

Measles SIAs Planning & Implementation Field Guide



**WORLD HEALTH ORGANISATION
REGIONAL OFFICE FOR AFRICA**



Revised April 2010

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Cover photo. A child being vaccinated during measles SIAs in Minjibir Local Government Area in northern Kano. Photo by Christine McNab.

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ACRONYMS

AD	Auto Disable/ Auto destruct (syringes)
AEFIs	Adverse Events Following Immunization
CFR	Case Fatality Rate
CPR	Cardio-Pulmonary Resuscitation
DPT1	Diphtheria – Pertussis –Tetanus vaccine 1st dose
EPI	Expanded Program on Immunization
FBOs	Faith based organisations
G/V	Gentian Violet
HIV	Human Immunodeficiency Virus
ICC	Inter-agency coordination committee
IEC	Information, Education and Communication
ITNs	Insecticide Treated Bed Nets
IU	International Units
KAP	Knowledge, Attitude and Practice
MoH	Ministry of Health
NGOs	Non-governmental Organizations
NIDs	National Immunization Day
OPV	Oral Polio Vaccine
RCM	Rapid Convenience Monitoring
SIAs	Supplementary Immunization Activities
SMC	Social Mobilization Committees
TAG	Technical Advisory Group
UNICEF	United Nations Children’s Fund
VVM	Vaccine Vial Monitor
WHO	World Health Organization

1 GENERAL INTRODUCTION

1.1 Background

Measles is a highly infectious viral disease for which humans are the only reservoir. Transmission is primarily person-to-person via aerosolised droplets. The average incubation period for measles is 10 – 12 days. The clinical syndrome is characterised by generalised maculopapular rash that starts at the hairline and descends to cover the whole body in 3 days, fever, conjunctivitis, coryza, cough and the presence of Koplik’s spots in the mouth. (Figure 1)



complications and death from measles.

In developing countries, up to 75% of cases may have one or more complications. These include pneumonia, diarrhoea, otitis media, laryngo-tracheo-bronchitis (croup) or encephalitis. The 3 major causes of high case fatality are pneumonia, diarrhoea and croup. Measles can lead to life long disabilities including blindness, brain damage and deafness. Low Vitamin A status is associated with a higher rate of

Figure 1. A case of measles with clearly evident facial rashes and a sick appearance.

The 3 major causes of high case fatality in measles are pneumonia, diarrhoea and croup.

Before the widespread availability of the measles vaccine, virtually all children contracted the disease and seven to eight million deaths occurred each year worldwide. Childhood immunization programmes have led to a dramatic decrease in measles morbidity and mortality. Between 2000 and 2008, the mortality in the African Region from measles is estimated to have come down from about 371,000 deaths annually to less than 30,000 deaths.

Despite the remarkable progress made in measles control, a combination of factors such as crowding, exposure at a younger age and malnutrition contribute substantially to high case fatality rates (3- 10%). During major outbreaks, case fatality rates are known to reach levels as high as 30%.

1.2 Measles Vaccination

▪ **Vaccine characteristics and storage**

Measles vaccine is made from live, attenuated virus. When correctly administered at 9 months of age, measles vaccine confers life-long protection to approximately 85% of those vaccinated. Measles vaccine should be kept at temperatures below 8°C. At central stores, it is recommended to keep the vaccine (and not the solvent) at a temperature of -20° C. Reconstituted measles vaccines quickly lose their potency at room temperatures; at 22° to 25° C they suffer approximately 50% loss in potency in one hour. It is therefore extremely important to keep reconstituted measles vaccine cool and protected from sunlight. This can be done by keeping opened vials in a hole on the foam covering the top of the vaccine carrier (Figure 2). The vaccine, once reconstituted, should be used within 6 hours. Opened vials of measles must be safely discarded at the end of each immunisation session.

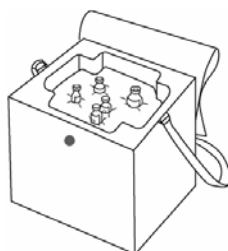


Figure 2. Keeping vaccine vials in the foam cover to protect them from direct sunlight.

Reconstituted measles vaccine should be kept cool and protected from sunlight at all times. The vaccine, once reconstituted, should be used within 6 hours.

▪ **Dosage and Administration**

Measles vaccine is given in a single dose of 0.5 ml subcutaneously usually at the outer part of the child's left upper arm. (Figure 3). It is recommended that measles vaccine be administered beginning at 9 months – the age when most children have lost maternally derived protection (maternal antibodies). There are virtually no contra-indications to measles vaccination.

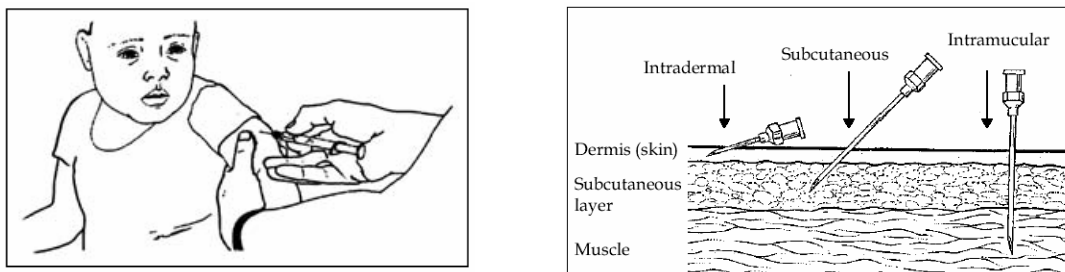


Figure 3. Subcutaneous administration of measles vaccine.

1.3 Reaction and Complications

Measles vaccine is generally safe. It is important to stress that the rate of serious adverse events following immunisation is quite minimal compared to the complications observed after measles disease or infection. Possible adverse events following measles vaccination are listed in the table below, indicating that these are very rare as compared to the occurrence of similar risks following measles illness.

Adverse Effect	Estimated Risk Associated with Vaccination	Estimated Risk After Measles
Fever \geq 39.4 C	1 in 9	Always
Rash	1 in 10	Always
Febrile convulsions	1 in 2500	1 in 200
Encephalitis/ Encephalopathy (and other serious neurological disorders)	1 in 1,000,000	1 in 1,000
Sub-acute sclerosing pan-encephalitis	1 in 1,000,000	1 in 50,000

Table 1. Risk of adverse events associated with measles vaccination and disease

1.4 Strategies for Accelerated Measles Control and Elimination

As of 2010, most of the developed countries have successfully managed to eliminate indigenous circulation of measles. The African Region has been implementing these same strategies since 2001, and has proven that measles mortality was reduced by more than 90% within less than 8 years. However, the push for the elimination of measles requires that further emphasis be laid on the routine immunisation component of these strategies, in order to attain near zero mortality levels in a sustainable manner.

The strategies are:

1. Strengthening routine immunisation to achieve and sustain high coverage
2. providing a second opportunity for measles immunization through the implementation of high quality Supplemental Immunisation Activities (SIAs)
3. conducting epidemiologic surveillance with laboratory confirmation of cases and outbreaks
4. ensuring that improved case management is implemented

Whatever the degree of control of measles in a country, high measles vaccine coverage in every new birth cohort through routine services is necessary to control measles and sustain the achievement over time. SIAs should therefore be accompanied by simultaneous actions aimed at improving routine services.

Attaining and maintaining high level coverage through the routine immunisation program is very important for the sustainability of measles mortality reduction and elimination, this document will only deal with the SIAs component of the strategies. The African Regional Guideline for implementation of the Reaching Every District approach for immunisation, the Immunisation in Practice modules, the EPI Mid-Level Managers' training modules and a number of other reference documents deal with the routine immunisation component adequately and should be referred to if needed.

2 SUPPLEMENTAL IMMUNISATION FOR MEASLES CONTROL

2.1 Purpose of SIAs

Supplemental Immunization Activities (SIAs), also referred to as mass immunisation campaigns, are necessary to reach never-vaccinated children who have never had measles disease and to provide an opportunity for a second dose for cases of primary vaccine failure. All children in the target age group and geographic area will be eligible to receive a dose of measles vaccine irrespective of past immunisation or history of clinical measles. A second dose of measles vaccine, available through good quality supplemental immunisation reduces the proportion of susceptibles in a given population quite rapidly, prevents measles outbreaks and in the context of high routine immunisation coverage, can help to eliminate indigenous measles transmission.

Even with high routine EPI coverage, susceptible individuals will accumulate for the following reasons

- Un-reached or un-vaccinated children within the community
- Primary vaccine failure as a result of the fact that measles vaccine is about 85% effective when given at 9 months of age.

SIAs, apart from providing a perfect second opportunity for immunising children, are also opportunities to build national capacity by improving cold chain and logistics capacity, by providing refresher training to health workers, strengthening local partnership and coordination among different stakeholders and partners, and by increasing community awareness regarding vaccination.

The capacity of countries to successfully undertake large scale SIAs is determined by the level of political commitment, technical capacity, human and financial resources, strength of routine immunisation services and capacity for disease surveillance.

2.2 Types of Measles SIAs

Supplemental vaccination activities will entail

- “Catch-up SIAs”: A one-time effort to vaccinate all children under the age of 15 years. Experience in several African countries has shown that there is significant incidence of

measles above 5 years and with equally significant mortality. In general, children aged 9 months to 14 years are targeted in catch up SIAs since more than 90% of measles incidence takes place in this age group. Here, the purpose is the rapid reduction of susceptibles in a population. As of the end of 2010, 43 of the 46 countries in the African Region have done successful catch-up measles SIAs between the years 1997 and 2006.

- “Follow-up SIAs”: periodic mass immunisation campaigns conducted every 2-4 years to reduce any build up of susceptibles born since the previous SIAs. The timing of follow-up SIAs is determined by the speed of accumulation of susceptibles which in turn is a function of the routine immunisation coverage and the coverage during preceding SIAs. Specially designed computerised tools are available to determine population susceptibility profiles and help in deciding the timing of campaigns.

2.3 Determining intervals between measles SIAs

Epidemics of measles occur when the number of susceptible individuals in a population reaches a critical threshold. As immunisation coverage increases, the size (number of cases) of the epidemics decrease, the inter-epidemic period lengthens, and the proportion of cases among older children increases. Figure 4 illustrates the relationship between routine immunisation coverage, the coverage achieved during SIAs and the expected window period before follow up campaigns may be necessary. For any given coverage achieved during SIAs, the interval between campaigns necessary to prevent epidemics increases with increasing routine immunisation coverage.

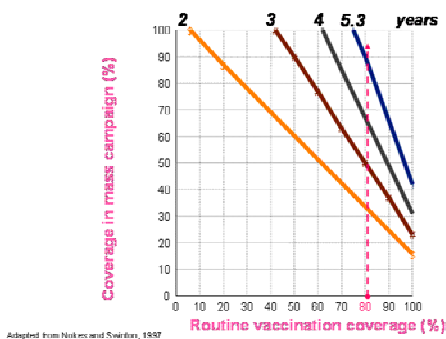


Figure 4. Relationship between routine immunisation coverage, campaign coverage and the expected inter-campaign interval

The African Regional measles Technical Advisory Group (TAG) has clearly laid out the criteria to be used for the determination of the interval and age target during follow up measles SIAs. These criteria¹ follow the “accumulation of susceptibles as compared to the size of the birth cohort model” and indicate that:

- *After measles SIAs that achieve relatively homogeneous coverage rates of >90%*
 - *If routine measles coverage >80% - an interval of 4 years is recommended targeting children 9-59 months of age.*
 - *If routine measles coverage >60%-79% - an interval of 3 years is recommended targeting children aged 9-47 months.*
 - *If routine measles coverage <60% - an interval of 2 years is recommended targeting children 9-35 months of age*
- *After measles SIAs that achieve relatively homogeneous coverage rates <90%*
 - *If routine measles coverage >80% - an interval of 3 years is recommended.*
 - *If routine measles coverage <80% - an interval of 2 years is recommended.*
- *After measles SIAs with “relatively heterogeneous” coverage rates*
 - *A decision should be made on a case by case basis after detailed analysis of country data*

Another related recommendation² from the second African Regional measles TAG meeting states that:

- *countries should consider using WHO/UNICEF coverage estimates in addition to administrative coverage data to calculate the inter-SIA interval.*

However, in addition to the guidance given above, the determination of the age group to target during measles follow-up SIAs should also take into consideration the measles epidemiology in the specific area.

2.4 The roles of partners in the planning and implementation of measles SIAs

SIAs provide a perfect opportunity to build new partnerships where they never existed, and to strengthen existing ones. In the initial planning stages, the MoH should conduct a role analysis of different partners and try to determine which activities might be better supported by specific partner

¹ First African Regional Measles TAG meeting. April 2005.

² Second African Regional Measles TAG meeting. May 2008.

agencies and organisations. Civic societies, Professional medical societies, the private sector, the manufacturing sector, the media, schools and teachers, cultural institutions, Religious leaders and organisations, relief and humanitarian organisations, volunteer groups, Bilateral aid agencies and UN agencies all have roles to play in mass immunisation campaigns. These roles span from financial support to advocacy and technical support, from the provision of facilities for social mobilisation (eg, free airing of radio messages, SMS messaging by cellular network operators), cold chain storage, waste management (use of industrial incinerators for getting rid of injection waste), transportation, personnel (eg., volunteers from nursing schools, NGOs, civic society groups, etc), and others.

Influential global partners have a significant role to play in terms of advocacy with national authorities and with local partners, so that the necessary commitments are secured, resources are mobilised and preparation for the SIAs are initiated early enough. Such advocacy visits or efforts are best conducted at least 6 to 9 months before the proposed date of the SIAs.

3 PLANNING MEASLES SIAs

3.1 General Considerations

3.1.1 *Target population*

Supplemental immunization activities should reach the members of the population who are most likely to die from measles to reach the goal of reducing mortality due to measles disease. All children in the target age group should be vaccinated, regardless of their history of measles immunization or illness. The receipt of measles doses in the preceding days, however recent, should not be a reason not to vaccinate a child during SIAs. This eliminates screening and provides protection for the 15% or so of children who have not developed immunity with their first dose of vaccine, thus giving them a second opportunity.

During SIAs, all children in the target age group should be vaccinated, regardless of prior measles immunization status, regardless of the date of last measles vaccination, or history of measles illness. Even if a child has received the routine dose of measles vaccine a few days earlier, it will still be eligible for the SIAs dose. This does not increase the risk of adverse events related to the vaccine.

Lower age limit: In normal circumstances, the lower age limit for measles vaccination during SIAs should be 9 months. Children as young as 6 months may be vaccinated in SIAs if a significant proportion of measles cases occur in children between 6 and 9 months of age. This decision has to be taken on a case by case basis after a thorough review of the epidemiological information. However, children who are vaccinated before 9 months should receive another dose at 9 months in order to ensure protection, because up to half of those vaccinated before 9 months do not develop immunity against measles.

“Upper Age Limit” – Follow-up SIA: target age group should include children born since the last campaign. For example, if the most recent campaign was held three years ago, children born ever since, and those who were not yet eligible during the catch-up SIAs (aged below 9 months or 6 months of age as the case might be) should be immunized. According to this scenario, this would include children 9 to 47 months. However, the epidemiological picture, i.e., the age breakdown of confirmed measles cases and deaths, should also be taken into consideration to determine the extent of measles follow up SIAs. (Please consult the TAG criteria outlined on the previous page.)

3.1.2 Timing:

While measles may occur throughout the year, it is more often a seasonal disease with peaks during certain months. The best time to schedule measles SIAs is during seasons of low transmission, as determined from local experience and from review of epidemiological data. Planners should also take into consideration factors such as seasonal accessibility, and important events such as planting, harvesting, religious, traditional and political events, school openings, etc.

3.1.3 Duration:

Measles SIAs often take place over 4 – 7 days. Most countries initiate SIAs activities at the end of the work week, and use the weekend as well to conduct mass vaccination. This is to help busy parents and caretakers to bring their children for services during the weekend break. In addition, having a weekend for the SIAs permits urban vaccination teams and SIAs supervisors in big towns to operate more easily, since traffic is considerably lighter.

Experience has shown that the level of attendance at vaccination posts is quite high in the first three days, with a significant drop thereafter. In the first days of the SIAs, it helps to deploy more teams to densely populated areas to help deal with the load. In general, the more health workers are available to vaccinate, and the better the logistics preparation, the shorter the duration of SIAs will be.

It should also be noted that monitoring during the SIAs may indicate the need for an extension of the SIAs if children are not being reached adequately. This may be due to an unforeseen stockout of inputs, rumours disrupting the campaign activities, etc. National level immunisation program managers have to prepare for such an eventuality and, once the decision is reached, it should be communicated to the operational level timely and clearly.

3.1.4 Target area for SIA:

It is strongly recommended that SIAs be conducted in large, contiguous districts or ideally nationwide. In the absence of resources needed to launch nationwide SIAs, a “rolling” approach can be adopted where SIAs are conducted in smaller but contiguous regions, to cover the whole area within the shortest possible time frame. As an example, a country might decide to do SIAs targeting all children in the eligible age group in half of the provinces of the country during the first half of the year, and the other half during the second half of the same year.

The First African Regional Measles TAG recommendation³ states that:

As regards splitting mass campaigns (SIAs):

- ✓ *Catch-up SIAs should only be split or implemented in rolling fashion if it is logistically not possible to conduct nationwide campaigns in a single action. If so held, any split SIAs should address large geographically contiguous areas.*
- ✓ *Follow-up SIAs - even in the case where the catch-up SIAs was split - should*
 - *Not be split unless it is epidemiologically or logistically imperative*
 - *Only be split if routine coverage by province/region is “very heterogeneous”*
 - *Use the date of the earliest catch-up phase as “time zero” in determining the inter-campaign interval.*
 - *Address large geographically contiguous areas if at all split*

In order to enable more effective planning for SIAs, countries are encouraged to review the epidemiology of measles, and to assess their cold chain and logistics capacity, the policy and practices of injection safety and medical waste disposal, as well as disease surveillance and laboratory performance.

3.1.5 Integration with other child survival interventions:

Integrating measles SIAs with other interventions may provide managerial, financial and logistical advantages. Measles SIAs have in the past been successfully utilised to provide an integrated package of child survival interventions including Vitamin A, de-worming medicine, insecticide treated Bednets (ITNs), and oral polio vaccine. There is also experience from a few countries integrating measles SIAs with TT vaccination of women of child bearing age. However, detailed and early planning, as well as good social mobilisation and program coordination are vital to the success of such multi-intervention campaigns. Especially, the national authorities have to ensure that the human resource pool is adequate enough to deliver the multiple interventions planned.


The integration of multiple child survival interventions into a measles SIAs platform, as desirable as it is in terms of reaching the target populations, might endanger the success of the measles vaccination campaign unless properly planned and prepared for. The issues of national level integration and coordination between the different programmes, as well as the logistical complexities have to be very

³ First African Regional Measles TAG meeting. April 2005.

well thought out. Any gap in the training of staff and in the organization of the event is likely to be exaggerated from the program perspective because of the multiplicity of actors and interventions involved. There have been instances where the stock-out of one of the inputs has ended up affecting the turnout for the measles vaccination. The role of joint planning, monitoring and evaluation at every step of the campaign preparation and implementation cannot be overemphasised.

It is in the interest of all participating programmes to decide, as early as possible, which interventions are to be integrated and the geographic areas and target populations to reach. These should be incorporated in the initial macro-plan as much as possible, and communicated to the sub-national level prior to the initiation of the micro-planning process. It is also important to note that once the micro-plans have been developed at the district level, changes in scope (target populations, type of interventions) should be kept to a minimum as this often weakens the quality of the microplans, requiring desk reviews and creating difficulties in coordination and logistics at all levels.

Because of the different target age groups for the various interventions, some countries have found it useful to introduce a triage or screening card where, after verifying the age of the child, the screener and or a health worker help to identify and mark the interventions for which the child would be eligible. One such triage card from Angola is indicated in figure 5.


Ministério da Saúde
 Direcção Nacional de Saúde Pública

CARTÃO DE CRIANÇA
Campanha Nacional Viva a Vida Com Saúde

Município : _____ Nome : _____
 Aldeia/Bairro/Município : _____ Idade : _____
 Data : ____/____/____



IDADE	A receber	Serviços	Recebido
0 menores de 5 anos	<input type="checkbox"/>	Pólio	<input type="checkbox"/>
6 meses a 11 meses	<input type="checkbox"/>	Vitamina A (Capsula azul)	<input type="checkbox"/>
1 ano a menores 5 anos	<input type="checkbox"/>	Vitamina A (Capsula vermelha)	<input type="checkbox"/>
1 ano a menores 2 anos	<input type="checkbox"/>	Albendazol (½ comprimido) 	<input type="checkbox"/>
2 anos a menores de 5 anos	<input type="checkbox"/>	Albendazol (1 comprimido) 	<input type="checkbox"/>
9 meses a menores de 5 anos	<input type="checkbox"/>	Sarampo	<input type="checkbox"/>
0 a menores de 5 anos	<input type="checkbox"/>	Mosquiteiro	<input type="checkbox"/>

Figure 5. Triage card used during integrated measles SIAs in Angola.

3.2 National Level Planning

Macro-planning at National level helps to develop realistic budget estimates to secure policy level commitment and to mobilise resources, to obtain commitments from key partners, and to order vaccines, cold chain equipment and related supplies. The national level planning process has to include a thorough review previous performance in order to glean out good local practices that have been associated with successful outcomes in the past. The plan has to ensure that these practices will be scaled up and rigorously implemented.

At national level, planning for measles SIAs includes the following elements:

- Obtaining go ahead from policy makers
- Soliciting high-level political commitment
- Involving the EPI Inter-Agency Coordinating Committee (ICC)
- Establishing appropriate inter-sectoral sub-committees (e.g., planning, social mobilisation, logistics, monitoring and evaluation, resource mobilisation, training, etc)
- Resource mobilisation
- Developing a plan of action, that specifies the target population, target area, timelines for the various activities.
- Recruitment of extra personnel (national or international supervisors) as necessary
- Developing training materials/ guidelines etc...
- Social Mobilisation
- Developing logistics planning and monitoring tools
- Conducting micro-planning workshops
- Organising district-level training
- Procurement of vaccines and other supplies
- Distribution of vaccine, supplies and other campaign materials to peripheral levels

The proposed budget in the national level macro-plan is expected to address these issues adequately. Measles SIAs are often costed at around USD 1 per child targeted, and so the proportional distribution of these costs might look like the following:

- Vaccines and devices: USD 0.35 per child
- Operational cost: USD 0.65 per child roughly divided as follows
 - Micro-planning and training: USD 0.08 per child
 - Cold chain strengthening and waste management: USD 0.06 per child

- Social mobilisation: USD 0.1 per child
- Personnel: USD 0.3 per child
- Fuel and Transportation: USD 0.08 per child
- Monitoring and evaluation: USD 0.03 per child

However, these cost estimates remain rough guides, and the totals as well as the breakdown may vary depending on the country's specific situation.

The proposed timing and details of the preparatory and implementation activities at national level are given in table 2.

Table 2. Steps and timeline for planning high quality measles SIAs - National level

Suggested Timing	Activity
6 - 8 months before SIAs	Develop a budgeted macro-plan with a timeline to be used for resource mobilization purposes
	Initiate discussions within the MoH and the Ministry of Finance with regards to the allocation of budgetary resources to the measles SIAs
	Present draft macro-plan and initiate discussions within the Inter-agency coordination committee (ICC) regarding the financing
	Initiate discussions within local partners with regards to the mobilization of local resources for the measles SIAs
	Establish national coordinating committee
	Establish technical sub-committees and discuss their terms of reference
6 - 7 months before SIAs	Meet with district leaders and health officials
	Develop a plan for social mobilization and for logistics
	Update logistics spreadsheets and ensure consistency of calculations
6 months before SIAs	Develop and field-test guidelines
	Secure endorsement of the finalized macro-plan by the ICC
	Place order for vaccines and injection devices
	Initiate local resource mobilization efforts with NGOs, the private sector, Bilateral and multilateral organizations, etc.
4 - 5 months before SIAs	Conduct micro-planning workshops at district level
	Review and validate micro-plans at national level
	Recalculate a more precise budget and resource needs according to the micro-plan
4 months before SIAs	Print and distribute guidelines to provinces and districts
	Develop task lists for various levels
	Develop Social mobilization materials
	Confirm participation of important public figures in launching ceremony
3 months before SIAs	Develop & print supervisory checklists, tally sheets, summary forms etc
	Develop and prepare training materials and tools
	Develop radio/ TV announcements and press articles
	Develop the plan for the monitoring and evaluation of SIAs

8 weeks before SIAs	Conduct supervisory visits to provinces and districts
7 weeks before SIAs	Start to prepare the launching ceremony
6 weeks before SIAs	Verify availability of transport for supervision, social mobilisation etc...
	Make funds available to the district level for operational costs
3 - 4 weeks before SIAs	Transport vaccine from central level to provincial cold rooms and district levels
3 weeks before SIAs	Conduct supervisory visits to problem districts
	Prepare supervisory teams for SIAs
	Confirm preparations for opening ceremony
1 – 3 weeks before SIAs	Start regular newspaper, TV and radio announcements
	Conduct separate training of vaccination and supervisory teams at all levels
2 weeks before SIAs	Conduct supervisory visits to selected districts to confirm level of preparation
1 week before SIAs	Set up a national “operations control room” to follow the SIAs and provide back up support to the sub-national level
	Intensify all social mobilization activities
1 - 2 days before SIAs	Prepare site for launching ceremony and verify public relations arrangements
Day of start of SIAs	Conduct opening ceremony
Every day of the SIAs implementation	Visit / supervise service delivery posts and vaccinating teams
	Follow up and review implementation by contacting national supervisors deployed to the sub-national level
	Provide backup support to the sub-national level
	Support daily monitoring meeting at district, regional and central level with key stakeholders
	Support in-process monitoring (rapid convenience monitoring by supervisors and independent monitors)
1 week after the SIAs	Actively collect and compile the coverage results from all administrative units
2 weeks after the SIAs	Conduct a national review meeting with the participation of supervisors, consultants, program managers, national and sub-national level coordinators
	Conduct cluster survey
1 month after SIAs	Compile and submit a technical report
	Provide written feedback to the sub-national level

3.3 District Level Planning

District planning, supported by the provincial and the national level, follows a schedule of activities similar and complementary to national level planning but with greater operational elements (see Table 3).

Table 3. Steps and timeline for planning high quality measles SIAs at the District Level

Target Time for completion	Activity
5- 6 months before SIAs	Prepare initial planning meeting: census data, maps, list of communities, inventory of human resources, transport and cold chain equipment in the district
	Establish a district SIAs coordinating committee relevant technical subcommittees composed of participants from health and other sectors
4 months before SIAs	Conduct district level micro-planning workshop

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	Verify the availability of transport logistics for the distribution of vaccines and materials,
3 months before SIAs	Meet with the sub-district and local level SIAs coordinators
	Distribute a schedule and task lists
	Distribute SIAs guides to sub-district and local coordinators
8 weeks before SIAs	Initiate local level social mobilization activities
	Visit and design strategies for difficult to reach and special populations
6 – 8 weeks before SIAs	Verify the availability of transport logistics for the distribution of vaccines and materials, supervision etc.
	Finalize logistics distribution plans
	Conduct supervisory visits to health facilities and sub-districts to assess readiness
4 weeks before SIAs	Start to prepare for the local launching ceremony
1 - 3 weeks before SIAs	Transfer vaccines and materials to health facilities and sub-districts
	Organize second round of pre-campaign supervisory visits to selected sites
	Initiate activities for hard to reach areas and special populations
	Intensify social mobilization activities
	Conduct separate training of vaccination and supervisory teams at all levels
1 week before SIAs	Visit and support selected sub-district and post coordinators
1 – 2 days before SIAs	Confirm deployment of supervisors
Day of start of SIAs	Conduct opening ceremony
3 days after SIAs	Meet with all sub-district coordinators in district
Every day of the SIAs implementation	Visit / supervise service delivery posts and vaccinating teams
	Conduct in-process monitoring (rapid convenience survey by supervisors and independent monitors)
	Calculate immunization coverage at the end of each day for all levels
	Daily meeting of all district supervisors and coordinators to review daily admin coverage, and to review the quality of SIAs implementation
	Respond to all reports/ rumors of adverse events
1 week after SIAs	Review supervision check-lists
	Estimate vaccine coverage & wastage in district
	Submit coverage results and reports on locally learnt lessons to the national level
2 weeks after the SIAs	Participate in the national review meeting

3.4 Micro-planning



The micro-planning exercise is a bottom-up approach of planning that should start at the district level. This exercise should try to come up with valid and realistic estimates of the resource needs based on the target population and the reality on the ground with regards to existing and locally available resources – human as well as material. The opportunity should be maximally used to look into the cold chain status and waste management issues among others. The involvement of other

Ministries, NGOs, Faith based organisations (FBOs), civic society groups and other stakeholders in the planning stage helps to pool resources that normally may not be readily available.

The national level should provide guidelines on how to do micro-planning at the district level, based on the selected strategy of delivery and the selected mix of services during the SIAs. As preparation for the micro-planning workshops, guidelines should be provided in advance so that participants come to the workshop with the following information regarding their specific catchment areas:

- Target population by community
- % Population in rural and urban zones
- Cold chain situation: numbers, locations, gaps and possibilities from e.g. private sector
- Number of vehicles of various types, health workers, volunteers that can be mobilised locally
- A list of traditional and potential new partners (organisations, sectoral offices, private institutions, etc) working at local level, and their potential contributions to the SIAs
- Daily road map of each vaccination team and each supervisor
- Distances to position vaccine in the region/district
- Hard-to-reach areas and populations, with their suggested solutions
- Maps illustrating all the above

The national level should also clarify that the review and synthesis of microplans, to be done at provincial and national levels, may include some upward or downward revision of the district level planning figures (in consultation with the lower levels) for the sake of consistency, and to address any previously unforeseen factors.

Micro-planning exercises should include the mapping of service delivery posts, identification and mapping of high-risk areas and populations, mapping of stakeholders at the local level based on guidelines and templates to be provided from the national level. The key points for logistics planning include using the same format for micro-planning at all levels, making simple and consistent calculations and ensuring adequate cold space at all levels. The calculations specified below should be made using a spreadsheet or micro-planning tool for each sub-district. Sample micro-planning spreadsheets have been annexed (Annex 1).

The key to successful micro-planning lies in allowing enough time to plan in-depth and to include mapping as an essential part of the district micro-planning process.

3.4.1 *Types of Vaccination Posts*

Fixed (permanent or temporary) or mobile vaccination posts may be employed during measles SIAs.

Permanent - Fixed Immunization posts

These posts are located at permanent health facilities and community health posts. Immunization services will be provided at the health facilities the whole day for the days during the campaign. These sites will also serve as depots for storage and distribution of vaccine to temporary fixed sites and mobile teams.

Temporary - Fixed / outreach Immunization posts

These posts may be located at schools, churches, mosques, local administrators' offices, bus depots, roadblocks, market areas, border crossing points, village squares, etc. Villages and settlements with small populations may also be served through such temporary sites. Immunization will be provided at these sites for either the duration of the campaign or partially, depending on the population density.

Mobile - Immunization posts

These posts move from community to community reaching populations that are living in hard-to-reach areas who may not have access to a fixed site, too small in size to justify an all-day fixed post or unlikely to visit the fixed sites. Villages and settlements with very small populations may also be served through mobile services. These mobile teams set up an immunization post at a fixed site for a few hours or a day, and then move the post to a new site after completing their task. A mobile vaccination team may provide

services in a temporary site like in schools, churches, mosques, at the village square, under a tree shade, etc.

3.4.2 Estimating the target population

Immunisation program managers, and coordinators of SIAs should obtain population data from an official source before the campaign and for consistency, ensure that all involved in planning SIAs use the same figures. A review of coverage data from previous immunisation campaigns, and from the routine immunisation system often gives some ideas as to whether the official population figures are underestimated. If different population figures are available, the higher figure should be used for estimates. It is better to over-estimate rather than under-estimate the target population to avoid resource shortages.

It has already been stressed that all target children need to be reached regardless of vaccination status or history of measles disease. In order to be effective, measles SIAs have to reach over 95% of the target population. Estimating the denominator therefore assumes great significance in measles control. While it is advisable to use officially accepted population figures for the campaign, all efforts need to be made to ensure that all eligible children are reached. Towards improving the estimation of the denominator, it is recommended that local campaign managers and supervisors work with the communities (particularly women's groups, community health workers, etc) and ask them to line-list the children in the target age range by household. The children who attend are then ticked off against the list and volunteers are sent for door-to-door canvassing to encourage parents of any missing children to participate.

If the proportion of the target population living in urban and rural areas is known, the size of the population in the different areas can be calculated.

3.4.3 Estimating Vaccine Requirements

Experience from many African countries indicates that the average vaccine wastage rate during measles SIAs is less than 10%. Therefore wastage rates should be calculated on the basis of previous experience when available. However, for the purpose of estimating requirements, a rate of 15% is used and the balance will be used to supplement supplies for the routine immunization activities.

As measles vaccine is usually supplied in 10 dose vials, divide the number of doses required by ten to calculate the number of vaccine vials necessary. The final number of doses calculated should be rounded up to the nearest hundred. The following formula is used to calculate the number of vials of measles vaccine:

Target pop'n x wastage multiplier factor⁴ of 1.18 (wastage rate of 15%) = number of doses of measles vaccine

Example: Kano District

34,289 children aged 9-59 months x 1.18 = 40,461 doses

40,461 rounded up = 40,500

40,500 divided by 10 = 4,050 vials.

3.4.4 *Estimating syringes and safety boxes required*

As guided by WHO policy (*WHO/EPI/HIS/97.04*), all SIAs must only use auto-disable syringes. For mass measles immunization the following supplies are required:

- auto-disable syringes (0.5ml) and needles
- mixing syringes (5ml)
- 19G needle
- cotton swabs
- 'sharps' disposal safety boxes

Auto-disable (AD) syringes for injection:

The policy of one child- one syringe- one needle should strictly be observed in all measles campaigns. For ease of calculation, the same wastage factor is used for vaccines and syringes. The number of AD syringes equals number of doses of measles vaccine calculated above.

Example: Kano District

40,500 doses of vaccine ordered = 40,500 auto-disable syringes

Disposable syringes and 19G needles for vaccine reconstitution:

One disposable 5 ml syringe (and needle) is required for every vial of vaccine.

Example: Kano District

4,050 vials of vaccine ordered = 4,050 disposable syringes (and needles) for reconstitution

⁴ Wastage multiplier factor = 100/ (100 - wastage rate)

Safety boxes:

1 safety box (10L) can hold 100 syringes and needles. Therefore for each district, health centre and vaccination post, adding the number of vaccination - AD – syringes plus the number of disposable reconstitution syringes and dividing by 100 gives the number of safety boxes required.

Example: Kano District

40500 vaccine syringes + 4050 reconstitution syringes = 44,550 total syringes

44,550 divided by 100 = 4,455 safety boxes

3.4.5 Estimating cold chain requirements

Some calculations need to be done at each level to verify whether there is adequate cold space for campaign supplies at the district level. To calculate the amount of cold chain space available for vaccine supplies for SIAs, subtract the estimated amount of space used for routine immunization services from the total available space. This requires an updated inventory of the working cold chain equipment available, and a review of the cold space provided by each type of equipment. As a general rule, every 500 doses of measles vaccine require approximately 1 litre of storage space.

Example: Kano District

40,500 doses of vaccine / 500 doses = 81 litres of fridge (cold storage) space needed to store measles vaccines

In order to satisfy the extra demand, cold space may be “borrowed” temporarily from the private sector, other ministries or NGOs. In general, the most serious problems of inadequate cold space will occur at the provincial, or district level when mass supplies and vaccines arrive at the depot storage centre. Where there’s a functional fridge, storage space at the most peripheral level is usually adequate.

3.4.6 Estimating the number of teams necessary

The success of mass campaigns depends in large part on there being enough teams of dedicated personnel. Micro-planning activities should take into account the written terms of reference and job description developed by the national level for members of the various teams (vaccination and supervisory teams). Most operational costs are affected by the number of teams to an even greater extent than by the number of children to be vaccinated. Vaccination teams comprise vaccinators and

volunteers. Qualified health workers should be drawn carefully from hospitals and/or health facilities to ensure minimal disruption of essential services. The respective roles are indicated below.

The number of teams necessary and their composition will depend on the population density in the area, and the inclusion of other integrated interventions (e.g. distribution of bed nets, de-worming medicine, Vit A, other antigens,...).

Vaccinators; health workers trained in injection techniques and vaccination

- Reconstitution of vaccine
- Administration of vaccine
- Safe disposal of waste
- Response to adverse events
- Final summary of number of children vaccinated
- Supervision of and guiding the volunteers

Volunteers: have no specific health training

- Crowd control
- Screening children
- Recording/ tallying
- Mobilising the community and identifying unvaccinated children in the eligible age group

Volunteers may be organised from civil society organisations, NGOs and FBOs, Red Cross/ Red Crescent societies, high schools, nursing colleges, etc. However, SIAs coordinators at local levels need to secure prior consent and organise with the respective organisations to be able to deploy the volunteers on the specified dates. The issue of motivating volunteers, either through direct payment of an agreed upon amount of money as per diem or lunch allowances etc, or the provision of certificates of participation, etc has to be thought of well in advance and due preparations made.

The number of teams necessary and their composition will depend on whether the vaccination post is in a rural or urban setting. The presence of other integrated interventions (eg., distribution of bed nets, de-worming medicine...) as well requires that the team size increase accordingly.

Possible locations of vaccination posts include schools, churches, bus depots, and market areas. In urban areas these sites may have more than one vaccination post with a separate team for each post. Given the challenges attendant to the administration of measles vaccine, it is currently not recommended to use the house-to-house approach of vaccination service delivery in most African countries. However, mobile teams can complement the activities of the teams at fixed permanent and fixed temporary sites. These teams set up temporary immunisation posts for a few hours at a fixed site and then move the post to a new site after completing their task.

The schedule of deployment of vaccination teams depends on the local situation. However, it may be judicious to assign teams in sparsely populated areas to cover permanent fixed posts for the first few days when the expected turnout is high, and then deploying them in temporary fixed sites or even mobile teams for the remaining days of the campaign.

Urban: A vaccination team in the urban setting, with minimal travel requirements, can vaccinate between 300 and 400 children per day, depending on the number of volunteers available. In the urban setting, the ideal composition of a vaccination team is

- 2 vaccinators (1 for vaccination, 1 for reconstitution)
- 3 - 4 volunteers (1 recording, 1 for screening children, 1 - 2 for crowd control)

Under certain circumstances, a vaccination post may be operated with fewer persons depending on availability of health workers and volunteers. On the other hand, in high density urban areas, especially during the first 2 to 3 days of the SIAs, large crowds are likely to form and waiting times for services may be too long. In such cases, the option of placing more than one team in one site should be explored. The extra team may be dispatched elsewhere after the third day.

During measles campaigns, only qualified health workers should perform vaccine reconstitution and the actual delivery of the vaccination.

Rural: Teams in rural settings often have to cover large surface areas, and parents/ caretakers have to travel long distances. Therefore, the expected number of children to be reached every day at rural sites tends to be smaller than in urban areas. The team composition and numbers will depend on the location

of the service delivery post with regards to the area to cover, the population density and as well as the size of the target population. The following recommendations concerning the number of children to vaccinate per day are made for different sizes of rural vaccination teams

- A Team comprising 1 vaccinator and 1 volunteer: 100 – 150 children/day
- A Team comprising 2 vaccinators and 1-2 volunteers: 150 - 200 children/day

Example: Luapula rural sub-district has 1800 children to reach using 9 health workers.

1800 children / 100 children/ day = 18 days necessary

18 divided by 3 teams = a maximum of 6 days to vaccinate target population

3.4.7 *Estimating vaccine carrier and icepack requirements*

In general, each team should have 1 vaccine carrier, and will require 4 frozen ice packs or approximately 1 kilogram of ice per day of work. The number of days the cold packs or ice will be needed is determined by the number of days of duration of SIAs plus the 2 days for travelling to and from the vaccination post. In some settings it may be preferable to supply teams with more than one vaccine carrier, when all the foregoing estimates will be doubled. If ice is to be used, ice makers should be notified in advance of the amount needed and the timing.

3.4.8 *Estimating transport requirements*

Transport is needed at all levels before and during SIAs for the following purposes:

- Transportation of vaccines, Vitamin A, cold chain equipment such as cold boxes, ice packs, vaccine carriers and other supplies from the central to periphery levels of service delivery points.
- Distribution of social mobilization and monitoring materials.
- Transport of personnel for monitoring and supervision of SIAs planning and implementation, other personnel to conduct independent observation of SIAs process and manning the vaccination posts.

All rural-mobile vaccination teams should have an independent mode of transport. There is no simple formula for calculating transport requirements, as these will vary dramatically in each area. Districts are expected to use the vehicles within the health sector as well as solicit support from other government

departments, the military, FBOs, NGOs, as well as businesses and service establishments in the private sector. Depending on the terrain, alternative modes of transportation may be needed, including air transport, boats, rafts, and animals.

3.4.9 Calculating Fuel and Transport Costs:

Calculations should consider possible variation of fuel prices within a country and field conditions e.g. mountainous terrain, water transport etc., which affect the number of km/liters of fuel. One manner to calculate fuel costs is to give each team in a district an average number of kilometres of travel. Provision should also be made for vehicle maintenance and repair. One suggestion is to include 15% of all fuel costs for vehicle maintenance at the district level.

3.4.10 Estimating personnel costs:

Per-diem rates for vaccinators and volunteers should be decided before the micro-planning. The per-diem rate to apply during the SIAs should be clearly communicated to all participants beforehand. Any problems or misunderstanding regarding payment rates has to be resolved well before the SIAs start. Per-diem may be uniform for all personnel or may vary depending on the responsibilities of participants (volunteer or health worker).

Example

Kendu District has 30 vaccinators and 80 volunteers who will work for 3 days each to complete the measles SIAs. If there's a standard per-diem rate of \$15.00 per person per day for health workers and USD 10.00 for each volunteer per day, then the personnel costs for Kendu will be

30 vaccinators x 5 days x \$15.00 = \$2250.00

80 volunteers x 5 days x \$10.00= \$ 4000.00

In the case of integrated interventions that require additional staffing for service delivery, the national level should clarify the source of funding, and the costing for activities and for the different personnel involved in the SIAs.

3.4.11 Estimating budget for training and planning at district level

Estimation of training budget requires the number of trainees, the number of trainers, and the number of days of training to be multiplied by the per-diem rates. The stationery costs for a standard set of items is also factored in trainings and planning meetings. Transportation costs for the different participants in these sessions will have to be calculated as well.

3.4.12 Estimating other necessary materials

During micro-planning, it is important to remember and include the costs of materials not directly related to vaccination. These include:

- Pencils for vaccine posts
- Tally sheets (sufficient number per post)
- Materials for training - including pens, paper, chalk
- G/V paint or indelible markers for marking the tips of the fingers of vaccinated children
- AEFI management drugs and medical supplies
- Cotton wool
- Banners and posters
- Dry cells for megaphones
- Arm bands/ aprons for vaccination teams

3.4.13 Miscellaneous/ extra costs

Because of the unpredictability of field conditions and the frequent need for rapid response to unforeseen circumstances, it is important to allow for contingency funds for each district. This might cover costs such as emergency vehicle repairs, or hiring of extra transport to cope with unforeseen weather conditions etc.

3.5 Planning to reach “hard-to-reach” populations

To effectively control and eliminate measles, it is important to immunise the hard to reach, and under served populations who are often missed by routine vaccination. These populations may not necessarily be living in remote corners with poor geographic access. Actually most large cities have either “gated affluent

communities” or slums where people are likely to vaccination services during SIAs. Here, the questions, which need to be answered, are ‘**who**’ and ‘**where**’ are the hard to reach or hard to access populations? These will lead to the next question of ‘**why**’ these populations are under served, and help managers to develop effective strategies to reach them. These groups include those:

- Populations known to have a disproportionate share of the disease burden
- Areas of un-immunized or under immunized children in urban and peri-urban areas.
- Populations with poor sanitation
- Populations inhabiting difficult or mountainous terrain
- Nomadic populations
- Undocumented urban settlers / squatters
- Migrant workers
- Refugees, internally displaced persons, and other transient populations.
- Politically and or socially marginalized populations or minority groups
- Religious groups who oppose vaccination
- Persons living in areas of civil unrest
- Populations in areas near to international borders and provincial borders
- High class, affluent, suburban communities

District micro-plans should include the provision of additional financial and technical support to address social mobilisation, cold chain and vaccine logistics, vehicles, extra distances for transportation and security needs when targeting certain groups of hard-to-reach populations. Although intensified and targeted efforts are needed to reach under served populations during SIAs, care must be taken to avoid stigmatising or antagonizing them.

Strategies to reach the hard-to-reach populations

Reaching the hard-to-reach populations often requires working through local "non-official" leaders or informal channels like religious leaders and NGOs. Such agents as are accepted by them should be approached to participate in the development and implementation of appropriate strategies aimed at reaching their under served subjects.

Examples of **Pre-campaign strategies** for under-served and hard to reach populations include:

- Developing detailed maps in order to carefully plan the extra logistics and social mobilization needed to reach these populations.

- Involving local ethnic and religious leaders of the under served population in planning and social mobilization including special efforts to dispel false rumours.
- Understanding and overcoming barriers (cultural, educational, logistical, political, language or religion) that keep under served populations from bringing their children for immunization.

Examples of **campaign implementation strategies** for such hard-to-reach populations include:

- Using "mobile-fixed sites" during SIAs. i.e. teams that set up an immunization post at a fixed site for a few hours, then move the post to a new site after completing their task.
- Placing extra posts in highly visible and/or highly convenient sites (e.g., schools, churches, mosques)
- Placing extra posts in strategic sites such as markets, etc. to reach transient populations.
- Providing additional logistical support such as vehicles and mobile teams in areas with under served populations.
- Starting the implementation of the campaign early and extending the duration of the SIAs by a few days more in these areas
- Starting the daily immunisation activities very early in the morning before people disperse, or extending to the early evening hours after caretakers and parents come back from their daily chores
- House-to-house canvassing and community line listing
- Providing teams assigned to these areas with experienced supervisors

One to two weeks before SIAs, the supervisors should visit the most under-served, high-density urban areas to verify that mothers know about SIAs. This will give enough time to correct the situation through intensified social mobilization activities. Before and during SIAs, the supervisors should actively and frequently supervise preparations and efforts to reach under served populations.

Characteristics of successful measles SIAs

- Integrated into a comprehensive disease control framework
- Visible and tangible national ownership,
- Good buy-in from political authorities and stakeholders
- Bottom-up planning
- Active community participation
- Smooth course with no logistical disruption
- Adequately monitored and documented
- Administrative coverage in all districts attaining $\geq 95\%$,
- National level administrative coverage validated through coverage surveys
- Very low proportion of missed children esp in “hard-to-reach areas”
- Minimal wastage of inputs
- No or minimal number of severe AEFIs, which are all well managed
- No large pockets of unvaccinated children
- Able to forge and strengthen local partnerships beyond the SIAs
- Ensures that there is no harm to the health workers or to community, through practicing appropriate immunization waste management

4 MEASLES SIAs: PRE-IMPLEMENTATION ACTIVITIES

The last few months before the SIAs are crucial in terms of ensuring that all the technical preparation for the campaign is in place. Some of the key activities involve cold chain logistics, social mobilisation and the training of health workers and supervisors.

4.1 Ensuring Effective Logistics

Logistics planned well in advance is critical to the success of SIAs. The major steps in ensuring excellent logistics during an immunization campaign are:

- Agree on the best possible population estimate for the national and sub-national levels
- Order vaccine at least 6 months before the date of the SIAs.
- Use the best demographic data available and a standard formula throughout the country to make the best possible estimate of the size of the target population at every level. If in doubt, overestimate it!
- Use the standardised logistics spreadsheets from the national level to calculate requirements.
- Develop a written distribution plan specifying when and how supplies will be transferred to the various levels.
- Pay particular attention to logistics needs for hard-to-reach and under-served areas
- Ensure that vaccine, diluent, AD syringes, reconstitution syringes and safety boxes are always distributed together in matching quantities.
- Detailed planning (including the nomination of a responsible person at each post) is required for daily collection of safety boxes from vaccination posts and for incineration.
- Timely development and delivery of the fieldguides, formats and other tools to the district level

The transportation requirements for the distribution of logistics supplies include:

- Heavy-duty trucks to transport vaccines, injection materials, Information- Education- communication (IEC) materials, recording and reporting formats, etc. from the national to the first sub-national (provincial) levels
- Light trucks to redistribute SIAs supplies from the first sub-national (provincial) to the district levels

- Vehicles or motorcycles or pack animals (horse drawn carts, donkeys, mules, camels etc) are needed to transport vaccines and other logistic supplies from distribution points (district health office/ health facilities) to vaccination sites.

Ideally, the transportation requirements for the human resource involved in the implementation of the SIAs include:

- ✓ One vehicle for each national level supervisor
- ✓ One vehicle for each provincial and/ or district level supervisor
- ✓ A vehicle or motorcycle for district team supervisors
- ✓ A vehicle or motorcycle or pack mule needed for the movement of mobile vaccination teams.

Means of transportation may have to be rented for the purpose of the SIAs, but often it is organized from government agencies, the military or partner agencies. In this case, advance arrangement has to be done to ensure that adequate fuel, drivers' per-diem etc is organized. Partnering with the army helps in accessing difficult to reach and remote populations – with the use of helicopters and boats. In some areas public transport may be utilized.

4.2 Maintaining the Cold Chain System

Following an inventory of the cold chain capabilities at all levels, there is almost always room for further strengthening of the cold chain capacity through the repair of some cold chain equipment. The SIAs present a golden opportunity to strengthen the routine health services, especially in the area of cold chain equipment. However, should cold space be found critical, all efforts need to be made to acquire more new equipment or borrow cold space from other sectors. These provisions have to be clearly stated in the micro-plans.

Provincial and district EPI managers and EPI logisticians should ensure that the cold chain is working both at the district and health centre level during SIAs. As much as possible, back-up capacity should be organised for national and provincial cold rooms including generators and spares. Adequate power supply has to be assured at all times: the supply of paraffin should be guaranteed for paraffin refrigerators, the batteries for the solar refrigerators need to be in good condition and the solar panels kept clean.

4.3 Ensuring proper waste management

In addition to national level policy decisions regarding how immunisation waste will be managed, the district level will have to do an inventory of the waste management facilities, as part of its micro-planning process to ensure that all working incinerators and other waste management facilities are optimally utilised during the SIAs. The district micro-plan is expected to reflect the status and location of incinerators (including industrial incinerator sites), as well as burn and bury sites. The task description at the district and the service delivery site has to reflect the responsibility of the post supervisor to ensure daily incineration of filled safety boxes and other dry waste.

At the service delivery post, syringes will be discarded into the safety box provided at the vaccination post. At end of each implementation day, each team will bring back their $\frac{3}{4}$ filled safety boxes to the incinerators in health facilities. Any other waste should not be put into the safety boxes. Instead, other waste should be disposed of in a bin and burnt regularly along with the safety boxes.

4.4 Training

All key players in SIAs should take part in training sessions in preparation for SIAs. These include coordinators, supervisors, vaccinators, committee members, social mobilisation officers, logisticians, surveillance officers and other health staff. Training for SIAs should occur as a cascade with the central level providing training to the provincial level, the provincial level training the district level, and the district level in turn training community volunteers and health workers. Training approaches should be simple but strive to address the specific needs at different levels. These training sessions should take at least two whole days, and be as interactive as possible, with the inclusion of role play, practical demonstrations, case studies and exercises, as well as group work to stimulate discussion. It may be useful to include an objective means of assessing the effectiveness of the training exercise by introducing a pre-test and post-test.

At least three months before the SIAs, the national level should elaborate training plans that incorporate training needs for different levels, methods and key areas of focus, training and resource materials, the agenda, a framework of “what-who-where-when“, and a budget. The plan for training may be preceded by a formal training needs assessment, to address specific gaps in health worker knowledge and to correct malpractices, if any. Some countries have introduced pre-and post-tests as a means of assessing the effectiveness of the training sessions, but also in order to tailor the training to address gaps in knowledge. The national level may hold a consultation to pool lessons from previous SIAs, or may conduct a review of previous SIAs reports to tailor the training for optimal effect.

Training at each level should include information on the following points, but need to be customised depending on the type of integrated interventions:

- ✓ Introduction:
 - Objectives of SIAs
 - Dates of SIAs
 - Target age group for SIAs
 - Partnerships and resources
 - Chronology of events and activities
 - Update on the global and national status of measles control
- ✓ Advocacy and Social mobilisation issues
 - Advocacy with political and administrative authorities
 - Key messages to mobilise the community and ensure community involvement
 - responding to community and media concerns about the campaign
- ✓ Logistic issues in the preparation of Measles SIAs
 - Consistent calculations for the allocation of inputs and personnel assignment
 - Storage and transportation of the key inputs
 - Timing and modality of distribution of the different inputs (bundled vaccine, social mobilisation materials, recording and summary forms, funds, etc)
 - Adapting logistics to ensure that hard-to-reach populations are provided with services
- ✓ Tasks and activities during the campaign
 - Organisation and management of vaccination posts
 - Team composition and task allocation
 - Flow of services and crowd control
 - Screening for the different age groups/ different types of interventions
- ✓ Handling vaccines and issues of safety of vaccination
 - Good cold chain maintenance,
 - Care of vaccine and diluents
 - How to use vaccine vial monitors.
 - How to reconstitute the measles vaccine.
 - How to safely administer measles vaccine by subcutaneous route using auto-disable syringe
 - How to prevent needle stick injuries, and safely dispose of the syringes.
 - How to identify, investigate and manage adverse events following immunization (AEFI)

- ✓ Recording, documentation and review
 - How to complete tally sheets
 - How to complete logistics forms at each level
 - Daily activity summary and review at different levels
- ✓ Monitoring and supervision
 - Objectives, methodology and tools
 - Pre-implementation supervision of preparations
 - Intra-campaign supervision
 - Rapid convenience monitoring and troubleshooting during the campaign
 - Introduction to the different supervisory checklists and the monitoring tools
- ✓ Strengthening various aspects of the routine immunisation service delivery
 - Vaccine needs forecasting and vaccine management
 - Demand creation for immunisation
 - Quality of routine immunisation service delivery
 - Monitoring coverage and programmatically addressing coverage gaps
- ✓ Case based surveillance for measles
 - Case definitions, case investigation and specimen collection procedures
 - Tools for specimen collection and case reporting
- ✓ Training plans and content for the different levels

A pre-requisite to successful training lies in the identification of appropriate participants, as well as qualified and committed trainers, and making sure that the training sessions are interactive, as much as possible.

Training should be as practical as possible. It helps to have role plays, group work or individual exercises to ensure that participants are fully conversant with the concepts and procedures. Specific areas that work best with practical exercises include the organisation of immunization sites, filling of the tally sheets, roles of the different team members, and the supervisory process. It is advisable to limit the overall duration of training to 2 days.

Training materials are best presented in the local languages as much as possible, and the training session should be separated from micro-planning activities to allow enough time for the microplans to be

implemented. It helps to conduct training sessions as close to the implementation as possible, to ensure that skills and concepts learnt during the training are utilised while they are still fresh in the trainees' minds.

Organisers of training sessions should always weigh the number of people trained in one session against the advantage of having a smaller group that gets to be coached very well. The alternative of increasing the number of facilitators should be explored very well.

4.5 Social mobilisation

Effective social mobilisation is a critical element of successful SIAs. The objective of social mobilisation is to ensure appropriate awareness so that eligible people seek and accept the immunisation services.

Social mobilisation coordination committees should be organised at each administrative level and ensure that similar high quality information is disseminated at all levels. The National committee should develop a plan to address priorities including the development of and dissemination of key messages, fact sheets and other written materials, involving mass media at all levels, and coordinating with provinces and districts. The plan should be clear about who needs to be aware, what information to release and how to reach target groups. Chapter 8 provides more details on advocacy, social mobilisation and communication.

4.6 Coordination of the SIAs implementation

Starting the last week prior to the measles SIAs, the national level needs to set up a national **“operations control room”**, to be manned by experienced logisticians and program persons very well conversant with the national plan, the validated microplans and the partner coordination mechanisms. Such a coordination center will need to be operational at least 12 hours a day until the end of the SIAs in all areas.

The operations center should have dedicated telephone and other communication facilities to communicate with the provincial level and the field personnel. The communication between the field and the operations center may be supplemented by a cell-phone messaging or a daily call-in protocol to be used by selected supervisors, monitors and facilitators to provide updates on the SIAs logistics, community turn out, daily coverage levels, and other relevant pieces of information. The operations room is expected to regularly contact central and provincial level SIAs supervisors, campaign monitors

and facilitators in order to follow the progress of the SIAs, and to provide back up support to the sub-national level as required.

The coordinators at the national operations center level are expected to process, summarise and disseminate the information from the field, and bring issues related to the movement of resources, etc. for decision to the national program manager.

4.7 Supervision

Supervision is necessary to ensure quality of planning and implementation. Supervisors should be identified at each level to guide and support personnel for quality implementation of the campaign. These supervisors should be given refresher training in order to re-orient them on key skills and activities required to conduct effective and supportive supervision for the measles SIAs.

Ideally, during measles SIAs, the selection of supervisors should be based upon the following attributes:

- ✓ Committed health workers with experience in immunization programs, preferably including
- ✓ administration of vaccines and handling or maintaining cold chain equipment
- ✓ Has received supervisors' training prior to the SIAs
- ✓ Has motivational skills
- ✓ Has problem-solving skills and approach
- ✓ Has good communication skills, speaks the dominant language of the area of assignment
- ✓ Is familiar with the measles SIAs fieldguide and the measles SIAs plan of action
- ✓ Has basic understanding of the monitoring and evaluation methods and tools for the measles SIAs
- ✓ Has basic understanding of the logistics requirements at a service delivery post
- ✓ Is able to identify, investigate and manage AEFIs.

The first phase of pre-campaign supervisory visits from the National level to the provinces and districts should take place no later than 2 months before the SIAs, in order to help verify the status of preparedness. This visit will also help to advocate for and positively influence the preparations for the SIAs at subnational level. A second round of pre-campaign supervisory visits from the national level is often scheduled 2 weeks prior to the SIAs. This visit will help confirm that the pre-positioning of supplies, the selection and training of health workers and volunteers, the local coordination of activities, the involvement of local partners, the organisation of cold chain and transportation facilities, etc are okay.

Structured supervisory checklists are used during these visits in order to document the findings and ensure that action is taken to address gaps if any. See Annex I and II.

Chapter 9 will deal with the area of supervision, monitoring and evaluation in more detail.

5 IMPLEMENTING MEASLES SIAs

The phase of implementation, for the clarity of description in this document, has been taken to be the period time from vaccine and supplies distribution, the launching of SIAs, the actual events at the immunization posts, as well as supervision and monitoring.

The last 6 weeks before the campaign are critical in terms of determining whether or not the preparations for the campaign are going as scheduled and whether or not to expect major hitches in the implementation phase. It helps to keep in mind some of the major factors that have in the past resulted in suboptimal performance in mass vaccination campaigns.

Most common errors in the preparation and conduct of mass campaigns:

- **Preparations begin too late, vaccine ordered too late**
- **Unclear designation of responsibilities at the service delivery level**
- **Inadequate social mobilization**
- **Delayed/ inadequate distribution of supplies to post teams**
- **Inadequate transport facilities**
- **Inadequate involvement of other sectors, and non governmental entities**
- **Long waiting lines at vaccination posts (for whatever reason)**
- **Posts not open early enough, late enough or during lunch hours to be accessible to working parents (especially in urban and peri-urban areas)**
- **Inadequate feedback to peripheral levels on lessons from previous SIAs**

5.1 Vaccine and supplies distribution

A plan should be made for distribution of vaccine/injection equipment at each level: central level to district, from where distribution goes out to the sub-district and the immunisation posts. The plan should consider

- Number of kilometres round trip for vaccine distribution
- Method of transport for vaccine distribution with fuel costs
- Personnel required (drivers, technicians for last minute cold checks and maintenance)
- Duration of time required for distribution

Calculations can be based on formulas outlined in earlier sections. In as much as is possible, managers should use supervisory site visits for other aspects of the campaigns (training, social mobilisation, cold chain assessment) to deliver other materials necessary for SIAs (tally sheets, social mobilization materials, supplementary cold chain equipment, training materials).

Delivering vaccines for SIAs should be strategically timed when stocks for routine vaccines are low. This will allow more space for the higher but temporary demand on the cold chain.

In temporary service delivery sites, vaccines may have to be delivered and kept in cold boxes, or even in vaccine carriers, depending on the estimated population size and work load. When using vaccine carriers, make sure to prepare adequate ice packs the previous day, and place ice-packs in the vaccine carrier as shown in the figure below. Place the vaccines and diluents into the vaccine carrier and close the lid tightly. If you use ice instead of ice-packs, you must always put ice cubes in a sealed plastic bag. The bag prevents water from collecting in the bottom of the carrier when the ice melts. During immunization sessions, keep opened vials inserted through the foam pad of your vaccine carrier. The foam pad keeps vaccines inside the carrier cool while providing a place to hold and protect vials in use. Do not cover the vials with ice.

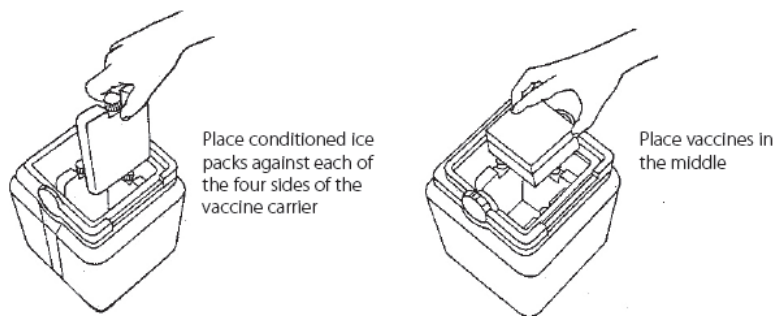


Figure 6. Packing a vaccine carrier.

5.2 Role of personnel at immunization posts

5.2.1 *Post coordinator*

A health worker may be designated coordinator of the post. The coordinator is responsible for the overall coordination of all activities of the post including:

- Supervising vaccinators and the other health worker at the post
- Designating specific responsibilities to health workers and volunteers
- Mobilizing volunteers to make house-to-house visits to find eligible children
- Going into the community and seeking out eligible children during SIAs

- Liaison with District and sub-district supervisors; re-supplying the post
- Ensuring that AEFI cases are detected and managed promptly and correctly
- Checking tally sheets are correctly filled and summarized at the end of the day
- Conducting post campaign community coverage mini-surveys
- Liaison with community leaders in the catchment area

5.2.2 *Health workers*

- Post coordination
- Ensuring correct conditions of storage for vaccine.
- Reconstituting and administering vaccines
- Ensuring safe disposal of injection equipment and, eventually, safety boxes
- Training and supervising the volunteers they may be working with
- Answering questions and clarifications from the people whenever asked

5.2.3 *Volunteers*

- Crowd Control: maintaining order around the immunization post
- Ensuring efficient flow through the post
- Screening: welcoming of parent/child and referring for vaccination children in correct age group
- Tallying: Each vaccinated child should be recorded on the tally sheet irrespective of previous vaccination history.
- Going into the community and seeking out eligible children during SIAs

Through the use of maps and other guides, each vaccination team must know exactly where they will vaccinate, when, the size of the target population, etc. and this information has to be made available to the team supervisors as well.

5.3 **Requirements for vaccine posts**

Each immunisation post should have a clear sign indicating the event. This can be done using posters, banners or a flag. Another method is making sure that all volunteers and health workers identify themselves by wearing an armband or an apron with a clear message or sign. The vaccination team (a team of health workers and volunteers) should know their assigned roles.



Figure 7. An orderly queue outside a temporary immunisation post

A well functioning post should have a one-way traffic flow of clients without any bottlenecks or confusion or long waiting hours for mothers/guardians being attended to. "Bottle-necks" most often occur during screening and recording. At busy posts, it may be useful to have two screeners to avoid "bottle-necks". An example of a vaccination post with an efficient flow is shown in Figure 7 and 8.

Attendance at vaccine posts is not evenly distributed over the time of operation of the post. It may be necessary to plan vaccination of up to 40-50% of the target population for the catchment area within the first one or two days of immunization.

Other ways to improve "flow" at vaccine posts include having a fair and proper distribution of posts in the community, and organizing volunteers with well defined tasks and responsibilities to run the post.

A vaccine post, be it temporary or permanent, should at least have:

- Two tables, some chairs and benches that can be borrowed from the local community
- Possibly some metal trays and plastic sheeting
- Personnel: 2 health workers - one each for vaccine administration and for reconstitution.
- A variable number of **trained** volunteers.
- A vaccine carrier, 4 frozen ice packs, (or 1 kilogram of ice for each day of SIAs if ice packs are not available)
- An appropriate number of vials of measles vaccine depending on daily target of the post
- Auto-disable syringes; disposable syringes and needles for reconstitution, safety boxes
- An indelible marker to mark fingers of immunised children
- Emergency drugs and equipment for treating any case of anaphylaxis.

- Appropriate number of tally sheets to record daily target of post
- AEFI case investigation and reporting forms
- 1 bin for non-biologic, non-sharp waste
- A banner/ poster to identify the area as a service delivery post for the duration of the SIAs

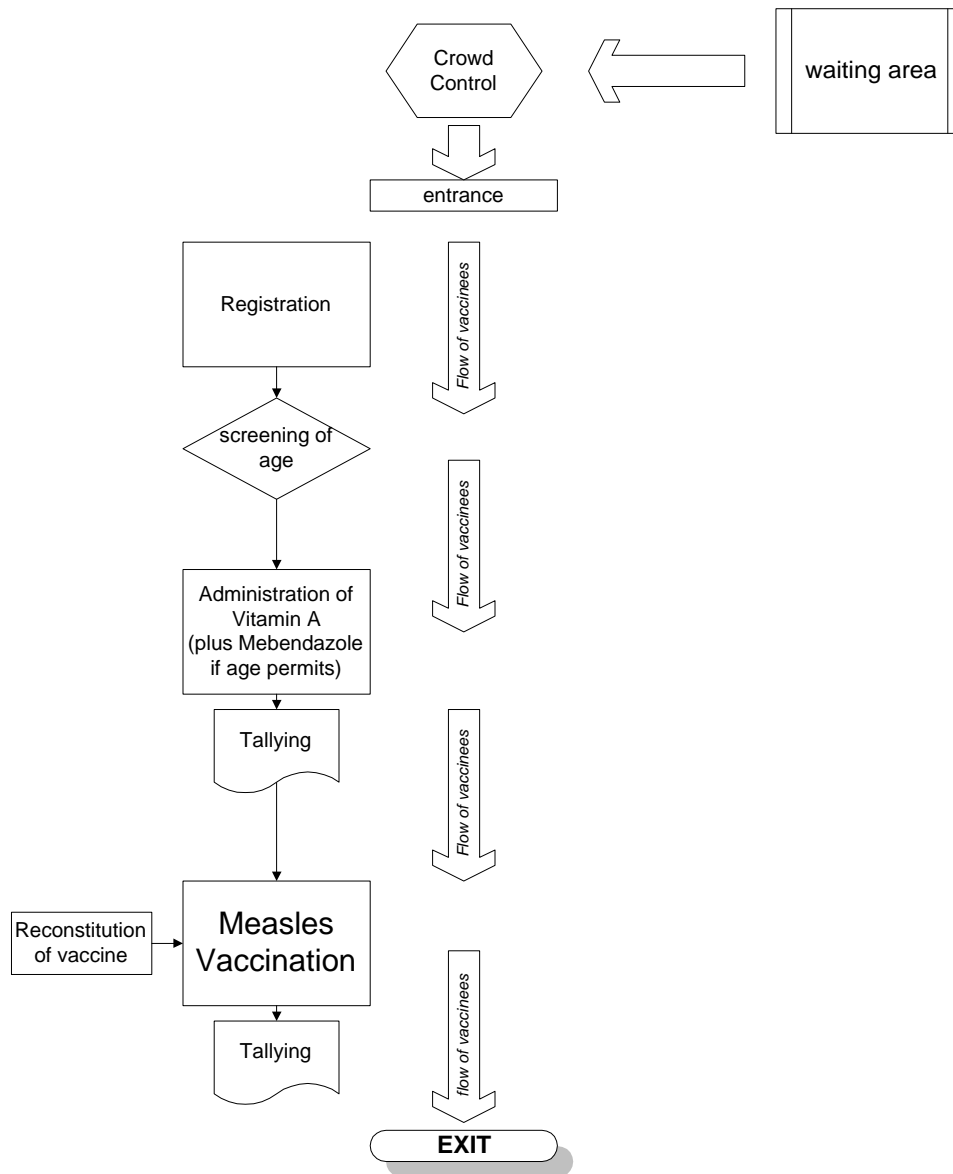


Figure 8. Schematic representation of the organisation of a vaccination post.

5.4 Reconstituting measles vaccine

Vaccine reconstitution should be performed by a health worker using the diluents provided by the manufacturer of the vaccine. The diluents to be used in the reconstitution should be at the same

temperature as the vaccine vial, and so it is important to keep the diluents in the refrigerator before reconstitution. Reconstituted vaccine must be used within 6 hours of reconstitution. Reconstituted measles vaccine must be discarded at the end of the day; it cannot be put back in the fridge for use the following day. It should also be discarded immediately if sterile procedures have not been fully observed, there is any suspicion that the opened vial has been contaminated, or there is visible evidence of contamination, e.g. a change in appearance, floating particles or the cold chain has obviously been broken.

5.5 Administering measles vaccine

The following steps should be followed to administer measles vaccine

1. The injection site should be cleaned with cotton wool dipped in clean water to remove visible dirt.
2. Hold the child's arm from underneath. Your fingers reach around the arm and pinch up the skin.
3. The dose is 0.5 ml, given subcutaneously in the outer part of the upper left arm.
4. Push the needle into the pinched skin to a depth of not more than 1 cm. The needle should go in at a sloping angle, not straight down.
5. Press the plunger with your thumb to inject the vaccine.
6. Withdraw the needle and press with cotton wool over the injection site. If there is any bleeding, keep pressing with the cotton wool until the bleeding stops.

DO NOT

Pre-fill vaccine syringes!

Recap needles!

Inject a child in the buttocks! This may injure the sciatic nerve and cause paralysis of the legs.

The following are **NOT** contraindications to measles vaccination

- HIV infection
- Malnutrition: Malnutrition is actually an *indication* to immunize.
- Minor illness: Low grade fever, mild respiratory infections, and diarrhoea. Sick children should be referred for treatment after they have been immunized.

Since measles SIAs doses are to be provided to all children in the eligible target age group irrespective of previous immunization status or previous history of measles, the persons responsible for screening should not spend time querying the measles vaccination history of any child of eligible age during a

measles campaign. To fail to provide SIAs doses to previously vaccinated children, deprives the child who failed to seroconvert at 9 months of the benefits of re-vaccination.

Do not record doses of measles vaccine given during SIAs on childhood immunization cards.

5.6 Disposal of injection waste:

Immediately after injection, all AD syringes should be disposed of into the safety box without any attempt to remove or recap the needle. Do not attempt to reuse the injection syringe, nor the reconstitution syringe and needle. The safety box should be filled about $\frac{3}{4}$ full and then sealed by closing the lid to avoid spillage of the contents.

These filled safety boxes should be turned over to the responsible person for final disposal and destruction. The recommended method of disposal is incineration. Optimally functioning incinerators can generate temperatures up to 800° Celsius, killing micro-organisms and reducing the volume of waste to a minimum. Incinerators built for campaign purposes or already existing ones in health facilities may be utilised if proven to be properly functioning. Otherwise, the incineration facilities in some industries may be borrowed for the campaign. If there are no incinerators available, another alternative is open burning in a pit dug for this purpose. Such pits should be dug in an unused area, as far from buildings as possible. The pit has to be about 1 meter deep, and the waste has to be burnt until the boxes are destroyed. Once the burning is over, the residue has to be buried or covered with soil.

At the end of each day of immunisation, the team should make sure to cross check and sum up the tally sheets and summary forms, that all safety boxes and buckets with cotton wool are collected for safe disposal (burying or incineration), and inspect and clean the surroundings of the immunisation post for the following day's work.

All AD and reconstitution syringes should be disposed of into the safety box without any attempt to remove or recap the needle.

Safety boxes should be filled about $\frac{3}{4}$ full and then sealed by closing the lid to avoid spillage of the contents. Safety boxes should be incinerated at the end of each day.

5.7 Program coordination during SIAs:

Once the SIAs have been launched the “**SIAs operations control room**” has to be fully active in order to:

- Monitor logistics utilisation and address shortages if any
- Monitor daily coverage reports and take action in problem areas
- Address rumors and any adverse social reaction to the SIAs
- Respond promptly and proactively to any programmatic errors leading to severe AEFI or to clusters of AEFI
- Mobilise contingency resources to address exceptional situations
- Ensure that all national and provincial immunisation program managers and SIAs supervisors are informed of any major issues related to the conduct of the SIAs

The “SIAs operations control room” should be manned by experienced logisticians and program staff, and is necessary to coordinate logistics, social mobilisation, and for any emergent need to reorganise SIAs resources, as well as for monitoring of overall SIAs progress and coverage.

5.8 Returning un-used supplies:

Following the SIAs, remaining supplies including vaccines, un-used syringes and needles, etc, should be returned to the hub station (health facility/District) depending on storage space availability. The district level should specify to all immunization posts and team coordinators **exactly where** all vaccine should be returned. Reconstituted measles vaccine must be discarded at the end of each day. The responsible EPI manager/ officer should count the remaining vaccine and supplies, calculate the vaccine wastage rate, and make sure that vaccines are properly stored at the correct temperature.

6 MONITORING IMMUNIZATION SAFETY

It may be more difficult to maintain immunization safety standards during campaigns than during routine services. To ensure the safety of injections during campaigns and outbreak control activities, WHO and UNICEF recommend that sufficient quantities of auto-destruct syringes (which cannot be reused) and safety boxes be provided for every fixed or temporary post and every outreach team. Injections must not be given during campaigns if adequate quantities of these syringes are not available. The proper use of auto-disable (AD) syringes in immunization campaigns greatly reduces the risk of person-to-person transmission of blood-borne pathogens.

Ensuring the safety of injections should be one of the top priorities for managers during any mass campaign involving injectable vaccines. Some of the managerial priorities are:

- Developing an injection safety plan including the designation of focal persons at all levels, defining activities, and orientation of health workers
- Assuring safety of injections at the point of use through the provision of appropriate equipment, supplies, training, and supervisory support
- Assuring safe disposal of used injection equipment by orienting health workers about the method and location of disposal, assigning a responsible person at each site, and numbering all safety boxes and ensuring their return to destruction points
- Monitoring injection safety during mass campaigns using standardised checklists

In order to ensure immunization safety, health workers must be particularly aware of the need to ensure that the vaccine vial monitor does not indicate that the vial has been exposed to high temperature at some point, to keep reconstituted measles vaccine cool, to use an AD syringe for every injection, even if this means ending a session early. Proper injection procedures should be observed at all times. Reconstituted vaccine should be discarded after six hours or at the end of a session, whichever comes first. A VVM is not of use after the vial is open. (Figure 9)

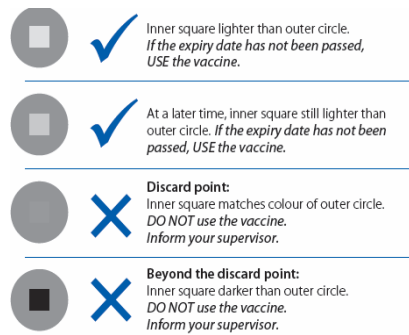


Figure 9. Stages of the vaccine vial monitor and the implications for use of vaccine vial.

Health workers should guard against needle-stick injuries by handling syringes and needles carefully. They should be warned against recapping needles after use. Used syringes and needles (including reconstitution syringes and needles) should be placed immediately, without recapping, into a designated puncture-resistant container, which must be disposed of by incineration or burning as soon as possible after it has been filled. See figure 10 about the assembly and use of safety boxes.

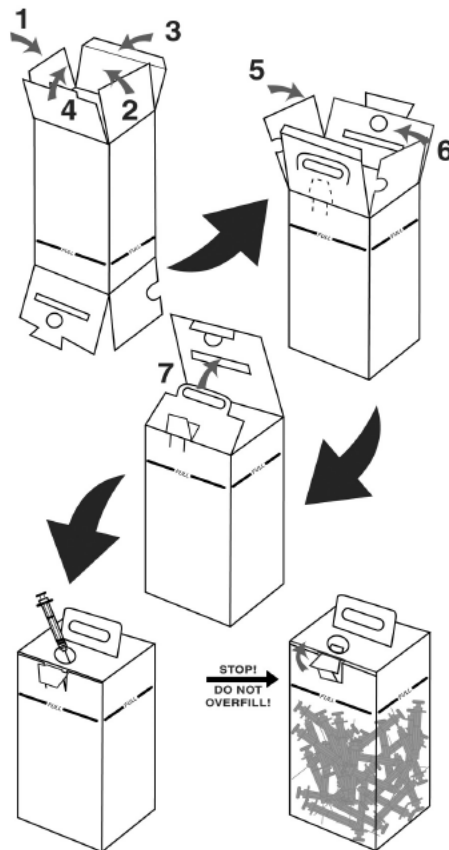


Figure 10. Assembly and use of safety boxes.

For further reading on this topic, refer to *Safety of Injections: WHO/UNICEF policy statement for mass immunization campaigns, WHO/EPI/HIS/97.04*. This WHO and UNICEF joint policy statement recommends that sufficient quantities of auto-disable syringes and safety boxes be automatically provided (bundled), together with high quality vaccine, for all mass immunization campaigns.

Health workers should learn to monitor immunization practices by observing each other and immunisation supervisors should cover safety in their supervisory visits. Annexed is a sample rapid assessment tool for injection safety during mass immunization campaigns.

Key steps to prevent programmatic errors and ensure safety of immunisation during SIAs:

- Check expiry date and VVM on vaccine vial.
- Check expiry date on diluent ampoule.
- Check that vaccine and diluent are from the same manufacturer, and that the diluent is clearly labelled for use with measles vaccine.
- Check that vaccine and diluent are at the same temperature.
- Reconstitute one vial at a time.
- Use a new reconstitution syringe for each vial of vaccine.
- Do not touch or recap the needle.
- Do not pre-fill syringes.
- Use only AD syringe to administer vaccine to every child.
- Always keep reconstituted vaccine in the hole in the ice pack and away from direct sunlight.
- Never use reconstituted vaccine more than 6 hours after reconstitution.
- Never take reconstituted vaccine from one session to another.

7 ADVERSE EVENTS FOLLOWING IMMUNISATION (AEFIs)

The current measles vaccine is a very safe vaccine. Nevertheless, there are some rare reactions that may occur following immunisation, and these will assume greater significance after mass campaigns. Measles vaccination is normally associated with mild AEFIs including soreness at the vaccination site, and transient (2 days) mild fever, all of which resolve spontaneously without permanent damage.

7.1 AEFI surveillance and causes of AEFI

AEFIs may be caused by programmatic errors or reactions. On the other hand a reported AEFI may be a purely coincidental event, but might have an equally damaging effect on the outcome of the SIAs.

Accordingly, AEFIs are classified into 5 main categories as detailed in Table 4.

Causes of AEFI	Description
Programmatic errors	These are events caused by an error in vaccine handling, preparation or administration. Programmatic errors are the most frequent cause of adverse events and can be avoided.
Vaccine reaction	This is an event caused by the vaccine even when given correctly. The event is, caused by inherent properties of the vaccine itself or by an individual's response to the vaccine
Coincidental	A medical event that happens after immunization but is not caused by the vaccine. There is no association between the immunization and the medical incident following the immunization.
Injection Reaction	An event from anxiety about, or pain from, the injection itself rather than the vaccine
Unknown cause	With continued research, unknown causes will hopefully be classified in one of the above three categories.

Table 4. Types of AEFI according to the causes.

Surveillance for AEFIs is a critical component of a strong immunization program in order to monitor the quality of safe immunization practices, to detect and respond to emergencies and to reassure the public about the safety of the immunization program. Every measles immunization campaign should have a list of reportable conditions and a system of tracking and responding to these reports.

These reportable AEFI conditions should be investigated in order to demonstrate whether the cause of the event was vaccine related. Minimal initial information should include the name of the vaccination site or post, details of the vaccinee (name, age, sex, address), the date and time of vaccination, the time of onset of the first symptoms, and the time of detection or reporting of the symptoms to a health worker.

Supervisors and post coordinators as well as health workers have to be on the alert for any clustering of adverse events of any type during or immediately following vaccination campaigns. AEFIs that occur in the form of a cluster (within a localized area/ facility, within a brief period of time) with unusual frequency, by vaccine or by type of reaction may indicate very serious programmatic errors and need to be managed as a programmatic emergency.

The following table indicates the timing of occurrence of some of the severe AEFIs and their clinical manifestations.

Timing of occurrence	Type of AEFI	Major clinical signs and symptoms
Within 24 hours of immunisation	Anaphylactic reaction (acute hypersensitivity reaction), anaphylaxis, toxic shock syndrome	Sudden collapse, respiratory difficulty
Within 5 days of immunisation	Severe local reaction. Sterile or bacterial injection site abscess, sepsis	Painful and red swelling at injection site, with or without pus, high fever, respiratory difficulty, etc
Within 6 - 12 days of immunisation	Seizures, including febrile seizures, encephalopathy	High grade fever and seizures, disorientation and coma
Within 15 - 35 days of immunisation	Thrombocytopenia	bleeding from the gums, mucosa and the skin, easy bruisability,

Table 5. AEFIs according to the timing of occurrence of clinical signs

Injection site abscess occurs as a result of a suppurative bacterial infection introduced as a result of improper manipulation of the vaccine and devices (esp needles) while extracting diluted vaccine from a multi-dose vial. An increasing, tender and warm swelling at the injection site may be associated with increasing fever and pain noted on the second to third days of the injection. This requires antibiotic therapy and possible drainage depending on the size of the abscess.

7.2 Anaphylactic reaction following measles vaccination

A rare but serious adverse event following immunisation is anaphylactic reaction, occurring at a rate of about 1 per a million doses. Anaphylaxis must be distinguished from fainting which is characterised by sudden pallor, loss of consciousness and collapse. Fainting is managed by placing the patient in a recumbent position, following which patients regain consciousness though pallor and hypotension may remain for some more minutes.

Anaphylaxis is usually noted within 30 minutes of the injection of the vaccine. It is characterised by changes that develop over several minutes and involve multiple body systems. Some of the cardinal features, according to the clinical stages of progression of the symptoms and signs include, an itchy urticarial rash, dizziness and feeling of warmth, progressive swelling of the face and mouth area (angioedema), respiratory symptoms including sneezing, wheezing, laboured breathing and hoarseness, and hypotension leading to shock and collapse. In cases of presumptive anaphylactic reactions, aggressive case management should be undertaken immediately, and a detailed investigation is required. An outline of emergency management of anaphylactic reactions is given in the text box below. SIA planning has to ensure that all the necessary medications are made available in order to deal with such emergencies. Please refer to the Annex for a sample AEFI investigation form.

The preparation of measles SIAs should involve the supply of basic AEFI kits to the district and operational level. These kits should contain the following:

- ✓ 2 ampoules of Adrenalin injection (1:1000) solution
- ✓ 1 vial of hydrocortisone (100 mg)
- ✓ 2 sets of disposable syringes (insulin type) with 0.01 ml graduations and 26 G IM needles
- ✓ 2 sets of disposable syringes (5 ml) and 24/ 26 G IM needles
- ✓ 2 scalp vein sets
- ✓ IV fluids (Ringer's lactate/ normal saline)
- ✓ IV fluids (5% dextrose)
- ✓ IV drip set
- ✓ AEFI reporting form
- ✓ Drug dosage tables for adrenaline and for hydrocortisone

At hospital setting, oxygen support and airway intubation facilities are expected to be available.

Emergency Procedures in case of Anaphylaxis

Anaphylaxis is a rare but severe reaction, which may occur after any injection including after measles immunisation. Characteristically, the patient collapses with signs of shock and difficulty in breathing. Once recognised,

1) Immediately lay the patients down flat or preferably with the legs raised and call for assistance.

2) Set up an intra-venous line

3) Check breathing and pulse or heart beat

4) If the patient is not breathing,

Clear the airway and ventilate (mouth to mouth or with the Ambu-Bag)

Give Oxygen at 4-6 litres per min if available

5) If there's no heart beat, do Cardio-Pulmonary Resuscitation (CPR)

6) Give Adrenaline – 1:1000 concentration

Children up to 3 years: 0.1ml subcutaneously at once

Children 4-7 years: 0.2ml “ “ “

Children 8-15 years: 0.3ml “ “ “

7) Give Hydrocortisone slowly intravenously

Children Under 1 yr. - 100mg

Children 1-3 yrs - 200mg

>3 to 7 yrs - 300mg

> 7 to 9 yrs - 400mg

10 yrs and above - 500mg

8) Check blood pressure: if systolic is less than 80 mm Hg

a) Give adrenaline 1: 10 000 (i.e. 1 ampoule diluted with normal saline to make 10 ml) at a dose of 0.1 ml/kg of the child's body weight – slowly intravenously, or via endo- tracheal tube. This can be repeated every 10-20 minutes if necessary until the situation stabilises. Monitor the heart rate so that it does not exceed 160 per minute.

b) Give 0.9 % Saline or Ringer's Lactate at 20mls per kg of the child's body weight fast. Repeat if necessary – if the peripheral pulse is weak or absent.

9) Arrange evacuation by ambulance to a well equipped facility if necessary.

10) Explain and reassure the parents and the community

7.3 Communication regarding AEFIs

The management of individual cases of severe AEFIs should be supplemented with measures to ensure that the community understands the issues, and that immunisation services are not disrupted. The role of appropriate and timely information and communication cannot be overemphasised in this regard.

Before the AEFI:

- ✓ Maintain a database of journalists who cover health issues in the print and electronic media
- ✓ Develop an information package with Frequently Asked Questions (FAQs) on measles vaccine and immunisation in general.
- ✓ Develop a fact sheet on AEFIs
- ✓ Identify and train a spokesperson at national level

In the event of a severe AEFI:

- ✓ In consultation with the immunisation program manager, collect all relevant information and prepare a written media release before any personal contact with the media

The media release should contain key messages on:

- ✓ the proved benefit of immunisation,
- ✓ the importance of immunisation safety,
- ✓ the fact that vaccines do not normally cause serious reactions unless in exceptional cases,
- ✓ the investigation of the current problem,
- ✓ the need to continue immunisation services.
- ✓ answers to likely questions.

8 ADVOCACY, SOCIAL MOBILISATION & COMMUNICATION

In order to achieve quality measles SIAs, effective advocacy, social mobilisation and communication need to be planned and implemented to get support of and participation of decision makers, individuals, families and communities. Planned activities should be based on experience as well as an assessment of the best methods of getting across to the community.

8.1 General organisation

The management of Social Mobilisation activities is a key factor to success. In this respect, having a hierarchy of social mobilisation focal persons working with committees through the various administrative levels has been found to be effective in securing community and leadership participation in mass campaigns. As much as possible, committees should come from pre-existing structures such as those established in the polio eradication initiative. Ideally, the committees should be multi-sectoral but with clearly defined responsibilities and resource allocation regarding the measles campaigns.

8.2 The social mobilisation plan

Planning for social mobilisation should be done at least 6 months in advance as part of the overall SIAs micro-planning. At each level (national, district and community), a work plan with objectives, activities, responsible persons and budget should be prepared.

Planning for social mobilisation should answer the following questions: -

- Who should be involved?
- What information or messages need to be given to the various groups?
- What are the most effective available channels of communication?
- What activities should be planned for?
- What should be the roles of the various actors?
- What will it cost?

The objectives of program communication/ social mobilisation/ advocacy targeting different groups need to be designed and specific messages as well as activities planned in advance. It will also be important to consider other issues such as hard to reach populations and resistant groups.

A communication needs assessment should be carried out early in the preparation of the SIAs in order to understand the lessons from past SIAs, the media use by the target population, and to determine the resources required.

Budgeting for social mobilisation activities

The social mobilisation budget should be reflected in the overall plan. Any social mobilisation funds from the national level need to be disbursed to districts early so that social mobilisation activities can be conducted in good time ahead of the immunisation days. Nevertheless, local activities should not wait for funds from elsewhere. Resources should be mobilised at all levels to support feasible activities.

The budget may include the following: -

- Cost of briefing meetings for leaders and community groups
- Small incentives for local mobilisers and announcers
- Cost of informational and promotional materials, megaphones etc
- Cost of radio and TV spots
- Cost of transportation for social mobilisation activities
- Cost of launching activities

8.3 Advocacy activities

During the preparatory phase, MOH should obtain high-level commitment early from national authorities and major partner agencies to support the SIAs. Advocacy with various leaders at all levels must also be conducted for building community acceptance and support. Early support from the health practitioners is also very crucial. Target groups for advocacy may include Heads of State and government, parliamentarians, religious leaders, donor agencies, MOH decision makers and community opinion formers. Advocacy may also involve the recruitment of popular celebrities or goodwill ambassadors. Enlisting the support of media will also be important for the success of the SIAs

A variety of advocacy activities will therefore need to be implemented at various stages including

- preparation of convincing briefs e.g. impact of SIAs on morbidity and mortality reduction, success stories from other countries or other Districts
- briefing with health practitioners, health professional societies, key groups and individuals

- using goodwill ambassadors
- using the ICC to lobby with the policy and decision makers
- using the mass media for advocacy and re-enforcing commitment of decision makers
- national level launching of SIAs by eminent persons: the First Lady or the Head of State
- local authorities and opinion leaders launching the SIAs at district level

Key advocacy messages will have to be drawn up and may include the burden of the disease in the community, the effectiveness of SIAs in reducing measles morbidity with examples from other countries or districts, the need for supplemental doses of measles vaccine, the social and economic benefits of measles elimination, and the safety of the vaccines and the injection.

The launching ceremony

The launching ceremony can be an important occasion if attended by eminent personalities such as Heads of State, celebrities, etc. It is therefore crucial that any launching ceremony be planned in advance and conducted extremely well. Key public figures should be contacted well in advance to ensure their participation. During the launching ceremony, such eminent personalities should give Vitamin A drops. In view of injection safety precautions, measles injection should only be administered by a trained health provider. The event should be well covered by the media. The launching ceremony should also be used as an informational opportunity and simple 'take away' fliers with key information can be distributed.

8.4 Social Mobilisation activities

The roles of different partners

Social mobilisation activities should be planned so as to enlist all feasible support from various groups, institutions, organisations etc. These may include health committees, religious and community groups, FBOs, NGOs, civic society groups like youth and women's organisations, and others in the area. When making initial contact with individuals and groups, ask for their views and allocate specific tasks for their participation, which may include

- Announcing SIAs at key meetings, at cultural and sporting events;
- Providing human, financial and other resources
- Materials development such as banners, armbands, T-shirts, caps
- Providing cold boxes and making ice during the campaign

- Providing meals/snacks/drinks or other incentives for volunteers
- Allowing safe passage and/or accommodation in areas of insecurity
- Sponsoring radio and television announcements

Mobilising the community

SIAs should reach all eligible children and particularly those whose parents are doubters, the unknowing or those simply busy. Clear messages therefore need to be designed and disseminated through methods that are suitable for reaching such parents and others who can influence or motivate them. Therefore, social mobilisation plans should give due prominence and resources to these preferred methods of communication.

Social mobilisation activities in the districts and communities should start 2 months before and be intensified in the last 2 weeks before the SIAs. While actual activities will depend on each country/community, these may include door-to-door canvassing, media campaign (esp. through the use of radio programmes and spots), and announcing measles immunisation days at all community meetings, religious gatherings.

Informational and promotional materials such as posters, brochures, letters, T-shirts, caps, post-banners and street-banners should be designed, prepared, ordered and distributed about a month in advance before SIAs.

In addition to local social mobilization activities, the mass media is very effective in mobilizing for SIAs. The national and provincial/regional Social Mobilisation Committees (SMCs) should work closely with media executives to plan dates, time, frequency and content of media messages and press releases. Before and during SIAs, the SMC should continuously feed the press with fact sheets and regular well-written updates. Town criers and local community groups (especially youth's and women's groups) have been used effectively in urban areas to disseminate information about the SIAs. Some countries have utilised mobile phone companies successfully to mobilise communities through the mass dissemination of text messages advertising measles SIAs.

Efforts should be tailored to reach under served populations or special populations. These may include minority groups or marginalized populations, religious communities that may resist public health interventions, nomadic/migratory groups, refugees, elite groups and their staff. Such efforts might include:

- The SIAs coordinators or social mobilisation experts holding preliminary meetings with opinion leaders of those communities,
- Working closely with leaders of the minority communities, and ensuring that members of the group who speak the same language are working at the immunization post.
- Working with local NGOs and Faith Based Organisations (FBOs) that provide assistance to the groups
- House-to-house canvassing during the SIAs by community mobilisers or volunteers, especially in dense urban centres and areas known to have low coverage or turnout, in order to ensure that all eligible children are reached.

8.5 Messages on measles vaccination and vitamin A supplementation

The development of social mobilisation messages and approaches should be informed by appropriate communication needs assessment exercises. These may include KAP studies or focus group discussions with relevant community members. Such studies will help to clarify the community's perceptions, misconceptions, concerns and experiences regarding the disease and the immunisation services. These studies will provide essential material for the development of a "Frequently Asked Questions" paper that specifically addresses community concerns and queries.

The key messages on measles (and vitamin A) that will be developed, pre-tested and disseminated should be as simple as possible and should be adapted to suit particular groups through the use of local language. Clear and crisp messaging using multi-channel communication should be employed in the appropriate languages. Some generic messages are given in the text boxes below.

- **Measles** is a dangerous disease which kills children
- Measles is a disease caused by a germ (the measles virus). The signs include a red, blotchy rash over the whole body, fever and a runny nose, red eyes or cough.
- Children with measles must be taken to a health centre immediately. If not treated, a child with measles can develop problems such as pneumonia, eye and ear infections, sores in the mouth and other complications, sometimes leading to death.
- Measles can be prevented by giving measles vaccine. A single dose is given when the child is 9 months or soon afterwards. An extra dose is given during the campaigns to all children aged 9 months to under 5 years

- Take your child 9 months to 5 years to the nearest health centre or vaccination post for vaccination during measles immunisation days taking place on (*dates*)
- All children 9 months to 14 years should be vaccinated against measles during measles immunisation days even if they were vaccinated before or whether or not they had measles.

Routine immunization

- Immunization protects your infant from certain diseases like polio and measles.
- Know when and where to take your child for his or her next immunization. Check your baby's immunization card or ask your health worker.
- To get good protection against some diseases, infants need to have some vaccines repeated three times. Ensure that your infant completes the basic series of immunizations by his or her first birthday.
- Ask your health worker if you and your children need additional vaccinations.
- Some injections may cause mild side-effects such as light fever, soreness and redness. If this happens, ask your health worker for advice about what to do.

- **Vitamin A** is necessary for healthy growth and development of the child. It promotes good eyesight, and helps children to defend themselves against infections such as diarrhoea and measles.
- Deficiency of vitamin A can cause night blindness and other eye problems
- To reduce vitamin A deficiency in(area), vitamin A drops will be given to all children from 6 months up to 5 years of age during the measles immunisation days which will be conducted on(Dates)
- Take all children 6 months and under 5 years of age to receive vitamin A drops. Every child under five years of age should receive an additional dose of Vitamin A every 6 months
- Vitamin A deficiency can be prevented by administering Vitamin A supplements to all children aged 6-59 months. It is also very important to eat foods rich in Vitamin A, such as breast milk, whole milk, liver, green vegetables, carrots and foods with yellow/orange/red colour e.g. paw paws, mangoes, sweet potatoes, pumpkins, palm oil and yellow maize.

Key messages targeting health workers will provide technical information aimed specifically at addressing concerns about procedures and dosage. Their understanding of some concerns will help them address parents' concerns.

- There are no contraindications for measles vaccine
- The measles vaccine given during SIAs is considered an extra dose. All children who turn 9 months during SIAs should still receive their routine measles vaccine one month after the SIAs dose.
- During SIAs, health workers or volunteers may encounter children who have had a dose of measles less than four weeks previously. These children should still receive a dose of measles during SIAs
- Children 9 months to 5 years admitted in hospital should also receive measles vaccination during the SIAs

8.6 Anticipating and dealing with negative publicity & AEFIs

Program managers must anticipate some negative publicity during campaigns and develop pro-active strategies of dealing with them so that they will not hamper immunisation activities. Some tips of dealing with these rumours include:

- Preparing appropriate media materials in advance to facilitate a rapid response to such negative claims
- Having a trained focal person in the media who responds to questions and reviews materials before publishing
- Using a credible spokesperson in the ministry/community to quell the rumours and reassure the community

See previous chapter for more on the communication regarding AEFIs.

9 SUPERVISION, MONITORING AND EVALUATION

9.1 Supervision before and during SIAs

Supervision is necessary to ensure quality of planning and implementation. The success of a campaign will largely depend on the work of motivated and hard working supervisors who assist in the campaign preparations, and who identify and solve problems or refer issues to the next management level. Supervisors should be equipped with transport in order to bring extra and essential supplies with them, such as tallying and recording forms, social promotion materials, guidelines, and vaccines (when appropriate).

Staff from all administrative and technical levels is expected to participate in supervisory activities in the preparatory and implementation phases of the SIAs. Supervisors from the central level should visit all districts at least six weeks before SIAs and again 2 - 3 weeks prior to the SIAs in selected districts with particular difficulties or questionable quality of preparations. Supervisors from the district should pay visits two weeks before SIAs to all sub-districts, as well as to permanent fixed posts and health facilities. Additional supervisory visits from the central and/or district levels may be needed as the situation dictates, particularly in difficult areas.

During all phases of the campaign, supervision must focus on quality, effectiveness, and safety. Supervisors must be familiar with what is expected and what is happening in order to detect any harmful practice and to be able to recommend and enforce appropriate changes. They should be systematic, thorough, reliable problem solvers, and need to motivate and encourage local staff. Good supervisors understand the planning of SIAs and are fully knowledgeable with the task lists, logistics, and all other SIAs forms.

In the last 2 - 3 weeks of preparation before the start of the SIAs, supervisors at all levels need to pay visits to selected sites at the next lower level to verify the smooth course of the preparation stage. Some of the program elements that need to be included in the verification of the preparation include:

- Quality of planning to access the target groups (maps, drawings, lists...)
- Timely receipt and distribution of the various inputs including vaccines, devices, recording and summary forms
- Cold chain capacity, and preparations to handle immunisation waste
- Coordination of social mobilisation activities and community awareness about the SIAs

- Strategies to address hard-to-reach areas and populations
- Transportation resources for the period of the SIAs

This pre-implementation supervisory activity may include house-to-house visits in selected hard-to-reach areas or populations in order to verify if parents know about the campaign, the dates, the target population and the location of the nearest vaccination post. If this spot check indicates that social mobilization efforts are inadequate or ineffective, these must be intensified or messages changed immediately.

During the implementation stage of the SIAs, the supervisor should verify that campaign personnel at various levels understand their tasks, identify any constraints and work with SIAs committee members and the local community to overcome the constraints. During the conduct of the SIAs, supervisors should discuss plans with coordinators and observe vaccination teams in action. This requires travelling early in the morning and visiting different service delivery posts and teams. During these visits, supervisors must ensure that teams are replenished in case they run out of vaccine; gaps are identified, problems solved, and the strategy revised as necessary; problems with regards to vaccination technique and community acceptance are solved immediately (e.g. if a community refuses vaccine, the supervisor should intervene); and that results are collected and reviewed with teams at the end of each day.

The supervisory visits should be duly documented using the structured pre campaign and intra-campaign supervision checklists. Supervisors are expected to document the findings and actions taken, as well as any managerial issues, and use this documentation to discuss with the SIAs coordinators at the respective levels. These issues may include logistical, social mobilisation or operational issues related to the vaccination efforts. In addition to immediate troubleshooting, managerial measures and corrective actions, the supervisory checklists should be reviewed by the SIAs coordinators to be able to identify any lessons to be applied in future SIAs. Sample supervisory checklists for the verification of preparations and to be used during the implementation phase have been annexed.

Using the simple but comprehensive supervisory checklists, SIAs coordinators should be able to extract key information and calculate performance according to a set of indicators agreed upon at National level. This would help to pinpoint problems and compare performance across districts. Some of these indicators are outlined below.

Some Qualitative monitoring indicators for Pre-campaign preparations:

- Proportion of districts with operational funds available at least 7 days before the start of SIAs
- Proportion of districts with planned quantities of vaccine and devices at least 2 weeks before the start of SIAs
- Proportion of caretakers who can identify the target disease, campaign dates, venues and age groups

Some Qualitative monitoring indicators for Campaign implementation:

- Proportion of vaccination sites with no shortfalls of vaccines and devices
- Proportion of sites with proper cold chain (refrigerators monitored daily and temperatures between 2 – 8 °C)
- Proportion of sites where used syringes are placed in safety boxes
- Proportion of sites where tally sheets are filled correctly
- Proportion of sites where vaccinators know AEFI reporting procedures

9.2 Weekly monitoring of preparations

In the three months preceding the SIAs, the technical and managerial body responsible for the coordination of the SIAs at national level should organise weekly coordination meetings with the participation of all major players. These coordination meetings are supposed to track the pace and level of preparatory activities and look into all aspects of the SIAs preparations including micro-planning, timely availability of financial and human resources, advocacy and social mobilisation activities, cold chain and transportation logistics, training, and preparations for monitoring and evaluation of the SIAs. These meetings should be minuted, and action points recorded for review with every subsequent meeting.

Similar coordination meetings should take place at provincial and at the district level, particularly in the last two to three months prior to the SIAs.

9.3 Monitoring during the campaign

One of the key activities that can significantly improve the quality and outcome of the SIAs is monitoring. Experienced and trained supervisors should be deployed to support the intra-campaign monitoring process, and provide on-site and practical solutions to problems and issues that may arise. On the other hand, independent monitors may also be deployed in order to document their observations with regards to the qualitative/process aspects of the SIAs as well as monitoring the quantitative coverage of the SIAs.

Monitoring of the qualitative aspect of SIAs involves mainly observation of the vaccination post and the teams in action, with specific emphasis on the cold chain and handling of vaccines, injection practices, registration and recording, monitoring of AEFIs, and post organisation. Empowering supervisors with the necessary means of communication, eg., providing adequate airtime for them to use cellphones to communicate to the operational coordinators or the district level, will be helpful. This is especially so during monitoring of SIAs, where immediate and effective managerial action to address issues related to vaccine stocks, injection safety, rumors and resistance, etc., will be crucial to the success of the SIAs.

The quantitative monitoring of measles SIAs includes:

- Careful tallying and recording of doses administered, vials utilised, and doses wasted
- Daily summary and review of the number of doses administered against the expected daily targets for each service delivery post
- Daily conduct of rapid convenience monitoring (RCM) by program supervisors
- Daily conduct of rapid convenience monitoring by independent monitors – focusing on out-of-house monitoring to look for eligible children in the streets, playground, transportation hubs, etc or on a house to house basis.

Independent monitoring is expected to generate an estimate of the proportion of missed children in each locality, specially focusing on hard-to-reach populations and traditionally low performing areas.

9.4 Daily summary of administrative vaccine coverage:

The district level administrative coverage data is an important quantitative indicator of the performance of SIAs. However, administrative coverage data may not reflect the reality in cases where the denominator used for the target population is inaccurate. The latter is a common problem in situations where there is substantial population movement (eg., internal displacement, rural-urban migration) that may not be factored when projecting population figures using old census data. It is therefore mandatory to do intensive and organized monitoring of campaign activities in order to ensure that large pockets of unvaccinated children do not remain undetected and un-reached.

At the end of each day, supervisors can estimate accomplishments by reviewing the tally worksheets of the teams under their supervision, comparing the number of children vaccinated against the micro-planning and community line-listing targets established for the various teams. These figures are plotted

against the targets set for the area on a daily basis and the cumulative in the first few days can be used to assess the rate of progress and, if need be to re-strategize. This basically means trying to determine the number of children to be vaccinated in the remaining days of the SIAs, determining the deployment of available human resource, and the distribution / re-distribution of vaccines and other materials. The administrative coverage figures are summarised for each administrative level on a daily basis and the information is used to make decisions regarding re-allocation or re-organisation of resources, and possible extension of the duration of the campaign in some areas.

In the example below (figure 11), it is obvious by the third day of the SIAs that the pace is quite slow in Province 2 (only 30% of eligibles vaccinated as compared to nearly 60% in Province 1). A proactive EPI management team would at this point ask why, and work to improve logistics, resource allocation, social mobilisation... to ensure that the target coverage of 100% is reached much sooner than the 20 days it took Province 2 to cover all eligibles as in the example.

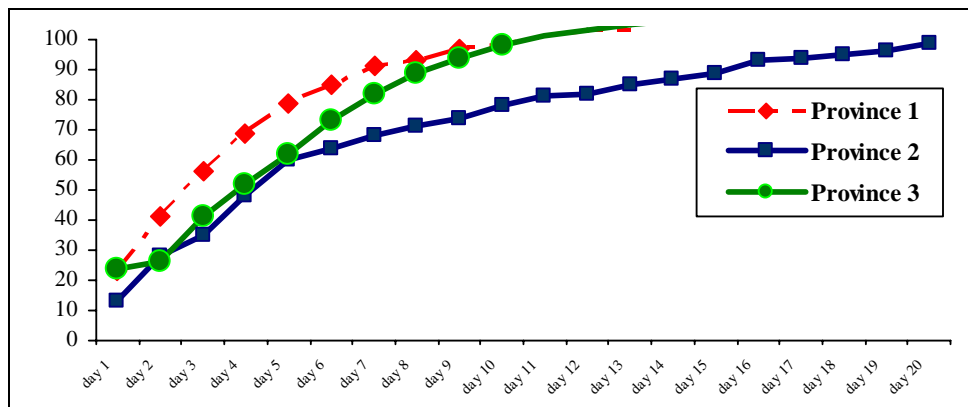


Figure 11. Daily charting of administrative coverage during SIAs

If the tally sheets include provisions for identifying “zero-dose” children, i.e., children receiving measles vaccination for the first time during the SIAs, the proportion of zero dose children is a strong indicator of the quality of the routine programme, and of the ability of the SIAs to “reach” previously un-reached populations.

9.5 Rapid Convenience Monitoring (RCM):

During the course of the SIAs, especially starting on the second or third day of the campaign, starting in areas already covered by the SIAs, all supervisors should conduct daily systematic monitoring of performance by randomly looking at a minimum of 20 children within the target age group (either

within 20 randomly selected households or as out-of-house monitoring in market places, in the streets, or other public places) in each of the areas under supervision. In conducting this monitoring activity, care should be taken to include as many sections of the catchment community as possible and to particularly seek out hard-to-reach populations already covered by the vaccination teams. The only piece of information needed during these monitoring visits would be the age and vaccination status of the eligible child in the selected household, and if not vaccinated, the reasons thereof. As the finger-tips of children vaccinated would have been marked with indelible markers during the vaccination sessions, it should be possible to objectively determine whether or not the child had received the SIAs dose with some certainty. The other alternative would be to look at any written evidence of vaccination provided during the SIAs. Some countries have used the marked triage cards provided to each eligible child as an evidence of vaccination, especially when finger marking was not done uniformly. (Figure 12)

Once the area for RCM is identified, the monitor will visit 20 children in the target age group (through house-to-house or outdoor monitoring) to confirm whether they have received the SIAs dose. The finding of one unvaccinated child out of the 20 should invite a further verification by looking at 10 more children. However, if 2 or more children out of 20 are not vaccinated, there is a reason to be concerned, and all efforts should be made to understand why these children missed their doses. Immediate remedial action needs to be taken to address the reasons – either by taking action to increase demand or by improving the access to the service.

RCM often takes only less than 1 hour of the supervisor's time to cover an area, and is technically easy to conduct. A simple tool consisting of a tabulation of the child's age, vaccination status and reasons for non-vaccination should be adequate to generate the information needed for this monitoring. (See Annex)

Please note that RCM is no more than a "quick look" into the program performance. It is not a survey. It does not involve any sampling methods except for "convenience sampling" of the target population, and is not expected to take place in all geographic areas, and so is not scientifically valid as a means of generating proportions that can be cited as coverage figures. The RCM can be equated to the lot quality assurance method in that it only helps to look at whether there are a significant number of "bad" units – in this case unvaccinated children – from among the ones within the sample.

The primary objective of the RCM is to use the results to ensure that any group of unvaccinated children is immediately identified and addressed before the vaccination team moves out of the locality. A team of vaccinators accompanied by supervisors should in due time organise to mobilise the community further, or return to the pockets and vaccinate the unvaccinated children. By looking into the reasons for non-vaccination, the rapid monitoring also helps to identify negative publicity and resistance groups early in the campaign and manage them accordingly. The results of RCM will be valid for the specific unit of the monitoring activity and cannot be generalised to a wider area. In addition, it will be methodologically erroneous to aggregate the results of RCM across a wide area and refer to it as coverage proportions. On the other hand, one can use the RCM results to compare various units of monitoring by looking at whether a cut off point for the proportion of missed children has been reached or not.

The RCM method may also be implemented using independent monitors not linked to the implementation, and recruited for the purpose of providing an independent picture of the SIAs. While the outcomes of the monitoring done by SIAs supervisors is expected to be used for immediate action, the results of the independent monitors may be compiled and used to assess the SIAs performance in directly alongside the administrative coverage results, as indicated above and taking care to avoid mis-interpretation. Mop up actions may be organised based on the independent monitoring results.

In addition to the immediate local action taken based upon the findings of RCM by the different supervisors and independent monitors, the national level should ensure that an analysis of the findings is done in all measles SIAs and the results are used to inform the planning and implementation of future SIAs.

The following indicators may be generated from the results of RCM, and can be used as a proxy to measure the quality of the measles SIAs:

1. % of targeted districts monitored
2. # of children checked by independent monitors and / or supervisors
3. % of eligible children monitored/ total SIA target
4. % of monitored eligible children vaccinated during the SIAs by sub-district or monitoring area
5. % of sub-districts / monitoring areas surpassing the minimum proportion of unvaccinated children
6. % of reasons for missing children or for non-vaccination

7. % of parents aware of the SIAs
8. % of parental or caretaker source of information on the SIAs

The results of rapid convenience monitoring are used to ensure that any group of unvaccinated children are immediately identified and the reasons for non-vaccination are adequately addressed during the course of the SIAs.

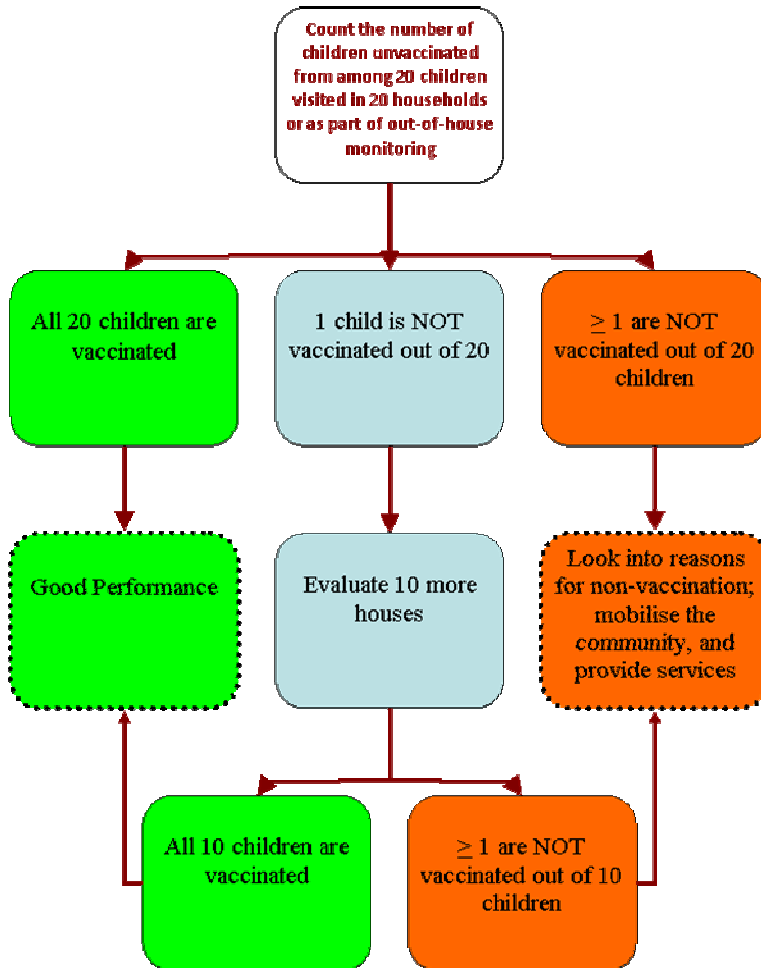


Figure 12. Flow chart for rapid convenience monitoring (RCM) during measles SIAs.

9.6 Post campaign coverage surveys:

An immunization coverage survey is a survey of small numbers of individuals to determine their immunization status. It includes visiting homes in a systematic way so that only a small proportion of homes need to be surveyed in order to obtain valid results for a larger population.

Post SIAs coverage surveys provide an opportunity for validation of the administrative coverage results. These coverage surveys should be led by an independent team not linked to the SIAs, and should be conducted within one month of the completion of the SIAs. The initial SIAs plan should include provisions and budget for the post-campaign coverage surveys.

The traditional EPI cluster survey methodology (30 clusters of 7 each) or a modification of this method (e.g., 40 clusters of 10 each) is often used for this purpose. The first step in doing such a cluster survey is to know the total population of the area to be surveyed and the population of the administrative units in the area. The selection of districts in this kind of survey has a probability proportional to the size of each district. Thus, districts with larger populations would have a greater chance of being selected.

This survey provides the vaccination coverage estimates within 10 percentage points of the true value. In addition the survey may be used to determine a number of other factors related to the SIAs like community awareness and access to social mobilisation channels, routine coverage, adverse events, etc.

A survey using the cluster sampling technique will only allow conclusions to be drawn about the population surveyed as a whole. It will not permit comparisons among different clusters or subsections of the population surveyed. However, comparisons of coverage in different parts of the population may be done if separate surveys are done in each part of the country.

For more information refer to the African Regional Measles SIAs Monitoring and Evaluation guideline, and the WHO HQ manual on Immunisation Coverage Surveys.

10 MOP-UP IMMUNIZATION IN LOW COVERAGE DISTRICTS

10.1 Administrative vaccine coverage:

Once the district level administrative coverage is compiled and completed, it will be possible to look at the proportion of target group covered as compared to the target. The goal of measles SIAs is to vaccinate 95% of the eligibles in all districts, and so any coverage figure below this in any district is a cause for concern. This coverage data is best reviewed against the monitoring and supervision reports since there may be some issues with the denominator population data.

Children not reached during measles SIAs are often the same children that are not benefiting from routine services as a result of geographic isolation, or marginalization due to socio-economic or other factors. Therefore every effort has to be made to reach these populations. One way of doing this is to extend the duration of the SIAs by a few more days once the cumulative daily administrative coverage charting and the rapid convenience monitoring results indicate the need for such an action. Such an extension should only be based on data and supervisory findings, and calls for making quick decisions to pool resources.

On the other hand, very good administrative coverage results, as reassuring as they are, may partly be due to some children out of the target age group receiving services and being misclassified as belonging to the target age group. Eg. Children beyond 4 years of age being vaccinated in measles SIAs targeting 9 to 47 months olds. It helps to look at the coverage data broken down into smaller age categories. Therefore all coverage reports have to be critically evaluated alongside monitoring reports in order to determine SIAs coverage and quality.

10.2 The decision to do mop-up vaccination:

In the immediate post-campaign period, once all the administrative coverage data has been tallied and summarized at district level, districts with low administrative coverage should be addressed appropriately. The decision to do further mop-up vaccination is based upon the finding of sub-optimal coverage suggestive of a sizable number of un-reached children.

The proposed decision matrix shown below (Table 6) takes into account the district level SIAs administrative coverage and the district level routine immunization coverage figures in order to decide whether mop-up vaccination should be considered or not. The cut off point of 90% administrative coverage during SIAs has been used for immediate decision to mop-up because of the need to ensure that the highest possible coverage is attained. The availability of resources is a critical factor in the decision to go ahead with mop-up efforts.

District level administrative coverage during SIAs	Latest* Routine immunization coverage figures for the district	Decision to do “mop-up” vaccination
≥ 95%		Accept result; no need to mop up
90- 95%	≥ 60%	Accept result; no need to mop up
90- 95%	< 60%	Consider mop-up vaccination in low performing sub-districts
< 90%		Do mop-up vaccination in low performing sub-districts

* Coverage figures for the preceding calendar year.

Table 6. Decision matrix for conducting mop-up vaccination after the completion of SIAs.

10.3 Planning and implementing high quality mop-up vaccination activities:

The National plan for the SIAs should have some provisions for the possibility of mounting a mop-up operation should coverage results justify the need for such an activity. Contingency plans have to be made in order to access resources if and when mop-up is needed. The implementation of mop-up vaccination efforts has to be focused to reach the un-reached target group as much as possible. Since district level coverage rates may hide some inconsistency in coverage at lower levels, it is best to disaggregate data and review coverage by sub-district level.

The following steps will help guide action once the decision to do mop-up has been reached.

- Review administrative vaccination coverage figures by sub-district
- Review daily cumulative vaccination charting for each sub-district
- Review results and reports from Rapid Convenience Monitoring activities
- Disaggregate data by age group, geographic area and see if there has been any under-representation of a specific age group...

- Meet with the district program managers to review data and brainstorm on reasons for low coverage
- Review the logistic inputs and organization in the sub-district (manpower, supplies, transportation..)
- Review the micro-plans and reports of supervisory teams
- Identify the sub-districts where mop-up vaccination activities should take place
- Review available resources and prioritize areas to cover with the mop up vaccination
- Hold a consultation with potential supervisors and opinion leaders in the community
- Decide on the dates and select the vaccination and supervisory teams
- Organize personnel, supplies, transportation and other logistics for the mop-up activities
- Conduct further intensive and targeted social mobilization in the area
- Address any resistant groups or rumours
- Set-up temporary fixed vaccination posts or use mobile teams to address un-reached populations
- Do intensive qualitative and quantitative monitoring, and review of activities on a daily basis
- Calculate the administrative coverage figures for the whole district by including the number of un-reached children vaccinated during the mop up efforts

11 USING THE SIAs TO REINFORCE ROUTINE IMMUNISATION

The planning and preparation for measles SIAs presents a unique opportunity to re-examine the routine immunisation program, with the aim to identify and start to address future areas for improvements, eg., to reach un-vaccinated populations, to improve reporting and monitoring systems, to identify new partners and strengthen the collaboration with existing ones, etc. Critical programmatic information from the routine immunisation program like the target population, risk factors for non-vaccination, district level disease burden, low coverage districts, cold chain status, etc will be very useful for SIAs planning. At the end of the SIAs, similar programmatic information generated through the course of preparation and implementation of the SIAs, will be fed back to the routine immunisation program, and will provide the continuity required to maintain and sustain high population immunity between the SIAs.

The following is a list of potential areas where measles SIAs may be linked to efforts to strengthen routine immunisation systems.

- Plans and microplans
 - National immunisation programs are expected to have a long, medium and short term Plan of action. SIAs should be included in those Plans of action as a strategy to achieve the objective of measles mortality reduction or pre-elimination.
 - Micro-planning for SIAs should begin with a review of micro-plans for routine immunization services, and routine immunisation coverage as well as activity reports.
 - District micro-planning for measles SIAs should be used to strengthen micro-planning for routine immunization, using the Reaching Every District (RED) approach.
 - Lessons learned while developing and implementing district micro-plans for SIAs will be used to strengthen micro-planning for routine immunization.
- Partnerships and program coordination
 - The SIAs opportunity should be used to identify national and local partners, businesses, NGO's, community based programs, etc that can be brought on board to support any aspect of the routine immunisation program, beyond the SIAs.

- Cold chain
 - The opportunity of the SIAs helps to conduct a review of the national cold chain status, to launch maintenance of cold chain equipment, to bring non-functional cold stores into the cold chain system, and to import new equipment to cover gaps.
 - The equipment purchases for the SIAs should bring up the cold chain capacity to national standards as determined by recommended requirements for every district for the routine immunisation program.

- Identification of target population for measles SIAs
 - Planning activities to identify the target population for SIAs should be linked to the routine immunisation program to identify high risk and underserved populations and to develop special micro-plans for these areas.
 - Community health workers, community based distribution networks, and other grass-roots structures may be mobilized to enumerate target populations for the SIAs, and may be tapped to provide support for routine immunisation as well.

- Advocacy and Social mobilisation
 - Advocacy activities for the SIAs should include messages in support of routine immunisation.
 - SIAs contacts can be used to reinforce messages that both SIAs and high routine immunisation coverage are necessary for sustained reduction in measles mortality
 - The SIAs opportunity can be used to conduct studies to understand the concerns of parents and caretakers related to immunisation in general and to address these as part of the social mobilisation for the SIAs
 - SIAs present an opportunity to improve the understanding of the use of communication methods and channels in support of the immunization program.
 - Health workers participating in the SIAs should remind parents and caretakers about the routine immunisation schedule.

- Training activities
 - Training sessions for measles SIAs need to include refresher training on critical topics related to the immunisation program in general, eg., immunisation logistics, vaccine needs

forecasting, skills in cold chain management and vaccine handling, AEFI surveillance and management, etc.

- Supervision
 - Planning and training for supervision during SIAs will be expanded to include promotion of supervision of program elements that go beyond the immediate SIAs activity.
 - Information from the routine immunisation program should be used to target high risk districts for extra supervisory support.
 - Supportive supervision during SIAs helps to improve routine immunization and provide an opportunity for on the spot training of health workers
 - Field supervisory visits will include supervision of general routine immunisation program performance and will not be limited to topics or issues devoted strictly to the measles SIAs.
- Data management
 - Capacity building and technical support to improve data management practices including record keeping, analysis of data, coverage calculation, mapping, use of indicators, etc, for measles SIAs will bring an added value to the routine EPI program.
- Vaccine safety
 - Activities to ensure safe injections and surveillance for AEFI during SIAs can be expanded to provide capacity and to lay down a solid system for the routine immunisation program.
 - Safe disposal assessments and construction/ maintenance of incineration facilities for measles SIAs should be designed to cover the needs for the routine immunisation program.
- Monitoring and Evaluation
 - AEFI surveillance systems can be strengthened by building the capacity of health workers and by introducing the procedure for case reporting that lasts beyond the SIAs
 - Coverage surveys to evaluate measles SIAs coverage will be designed to also review routine immunization coverage and utilized to identify reasons for non vaccination according to the routine immunisation schedule.

- Others
 - SIAs help to strengthen the resource inputs into the routine immunisation programme by providing injection devices, safety boxes, cold chain equipment, written guidelines, and other supplies that last beyond the SIAs
 - Areas identified as missed during the SIAs, or with high number of zero dose children during the SIAs should be targeted by the routine immunisation program through regular outreach services beyond the SIAs.
 - Supervisory visits for SIAs present an opportunity for senior program managers and decision makers to visit the operational level
 - SIAs have been used to introduce new technologies and equipment into the routine immunisation system, eg., AD syringes and syringes with reuse prevention features.

12 POST-CAMPAIGN REVIEW MEETINGS

At the end of the campaign, the national level coordination and technical committee members, supervisors, observers and coordinators at sub-national level should conduct review meetings, and prepare a summary report of the results based on the coverage data, the supervisory findings, as well as their own impressions and experiences. These results should be used to evaluate the preparations and implementation of the campaign, using the set of indicators agreed upon to measure the quality of the SIAs. The lessons learned should be properly documented and used to improve subsequent SIAs.

The following is a proposed discussion agenda for the post-campaign review meeting:

- Pre-campaign activities
 - Quality of micro-plans and the planning experience
 - Quality of training as evidenced by the observation / supervision of SIAs implementation
 - Social mobilization
 - Appropriateness and quality of mobilisation materials/ media used and the impact on the community
 - Coordination with other sectors for social mobilisation
 - Logistics and cold chain
 - Timeliness and adequacy of logistic inputs
 - Coordination at different levels
 - The quality of pre-campaign monitoring and subsequent response
- Implementation
 - Central coordination and support to the SIAs
 - Coordination between district operations, vaccination and supervisory teams
 - Flow of information
 - Transportation and quality of communication between the different levels
 - Decision making and execution of responsibility at each level
 - Organisation and quality of service delivery at immunisation posts
 - Availability of supplies at the posts
 - Vaccine wastage
 - Monitoring and evaluation
 - The cold chain status, Injection safety and waste management practices

- Identification and management of AEFI
- The documentation of supervisory findings using the standard checklists
- Rapid convenience monitoring and subsequent actions
- Community turnout, resistance groups and negative publicity
- Efforts to reach hard-to-reach populations and areas
- Recording of activities, daily summary and data flow
- Achievements
 - Administrative coverage
 - RCM and independent monitoring results
 - Mop-up activities
 - Partnership issues
 - Spin off for the routine immunisation services
- Constraints, lessons learnt and recommendations

Finally, health workers, and all partners should be congratulated for their efforts. The results of the campaign should be publicised and used as a motivational tool to show all what can be accomplished with good planning and hard work.

Within 5 weeks after the campaign, EPI managers are expected to forward a technical report to UNICEF and WHO. See sample outline in Annex. The technical report is as much a documentation of experiences as it is an official report, and so should, as much as possible, contain informative narratives of the SIAs experience as compared to the thinking and assumptions in the macro and micro-plans. In addition, any identified best practice in planning, implementation and monitoring of the SIAs that has contributed a lot in terms of attaining the objectives needs to be documented properly and disseminated along with the SIAs report.

ANNEXES

- I. Sample Pre-campaign preparation Supervision checklist
- II. Sample Supervision checklist for campaign implementation
- III. Unsafe immunisation practices
- IV. AEFI Case investigation form
- V. Rapid Convenience Monitoring tool
- VI. Set up for an immunisation session at a fixed site
- VII. Essential outlines of measles strategic and activity plans of actions
- VIII. Measles SIAs Technical report outline

ANNEX I. Sample Pre-campaign preparation Supervision checklist:

Date of visit:	Observer:	
Region:	District:	
Service delivery post:	Service delivery post coordinator:	
	Yes/ No	Comments
Planning and Coordination		
Microplans developed and complete?		
High-risk areas & populations identified? Special strategies defined?		
Mechanisms for effective partner/inter-sectoral coordination in place?		
Coordinating committees organised?		
Campaign guidelines in place?		
All required funds available?		
Supervisory structure in place?		
Enough vaccinators allocated to posts so that no vaccinator must inject >200 children/ day?		
Social Mobilisation		
Social mobilization committee functions?		
High-level advocacy given for the campaign?		
Effective mobilization strategies in place to generate demand?		
Community members know the campaign dates and targets?		
Logistics and Supplies		
Adequate quantities of vaccines and diluents distributed?		
Adequate quantities of Vitamin A distributed?		
Health workers & volunteers trained?		
Adequate transport organized for supervisors and to transport supplies?		
Adequate cold chain supplies and equipment in place?		
Adequate copies of tally sheets, forms in place?		
Injection Safety and AEFI		
Health workers understand how to use and dispose of AD syringes?		
Adequate supplies of safety boxes?		
AEFI surveillance and management procedures understood and reporting forms in place?		
Waste Management Practices		
Procedures in place for disposal of used needles, syringes and other wastes?		

Other observations:

ANNEX II. Sample Supervision checklist for campaign implementation

Date of visit:	Observer:	
Region:	District:	
Vaccination Post:	Post Coordinator:	
	Yes/ No	Comments
Social Mobilization and interaction at Service delivery point		
Population aware of campaign dates, purpose and post locations?		
Hard-to-reach populations/areas identified and targeted for special strategies?		
Post clearly identified by banner or other means?		
Health workers or volunteers actively searching for un-vaccinated children, and directing them to vaccination post?		
Health workers explain to caretakers about the vaccine, possible side effects?		
Parents informed that routine immunization should continue?		
Cold Chain		
Vaccines stored in vaccine carriers with at least 2 frozen ice packs?		
Refrigerator temperature is 2-8°C with up-to-date temperature monitoring form?		
Diluent cooled before reconstituting the vaccine?		
Reconstituted vaccine discarded after 6 hours?		
Availability of Vaccines & Supplies		
Sufficient measles vaccine and diluent?		
Vaccines bundled with enough reconstitution and AD syringes?		
Enough cold boxes?		
Enough safety boxes?		
Post Organization		
Post well organized, with good client flow?		
Sufficient vaccinators and volunteers?		
Every child vaccinated is tallied?		
Coverage estimated daily? Action taken if coverage low?		
Immunization Safety Practices		
Measles injection given correctly?		
Used syringes inserted into safety boxes without recapping?		
AEFI reporting procedures applied, reporting forms in place?		
Waste Management Practices		
Filled safety boxes are incinerated/ disposed of according to National guidelines?		
Recording and Use of Data		
Are health workers tallying every child vaccinated?		
Does post staff calculate coverage daily?		
Does post staff increase efforts to mobilize the population if coverage appears low?		

ANNEX III. Unsafe immunisation practices



Do not overfill the safety box



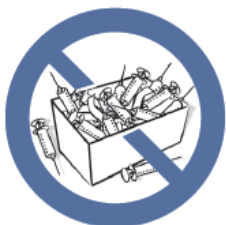
Do not recap the needle



Do not leave the needle inside the vial



Do not touch the needle



Do not dispose of used needles
in an open cardboard box

ANNEX IV: Sample AEFI case investigation form

Complete this summary page at the end of the investigation; file with field report and AEFI report forms

Investigation ID:	AEFI report ID:	Date investigation started: / /
Describe trigger event:		
Diagnosis/ case definition of event:		
Community investigation: Yes/No/? If yes, number of cases immunized with suspect vaccine in specified time window*, and number not immunized: immunized: _____ not immunized: _____		
Clinic investigation carried out: Yes/No/? If yes, key finding(s):		
Laboratory investigation(s) : Yes/No/? If yes, key result(s):		

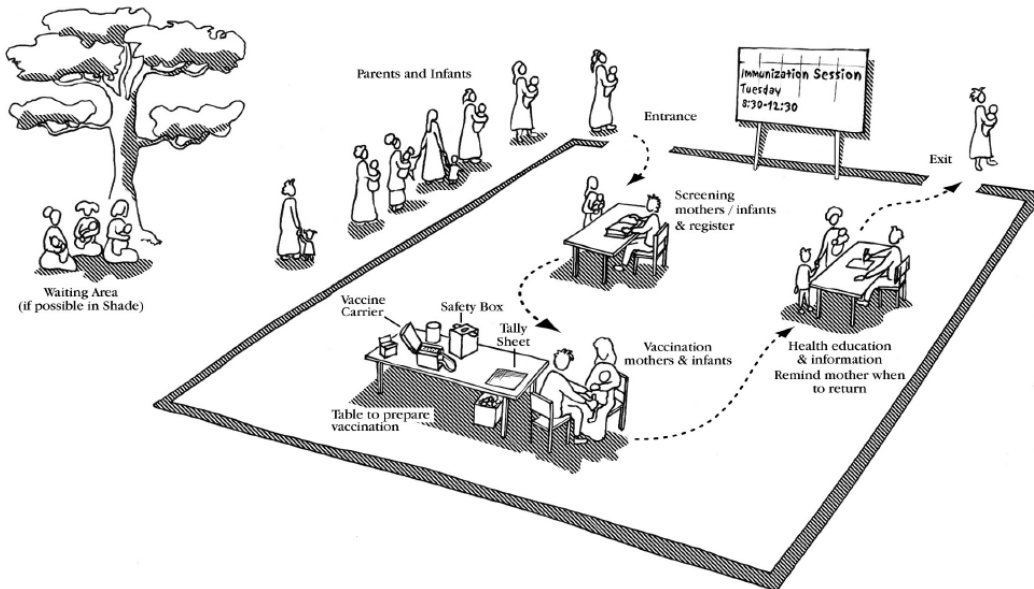
Assessment

Conclusion about cause of AEFI: tick categories and rank if more than one cause. Tick categories and rank if more than one cause.			
<input type="checkbox"/> Programme error	<input type="checkbox"/> Vaccine reaction	<input type="checkbox"/> Coincidental	<input type="checkbox"/> Unknown
<input type="checkbox"/> Non-sterile injection	<input type="checkbox"/> Vaccine lot problem	<input type="checkbox"/> Similar event in unimmunized	
<input type="checkbox"/> Vaccine prepared incorrectly	<input type="checkbox"/> Known vaccine reaction at expected rate	<input type="checkbox"/> Other:	
<input type="checkbox"/> Improper administration technique/site	<input type="checkbox"/> Other:		
<input type="checkbox"/> Improper vaccine transportation/storage			
<input type="checkbox"/> Other:			
Confidence about conclusion on main cause of AEFI: <input type="checkbox"/> certain <input type="checkbox"/> probable <input type="checkbox"/> possible			
Reason(s) for conclusion:			

Corrective action taken: Yes/No/? If yes, specify
Further actions recommended: Yes/No/? If yes, specify

Investigator:	Signature:	Date: / /
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ANNEX VI: Set up for an immunisation session at a fixed site



ANNEX VII: Essential outline of measles strategic and activity plans of actions

EPI managers responsible for drawing up strategic and activity plans for measles control need to ensure that the following elements are included in the plan documents:

- Plan consistent with WHO/UNICEF-recommended strategies
- Plan consistent with or incorporated into cMYP and other EPI/GAVI plans
- Strategies complement but not deter from polio eradication efforts
- Routine immunization and campaign strategies defined and are complementary
- Endorsement and definition of the role of the ICC in the planned activities
- Adequate background on measles epidemiology and measles control activities as well as on the National EPI program (mortality, morbidity, coverage)
- Adequate analysis of surveillance data and quality as well as description of investigated outbreaks in the past
- High risk areas and populations identified (age range, geographic)
- Experience from past SIAs well thought out and indicated in planning for the present one
- Realistic objectives given measles epidemiology, available resources, proposed length of campaign, type of campaign, and available time allocated for planning, procurement, training and implementation
- Detailed description of other interventions to be integrated with measles SIAs
- Partners and their potential roles identified
- Local resource mobilisation considered and included
- Micro-planning for campaigns programmed
- Staff identified (technical, management, logistics)
- All key components addressed and described in detail:
 - Vaccination posts distributed to facilitate access
 - Cold chain status and needs
 - Injection safety and waste disposal
 - Adverse event monitoring
 - Record-keeping
 - IEC/social mobilization
 - Reaching the previously un-reached
 - Transportation
 - Needs for technical assistance (epidemiologist, logistician, external monitors, laboratory support...)
 - Pre-campaign monitoring and evaluation
 - Campaign supervision and monitoring
- Post-campaign evaluation plans described, are technically sound and feasible
- Detailed timeline of activities included
- Budget clearly shows government and partner contributions and shortfalls

ANNEX VIII: Recommended AFRO measles SIAs technical report outline

WHO African Region Summary Measles SIAs Technical Report (National EPI Programme to fill and submit to UNICEF & WHO within 4 weeks of the end of SIAs)

1. Country:	
2. Dates of SIAs:	
3. Target provinces (if not a nationwide activity):	
4. Target population (please specify age target and numbers for each intervention, including details by first sub-national level if necessary):	
5. Overall campaign coverage (Number reached and % coverage for each intervention) ⁵	
6. Number and proportion of districts with measles vaccination administrative coverage \geq 95% during the SIAs:	
7. Number (numerator and denominator) and % of monitored sites with more than 10% un-reached children during end-process monitoring	
8. Amount of financial resources mobilized within country (provide details broken down by source of funds)	
9. Non-monetary contributions from different local sources during the SIAs (provide details broken down by source)	

⁵ This summary technical report should be accompanied by an updated and detailed spreadsheet of the administrative coverage result reports by district level.

<p>10. What other roles did the major national/local partners play in the SIAs? Describe:</p>	
<p>11. What were the mechanisms put in place in order to coordinate the different partners and stakeholders?</p>	
<p>12 . Resource utilization: Cost/child immunized</p>	
<p>13. Number of immunization posts actually operational during the SIAs</p>	
<p>14. Number of vaccination teams actually deployed during the SIAs</p>	
<p>15. Number of health workers actually deployed during the SIAs</p>	
<p>16. Number of district supervisors actually deployed during the SIAs</p>	
<p>17. Number of national supervisors actually deployed during the SIAs</p>	
<p>18. Number of volunteers actually deployed during the SIAs</p>	
<p>19. Describe the strategies employed to identify AND to address hard-to reach children, including the descriptions and size of these populations and the experiences in the SIAs?</p>	

20. Comments on Vaccine Quality and any AEFIs observed or reported ⁶	
21. Comments on the experience with injection safety and immunization waste management	
22. Estimated Vaccine Wastage rates at national level, and any major outliers at sub-national level	
23. What activities were carried out during the planning and preparation of the SIAs to improve routine immunization? Explain in detail.	
24. Were there any mop-up activities organised, and on what basis was the selection of areas for mop-up done? (Give numbers and proportion reached vs targeted, and explain how resources were organized)	

⁶ Please attach detailed AEFI investigation reports and any other additional documentation as necessary.

<p>25. Highlight the three major problems that occurred during this particular SIAs, and how these were addressed?</p>	
<p>26. Highlight the three major achievements during this particular SIAs, and how these can be sustained?</p>	
<p>27. What are the three major relevant best practices and / or innovative approaches from this SIAs that can be replicated /sustained in the future in this country and in other countries? Describe in detail.</p>	