to reach only 40 children/day

Immunize each and every child in the assigned geographic area:
the estimated target population should serve as a guide and not as a maximum objective.

IV.10.4Mapping

Detailed mapping is an integral part of the planning process. Every supervisor must carry maps of all areas supervised. Ideally, each team must have a hand drawn map and itinerary for the area it will cover. It has been shown repeatedly that even people originating from a given area will miss children if they do not have a map and itinerary to guide them. In addition maps are helpful for teams to mark and revisit houses where children were missed.

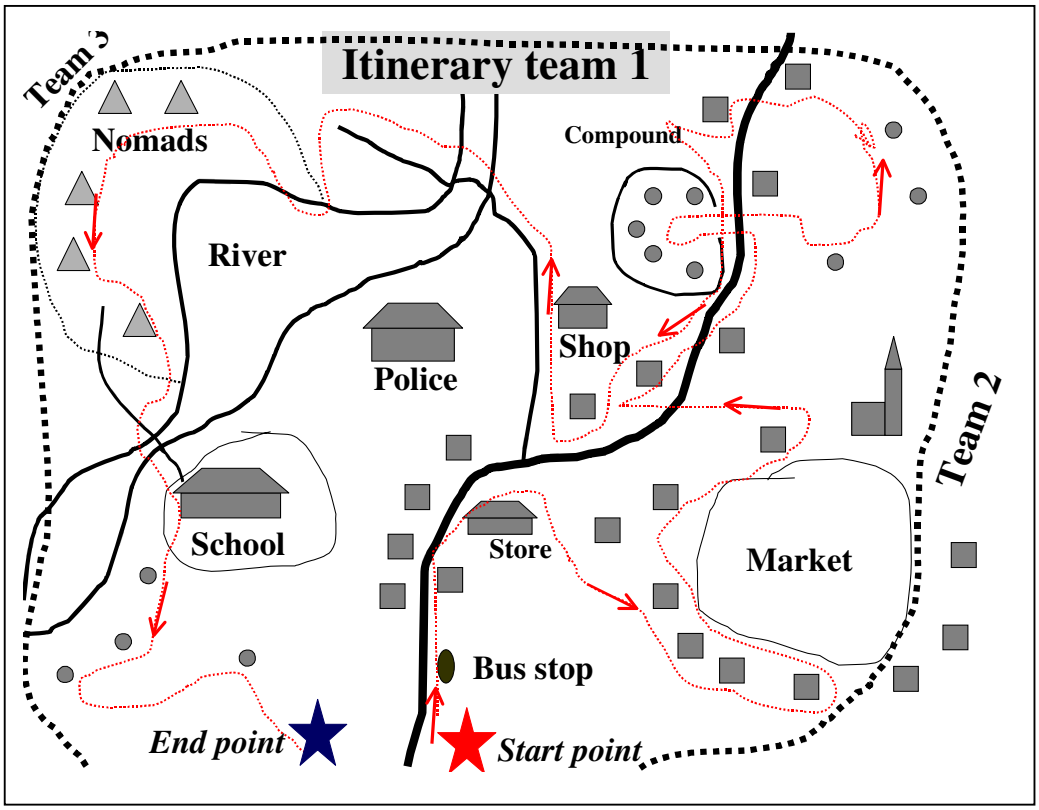
For each team, find or draw a map that indicates (Figure I):

- Each settlement's location
- Streets and landmarks within each settlement and city
- Houses and hamlets lying outside of the main roads
- Major landmarks (e.g., rivers, bridges, health centres, schools, markets, nurseries, train/bus station, police check points, etc.)
- Roads and tracks
- The precise limits of the catchment area of the team (the border of their working area), showing where another team takes over. Lines separating territories of villages often overlook houses in between the main settlements

A team that is not equipped with a map of the area and an itinerary for covering the area is likely to miss children.

Supervisors need maps that clearly indicate the area they cover as well as the areas covered by the teams. These maps should be made on the spot and not based on memory only, because that is how houses are missed.

Figure 1: Example of detailed map and itinerary for vaccination teams



A central map should indicate supervisors' areas, vaccine distribution points, risk areas and major landmarks (see the general chapter on planning)

IV.10.5Vaccine requirements

Vaccine required at national and sub-national level should be calculated taking a wastage multiplier of 1.20 (wastage rate 17%). Evaluations have shown again and again that wastage is usually between 5-10%. If the wastage exceeds that percentage by a large amount, the causes should be investigated and dealt with. Are vaccinators properly trained, do they open the vial correctly, etc..

Total OPV doses required each round = estimated < 5 children x 1.20

$$\text{OPV vials required each round} = \frac{\text{Total OPV doses required each round}}{20}$$

(rounded off to the next higher whole figure)

Adapt OPV needs on basis of experience and constraints

- Plan on basis of experience from previous SIA
- Vaccine for the teams should be based on the anticipated number of children to be immunized during the day. Experience shows that a disproportionate number of the total number targeted will be immunized the first two days (up to 80%). Give additional vaccine to teams that go to areas with difficult access and uncertain population size

IV.10.6Equipment

Micro plans should not only ensure the availability of adequate quantities of vaccine, vaccine carriers and icepacks/ice but also the vaccine distribution points and the distribution plan for these essential logistics.

Team/supervisors require the following materials:

- vaccine carrier/day carrier/ flask
- An appropriate number of tally sheets per team
- Supervisors' tally sheet
- One vial opener per house to house team (if glass vial supplied).
- 10 to 20 chalk pieces for house marking per team
- 2 arm bands/ identity card per team.
- permanent marker pens (one for each team)

Continued circulation of wild polio virus means that children are not being immunized.
Copying previous plans without revision will not help to interrupt transmission.

IV.10.7Logistics

Adapt logistics needs to the chosen strategy:

- Determine how the cold chain will be used (see chapter 2.8) and ensure the presence of a contingency plan.
- Determine the number of teams and supervisors (district, regional, national)
- Determine the number of vehicles, boats, bicycles, donkeys, etc. needed to transport vaccination teams and vaccine/supplies to every residence. This should be on basis of local constraints.
- Consider how houses will be marked to indicate houses which have been visited or which need to be visited again because of missed children (chapter 2.5)
- Make sure that during the whole house to house phase fixed sites are maintained in strategic places like markets, bus and railway stations and other transit points.
- Calculate the resources that will be required for transportation, fuel, additional staff, security, per diem if required, icepacks, overnight stays for staff in rural areas, etc. (see the chapter on budgets)

IV.11 Marking

IV.11.1Marking of children

Children vaccinated should be marked with a silver nitrate permanent marker pen on the left little finger. The mark should be large and cover the nail and the adjoining skin. (see separate Training Module fro Vaccinators).

IV.11.2Marking of houses

Houses covered should be marked with white/coloured chalk to distinguish (see examples in the annex):-

A mark and date for a completed house, meaning:

1. All children < 5 years of age staying in the house, including visitors, have received OPV dose in this round.
2. No child < 5 years in the house.
3. Children under 5 are absent during the duration of the campaign.
4. Permanently locked houses

A mark and date for a house that needs to be revisited

Houses should be marked for revisiting only when children under 5 are absent and can be immunized during the duration of the campaign

A list of the houses to be revisited should be made on the reverse of the tally sheet and submitted to supervisor at the end of each day by each team.

Flexible working hours must be considered to match the team's visit with the time the parents are most likely to be at home.

The team should revisit all houses where children were missed on the same day or subsequent days to immunize all the leftover children.

Clear instructions are needed about how to deal with children not found at home. The planning of the teams must allow for flexible working hours to find those children.

IV.12 Recording and reporting

A tally sheet should be used for recording the number of children immunized and houses visited. Contrary to the tally sheets that give only the number of children immunized, sheets that allow for recording of the number of children immunized and missed per household facilitate follow up of defaulters and supervision.

Record the number of houses visited and the number of children immunized. Details of houses to be revisited should be recorded on the reverse of tally sheets by each team every day.

On each day, record the details of the vaccine received and vaccine returned (used and unused) on the tally sheet.

There should be no registration or enumeration of children. This is needlessly time consuming and gives a false sense of security. Vaccinators should target all children in their catchment area and not be constricted to lists with names.

At the end of each day, each supervisor should go through the tally sheets of all his/her teams, compile the information and submit a consolidated report using the reporting form for supervisors.

At the end of each day, each (sub) district should send to the District or regional level a report of children immunized and houses visited.

All reports should be analysed on a daily basis to be able to respond to problems and adapt the strategy:

- what is the result compared to previous campaigns

- are there any regions with specific problems and what was done to fix them
- were all teams and supervisors present
- was vaccine availability ensured everywhere

IV.13 Supervision

High quality supervision is an indispensable part of SIA. Minimum requirements for quality are a sufficient number of supervisors, correct training, appropriate tools and means of transport.

Supervisors help to plan and oversee the delivery of OPV, review daily plans with the teams, ensure that plans are implemented, take corrective action when necessary, and solve problems for teams (see below).

Key elements of quality supervision are:

- Training of supervisors. Before beginning the house-to-house delivery of OPV, supervisors should:
  - Walk or drive through the areas where their vaccination teams will be working and develop a reasonable daily itinerary for each team
  - Agree with teams on contingency plans if problems arise (e.g., when to visit houses again if children are away during the initial visit)
  - Assist in mobilizing the community, including identifying village councillors, mayors, and other officials who can assist
- Following the strategy supervisors must ensure that:
  - All areas and houses are visited, including isolated communities, mountainous areas, and apartment dwellers on top floors
  - All children <5 years receive two drops of OPV
  - All teams know how to interpret the VVM to ensure delivered OPV is potent
  - Tally sheets are completed immediately after each home visit
  - Teams are replenished in case they run out of vaccine
  - Gaps are identified, problems solved, and the strategy revised as necessary
  - Houses are correctly marked
  - Progress and problems are communicated to the local health authorities
  - Vaccination teams return to houses where children were missed
  - Results are collected and reviewed with teams at the end of each day
  - Logistics and supplies are prepared for the next days work
  - A report is prepared to summarize the vaccination activities and suggest improvements for the next day/round.
  - Additional training is provided to the teams not performing well. Team members are replaced as necessary.
  - Spot checks (convenience sample surveys) are done to determine any areas in which children are being missed. Corrective action is taken as needed.
  - Lessons learned are used for next rounds
- The number of supervisors should be calculated on basis of how much time it takes to fulfil these tasks. The numbers below are recommended, based on experience:

  urban: 1 supervisor for 4-5 teams

  rural: 1 supervisor for 2-3 teams
- Supervisors have the tendency only to go where the teams go. It is crucial supervisors pay attention to:
  - risk areas (see the description above)
  - areas and population groups where teams do not like to go, e.g. slums

Supervisors must pay attention to high-risk areas and go where the teams do not like to go.

- No matter how many supervisors are trained, if they are not mobile, they can not supervise properly.

- Supervisory checklists should be designed. These lists should be simple, basic, action-oriented, and 1 page maximum.
- Supervisor's debriefing with the MOH should take place on a daily basis and lead to corrective action.

Proper accountability and responsibility must be maintained. Weak and ineffective supervision should be dealt with appropriately.

IV.14 Cold chain and the use of the VVM

The cold chain has been one of the main obstacles to overcome for the implementation of high quality campaigns.

Oral polio vaccine is the most heat sensitive of all EPI vaccines. Storage and transport have to comply with good cold chain practices. However, cumulative heat exposure can be monitored with the help of the Vaccine Vial Monitor (VVM)[1].

A heat sensitive square within a circle (figure 2) changes colour under the combined influence of heat and time. If after exposure to heat for a certain amount of time, the square reaches the same colour, or becomes darker than the circle, the vial should be discarded (stage 3-4).

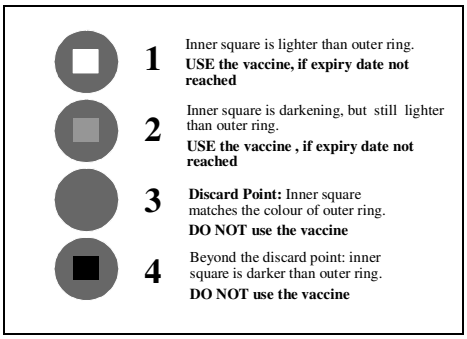


Figure 2: The stages of the VVM

OPV, supplied by WHO accredited manufacturers, retains satisfactory potency for at least 48 hours at an ambient temperature of 37°C.

At lower temperatures the loss of potency is slowed down and the time taken for the VVM to reach the discard point increases substantially.

The VVM allows the user to see at any time if OPV can still be used in spite of possible cold chain interruptions. If necessary, health staff and management can then take the required corrective measures.

With the VVM a more flexible, less stringent and cheaper cold chain, can be planned for. This is of particular importance for SIA.

OPV can be safely used beyond the cold chain until the VVM reaches the discard point. The length of time will depend on ambient temperatures and the quality of the cold chain until that point.

With the VVM, the absence of ice is not a reason to interrupt immunization

The advantages of the use of VVMs during SIA are:

[1] Making use of VVMs; Flexible vaccine management for polio NIDs, SNIDs and Mop-ups, WHO/V&B/00.14.
Vaccine vial monitor – Training guidelines. WHO/EPI/LHIS/96.04 (update planned for 2000).
Vaccine vial monitor and open vial policy. WHO/EPI/LHIS/96.01 (update on Multi dose vial policy in process).

- teams can go further in time and geographic distance, due to less bulky equipment and decreased dependence on re-supply of ice;
- difficult access and weak cold chain cease to be reasons not to immunize population groups usually missed during SIA and routine services;
- teams do not always require a vaccine carrier with the full load of icepacks. One or two icepacks may be enough, especially if the teams returns the vaccine in the evening to the stock.
- because fewer icepacks are required, freezing can be faster and with less equipment
- cold chain costs can decrease due to these factors
- health worker and stock manager can decide which vials to use first or in nearby areas on the basis of the change of colour of the VVM

It is strongly recommended regional and district health staff actually tries the VVM in their areas to get an idea of how flexible the cold chain can be in a given ambient temperature. OPV vials can be put in vaccine carriers with different number of icepacks and the time it takes for the VVM to reach the discard point can be monitored. This is the most convincing way to gain confidence in the use of VVM.

Pro active management should lead to a tailor made cold chain, combining VVM with excellent micro planning and sensitized health workers.

This contrasts sharply with the traditional top-bottom and "ice everywhere" approach.

IV.15 Monitoring (for more details see Independent Monitoring Guidelines)

For maximum effectiveness, monitoring should be done by independent observers as well as by MOH and partners.

Independent monitors should be recruited, trained and managed by WHO to ensure true independence.

Independent monitoring has proven an important factor in the rapid detection of problems:

- Provides an objective independent source of timely and reliable quantitative data for each campaign.
- Identifies reasons for missed children to guide future interventions specific to needs of the area.
- Identifies problems with the implementation of the campaign and recommend actions for corrective action (e.g. training of teams, supervision, etc)
- Identifies data quality problems by highlighting areas with significant discrepancies between reported administrative coverage and independent monitoring coverage.

Independent monitoring staff should be totally independent from the national polio eradication programme and its activities, they can be recruited from NGOs, students, Rotarians, private companies, etc..

Independent monitoring should be conducted in identified high-risk districts and sub-districts, selected on the basis of surveillance and previous SIA performance. The presence of finger-marking is the vaccination indicator of choice.

- In process independent monitoring requires observing teams in action, and checking areas already covered during the SIA. The monitors should be independent from vaccination team supervisors they should NOT be giving vaccine, even in poorly covered areas, since this will introduce a bias, and they are not responsible for carrying out corrective measures
- End process or house-to-house independent monitoring is based on a random selection of houses within a randomly selected Cluster in a sub-district
- End-process out of house independent monitoring (market/street surveys) should be conducted on 50 to 100 children, to check for finger-marking.

The degree of scientific validity should not be a major concern for monitoring. The purpose is to identify weak areas and a certain level of subjectivity is inevitable.

It is essential that just before the NID all monitors be thoroughly briefed on the areas to be monitored and on the methodology of monitoring (see the Monitors training module). A mechanism of daily feedback from all monitors to the MOH needs to be established so that the immediate action can be taken.

Given the short time for preparation and training and the urgency of the intervention, the indicators to be used should be simple and action oriented:

- Number of children immunized/missed on any given day per age group (0-11 and 12-59 months) in a given area;

- Reasons for non-vaccination;
- Quality of house marking.
- Source of information on SIA

There are many other aspects of the SIA that do not necessarily require independent observation. National and regional supervisory staff from the MOH and staff from WHO/UNICEF can focus on more qualitative issues e.g.:

- Numbers of teams and supervisors actually in the field;
- Number of teams and supervisors using quality maps;
- Number of teams with a female vaccinator in areas where this is an issue;
- Number of health centre with adequate planning tolls (maps, work plan, etc.);
- Vaccine use;
- Adequacy of micro plans and training.

IV.16 Evaluation of SIA

The activity must be reviewed during and immediately after each round for corrective action. Monitoring and anecdotal data should be reviewed at all levels, district, region and national to look for areas where children might have been missed to ensure that these missed children are covered subsequently.

For the evaluation of SIA, reliance on coverage figures may be very deceptive. Even though the use of the result of the best previous round as target may be the best option, it is critical to remember that ongoing or re-established transmission implies that children are being missed. Many epidemics have occurred in countries where clusters of unimmunized children remained undetected.

AFP surveillance is the gold standard for evaluating the quality of the campaign in the longer term. If a few rounds of SIA have been successful in reaching all target children, no more cases of polio should occur.

The only true indicator for the success of SIA is the absence of wild polio virus in the presence of high quality AFP surveillance

The immediate evaluation of SIAs can be done by examining the following indicators:

- Was there a transparent and functional coordination structure?
- Were funds timely available at the appropriate level?
- Was training conducted for all SIA staff and volunteers?
- Was bottom-up micro planning conducted including mapping of local areas?
- Was the cold chain implemented and managed according to standards? Proper use of VVMs?
- Were VVMs still showing potent vaccine when examined by supervisors?
- Were all areas of the country accessed? Proportion of households missed in an area?
- Was social mobilization carried out such that banners were widely visible at all vaccination posts and all parents of target children were reached by television, radio, or loudspeaker announcements?
- Was the number of supervisors sufficient?
- Were supervisory checklists completed? Results analysed and corrections made?

It is important that the MOH insists on plans for evaluating the quality before the campaign occurs, and that information from AFP data, process evaluation, and convenience samples is analysed to determine whether the quality was adequate. Steps to improve future rounds should be based on information obtained during monitoring and evaluation.

V BUDGETING

The micro planning exercise needs to be translated into budgets for operational costs and OPV. Starting from the lowest level, each administrative unit (at least at sub district level) needs to have a detailed budget reflecting the micro plan for that unit. All budgets will then be summarised at the next level (e.g. district level then provincial level then a total budget) and additional costs might be added for expenses incurred at this level e.g. district training

or district social mobilisation). These budgets will exclude regular staff costs and will be broken down in the following categories

- OPV (including international transport)
- The number of doses required (including the wastage factor) will be indicated and multiplied by the unit cost of one dose (including transportation to the country).
- In country transportation costs should be added under the transportation section.
- Manpower and incentives
- This section includes expenses for temporary staff that will be working for a few days during the SIA activities. It includes incentives for vaccinators and supervisors, monitors, cold chain staff as well as per diem for a number of ministry staff who might need to travel for the preparation and implementation of the SIA.
- Under the column "number" the formula should be as follows: number of persons X number of rounds X number of days. The daily rate paid should be shown under column "costs / unit".
- Training and meetings
- Detailed calculations should be made for each training and should be summarised on the budget form under separate budget lines in this section. E.g. training of vaccinators, planning meetings, etc…
- Supplies and equipment
- Whether through an international order or locally purchased, supplies and equipment needed for the activity should be listed n this section. For indicative prices and reference numbers please refer to the WHO/UNICEF product information sheets (PIS). Note that for international orders through WHO or UNICEF, a minimum delay of 4 to 6 weeks must be allowed before goods arrive in country. Additional time will be needed for clearance and in-country transportation.
- Transportation
- In country transport costs for vaccines and supplies, vaccinators and supervisors, and monitors should be listed under this section. These include car rental, fuel and lubricants, air and ground transport, use of boats, motorcycles, donkeys and camels where applicable.
- Under the column "number" the formula should be as follows: number of vehicles (of the same type) X number of rounds X number of days. If daily rates are not standard across the country, it is recommended to indicate an average in the column "$ cost / unit".
- Social mobilisation
- Detailed calculations should be made for each activity and should be summarised on the budget form under separate budget lines in this section. Supplies such as T-shirts, caps, banners, or posters and social mobilisation meetings should be included under this section.
- Other operational costs
- Under this section are included all the other additional costs that are normally not incurred by the partners outside the supplementary immunisation activities. It includes communication costs (e.g. telephone, HF radio, fax, stationary, bank charges, ..)
- Tips:
  - In the column "number", enter formulas rather than absolute numbers so that the reader can understand the logic.
  - For each budget line, indicate which partner (Government, WHO, UNICEF, others) would cover the costs, even tentatively. Add additional columns for additional partners if needed.
  - A narrative budget should accompany the total budget tables to explain the logic behind the calculation for each budget line.
  - Once finalised, the joint budget should be translated in US Dollars and forwarded to the respective agencies to look for funding possibilities.

VI ADDING OTHER INTERVENTIONS TO POLIO SIA

Because of the high risk of complicating service delivery, training and logistics, it is not recommended to add other interventions to polio outbreak campaigns

VII AFP SURVEILLANCE IN AN OUTBREAK OF POLIOMYELITIS

A rapid response to an outbreak requires good surveillance data. The surveillance system must be able to:

- detect wild poliovirus circulation
- detect situations of risk so they can be rapidly investigated or addressed
- identify high risk areas

The response to a suspected outbreak of poliomyelitis usually follows the following 7 broad steps:

- An intense and rapid surveillance response within 48 hours of detection, including detailed epidemiological and virological investigation of the suspected outbreak, review of surveillance quality in the area affected, active case search and retrospective record review, prioritization of any viruses for ITD and genetic sequencing as appropriate;
- Initial planning for an immunisation response to establish logistic and operational needs;
- A decision within one month as to whether the suspected outbreak can be confirmed, or has a high enough index of suspicion to warrant an immunisation response, based on the results of the rapid surveillance response;
- If the outbreak is confirmed additional steps will include:
- Immunization response within 1 months of detection (large scale, house to house);
- Longer term intensification of surveillance efforts;
- Documentation of the interruption of transmission.

This section attempts to outline the steps necessary to mount an intense and rapid surveillance response within 48 hours of detection (step 1 above), the longer term intensification of surveillance efforts (step 6 above) and the documentation of the interruption of transmission (step 7 above).

EPI managers have two sources of information from the surveillance system. One is the surveillance data and the regular analysis of that data; the other is direct information from surveillance officers in the field, which is more intuitive and less definitive, but more timely.

Regular, in depth analysis of surveillance data can help to identify risk situations:

- identification of districts with sub-optimal surveillance
- clusters of compatible AFP cases
- unexpected clusters of AFP cases

In order to obtain this information, data must be analysed weekly or at least monthly, and all indicators/data analysed down to district level. The analysis should aim to use the maximum number of indicators, effectively to "filter" the data for situations of risk; analysis should include mapping of all AFP cases, especially compatible cases, and to look for clustering of cases. Analysis should also include a review of pending cases, and harmonization of surveillance and lab data.

Information directly from surveillance officers in the field can lead to identification of high risk cases or clusters during the initial investigation, through the immediate impressions of the surveillance officer, prior to lab results or classification. This information must be used wisely, because no case can be confirmed without appropriate evidence; however, experienced surveillance officers recognise situations of risk and early action can be taken to investigate these thoroughly.

The first aim of the response to a suspected outbreak of poliomyelitis should be to confirm the outbreak as rapidly as possible. The next aim is to prepare for an immunisation response of appropriate scope, and a broader surveillance response, if the outbreak is confirmed.

VII.1 Investigation and surveillance response:

A full investigation and surveillance response should be initiated within 48 hours of the identification of a suspected outbreak.

- Clinical and epidemiological investigation of the cases or cluster, in addition to the initial AFP case investigations, to determine:
- if the cases signs and symptoms are consistent with polio;
- if there are additional AFP cases in the community (through active case search),
- the status of routine immunization coverage; and

- whether the community was reached and well covered during the last round of NID or SNID, if applicable.
  - Other relevant data to be collected includes travel information to determine whether the case/s (or their close contacts) have any connections with a polio-endemic country/area. If a cluster of cases is being investigated, the descriptive epidemiology should include information on geographical and temporal clustering, and age, gender, ethnicity.
- Virological investigation after ensuring specimen collection from cases and contacts. All specimens should be prioritized for processing in a WHO accredited laboratory and any polioviruses isolated should be prioritized for ITD and genetic sequencing.
- Surveillance quality investigation should review all relevant surveillance data to evaluate whether cases are likely to represent a poliomyelitis outbreak. The surveillance and laboratory quality indicators (non-polio AFP rate, timeliness of stool collection, processing of stools in an accredited laboratory, proportion of cases pending, geographical distribution of AFP cases, etc) for the area involved during the previous 12 months, should be assessed, to determine the possibility of transmission that might have been previously missed. Retrospective record reviews should be conducted in health facilities in the area of the suspected outbreak and surrounding areas.

VII.2 Enhanced surveillance

If the outbreak is confirmed to be due to poliomyelitis, AFP surveillance should be enhanced.

- Establish a group of experts in the Ministry of Health to advise and coordinate activities.
- Immediate notification by telephone, to all provincial surveillance units to inform staff that an outbreak has been detected, and to alert them of the possibility of further cases. Provinces must inform all districts that 100% timely and complete active surveillance reports, including zero reports, are required from every district without exception.
- Immediate notification to WHO and other international partners.
- Provincial and national staff begin immediate enhanced active surveillance by visiting all districts surrounding the case and the AFP reporting sites within that province to conduct retrospective record reviews and active searches for unreported AFP cases.
- Monitoring of reports at national/provincial level;
  - Daily reports to provinces from districts surrounding case
  - Weekly reports from all provinces (including all districts) to national level by telephone
  - Weekly review of situation by experts using mapping and other means of documenting the extent of surveillance.

VII.3 Documentation of the interruption of transmission of wild poliovirus

An equally important part of the response to an outbreak, especially in an area that has been polio-free or close to becoming polio-free, is the documentation of the interruption of transmission of wild poliovirus. Enhanced surveillance must be maintained for a period of at least six months after the last wild poliovirus associated case or clinical case of poliomyelitis is detected. The detection of any wild poliovirus in an area that has been polio free is considered a national public health emergency. Detailed and comprehensive documentation is required to describe the epidemiological background, findings of case investigation and surveys including laboratory results, description of immunization response and results of enhanced surveillance. The report should be completed in close coordination of all national and international experts involved. In the event of any importation of wild poliovirus, a separate report providing full documentation should be prepared in collaboration with the national and international experts concerned.

VIII VACCINE DERIVED POLIO VIRUS (VDPV)

The detection of vaccine-derived polioviruses (VDPVs) should be rapidly investigated, and be dealt with like an imported wild polio virus. An outbreak with circulating VDPVs (see definition) should be considered a public health emergency.

VIII.1 Response to the detection of VDPVs in a single individual

There are two situations that may be encountered: 1) VDPVs isolated from a single AFP case; and 2) VDPVs isolated from an apparently healthy individual.

The objectives of the investigation are three-fold:

1) determine rapidly whether the single isolation from an individual or the environment represents the proverbial "tip of the iceberg." If additional cases with the same viruses are detected, then the control and response activity should follow the guidelines outlined in this document;

2) determine the area of risk for outbreak control, if needed;

3) whether the individual from whom the VDPVs were isolated are long-term carriers of the virus.

Further enhancing surveillance for AFP cases is the highest priority. Active surveillance visits to likely reporting sites (hospitals where persons with paralytic disease most likely will present), if not already implemented, should be instituted. In addition, retrospective review of admission and discharge logs and records should be conducted in the vicinity of the case.

The laboratory should be notified of AFP cases from the same area and should prioritize processing of these samples for polioviruses.

In addition to enhancing surveillance to detect other cases or areas of risk, all VDPVs associated with an individual should be followed up by a specific case investigation. The purpose of the case investigation would be to determine whether this individual represents a long-term carrier for poliovirus.

Therefore, all VDPVs should be tagged, followed up, and documented. At a minimum, after notification from the laboratory network, monthly collection of stool samples should be arranged, until three samples are negative for poliovirus. If poliovirus is isolated for >6 months, a immunological workup should be initiated to determine whether the individual is immunodeficient. The workup should include a quantative immunoglobulin test (QIG) to determine whether the levels of immunoglobulin are within normal limits for age. Should there be difficulties in arranging for a QIG, WHO HQ should be contacted (Global Laboratory Coordinator).

If long-term carrier stage is confirmed (i.e., >6 month of virus excretion) with or without associated immunodeficiency disorder, the individual should be reported to the Registry of Long-term Excretors of Poliovirus maintained at WHO headquarters in Geneva (Global Laboratory Coordinator). This registry is the principle source for monitoring cases with long-term carriage of poliovirus.

Since these cases are rare, it is of outmost important that are investigated, treated, and followed up in a standardized manner, relying on the latest advice of the world's most prominent immunologists and virologists. There are a number of therapeutic options that have been used to eliminate the chronic carrier state. These include: 1) antiviral compounds (i.e., pleconaril); 2) intravenous immune globulin; 3) oral immune globulin; 4) breast milk; and 5) others. Consult WHO headquarters for more specific advice on therapeutic options.

Furthermore, long-term carriers should be enrolled in a monitoring program, that at a minimum collects stool samples every 3 months, and more often if therapeutic options are employed. WHO headquarters will consult on a case to case basis to discuss what long-term monitoring program should be employed.

ANNEX I: CRITICAL STANDARDS AND KEY NUMBERS

The following standards may show minor variations between specific areas, but have generally proven to be valid for quality outbreak response campaigns.

Topic	Standard
Number of children immunized per team per day	100-200 in urban areas 60-80 in rural areas
Number of teams per supervisor	4-5 teams in urban areas 2-3 teams in rural areas
Fuel consumption of a 4x4 vehicle	15 liter / 100 km on good roads 20 liter / 100 km off the road
Fuel consumption of a motor bike	4-5 liter / 100 km
Maximum daily distance for a national supervisor	150 km
Maximum daily distance for a team supervisor	100 km
Maximum daily distance for a vaccination team	30 km, if motorized
Vaccine wastage	Wastage 15%, wastage factor 1.2
Volume of a dose of OPV	1000 doses per liter storage volume

ANNEX II: THE FINAL SIA CHECKLIST

Questions that can be asked to help evaluate the level of preparedness of SIA:

- are all relevant persons, agencies and associations at all levels involved: Prime Minister, other relevant ministries, community leaders, religious leaders, international and national NGOs
- is there a coordination structure at all levels, including clear responsibilities, meetings agendas
- are work plans made, visibly displayed and with mechanisms for follow up
- do/are the micro plans:
  - based on bottom up planning
  - include maps, itineraries and clear demarcations for each team
  - include flexible working hours to ensure immunization of all children
  - based on realistic assumptions of how many children a team can really immunize per day
  - include additional teams/efforts for difficult areas with high population density
  - used to revisit and adapt the national plan
- are vaccination teams:
  - selected on an average of 150 children/day/team in urban areas and 60 children/day/team in rural areas
  - properly and timely trained
  - composed of 2 persons, respecting local constraints (female vaccinator) and one recruited locally
- are supervisors:
  - selected on basis of: 1 supervisor/3-5 teams in rural areas and 1 supervisor/4-5 teams in urban areas
  - properly and timely trained
  - mobile
- is coverage of the following areas/groups planned for:
  - populations requiring a non-standard approach, like nomads or boat people
  - slums and other areas with poor sanitary conditions and low access to health services
  - populations opposed or unknown to immunization

- markets, bus stations, border crossings, water ways, check points
- areas with low NID or routine coverage

- are logistics issues sufficiently prepared:
  - is mOPV management addressed
  - is there a logistics work plan and organigram with clear responsibilities and deadlines
  - is there a visible and feasible vaccine and equipment distribution plan
  - is there a visible vehicle use and maintenance plan
  - is there a contingency plan for vaccine storage (volume, energy sources) and distribution
  - are refrigerators and freezers installed where they are needed; is there a repair plan
  - are health workers trained in the use of the VVM
  - are a flexible cold chain and alternative storage and freezing facilities (private) considered
  - is mobility ensured for teams and supervisors
  - are there clear mechanisms at all levels for fund disbursement and justification
- is a monitoring system in place:
  - a functional communication protocol and system are in place to forward results and give feedback to the appropriate levels on daily basis
  - at all levels daily results are analysed and a response mechanism is in place (e.g. rapid response teams)
  - staff (international and national consultants, national and regional supervisors) are trained in data collection through a rapid assessment method and routine supervision and analysis on:
    - immunization coverage per area per age group (<1 and 1-4 years)
    - the quality of house and child marking
    - number/proportion of children missed
    - the quality of tools, in particular mapping
    - the quality of the preparation: availability of funds and plans
    - the quality of teams (numbers, composition, technique, IPC)
    - the quality of supervision (numbers, actual team visits, formative and corrective)
    - cases of refusal
    - effectiveness of social mobilisation
  - qualified staff is in place during and after the campaign for immediate data management
- is there a policy in place to deal with cases of refusal (management, assessment of the problem)
- was/did social mobilisation/communication
  - based on a timely prepared plan, including launches at all levels, and implying all media
  - conducted on time
  - based on an updated situation analysis (lessons learned, risk areas, specific aspects)
  - include a feasible distribution plan for materials
  - use materials that are understandable, appealing, available, with wide access and in the right language
  - continue during the campaign
  - make maximum use of celebrities, artists, politicians, religious and traditional leaders
  - adopt an innovative approach

ANNEX III: TARGETING OLDER AGE GROUPS

When a considerable proportion of WPV or AFP cases are older than 5 years of age, it may be justified to consider targeting an older age group.

Experience in Namibia, Tajikistan and Congo has shown that the change of age group has important consequences for the implementation strategy.

The basic principle of any strategy is to find the most effective way to bring the vaccine to the recipient. A population under 5 can largely be found at home, which is why a predominantly house to house strategy is appropriate.

However, populations above 5 and in particular above 15 are more likely not to be at home and the strategy should be adapted accordingly.

Experience has shown that even in an outbreak, people, in particular those occupied in an economic activity, are not easily willing to go towards the vaccination teams: the teams should go to them.

An equally important factor is that much more staff will be needed for a campaign targeting older age groups (more people). Use of non-medical volunteers will be more likely and with that the need to simplify the campaign as much as possible.

Rather than postponing a campaign in the hope to achieve maximum quality, it should be accepted that the best learning process is to go through the campaign practice. Campaigns done as soon as 2 weeks after confirmation of WPV, even at the cost of some quality, seem to have a bigger impact on transmission than postponed campaigns, despite the possibility of a few percent higher coverage with the latter.

On basis of these assumptions and experiences some aspects to consider when planning for older age groups are given below. The first 3 points can be adapted in rural areas with house to house starting earlier, but even in rural areas fixed sites are a necessity when older age groups are targeted.

- The basic strategy should be with teams on fixed sites wherever population gathering can be expected: large companies, markets, bus and train stations, village or neighbourhood chiefs, schools, health centres, churches, border crossing, etc.. These teams should be clearly visible, not too far apart and announced by town criers, television, radio, etc.;
- In addition to these fixed teams, teams should regularly sweep through the markets, bus and train stations and other crowded places with moving populations;
- After 2-3 days house to house teams should visit the households to immunize the remaining unvaccinated people. The fixed and sweep teams, albeit in reduced number, should continue for the duration of the campaign;
- Finger marking should be applied;
- House marking should be simplified (a V for visited, with a circle for everybody vaccinated);
- Tally sheets should be simplified. Zero dose reporting is not essential and a likely source of confusion;
- Monitoring should be simplified. In particular in areas where resistance is not widespread, recall in addition to finger marking should be an indicator for vaccination status. In-process house to house monitoring is as unreliable as is the house marking in these situations. The focus should therefore be on the end-process monitoring. Monitors can still be employed for in-process monitoring to identify poorly covered areas.
- The workload per team should be around 400 people per day, but keeping in mind that a disproportionate number of people will want to be immunized the first days, the teams should be supplied with sufficient vaccine, i.e. 1000-1500 doses. Stock-outs are a major source of tension during campaigns;
- The duration of the campaign can be 3-5 days;
- The communication strategy needs to be adapted to the target population, insisting on the absence of contra indications, and no risk for pregnant women or alcohol users, etc..

ANNEX IV: THE QUALITY INDICATORS FOR POLIO CAMPAIGNS

The use of quality indicators facilitates the evaluation, the follow up and the correction of vaccination campaigns. A list of indicators is given below. The choice of the indicators depends on the specific context of the country, but the basic indicators are recommended anywhere. The purpose of the indicators is not to find scientifically sound data, but to detect weaknesses that need to be dealt with.

It is important that, after having chosen the appropriate indicators, the various data collection tools are reviewed to ensure the indicators are reflected in them. Equally important is it to set up a mechanism and templates for data collection, transfer and analysis before the start of the campaign at all levels.

There are 5 data collection tools that can be used for the required analyzes:

- A tool for monitoring and rapid assessment for independent monitors.
- A form that allows for the evaluation of the quality of the work of the vaccination teams and supervisors to be filled out by the national/regional supervisors each time they meet a team or supervisor.
- A form that collects data on the level of preparedness of health centre or Districts health office, to be filled out by the national/regional supervisors each time such a facility is visited for the first time.
- If refusal is a real problem, not limited to some sporadic cases, a form on the management of cases of refusal, to be used at the end of the campaign,.
- The tally sheets.

Basic indicators

1. Number of children missed by age group : 0-11 months, 12-59 months
2. Percentage of houses not or incorrectly marked
3. Percentage of teams with a detailed map and itinerary of their catchment area
4. Percentage of teams with at least one member recruited in the team's catchment area
5. Percentage of parents aware of the campaign before the arrival of the vaccination teams

Additional indicators

6. Percentage of teams with a vial with VVM in state 3-4
7. Percentage of teams having been visited at least once a day by a supervisor
8. Percentage of Districts/HC with finalized micro plan before the start of the campaign
9. Percentage of Districts/HC with funds received according to micro plan, or having been informed timely to allow for the adjustment of the plan
10. Number of days between the arrival of the funds and HC/District/Regional level and the beginning of the campaign
11. Number of HC/Districts/Regions having a daily meeting with the supervisors
12. Number of children vaccinated per day compared with the number vaccinated the same day during the previous round (define critical level for action).
13. Number of households visited
14. Number and location (possible clustering) of cases of refusal before and after refusal management teams have passed
15. Immunization coverage by age group based on tally sheets
16. Percentage of households with children absent, but revisited during the campaign
17. Immunization coverage by age group on basis of the rapid assessment
18. Percentage of teams respecting the rules of IPC (Inter Personal Communication)
19. Percentage of teams with at least one female member
20. Duration of training (scale to be developed on basis of planned duration)
21. Percentage of teams with at least one member without training
22. Percentage of supervisors with a map with the location of the teams
23. Percentage of teams committing mistakes after the visit of the supervisor
24. Relative weight of the various sources of information : radio, TV, traditional leaders, others

ANNEX V: DEFINITIONS

Vaccine-associated paralytic poliomyelitis:

Vaccine-associated paralytic poliomyelitis (VAPP) is defined poliomyelitis caused by the live attenuated polioviruses contained in the OPV. VAPP is a rare adverse event. The global burden of VAPP has recently been estimated at 250-500 cases per year. No outbreak of VAPP has ever been reported.

The classification of VAPP is usually done by exclusion, and requires a review by the National Polio Expert Committee (NPEC).

Vaccine-derived polioviruses:

Polioviruses emanating from the oral poliovirus vaccine (OPV) can be classified based on virological criteria, as:

- Sabin-like (or OPV-like) if the sequence diversity in the VP1 (viral protein 1) in the structural part of the genome is <1% compared with the corresponding parent Sabin strain;
- VDPVs if the sequence diversity in the VP1 is >1% compared with the corresponding parent Sabin strain.

Vaccine-derived polioviruses (VDPVs) can be classified further based on epidemiological grounds, as:

- cVDPVs (circulating vaccine-derived polioviruses) if more than one case of acute flaccid paralysis (AFP) can be associated with related VDPVs.
  cVDPVs represent an outbreak and should be responded to as would be to an outbreak of wild poliovirus in an non-polio-endemic area.
- iVDPVs (immunodeficient vaccine-derived polioviruses) if VDPVs have been isolated from an individual with an immunodeficiency disorder.

ANNEX VI: HOUSE MARKING

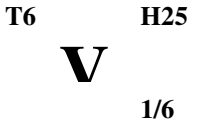
All household should be marked with white crayon. An attempt should be made to put the mark as visible as possible. If there is no wall, the mark can be put on a tree or any other big object close to the entrance.

The house mark should contain the following elements:

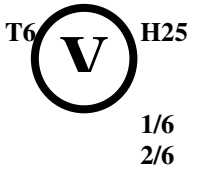
a) A team number, serial number of the house and the date of visit.
b) A V mark indicating that the house was visited, but children were missed for immunization. The house will be listed on the sheet for missed children and should be revisited.
c) A V mark in a circle indicating that the house was visited, and all children were immunized, or there are no children. The house does not need to be revisited.
d) An L mark indicating that a house was locked. The house will be listed on the sheet for missed children and should be revisited.
e) An L mark in a circle indicating that the locked house was revisited and still locked. If children were found and immunized, the L should be changed into a V.

Examples of house marking

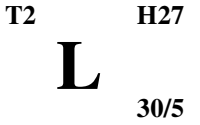
Team number 1 visited its 12th household on 1 June.
There are no children, or all children were immunized.



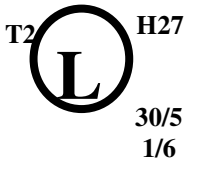
Team number 6 visited its 25th household on 1 June.
Some children were missing. The house needs to be revisited and is listed on the back of the tally sheet.



Team number 6 revisited its 25th household on 2 June.
All children were vaccinated.



Team number 2 visited its 27th household on 30 May.
The house is locked. It should be listed on the back of the tally sheet and revisited to check no children are missed.



Team number 2 has revisited the previously locked house on 1 June.
The house is still locked, but does not need to be revisited.

ANNEX VII: ORAL POLIO VACCINES (AND ITS DIFFERENT FORMULATIONS: MONOVALENT, BIVALENT, TRIVALENT)

There are three wild serotypes of polio: wild poliovirus type 1 (WPV1), wild poliovirus type 2 (WPV2) and wild poliovirus type 3 (WPV3). While WPV2 has already been eradicated (last isolated in 1999), indigenous WPV1 and WPV3 continue to circulate in areas of four countries: India, Nigeria, Pakistan and Afghanistan. Protection against one serotype does not offer protection against the other serotypes. For this reason, a variety of oral polio vaccines (OPVs) are available to strategically target the remaining serotypes in the most efficient manner.

All OPVs contain attenuated vaccine-strains of polio serotypes, and - unlike inactivated polio vaccine (IPV) - produces antibodies in the cell lining of the intestines, which is the primary site for poliovirus replication. These antibodies limit the replication of wild poliovirus inside the gut (should infection occur), and this can rapidly stop person-to-person transmission of wild poliovirus, which makes eradication of wild poliovirus feasible.

OPVs currently are available in four different formulations:

1. Trivalent OPV: the traditionally-used formulation, it contains attenuated vaccine-strains of all three serotypes, and hence offers protection against all three serotypes at the same time. However, it does so at a reduced efficacy than monovalent and bivalent OPVs.

2. Monovalent OPV type 1: the oral vaccine contains only the attenuated vaccine-strain of WPV1.

3. Monovalent OPV type 3: the oral vaccine contains only the attenuated vaccine-strain of WPV3. While both monovalent OPVs are effective in against their intended strains, it does so at a risk of increasing the prevalence of the opposite strain.

4. Bivalent OPV types 1 and 3: the newest vaccine developed, and first used in December 2009, delivers protection against both types 1 and 3 in a single dose. It has been shown to be significantly more effective than trivalent OPV, and almost as effective as the respective monovalent OPVs against specific serotypes.

New bivalent OPV (bOPV) is superior to tOPV for both serotypes & 'non-inferior' to mOPVs

New bOPV Product

Seroconversion after 2 x bOPV, India, 2008-9