WORLD HEALTH ORGANIZATION
EUROPE

FIELD GUIDE FOR PLANNING AND IMPLEMENTING SUPPLEMENTAL IMMUNIZATION ACTIVITIES FOR MEASLES AND RUBELLA

FIELD GUIDE FOR PLANNING AND IMPLEMENTING SUPPLEMENTAL IMMUNIZATION ACTIVITIES FOR MEASLES AND RUBELLA

March 2004

Address requests about publications of the WHO Regional Office to:

- *by e-mail* publicationrequests@euro.who.int (for copies of publications)
  permissions@euro.who.int (for permission to reproduce them)
  pubrights@euro.who.int (for permission to translate them)
- *by post* Publications
  WHO Regional Office for Europe
  Scherfigsvej 8
  DK-2100 Copenhagen Ø, Denmark

ABSTRACT

Measles and rubella remain important causes of vaccine-preventable disease and death in the European Region of WHO. The *Strategic plan for measles and congenital rubella infection in the WHO European Region* identifies key strategies to meet the objectives of interrupting indigenous measles transmission and preventing congenital rubella infection (< 1 case of congenital rubella syndrome per 100 000 live births) by 2010. *Surveillance guidelines for measles and congenital rubella infection in the WHO European Region* is a companion document, which provides technical advice on the design and implementation of surveillance programmes for these diseases.

Supplementary immunization activities (SIA) for measles are a way to quickly reduce the number of susceptibles in the population. When measles-rubella vaccine is used for cohorts susceptible to measles and rubella and rubella vaccine for other women of childbearing age, SIA provide the opportunity to quickly meet the 2010 objectives. *Field guide for planning and implementing supplemental immunization activities for measles and rubella* is intended to assist national immunization programme managers and subnational staff in the planning, organization, implementation and evaluation of SIA that may be required to meet the objectives.

Keywords

Measles
Rubella
Rubella, Congenital
Rubella syndrome, Congenital
Mumps
Immunization
Epidemiologic surveillance

CONTENTS

Annexes (by activity)

1. INTRODUCTION

1.1 GLOBAL AND REGION-SPECIFIC INFORMATION

Measles remains the fifth leading cause of death worldwide among children under 5 years of age *(1)* and is the most common childhood cause of death preventable by vaccination. In 2002, an estimated 614 000 deaths occurred, which was a 29% reduction from 1999, and demonstrates the successful implementation of supplementary immunization activities (SIA) in the World Health Organization (WHO) regions with the highest measles mortality rates. The WHO/ UNICEF measles mortality reduction strategy has targeted a 50% reduction in deaths by 2005 compared with 1999.

In the WHO European Region, a 78% decline in the annual number of measles cases was observed between 1991 and 2000 *(2)*, and by 2002 an 85% decline had occurred. However, the level of control varied by country *(3),* and outbreaks have continued to occur in many, including countries in western Europe.

The annual number of rubella cases reported in the WHO European Region during the last decade has declined in western, central and eastern Europe, but a large epidemic occurred during 1998–2001 in the Newly Independent States, where rubella vaccines are just being introduced *(3, 4).*

Given the current progress in controlling measles and rubella in Member States and the recognition that more than 80% of countries are using measles-containing vaccine (MCV) combined with rubella vaccine, the WHO European Region has developed a strategic plan for measles and congenital rubella infection *(4)* with the following objectives by 2010:

- interrupt the indigenous transmission of measles; and
- prevent congenital rubella infection (CRI; less than one case of congenital rubella syndrome per 100 000 live births).

The approach in the WHO European Region is to promote strong sustainable routine two-dose measles vaccine programmes in all Member States and to provide second vaccination opportunities for cohorts susceptible to measles.

The strategic plan aims to strengthen routine immunization programmes, meeting these targets through the use of six key strategies:

1. achieving and sustaining very high coverage with two doses of measles vaccine through high-quality routine immunization services;
2. providing a second opportunity for measles immunization through SIA for populations susceptible to measles, consistent with national targets for measles control;
3. using the opportunity provided by SIA for measles to target populations susceptible to rubella, where appropriate;
4. ensuring protection to women of childbearing age by providing high coverage with rubella vaccine;

5. strengthening surveillance systems by vigorous case investigation and laboratory confirmation; and
6. improving the availability of high-quality, valued information for health professionals and the public on the benefits and risks associated with immunization against measles and rubella.

The following guidelines are intended to assist Member States in the planning, organization, implementation and evaluation of SIA as part of their plans of action to meet the 2010 objectives.

1.2 APPROACH AND AGE GROUPS TARGETED

Interrupting indigenous measles transmission requires reducing the pool of non-immune individuals in the population to the point where sustained transmission of the virus cannot occur after an importation *(4)*. Measles, however, is one of the most contagious human diseases, and large outbreaks have occurred in countries that have achieved a high degree of vaccination coverage with a single-dose strategy *(5, 6)*, because approximately 5% of children immunized at 12 months of age will not respond to the initial dose of measles vaccine (primary vaccine failure). Children, who are vaccinated but not immunized, can permit sustained measles virus transmission when measles virus is introduced into the community.

Countries that historically have had less than 95% coverage with two doses of MCV may also have a sufficient number of susceptible children and young adults in group settings such as schools, universities, the military or hospitals, where measles virus can be introduced and easily spread. Susceptible age cohorts can be easily identified by reviewing epidemiological data of sporadic or outbreak-associated cases (specific rates of incidence by birth year). Occasionally, it may be useful to supplement these epidemiological data with serosurveys to better define susceptible age cohorts; however, consideration should be given to their cost, the serological and population sampling methods used and the feasibility of getting information in a timely manner for decision making.

All countries with susceptible cohorts older than the age of the second routine MCV dose or with inadequate first- or second-dose coverage need to develop SIA strategies aimed at achieving very high (> 95%) coverage among the groups targeted.

SIA, by providing vaccine to identified susceptible age cohorts, are an efficient method of rapidly reducing the number of susceptible individuals *(7)*; however, during SIA, vaccination should be done independent of an individual's prior vaccination status or history of clinical measles.

SIA provide opportunities to strengthen routine immunization services, allowing the programme to be boosted to a new sustainable level, where very high routine coverage is maintained *(4)*. By including rubella immunization for women of childbearing age, SIA can rapidly achieve the European Region targets for both measles and CRI.

1.3 COMPARISONS WITH POLIO NATIONAL IMMUNIZATION DAYS

A broad range of experience in immunization campaigns has been accumulated through polio national immunization days (NIDs) for eradicating polio. Since mea-

sles and rubella SIA will need to be conducted in many Member States, the experience gained in conducting NIDs can be used to plan SIA. Experience gained so far in countries conducting SIA *(8)*, however, has shown that SIA specificities must be considered. The following are some of the differences between NIDs and SIA.

- Well-trained lay vaccinators can administer live oral poliovirus vaccine (OPV), while SIA for measles and rubella need health personnel qualified to give injections.
- SIA require the disposal of used syringes and needles and need to address parental and societal concerns about injections.
- NIDs target preschool children; frequently the age group targeted for measles and rubella includes traditionally difficult to reach groups, such as adolescents (sometimes those not attending school) and young adults.
- SIA for measles and rubella require thorough attention to cold-chain storage capacity rather than to short-term cold transport capacity, as in NIDs.
- The highly technical and operational complexity of SIA makes them, ideally, a one-time intervention in each country. Poorly planned or poorly implemented SIA result in unnecessary use of scarce resources to redo activities.

A common feature of NIDs and SIA is that both develop the capacity of public health workers to plan and implement mass interventions. The following guidelines capture and summarize the collective experience of public health workers in conducting mass immunization campaigns.

2. GENERAL CONSIDERATIONS

A number of factors are important in assessing a country's capacity to undertake SIA:

- political commitment as reflected in an approved, comprehensive multi-year national plan for measles and if appropriate, rubella;
- technical capacity;
- adequate human and financial resources;
- a strengthened and sustainable routine immunization programme; and
- strengthened surveillance and laboratory capacity.

Measles and rubella SIA are complex and require adequate time for planning, if they are to be used as an opportunity to strengthen the immunization programme (Annex 1). An abridged suggested time frame for preparation of SIA is shown in Table 2; a more complete description is given in Annex 2.

Table 2. Template of suggested activities for planning and implementing SIA

Main activities	Lead time (months)										
	> 8	- 8	- 7	- 6	- 5	- 4	- 3	- 2	- 1	SIA	+ 1
Assessments, commitment, consensus											
Coordination, tasks, responsibilities											
Budget and resource mobilization											
Microplanning and logistic estimations											
Social mobilization											
SIA safety strategy											
Training, guidelines											
Supervision and monitoring											
Implement "special" strategies											
SIA evaluation (preparation & implementation)											

2.1 KEY ASSESSMENTS

Several assessments are suggested to enable more effective planning (Table 3). Use of these assessments in planning SIA will help ensure that the immunization programme is strengthened following SIA.

2.2 TIMING

Factors that should be considered when choosing the best time for SIA include:

- the disease epidemiology and when the next peak in incidence is expected – SIA are an effective way to prevent disease when done before an outbreak occurs, but they are not as effective when done during an outbreak;

- local factors such as school year, accessibility of populations due to weather conditions, and social and political events, e.g., holidays, elections, etc.; and
- availability of resources and the budgeting cycle.

Table 3. Assessments useful for planning SIA

Programme component assessed	Selected indicators
Cold chain	• Backup capacity at national/provincial levels for cold rooms, generators, alarms, and spares. • Freezing capacity at peripheral levels. • Adequate power supply.
Injection safety	• Training and practices of vaccinators *vis a vis* recommended best practices. • Availability of adequate supplies. • Use of safety boxes. • Proportion of health facilities with safe injection practices.
Medical waste disposal	• Methods to dispose of disposable syringes. • National guidelines or regulations for disposal of medical waste.
Surveillance for adverse events following immunization (AEFI)	• Number of serious AEFI reported over last 5 years. • Presence of a national committee to review serious AEFI.
Information, education communication	• Perceptions of health professionals and the public regarding vaccination, measles and CRI. • Experience with effectively communicating public health messages to the public.
Legal contraindications to routine vaccination	• List of conditions either officially approved and/or used in routine practice to exclude children from vaccination.
Surveillance for vaccine preventable diseases	• Number of cases reported, including timeliness and completeness of reporting from second and third administrative levels.
Laboratory capacity	• Quality assurance programme and proficiency testing results of national laboratory and any participating subnational laboratories. • Number of specimens received for measles and rubella antibody testing (rate per 100 000 population) and number of positive tests. • Number of specimens received for virus isolation/ detection.

Note: Countries may add other assessments based on their situation.

2.3 VACCINE OPTIONS

Vaccines available for SIA include measles, rubella, measles–rubella (MR) and measles–mumps–rubella (MMR) (Annex 3). When choosing vaccine(s), a Member State should consider: national priorities, objectives and targets for disease control, vaccine costs and all real or potential impacts to the long-term sustainability of the immunization programme. The introduction of rubella antigen should be done with a long-term, programmatic commitment; otherwise, it may lead to more girls reaching the age of childbearing without protection, thus inadvertently increasing the burden of CRI in the future. The selection of MMR vaccine for SIA has specific and important considerations (Annex 3), which could have an impact on the public's perception of the safety of these vaccines.

3. PRELIMINARY PLANNING ACTIVITIES (MACROPLANNING)

Macroplanning is the process by which commitments are made that will define the image of SIA as a high-quality, effective and safe intervention. The specific objectives of this phase are to:

- **develop realistic budget estimates used to obtain policy-level commitment and provide for resource mobilization activities;**
- **obtain policy-level direction on the organization of the national level coordination committees and their composition;**
- **obtain commitments from key partners; and**
- **order vaccine and related supplies and cold-chain equipment.**

3.1 CONFIRM POPULATIONS AND GROUPS TARGETED

A review of epidemiological data on sporadic or outbreak-associated measles cases and an analysis of incidence by birth year will usually be sufficient to identify susceptible age groups for targeting.

- Size of the targeted population should be taken from the most official sources, e.g., the last census or yearbook. If there are multiple sources, the figure for the larger population should be used.
- The source of population data should be clearly specified in all appropriate documents.

Population figures must be obtained from the most authoritative and accepted source; these figures should be shared with all parties, and used for planning and computing vaccine coverage.

Description of age group targeted

- Use lower and upper age limits, e.g., dates of birth of youngest and oldest, respectively.
- Describe by operationally convenient age groups, e.g., pre-school, school-aged, university students, the military and women of childbearing age.

Size of age group targeted

- ***Calculate*** from official sources if available or ***estimate*** from a microplanning exercise conducted in a typical region.
- The size of age groups targeted in provinces and districts may be calculated from existing demographic data or estimated based on proportions determined at the national level (Annex 7).

3.2 ESTIMATING RESOURCE REQUIREMENTS (TOP-DOWN PLANNING)

To order SIA supplies well in advance and to ensure adequate financial resources, it is usually necessary to make the initial calculations of logistics and financial requirements from the central level for the entire country, i.e., top-down. Later on, more precise logistics and financial needs for each province and district are calculated "bottom-up", i.e., starting from the more peripheral levels and moving towards the central levels. To obtain a preliminary budget estimate for discussions with partners and donors:

- start early, using the tables and categories of expenses identified in Annex 4;
- use a crude microplan exercise to estimate peripheral needs for logistics and a national budget. *In a region representative of the country with regard to urban/rural mix and economic development and with good data, the national coordinator can conduct a microplanning exercise as a pilot project;* and
- select cold-chain equipment (Annex 9).

3.3 ADVOCACY, HIGH-LEVEL POLITICAL COMMITMENT AND CONSENSUS

The health ministry/immunization programme national manager should obtain a high-level commitment from national authorities and major partner agencies to participate in and support SIA based on:

- epidemiological data: age-specific incidence, prevalence of unvaccinated cases, anticipated outbreak and associated estimates of disease burden;
- cost effectiveness studies and/or SIA impact studies from other countries; and
- results of assessments, including activities necessary to strengthen the immunization programme, e.g., the opportunity to refurbish central and mid-level cold-chain stores should be presented as a long-term investment in health services.

SIA should be discussed with major agencies to find a consensus on the vaccine(s) and approach to be used; solutions for budgeting and resource mobilization; and access to technical assistance and expertise. Once consensus is obtained and major resources are identified, approval needs to be obtained from policy-makers.

Commitment from policy-makers is indicated by their:

- recognizing the importance of measles and rubella control and using governmental resources (human, utilities and funds);
- empowering health ministry leadership and nominating a national coordinator; and
- assuming responsibility for ensuring availability of high-quality information and services and for being open to partnership and stewardship.

Based on the policy-makers' commitment, the health ministry should undertake planning, assisted by an interagency coordinating committee (ICC).

3.3.1 Hold a high-profile, interagency coordinating committee meeting

The partnership of government and nongovernmental and international agencies for SIA planning and implementation will increase the efficiency in use of important health resources, while ensuring credibility and wide visibility. The objectives of this ICC meeting are to engage all potentially interested partners and seek their approval of and commitment to support SIA both with *in-kind* and financial resources. The endorsement by and commitment of resources by ICC partners can be used to leverage additional resources from international donor agencies.

Considering the anticipated problems to be solved, issues needing decision may be classified as *urgent* and *less urgent*. An ICC meeting with all potential partners provides an opportunity to reach consensus solutions for problems and concerns.

- All strategically important partners should be invited using a letter that informs and orients them about their potential contribution to the meeting.
- The meeting should be chaired by a very high level official (e.g., deputy minister of health or designate), who has been well-briefed by the immunization programme manager.
- Epidemiological data and other information supporting the need for and benefit of SIA should be presented.
- The chair should state:
  - SIA objectives and delivery strategy (when, where, who and how);
  - SIA principles: the guarantee of human rights, access to information and quality services, and the right of confidentiality; and
  - the government's contribution: human resources, utilities and funds.
- Issues should be identified and resolved through cooperation and by the contribution of other ministries and agencies for transportation; communication; international procurement of goods; ethnic minorities; security (e.g., people, property and data); the environment; education; and intergovernmental or local affairs.
- The partner's roles and responsibilities and commitments should be stated in a letter of understanding.

Note: Only high profile matters should be resolved in a systematic manner; non-critical debates about partnership should be avoided. Clear statements should be made that local contributions are expected and encouraged.

3.4 DESIGNATE TASKS AND RESPONSIBILITIES

A pyramid structure is very effective for planning and implementation of SIA. The national coordinating committee should organize the various functions, and each level should develop and acknowledge its own tasks. Annex 2 provides a model that has worked in many mass interventions; countries, however, need to organize the coordination of SIA based on their local rules, traditions and perceptions of effectiveness,

including the possible aggregation of suggested committees into one task force with three subcommittees, chaired by a national coordinator.

It is suggested that at least 8 months before SIA, the national coordinator establish three national committees of approximately six persons each: a coordinating committee, a social mobilization committee and a technical committee. The national coordinator should be an *ex officio* member of the national coordinating committee.

3.4.1 Responsibilities of the national coordinating committee:

- overseeing administration, e.g., management of funds, personnel and communications;
- coordinating activities of the national social mobilization and technical committees;
- approving and overseeing implementation of logistics;
- monitoring work of social mobilization and technical committees and evaluating overall implementation; and
- approving and overseeing implementation of training plans.

3.4.2 Responsibilities of the national social mobilization committee:

- mobilizing leaders, celebrities, donors and private industry to promote SIA;
- mobilizing communities to participate in planning and conducting SIA;
- promoting SIA through mass media;
- developing and disseminating promotional materials;
- releasing high-quality information on the public health burden of measles and rubella and on vaccine safety;
- preparing the opening ceremony; and
- reporting on a regular basis to the national coordinating committee.

3.4.3 Responsibilities of the national technical committee:

- reviewing all social mobilization and media material for technical content;
- providing technical support for the safety strategy;
- overseeing development of training materials and reviewing technical content;
- providing other technical advice as needed; and
- reporting on a regular basis to the national coordinating committee.

At subnational levels, similar managerial structures and responsibilities should be established.

- Provincial and district coordinators should be appointed at least 7 months and 6 months, respectively, before SIA. These coordinators should establish coordinating and social mobilization committees in each province and district.
- Three months before SIA, health centre coordinators should be appointed and community committees formed to plan logistics and activities for social mobilization.

3.4.4 Important points

- Good communication can be enhanced by providing coordinators' and focal points' contact information (address, phone & Fax number and e-mail address) to those who need to know.
- Someone at each level should oversee the functioning of coordination committees, including a review of the minutes of previous meetings.
- Supervisors should continually review the status of implementation by observing the task list.
- Delays in achieving tasks on time can impact on vaccine coverage achieved during SIA.

3.5 ORDER VACCINE AND COLD-CHAIN EQUIPMENT

Avoid receipt of shipments during national holidays by indicating acceptable dates on the purchase order. Check that the consignee address, telephone number and e-mail address are written correctly.

Only bundled procurement of vaccine, AD syringes and safety boxes is recommended. The bundling option is based on the WHO/UNICEF recommendation *(9, 10)* for safe injection and avoiding reuse of injection equipment.

- Order vaccine and related supplies and cold-chain equipment at least 6 months before the period chosen for SIA, taking the following provisions:
  - ✓ order/assure ordering of bundled vaccine/ auto-disable (AD) syringes/ safety boxes;
  - ✓ select vaccines of ensured quality, preferably with vaccine vial monitors (VVM); and
  - ✓ avoid receipt of vaccine shipments during national holidays.
- Prepare instructions for receipt of the vaccine, ensuring that the correct consignee address, telephone number and email address are known to the manufacturer and shipping agent.
- Prepare a written plan for receipt and distribution of cold-chain hardware. *Imported equipment will need to be cleared by customs, stored temporarily, transported to precise destinations, installed and commissioned. It is suggested that contracting all these operations be organized in a single package for bidding.*

4. DETAILED PLANNING AND LOGISTICS (MICROPLANNING)

Microplanning is the process of calculating requirements based on the local/provincial needs, identifying what is available and requesting what is missing, to ensure adequate implementation of SIA. The specific objectives of this phase are to:

- **develop the final operational plan, including budget;**
- **complete resource mobilization activities;**
- **order and ensure delivery of all materials needed to implement SIA; and**
- **organize pre-SIA implementation activities.**

4.1 PLANNING AT THE NATIONAL LEVEL

This includes the following elements:

- revising SIA budget based on district/provincial reports;
- developing social mobilization activities;
- preparing a training plan;
- developing and disseminating SIA guidelines;
- planning the safety of SIA;
- developing plans for SIA supervision, monitoring and evaluation, including provision of feedback;
- planning for implementation of enhanced case-based surveillance with laboratory confirmation of cases; and
- using all opportunities to check the level of readiness.

4.2 PLANNING LOGISTICS AT SUBNATIONAL LEVELS (BOTTOM–UP PLANNING)

4.2.1 Key points for planning logistics

This includes the following elements:

- using the same format for microplanning spreadsheets at each level (Annex 6);
- confirming the number persons included in and the location of targeted populations through local enumeration if possible, including the number of children in school;

- understanding different logistic requirements for urban versus rural planning;
- making simple and consistent calculations at all levels;
- completing logistic forms at each level;
- ensuring adequate cold space at all levels; and
- adapting logistics to include each district's "special" strategy for hard-to-reach populations.

A critical factor in a successful SIA is to offer equal public access to services based on local adaptation of available human resources.

4.2.2 Six steps in microplanning at the district level

1. Six months before SIA, district coordinators should meet to review SIA strategy at the provincial level and present:
   a. the district's actual population;
   b. hard-to-reach populations including location(s) and size(s); and
   c. a map of the district.
2. Guidelines should be provided on how to do microplanning at the district level, based on SIA delivery strategy.
3. Adapt available human resources to SIA delivery strategy. This will clarify the total *number of teams* needing supplies and assistance with transportation, the *number of people to be trained*, *the number of supervisors requiring transportation support*, and *the number of drivers and volunteers needed*.
4. Calculate vaccine and vaccine-supply needs and cold-space requirements using spreadsheets. Use actual figures for the group targeted with the standard parameters provided in Annex 7.
5. Calculate operational costs using the suggested spreadsheet format. Use actual (district) costs in local currency and round off figures reasonably. Add and explain *other/miscellaneous costs,* e.g., incentives, unexpected events and car repairs.
6. Calculate *logistics and budget requests for "special" strategies*, e.g., the district coordinator needs to identify all hard-to-reach or high-risk populations that require a "special" strategy and develop a specific budget for each "special" strategy.

District coordinators should be requested to include the following components:

- a plan for supervision, i.e., number of supervisors and their transportation needs;
- a strategy for safe disposal (Chapter 5 and Annex 10);
- AEFI plan (Chapter 5 and Annex 11);
- a plan for monitoring: organization of the operations room at the district level, and a timeframe for reporting daily vaccine coverage and AEFI;
- strategies for special populations; and
- plan for social mobilization (Annex 15).

Five months before SIA, district coordinators within a province should meet again to consolidate microplanning spreadsheets; revised microplanning spreadsheets should be forwarded to the national level.

4.2.3 Planning logistics at the provincial level: key points

- Aggregate district summaries (Annex 6).
- Add province-specific supervision needs, e.g., supervisors, drivers and cars (Table A6.1).
- Add other province-specific costs (e.g., meetings, per diems and transportation) to be paid and accounted for at the provincial level (Table A6.3).

4.3 STRATEGIES FOR SPECIAL POPULATIONS

Ensure robust, proactive and individualized local social mobilization activities; do not rely solely on national social mobilization.

The ultimate quality of SIA will depend on properly planning for and effectively reaching "special" populations, which are frequently missed by routine immunization.

4.3.1 Special populations and groups

a. People hard to reach for health services, due to various barriers, e.g., geographic, cultural, and philosophical:

- persons living in remote and sparsely populated areas;
- refugees and internally displaced persons;
- marginalized and/or minority groups;
- persons living in areas of civil unrest;
- persons living in densely populated and peri-urban areas;
- persons living in areas with poor sanitation; or
- persons having negative perceptions about vaccination.

b. High-risk persons and groups that can support or facilitate transmission of measles virus due to:

- low vaccine coverage;
- a disproportionate share of the disease burden in the country; or
- work or residence in settings where measles virus transmission can easily occur, e.g., the military, health care settings, etc.

4.3.2 Special strategies planning

- Develop detailed maps – an important prerequisite of proper planning of the supplementary logistics and social mobilization needed to reach these populations.
- Involve local committees and leaders of special populations (i.e., religious, ethnic and minority group leaders) in the planning and social-mobilization activities, including special efforts to dispel false rumours.
- Understand and overcome barriers (cultural, educational, logistic, political, linguistic or religious) that cause special populations to be inadequately served,

ensuring that at least one member of the vaccination team speaks the local language, and selecting all volunteers from the local community.

Although intensified and targeted efforts are needed to reach populations inadequately served during SIA, care must be taken to avoid stigmatizing or antagonizing them.

- Plan for additional human resources and logistic support, e.g.:
  - vehicles;
  - mobile teams;
  - "mobile fixed-posts", i.e., teams set up an immunization post at a fixed site for a few hours and then move the post to a new site after completing their task; and
  - extra posts in highly visible, highly convenient sites, or strategic sites, e.g., markets, churches or mosques, major waterways, etc.
- Provide measles teams targeting these populations with excellent supervisors.
- Plan to include other preventive interventions if appropriate, e.g., vitamin A; oral rehydration salts; polio, diphtheria, pertussis, and/or tetanus vaccines; family planning information; etc.
- Develop a list of all eligible persons in the community through house-to-house canvassing and "community line listing".

4.3.3 Support and budget for special strategies

For each population defined that is treated with a special strategy, the district coordinator will prepare an additional form with logistic needs, which will be handed over to the province at the next meeting, 5 months before SIA.

5. PRE-IMPLEMENTATION ACTIVITIES

Pre-implementation activities are those of: training; social mobilization; logistics; immunization safety, including an AEFI monitoring system; and verification of preparations by systematic supervision. The specific objective of this phase is to complete all SIA preparation activities, ensuring an effective start to SIA.

5.1 TRAINING

All SIA key players must participate in SIA training sessions; these include coordinators, supervisors, vaccinators, committee members, press/public relations officers and other health staff involved with SIA.

5.1.1 Strategy and planning for training (Annex 12)

Training should be planned and implemented in a top-down approach, i.e., the people trained at upper levels become trainers at the lower levels. All participants should be familiar with SIA strategies, rules and methods, to ensure a high-quality, effective and safe intervention. At least three months before SIA, the national coordinating committee should elaborate a plan for training, including:

- general learning objectives: knowledge, skills, behaviour and practices related to SIA, including social mobilization activities;
- priority areas of focus, e.g., AEFI, cold chain, injection safety, etc.;
- a framework: places, dates and trainers;
- who should participate; and
- a budget.

Training tips:

- **Practical exercises and practice sessions are very useful training methods.**
- **Teaching effective methods for engaging the community is very important**
- **One can assess the quality of training by the level of compliance with rules for safe injection.**
- **An excellent method of evaluation is to assess specific knowledge and behaviour pre-SIA compared to post-SIA.**

5.1.2 Recommended general format for training

- Objectives of and justification for SIA.
- Dates of SIA.
- Age groups targeted by SIA.
- Key social mobilization messages and methods to ensure community involvement.
- Plans for sparse and hard-to-reach populations.

- Best practices for:
  - vaccination teams, proper management of the vaccination post and accurate registration;
  - injection safety: correct use and safe disposal of injection equipment;
  - MCV: handling and administering it in the correct way;
  - AEFI: case definitions, causes, treatment, immediate reporting and forms; and
  - cold-chain maintenance and cold-chain monitoring.
- The supervision plan:
  - monitoring of vaccine coverage and serious AEFI; and
  - methods for evaluation and documentation of outcomes.

5.2 SOCIAL MOBILIZATION

The objective of social mobilization activities is to ensure appropriate awareness, so that eligible people seek and accept the service.

5.2.1 Planning for social mobilization (Annexes 14 and 15)

A national social mobilization plan for SIA should be developed immediately after obtaining policy-level commitment and consensus among key partners. The social mobilization plan describes specific activities and tasks, as well as dates and people responsible. The content of the plan should address the following questions:

- Who needs to be aware?
- What information needs to be released?
- How will information reach the groups targeted?

Effective social mobilization is a critical element of successful SIA.

5.2.2 Social mobilization budget

All cost estimates should be obtained 6 months in advance, so that a final budget can be approved 5 months in advance of SIA.

5.2.3 Social mobilization coordination

Social-mobilization coordinating committees should be organized at each administrative level (national, provincial, district and community) and be responsible for achieving high coverage by:

- promoting similar effective, key messages and high-quality information at all levels, while using local channels for dissemination;
- developing and using messages linked to priorities of targeted individuals and groups; and
- using central level activities where appropriate to avoid overlap and duplication.

5.2.4 Recommended social mobilization activities for successful SIA

- Develop and disseminate simple key messages.
- Prepare and selectively disseminate high-quality information on the benefits and risks associated with vaccination.
- Prepare information in advance for possible adverse publicity.
- Prepare and distribute written materials.
- Prepare and distribute a broadcaster's guide.
- Involve the mass media at all levels.
- Prepare and conduct an opening ceremony.
- Coordinate with provinces and districts.
- Seek community participation.
- Prepare and conduct a closing ceremony.

Advocacy meetings provide civil society and its leaders an opportunity to ask questions and make constructive proposals; leaders' natural inclination to support an initiative to protect children can be useful in sectors where the health system has less influence, such as hard-to-reach communities.

5.2.5 Spot-check survey in areas inadequately served

It is useful to conduct "spot-check" surveys one week before SIA among high-risk and hard-to-reach populations, particularly in high-density, urban areas. A spot-check survey consists of visiting several households to verify that parents know about SIA, the dates, the population targeted and the location (Annex 8). This assessment allows time for last minute adjustments to social mobilization activities.

5.3 IMMUNIZATION SAFETY

5.3.1 Receipt of vaccine

Live virus vaccines lose potency when exposed to heat or strong ultraviolet light, i.e., sunlight or fluorescent (neon) light. Freeze-dried vaccines are bulky and come with diluent. As cold space at the central level may be inadequate to simultaneously hold routine and SIA vaccine, a plan should be developed that includes the following options:

- receiving vaccine for SIA at a time when the routine vaccine supply has been recently distributed, temporarily leaving more space; or
- borrowing cold-chain equipment with adequate temperature monitoring devices from the private sector, other ministries or NGOs.

Consignments are to be verified at country port of entry using the vaccine arrival report *(11)*.

Diluent must always be of the same type and from the same manufacturer as the vaccine it accompanies.

5.3.2 Distribution of vaccine

SIA coordinators/committees should ensure that vaccine, diluent, AD syringes, reconstitution syringes and safety boxes are always distributed *together* in matching quantities.

It is strongly recommended that a means be established to trace the distribution of each batch of SIA vaccine, diluent and AD syringes; ideally, a unique batch number would be given to each district. This option can simplify the classification of reported adverse events as SIA-related.

For each distribution link, the cold chain will normally include cold boxes or vaccine carriers with ice packs.

5.3.3 Recommendations and tips for coordinators at all levels

In all documents /meetings the following points should be made regarding proper storage and handling of vaccine and diluent.

- Teach how to calculate cold-chain requirements (Annex 7).
  - ✓ A thousand doses (in 10-dose vials) of measles, rubella, MR, or MMR vaccine need 3 litres of cold space (without diluent).
  - ✓ A regular 1.5-litre vaccine carrier can hold sufficient vaccine in 10-dose vials for 250 persons (without diluent).
  - ✓ Four frozen ice packs (0.4/0.6 litres) or an equivalent amount of ice per vaccine carrier must be available daily for each field team.
- Reconstituted vaccine should be discarded after 6 hours.
- A VVM is not of use after the vial is open.
- At central/mid-level stores, vaccine may be kept in a freezer if storage between 2° C and 8° C is not available.
- In the field, reconstituted vaccine can be kept cool in a slit of the foam pad under the lid of the vaccine carrier; if the original pad is missing, a replacement can be easily made.
- Polystyrene boxes and ice packs frozen for international shipment may be used for primary and secondary distribution of vaccine.
- SIA conducted outside health facilities require frozen ice packs every morning.
- The freezing of ice packs should begin one week before the first day of SIA.

5.3.4 Injection safety key actions

- Written procedures for the immediate management and follow-up of occupational needle-stick injuries should be prepared/ reviewed by either the national technical committee or a group specifically responsible for AEFI *(12)*.
- One of the key roles of pre-SIA supervision is to check that AD syringe and safety-box requirements are respected at each setting.
- Guidelines for vaccination teams should be prepared for distribution using the material provided in Annex 10.

5.3.5 Planning AEFI monitoring system

- The ***national coordinating committee*** is responsible for:
  - reviewing the existing AEFI monitoring system *(12, 13)*;
  - overseeing the strengthening of the system, such as the development and printing of appropriate forms; and
  - procuring components for emergency kits and their distribution on time and in the correct amount.
- The ***national technical committee*** is responsible for:
  - reviewing and revising as necessary the list of AEFI, which should be reported; and
  - developing, as necessary, protocols/guidelines for the management of anaphylactic/anaphylactoid reactions in settings outside health facilities.
- The ***national social mobilization committee*** is responsible for:
  - inserting positive messages and scientifically correct information on printed matter for the public; and
  - providing health professionals and media with high-quality information on and scientific evidence for the safety of vaccines (e.g., published nature/rates of AEFI in prior SIA conducted) *(14–17)*, using attractive formats such as high-quality prints and TV/radio talk shows.
- ***District SIA coordinators*** should alert hospital/outpatient clinics treating suspected cases of AEFI on the responsibility to report isolated cases or clusters and to fully document the clinical course, tests carried out and reasons for medicines prescribed. This information should be obtained confidentially.
- ***Operations rooms*** at district-, provincial- and national-level should be organized and staffed with personnel able to cover the following main responsibilities:
  - recording all case reports of suspected AEFI received from the field;
  - holding reports of suspected AEFI that do not meet case definitions in a separate file;
  - preparing daily summaries of new probable cases of AEFI and sending reports and vaccine coverage data to the next level (integrated monitoring); and
  - supporting field teams regarding problems related to AEFI monitoring and management.
- ***Training of vaccinators*** should be based on practical aspects specific to mass immunization with injectable antigens, e.g., true contraindications, pregnancy policy, detection and treatment of immediate hypersensitivity, and management of syncope and panic attacks.

5.3.6 Suggested AEFI case monitoring and management system

Expect and plan for fainting and panic attacks!

The concepts and practices recommended in the present guideline imply an integrated approach to daily monitoring of vaccine coverage and AEFI. The integrated framework is described in the sections on "Monitoring" and "Supervision" in Chapter 6. The present section describes suggested activities related to monitoring and management of AEFI.

Health worker at health facility /post

- Treat any case presented or detected as a suspected AEFI.
- Report suspected cases, as soon as possible, to focal person (see the "Suggested reminder form for immediate verbal report of suspected cases of AEFI" in Annex 11).

District focal point staff and district SIA coordinator

A report about a serious case of AEFI should NEVER lay unattended on the desk.

- Investigate clusters or unusual cases of AEFI by having a professional team (paediatrician, neurologist and epidemiologist) constantly prepared and by ensuring a means of transportation and per diems.
- Follow carefully all severe cases of AEFI.
- Record *all* suspected cases of AEFI reported from the field.
- Discard on a daily basis suspected cases of AEFI that do not match the case definition *(13;* and Annex 11).
- Compile new probable cases of AEFI per district and complete the appropriate form for reporting (Annex 11).
- Receive AEFI case investigation reports when ready (send confidentially the original to the national coordinator and keep copies for further references).
- Assess all AEFI for possible errors in vaccine handling/ administration and correct any identified errors without delay.
- Send district report forms by fax to the province, together with district midday coverage data – include it even when no AEFI cases have been identified (zero reporting).

Staff in provincial coordinators' operations rooms

Record all cases of AEFI up to one month after administering the last dose of SIA vaccine as part of SIA.

- Receive daily district reports of AEFI and vaccinations given.
- Compile district summaries of AEFI.
- Prepare daily provincial summaries (same format as for the districts).
- Calculate cumulative incidence of AEFI and the proportion of facilities providing reports, including zero cases.
- Send provincial reports on the same day by fax to the national coordinator.
- Provide feedback for AEFI rates by district to motivate efforts.

Staff in national coordinator operations room

- Same as for provincial coordinator operation rooms.
- Submit a daily national report to the designated national authority and to the health ministry public relations or press officer.
- Collect all investigation reports of severe cases of AEFI and prepare folder for an independent review at the end of SIA.

5.4 WASTE DISPOSAL

Ensuring safe disposal of waste requires a coordinated effort to find viable, locally adapted solutions for safe disposal of injectable materials. SIA may be used as an operational model for a long-term, national strategy for safe disposal of medical waste. The following actions can accomplish these two objectives.

- ***Review safe disposal options based on an assessment of existing local medical-waste management practices.*** Ideally, this should be done by appropriate persons (i.e., sanitary engineers from the Ministry of Health and/or Ministry of the Environment) well ahead of SIA preparations, and the most locally sustainable method of safe disposal of injectable equipment should be "on hand" before starting negotiations for undertaking SIA.
- ***Decide on the safe disposal strategy.*** The national technical committee should elaborate SIA strategy for safe disposal. There are WHO-suggested methods for safe disposal of equipment used for injections *(10, 12)*.
- ***Develop a district operational safe disposal plan and budget.*** At the first orientation meeting, district health officials should be requested to fully implement SIA safe disposal strategy in their territory after being provided with parameters for proper logistic and budget estimations (Annex 7). Five months before SIA, each district's safe disposal plan should be reviewed by the provincial coordinating committee and included in the consolidated budget for SIA.

The waste disposal method selected for SIA should be the most affordable for the local situation and acceptable by the environment protection authority and the public.

5.4.1 Elements of a safe disposal strategy

- Health centres should store in a secure condition filled and sealed safety boxes until their disposal.
- In *rural* settings, safety boxes can be burned or buried locally under supervision, avoiding dispersion and preventing any property damage, or taken to a centralized disposal facility (Annex 10).
- In other settings, safety boxes should be collected from health facilities, transported to designated locations and safely treated under supervision.
- All processes related to the collection, transport and destruction of safety boxes MUST be documented.
- Each health facility should nominate a person responsible for safe disposal.

- SIA policy should include clear instructions for the disposal of other waste, such as vials, used alcohol preps/cotton swabs and syringe wraps.

5.4.2 Tasks and roles of coordinators at all levels

Tasks and roles related to safe disposal should be distributed for coordinators at all levels as follows:

District coordinator

- Develop a spreadsheet for the district safe disposal plan and its corresponding budget.
- Negotiate transport contracts with a trucking company (if applicable).
- Ask for community support at advocacy meetings.
- Together with local officials, find a place for safe waste disposal.
- Nominate supervisors from districts.
- Assign and meet health care waste management operators.

Provincial coordinator

- Check the consistency of plans for each district with the national strategy.
- Ensure proper and equitable distributions of available funds.

National coordinating committee

- Give clear instructions on the option used for waste management in SIA guide.
- Add safe disposal costs to the budget for operations.

5.5 SUPERVISION

Supervision in the planning phase is focused on checking the capacity to solve problems, and during SIA it is focused on checking the adequacy of implementation and on preventing deviations from SIA strategies, methods and rules.

Supervision must focus on the critical aspects of quality, effectiveness and safety *and* on anticipated weaknesses; in contrast to an evaluation, supervisors still have the possibility to alter bad plans or mediocre implementation, or both. Supervisors must be familiar with what is expected and what is happening, to detect "at first glance" any harmful deviation and to recommend/enforce appropriate changes.

Supervisors must be able to discuss planning matters with coordinators and be able to observe teams in action, which means supervisors must be able to travel early in the morning and be on time in different places. Encouraging and motivating field workers are very important.

5.5.1 Strategy and planning for supervision

Supervision visits should be scheduled in advance and used to re-emphasize knowledge of good practices and actual behaviour.

Tools for supervision. Supervisors should use a checklist as a tool to document the level of implementation of plans, actions and number of persons vaccinated.

Adapt supervision to SIA plan. The supervision checklist should be developed 3 months before SIA, leaving enough time to assess the level of preparation.

Supervision as a sample. As one part of the evaluation is based on supervisors' checklists, provision must be made for assessing places representative of all types of teams.

5.5.2 Scheduled supervision visits

A pre-SIA spot-check survey and an intra-SIA vaccine coverage assessment are key supervisory tools.

According to the schedule of activities and tasks, supervision should be conducted using the material in Table 4 and in Annex 16.

At the central level. Supervisors from the central coordinating committee should make supervisory visits to all provinces 5 weeks before SIA and 3 weeks in advance to selected provinces, including those with particular difficulties or questionable preparations for logistics or social mobilization.

At the provincial level. Supervisors from the provincial coordinating committee should make supervisory visits to all districts 3 weeks before SIA and a second visit at least 1 week in advance to selected districts, with particular difficulties or questionable preparations for logistics or social mobilization.

At the district level. Supervisors from the district coordinating committee should make supervisory visits to all post coordinators or mobile team coordinators 2 weeks before SIA and a second visit 1 week in advance to selected post coordinators.

At all levels. Additional supervisory visits from central-, provincial- or district-level supervisors may be needed depending on the outcome of the scheduled visits.

5.6 SURVEILLANCE

After a successful SIA when the incidence of measles is very low, each suspected case of measles will require laboratory confirmation. *Surveillance guidelines for measles and congenital rubella infection in the WHO European Region (3)* identify surveillance needs for countries at this level of control. During SIA planning and implementation phases, training and preparation can be done to ensure an appropriate level of knowledge and experience among health care providers and district, provincial and laboratory staff for the detection of suspected cases and the collection, transportation and handling of specimens for diagnosis and for virus isolation/ antigen detection.

Table 4. Verification of preparation

Critical subjects/questions	How to look for evidence of the correct approach
Has the targeted age group been appropriately assessed for special access problems?	Layouts, drawings, maps and lists: age group targeted grouped by residence and place of activity.
Does the targeted group have equal, equitable access to service?	Microplan – team deployment adapted to structure of group targeted – (place and time).
Do field teams have adequate transportation resources to cover the whole SIA period?	Descriptive written plan for transportation of teams and supplies.
What are the "special" strategies for sparse or difficult to access populations?	Special strategic logistic and budget request.
Who are the focal points (operations room contacts) for back up teams and for managing SIA data?	List of personnel assisted by secretarial teams with appropriate equipment, e.g., cell phones, fax machines, computers, etc.
Is there adequate access to funds for all planned payments plus any contingencies?	Mechanism in place to access budget for local operations.
Is local level supervision provided?	Local supervisors provided with mode of transport and per diem payments.
Is there cold-chain capacity to keep vaccine and diluent cold outside health facilities?	Inventory of available capacity for freezing and/or feasible plan to provide ice cubes.
Is there strong coordination of social mobilization activities?	Local committee's minutes of last meeting.
Is there adequate availability of high-quality information about SIA?	A designated district/province/heath ministry public relations officer (name and phone number) and visual assessment of quantity and location of posters and availability of information leaflets.
How effective are social mobilization activities?	Spot-check surveys' results.
Has planning for safe injection practices been adequate?	Adequate quantities of syringes, safety boxes and emergency aid kits.
Has planning for monitoring of AEFI been adequate?	Written procedures; communication identified (for example, land phones); hospital alerted.
Has planning for safe disposal of waste been adequate?	Written procedures with nominal responsibilities.

6. IMPLEMENTATION

A successfully implemented SIA is not only efficient and safe, but also creates a friendly atmosphere at vaccination posts, making participants' experience as pleasant and convenient as possible.

SIA will ideally achieve high coverage in all districts at the first attempt. The likelihood of this outcome can be enhanced by anticipation of all possible outcomes, i.e., expect unexpected events that could result in low coverage.

6.1 CHARACTERISTICS OF A WELL FUNCTIONING, CLIENT-FRIENDLY VACCINATION POST

- Pertinent advice and explanations are readily available, including leaflets parents can read while waiting.
- An efficient, one-way traffic flow of clients, preventing "bottlenecks" and confusion, e.g., avoid having mothers/guardians waiting for long periods of time.
- If vaccination of students is done in classrooms, the vaccinated student's back is turned towards the class to decrease anxiety amongst all students.
- Adequate space and furniture are provided for the vaccination team.
- The registration desk is not overburdened.
- Teams serving remote vaccination posts have well-organized means of transportation to avoid wasting the time of vaccinators and eligible people.

6.2 ACCELERATE SOCIAL MOBILIZATION AND COMMUNICATION

- Ensure ongoing advertising in mass media in the most striking way, e.g., SIA TV spot broadcast at prime audience hours.
- Assure good public awareness of vaccination posts, e.g., banners, indexes and posted messages.
- Ensure continuous flow at immunization posts.
- Prevent chaotic peaks of attendance during the first days by carefully planning the flow of people, based on local conditions. Some potential solutions for planning a safe workload and avoiding unnecessary waiting and bottlenecks:
  - teams work in different geographical areas by days of the week; and
  - teams focus on different age groups by days of the week.

6.3 IMMUNIZATION SAFETY PRACTICES

- Field teams should be provided each morning with frozen ice packs or ice, vaccine, injection equipment and registration forms for the anticipated number of vaccinees plus 10%.
- Each field team should bring filled safety boxes back to the health centre for secure storage and safe disposal.
- Health workers report as soon as possible suspected cases of AEFI; however, the first priority should be to treat/comfort/reassure the patient and if the AEFI is serious, refer the patient urgently to the hospital.

6.4 MONITORING

Investment in communications is a long-term investment, as the communication network can be used for timely reporting of notifiable diseases and laboratory test results.

Data should be collected daily on vaccine coverage and AEFI to detect areas with implementation problems or clusters/ increased frequency of adverse events; and to provide timely feedback to motivate staff. Reporting from peripheral levels to the central level can be done using model spreadsheets in Annex 16.

Daily monitoring should be supported with:

– SIA operations rooms at district, provincial and national levels provided with staff and adequate means of communication;
– appropriate reporting forms; and
– proper specific training and supervision.

A good monitoring system should:

- ensure receipt of reports from lower levels, prepare summaries and send timely standard reports to central levels;
- use spreadsheets to calculate daily and cumulative vaccine coverage and AEFI;
- use a single format reporting form (AEFI and coverage report daily reporting form);
- permit assessment of monitoring and performance indicators, i.e., completeness and timelines at provincial and national levels;
- respect a tight timeframe for reporting;
- Identify appropriate communication methods by levels:
  - health centre coordinators might use telephones at health centres, post offices, or police or mayor's offices; and
  - district, provincial and national coordinators could use fax machines *and* telephones in operations rooms.

6.5 SUPERVISION

During SIA, supervisors systematically collect information and provide feedback to teams (Table 5 and Annex 16).

- Supervisors should organize visits to cover representative proportions of urban and rural vaccination posts. Rural sectors may complete immunization activities more quickly than urban ones.
- Supervisors may want to organize their work by travelling in the morning to the periphery of a district, visiting 2-3 rural teams, and arriving in the district capital to visit a school team and a health centre.
- Consideration should be given to having more experienced supervisors join teams serving difficult areas, such as those with sparse or hard-to-reach populations.

Table 5. Supervision of implementation

Critical subjects	Evidence based on observation (O) or inquiry (I)
Post: crowd well managed	(O) No bottlenecks.
Post: roles accomplished	(O) Vaccinators properly assisted by support staff.
Post: registration accuracy	(O) Each vaccine recipient is tallied and provided with an attendance card.
Post: source of information	(O) Pertinent information provided by health care workers.
Cold chain	(O) Cold ice packs or ice cubes (field team). (O) Temperature chart looks good (fixed post). (O) Enough diluent kept cool.
SIA safety: vaccinee's safety	(O) No other medicines/diluents or other things such as food in the refrigerator. (O) Reconstituted vials kept on foam pad/refrigerator while not in use. (O) Date/time of reconstitution written on vial's label. (O) AD syringes not filled previously. (O) "No touch" technique respected. (O) Emergency aid kit available.
SIA safety: health care workers' safety	(O) "Do not recap" rule respected. (O) Safety box not overfilled. (O) Safety box in service placed for convenient use by vaccinator.
SIA safety: public's safety	(I) Evidence: right answers regarding filled safety boxes: • Returned to health centre? • Kept in a secure place? • Accounted for?
Monitoring of AEFI	(O) Guideline available.
Social mobilization: post easy to find	(O) Banner with SIA logo, poster outside, enough orientation signs.
Social mobilization: SIA promoted	(O) Evidence: posters in public places; street banners.

7. IMMEDIATE POST-SIA ACTIVITIES

The objectives of activities immediately following SIA are to quickly assess whether targets have been met, to respond to any populations/ groups not meeting these targets and to inform policy makers of outcomes.

7.1 REVIEW MEETINGS

The committee members, supervisors, observers and coordinators at each level should hold review meetings and summarize implementation actions and results to date (Annex 17). These summaries should include:

- information on implementation;
- information on service delivery and logistics;
- information on social mobilization and vaccine uptake by targeted groups at the district level;
- serious AEFI; and
- key issues identified in supervisory checklists.

7.2 COVERAGE SURVEYS

Twenty-person coverage surveys can be quickly done in areas with hard-to-reach populations to identify whether targets have been met (Annex 17).

7.3 COMMUNITY SURVEYS

Community surveys should be considered for districts with less than adequate coverage, focusing on understanding reasons for low vaccine coverage, and where there is uncertainty regarding the size of the target population. Reasons for low coverage could include:

- inadequate social mobilization, e.g., wrong messages, wrong language, vaccination posts not flagged with banners, no posters or unfounded rumours;
- low-quality service at a post, e.g., confusion, a long waiting time or an unfriendly atmosphere;
- inadequate delivery strategy, e.g., not enough field teams for markets, bus/boat stations or churches/mosques/temples; or teams started late and finished early; and
- lack of supplies.

7.4 IMMUNIZATION ACTIVITIES

In the event of low coverage among some targeted groups, provision should be made for continued immunization activities until an adequate level of coverage is achieved. These immunization activities may use previously established SIA delivery strategies or more intensive ones to vaccinate hard-to-reach individuals and groups, e.g., field teams may need to search house by house for eligible persons, providing vaccine to those without evidence of vaccination.

7.4.1 Key issues for the success of further intensive immunization activities are:

- ensuring teams have enough logistics, including means of transport;
- visiting households when families are home and revisiting in the evening those families missed during the day;
- marking visited houses; and
- involving community leaders.

8. EVALUATION

Evaluation is critical for assessing the impact of planning and implementation activities on immediate outcomes (e.g., vaccine coverage and safe injection practices) and the ongoing immunization programme (e.g., immunization safety, waste management and surveillance).

The evaluation should be planned early and identify:

- specific problems in planning or implementing SIA (lessons to be learned);
- specific populations with less than adequate vaccine coverage, thus at risk for measles virus transmission; and
- the likelihood of interrupting measles virus transmission.

8.1 PLANNING AND APPROACH

- ***approach:*** quantitative (process) and/or qualitative (impact) assessment;
- ***participants:*** a post-SIA meeting with relevant evaluators, such as coordinators, supervisors and partners;
- ***sources of data:*** tally sheets, supervisor checklists, survey results (such as a lot quality coverage survey), spot-check surveys and expense reports;
- ***logistics:*** all remaining supplies should be returned to the district store, listed and counted; and
- ***tools:*** standard equations for calculating vaccine coverage, supply wastage, etc.; post-SIA survey results, external observer reports, etc.

8.1.1 Review meetings and final report

Remember to plan and allocate a budget for an evaluation meeting.

Committee members, supervisors, observers and coordinators at each level should conduct review meetings and prepare a summary report based on their checklists as well as their own impressions and experiences. The reports should include:

- a table of contents and a map;
- a list of abbreviations;
- an executive summary;
- an introduction and background material;
- objectives;

- pre-SIA activities;
- information on orientation and training, e.g., number trained, level and duration;
- information on social mobilization, logistics and the cold chain;
- information on implementation;
- information on service delivery and logistics;
- information on social mobilization, monitoring and evaluation;
- reported AEFI;
- a summary of supervisory checklists;
- information on achievements;
- statistics, constraints, lessons learned and recommendations;
- conclusions;
- annexes: coverage spreadsheets and logistic supplies; and
- illustrations.

8.2 PROCESS EVALUATION

The main indicators are:

- ***vaccine coverage:*** based on all health centre summaries (Annex 17);
- ***wastage:*** vaccine and AD syringe wastage (Annex 18);
- ***incidence of AEFI*** (all types, by class, by nature, etc.): any programme error should be clearly analysed to understand its cause (training, lack of supplies, etc.); any severe post-vaccination adverse event should be thoroughly analysed, including the opinions of independent reviewers;
- ***safety:*** compliance with the safety strategy should be derived from supervisor checklists; explanations should be sought and given for deviations found, such as recapping, overfilling safety boxes and inappropriate behaviour;
- ***social mobilization:*** the main indicator is vaccine coverage in unorganized subpopulations (Annex 18);
- ***hard-to-reach and inadequately served populations:*** coverage in hard-to-reach areas (Annex 18); and
- ***cost:*** at the national level, all costs should be aggregated and the total cost calculated expressed in US dollars. Dividing the cost by the number of persons vaccinated will result in the cost per person vaccinated. This figure can be reported to donors.

8.3 IMPACT EVALUATION

An impact evaluation takes longer than a process evaluation, because it requires measuring the effect on disease control and/or routine immunization services.

Information from pre-SIA assessments can be used as a baseline for comparisons with similar assessments after SIA.

8.3.1 Incidence as an impact evaluation tool

The programmatic impact of the vaccination strategies, including SIA, may be measured and compared by considering age-specific incidence. When incidence is used as an indicator, only surveillance for laboratory-confirmed measles, rubella and CRS should be used. Case-based measles surveillance, with laboratory confirmation of measles infection, is the reference standard for evaluating programme impact *(18–20).* Post-SIA experience in countries with excellent laboratory capacity suggests that less than 10% of suspected measles cases will be laboratory confirmed following an effective SIA.

AIDE-MEMOIRE

ANNEX 1

to ensure the efficiency and safety of mass immunization campaigns with injectable vaccines *(21)*

Mass immunization campaigns pose specific challenges over routine immunization that national managers and decision makers must be aware of so as to maximize the benefits and minimize any potential real or perceived negative impact of the campaign. Campaigns represent a substantial financial investment that could be wasted if the necessary coverage is not reached. Campaigns are also a focus of high visibility and scrutiny by the general public and the media. Adverse events that occur during campaigns and the impact of these events must be managed quickly and effectively to encourage good practice and promote public confidence in the programme.

There are substantial challenges in reaching large populations over short periods of time. High coverage must be achieved in the total target population, including hard-to-reach populations, in order for campaigns to be successful. All partners and players at all levels need to be mobilized. There is a definite need to explain and justify the impact of the campaign to all involved parties with respect to optimal disease-specific control and in the wider context of disease prevention and health care.

The aim of mass immunization campaigns is to immunize large populations over a short period of time, which may be beyond the capacity of the existing health infrastructure. Campaigns may be conducted outside the normal healthcare setting. This necessitates proper and specific planning and very careful supervision. Good planning is essential to campaign success.

With respect to injection safety, the large number of injections to be administered and the large volume of waste generated pose added strains on the system, increasing the probability that breaches in safety may occur. With respect to adverse events following immunization (AEFI), an apparent increase in the numbers of adverse events may occur. Reasons for this include the large number of doses being given over a short period of time and the administration of vaccine to a wider, usually older, age group.

If not prevented or managed properly, these safety issues can result in the transmission of infection, impaired public and donor confidence in the campaign, and ultimately, reduced coverage and a negative public health impact. However, by considering safety issues from the start of campaign planning, EPI managers can avoid such problems. Components to ensure safety include: (1) assessing the existing injection safety situation; (2) preparing a detailed campaign plan which addresses key issues identified by the assessment; (3) implementing the plan; and (4) monitoring the results. Managers also need to introduce a simple and timely monitoring system for adverse events for campaigns if this is not already in place. Such a system, in addition to supporting the campaign, provides opportunities for the identification of key immunization and injection safety issues that should be addressed in routine immunization activities and included in a longer term immunization safety plan.

CAMPAIGN PLANNING

☐ **Is there sufficient evidence of the need for a campaign and of the pertinence of the timing and targeted populations?**

- ☐ Epidemiological investigation carried out, including a review of immunization data
- ☐ Need for a campaign, timing and targeted populations (age, sex, location) proposed
- ☐ Conclusions endorsed by National Committee
- ☐ Conclusions and plan of operations approved by the national Ethical Review Board as needed

☐ **Have all key players and partners been identified and respective roles and responsibilities clearly assigned?**

- ☐ Partners listed
- ☐ Roles and responsibility assigned
- ☐ Roles and responsibilities approved by partners

☐ **Has the Interagency Co-ordinating Committee reviewed the plan and budget?**

- ☐ Plan reviewed
- ☐ Plan to be revised
- ☐ Plan agreed

☐ **Is there evidence that adequate supplies of all necessary items have been planned for and will be delivered on time?**

- ☐ Supplies listed and quantities estimated
- ☐ Cost estimated
- ☐ Sources of procurement identified, supplies available and estimated date of delivery specified
- ☐ Cold Storage and other storage space secured
- ☐ Custom formalities ascertained and exemption obtained if necessary

☐ **Is there a detailed micro-plan from all local levels targeted including strategies for hard to reach populations?**

- ☐ Geographic area and population defined
- ☐ Micro-plans including delivery strategy available

☐ **Has a plan for social mobilization been developed?**

- ☐ Communication plan formulated and resourced
- ☐ Communication materials developed (including pre-testing) in consultation with key local and national stakeholders (including community and religious representatives)
- ☐ Mechanisms for dissemination of materials in place (print, radio and TV)
- ☐ Advocacy meetings with key local religious and community representatives scheduled

☐ **Is there a plan for regular monitoring of the implementation of the campaign including corrective action if necessary?**

- ☐ Monitoring plan developed with tools (forms) available for monitoring
- ☐ Supervisors identified and trained
- ☐ Supervisory checklists available
- ☐ Plan for regular review of progress and problems encountered available

☐ **Has a plan been developed and resourced for the evaluation of the campaign?**

- ☐ List of process and outcome indicators to be measured at each level available
- ☐ Plan for disseminating results to all key players exists

☐ **Is there a sufficient number of qualified vaccinators and support staff (including volunteers) to meet the campaign objectives?**

- ☐ Number of staff available is adequate to meet campaign objectives
- ☐ Adequate numbers of qualified health workers and support staff (including volunteers) are available
- ☐ Sufficient number of supervisors available to provide supportive supervision of all teams effectively

☐ **Has the availability of transport for supervision, social mobilization activities, vaccine and injection material been verified?**

- ☐ Sufficient number of vehicles available for transport for planned activities in area of supervision and social mobilization and for vaccine and injection material distribution
- ☐ Sufficient funds available for transport costs

☐ **Have supervisory visits been made to all provinces/first level administrative subdivisions to review plans and preparedness?**

- ☐ Visit reports available from each province/first level administrative subdivision indicating that campaign preparations are satisfactory or including recommendations for revisions to plans

SAFE AND EFFICIENT VACCINE ADMINISTRATION

☐ **Will only WHO/UNICEF pre-qualified vaccine or vaccine and injection material approved by national regulatory authorities be used?**

- ☐ List of vaccines and injection materials with procurement source identified
- ☐ All vaccines listed pre-qualified or approved by National Regulatory Authorities

☐ **Is vaccine bundled with reconstitution syringes, AD syringes and sharps boxes as per the terms of the joint WHO/UNICEF/UNFPA statement on injection safety?**

- ☐ List of quantities of vaccine, reconstitution syringes, AD syringes and sharp boxes

☐ **Have responsible staff been clearly informed of the importance of sending correct and matching quantities of diluents with freeze-dried vaccines?**

- ☐ Clear information given to responsible staff with respect to the of sending correct and matching quantities of diluents with freeze-dried vaccines

☐ **Have all healthcare workers been trained in proper vaccine administration techniques with an emphasis on the need for sterile technique, correct reconstitution and safe immunization injection practices, and on need to comply with proper cold chain procedures?**

- ☐ Training curriculum identified with written training material prepared
- ☐ Training completed
- ☐ Number of health workers who completed the course and number of absentees

☐ **Have staff been clearly instructed not to recap syringes?**

- ☐ Clear instructions given to staff not to recap syringes

☐ **Have staff been clearly instructed to discard all reconstituted vaccines within 6 hours or at the end of the immunization session whichever comes first?**

- ☐ Clear instructions given to staff to discard reconstituted vaccines within 6 hours or at the end of the immunization session whichever comes first

☐ **Is vaccine distribution appropriately tracked by lot?**

- ☐ Vaccine distribution forms include lot number and amount of vaccine and diluents distribution to all levels

☐ **Have the logistics been carefully planned to ensure availability of all supplies at all vaccination posts?**

- ☐ List of supplies (including quantities) to be delivered to each post available
- ☐ Distribution plan for supplies available

☐ **Have vaccine and injection material storage sites been identified?**

- ☐ List of storage sites and capacity of each site
- ☐ Required storage capacity identified

☐ **Has the capacity to freeze sufficient ice packs been ensured?**

- ☐ List of sites for freezing and capacity of each site
- ☐ Sufficient freezing capacity is available

☐ **Is there a sufficient number of vaccine-carriers for all teams?**

- ☐ Number of vaccine carriers available known

☐ **Has the need for vaccinations cards been assessed?**

- ☐ If vaccinations cards necessary:
  - ☐ Number of vaccination cards needed and available known
  - ☐ Vaccination cards include information on vaccine lot number to enable tracking
  - ☐ Training provided on accurate use of vaccination cards

SHARPS WASTE MANAGEMENT

☐ **Have local regulations and possibilities for sharps treatment and disposal been assessed?**

- ☐ Local regulations identified
- ☐ Possibilities for sharps treatment and disposal assessed (functioning incinerators, sites for burning etc.)
- ☐ Most appropriate option for treatment and disposal identified

☐ **Have practical, simple solutions for waste collection and disposal been identified?**

- ☐ Waste disposal system used for routine immunization program identified
- ☐ Plan for waste collection and disposal developed

☐ **Have equipment, places and facilities been identified for sharps waste disposal?**

- ☐ List of equipment, places and facilities for sharps waste disposal identified

☐ **Has the availability of adequate safety boxes, sharps waste disposal facilities, etc... been ensured?**

- ☐ Quantities of required supplies determined
- ☐ Sufficient quantities of all supplies currently available
- ☐ Sufficient supplies have been ordered and there is an appropriate estimated delivery date

☐ **Have clear instructions and guidelines for health staff on safe waste disposal (assembly, use, collection and disposal of safety boxes) been provided?**

- ☐ Training and has been provided for health staff
- ☐ Written guidelines for safe waste disposal available

☐ **Will disposal be monitored on a daily basis?**

- ☐ Responsible person identified to monitor waste disposal on a daily basis

AEFI MANAGEMENT AND MONITORING

☐ **Is there an AEFI monitoring system in place?**

- ☐ Responsible focal point for AEFI monitoring identified
- ☐ Clear guidelines exist on what to report, how to report and what to investigate

☐ **Are rapid reporting channels for AEFI and vaccine safety issues in place?**

- ☐ Reporting channels clearly stated
- ☐ Method of reporting known

☐ **Has a decision been made on which AEFI should be reported and which contraindications should be observed?**

- ☐ List of AEFI to be reported available
- ☐ List of contraindications to be observed available

☐ **Has an AEFI review committee been formed and the structure and capacity to rapidly respond to and investigate serious AEFIs been planned?**

- ☐ Membership of review committee documented
- ☐ Training incorporates information on potential adverse events

☐ **Have health care workers been trained on how to investigate and manage AEFIs and respond to rumours?**

- ☐ How to investigate and manage AEFIs included in training
- ☐ Focal points identified to deal with rumours

ANNEX 2 SCHEDULED TASKS AND RESPONSIBILITIES BY LEVEL

Time	National coordinator National coordinating committees	Provincial coordinator District coordination committees	District coordinator District coordination committees	Health centre coordinators Community committees
	Key situational assessments.			
At least 8 months before SIA:	Confirm population and groups targeted. Estimate resource requirements Obtain commitment and consensus. Hold an ICC meeting Appoint SIA national coordinator.			
8 months before SIA:	Establish SIA coordinating committees. Develop microplanning forms Develop list of scheduled tasks.			
7 months before SIA:	Meet with provincial health officers. Develop social mobilization plan.	Attend meeting with central level Establish provincial coordinating committees. Prepare meeting with district health officials.	Prepare for meeting at province (actual targeted group size, hard-to-reach populations).	
6 months before SIA:	Develop and test SIA guide. Compute amount and cost for social mobilization activities.	Hold meeting with district health officials (complete microplanning spreadsheets).	Attend meeting at province. Start to complete microplanning forms. Establish SIA district committees.	
5 months before SIA:	Recalculate more precise budget. Print SIA guide. Develop broadcaster's guide.	Meet again with districts to progress in completing microplanning spreadsheets.	Meet with provincial level to progress in completing microplanning spreadsheets.	
4 months before SIA:	Distribute SIA guide to provinces. Print broadcaster's guide. Develop SIA promotional materials. Confirm participation at ceremony.	Distribute SIA guide to districts. Develop SIA promotional materials.		
3 months before SIA:	Develop and print supervisory checklists. Develop and print tally sheets. Prepare training. Distribute broadcaster's guide. Develop media announcements. Develop plan for campaign evaluation.	Develop posters and street banners (if applicable).	Meet health centres' coordinators. Distribute list of scheduled tasks. Verify accuracy of district calculation. Define strategy for "special" populations. Develop posters and street banners.	Attend meeting at district. Develop posters and street banners.

8 weeks before SIA:	Train provincial level.	Attend training.	Meet with provincial level tFinalize “special” population strategies.	Recruit local volunteers.
7 weeks before SIA:	Prepare opening ceremony.	Prepare training of the districts. Invite districts to attend training.		
6 weeks before SIA:	Verify availability of transport for supervision, social promotion, vaccine. Finalize microplanning spreadsheets.	Train district level. Verify availability of transport – various modes. Finalize microplanning spreadsheets.	Train district level. Verify availability of transport – various modes. Finalize microplanning spreadsheets.	Identify means of transport.
5 weeks before SIA:	Supervisory visits to provinces.			
4 weeks before SIA:	Transfer vaccine to province. Verify that all media ads are prepared.	Receive/collect vaccine from central store.	Receive/collect vaccine from central store.	Attend training at district.
3 weeks before SIA:	Supervisory visits to selected provinces. Confirm preparations of opening ceremony.	Supervisory visits to all districts.	Supervisory visits to all districts.	Train volunteers. Meet community SIA committee. Confirm means of transport.
2 weeks before SIA:	Begin newspaper, TV, radio announcements.	Transfer vaccine from province to district.	Receive/collect vaccine from province. Supervisory visits to post coordinators. Start strategies for “special” populations. Begin social mobilization.	
1 week before SIA:	Intensify all social promotion activities.	Supervisory visits to selected districts. Intensify all social mobilization activities. Conduct pre-SIA spot check.	Visit selected health centres. Intensify social mobilization activities. Conduct pre-SIA spot checks.	Intensify social mobilization activities.
1-2 days before SIA:	Prepare site for opening ceremony. Prepare supervisory teams for SIA.			Start freezing ice packs. Transfer vaccine to posts Prepare posts.

Time	National coordinator National coordinating committees	Provincial coordinator District coordination committees	District coordinator District coordination committees	Health centre coordinators Community committees
SIA:	Conduct opening ceremony. Visit/supervise posts and teams. Make midday press briefing.	Supervise fixed posts and field teams. Compile and report daily provincial AEFI. Compile and report daily provincial coverage. Take actions as appropriate.	Supervise fixed posts and field teams. Compile and report daily AEFI. Compile and report daily coverage. Coordinate back-up teams.	Start immunizing. Assist/relocate teams. Totals and report daily tallies. Report suspect AEFI.
1 day after SIA:	Data collection and analysis and supervision. Conduct a closing ceremony.	Data collection and analysis and supervision.	Meet with health centres' coordinators to check performance. Data collection and analysis. Organize additional immunization activities for coverage < 95%.	Identify populations and areas not achieving coverage targets and continue SIA in those areas. Attend meeting at district. Return unused supplies to district.
1 week after SIA:		Hold meeting with district SIA coordinators. Estimate coverage and wastage.	Estimate district coverage and wastage. Attend meeting at province. Submit results to province.	
2 weeks after SIA:	Calculate coverage and wastage. Meet with provincial SIA coordinators.	Submit results to central level. Attend meeting at central level.		

RECOMMENDED VACCINES ANNEX 3

The choice of vaccines for SIA includes measles, rubella, measles–rubella (MR) and measles–mumps–rubella (MMR). Rubella vaccine alone or as MR can be used for women of childbearing age. All of the measles, rubella and mumps vaccine products currently available in the European Region are highly effective and safe *(22)*. The following is a description of these vaccines. The WHO pre-qualified list of vaccines is available at http://www.who.int/vaccines-documents/

MEASLES LIVE ATTENUATED VACCINE

- Measles vaccine is approximately 95% effective for children vaccinated at 12 months of age and 98% effective for children vaccinated at 15 months of age. More than 99% of children who receive two doses of measles vaccine separated by at least 4 weeks – with the first dose given at 12 months of age or later – will develop serologic evidence of immunity to measles. Most immunized persons who appear to lose antibody over time show an anamnestic immune response upon revaccination, indicating that they are probably still immune.
- Approximately 5% of vaccine recipients may develop a temperature of 39.4° C, beginning 7–12 days after vaccination and lasting 1–2 days *(23)*. Transient rashes, appearing 7–10 days after vaccination, have been reported in 5% of vaccine recipients. The incidence of encephalitis or encephalopathy after measles vaccination of healthy children (less than one case per million doses distributed) is lower than the observed incidence of encephalitis of unknown aetiology, and therefore some reported cases may be related coincidentally, rather than causally, to MCV. These adverse events should be anticipated only in susceptible vaccine recipients, i.e., reactions after the second dose occur only among the small proportion of recipients who failed to respond to a first dose *(24)*.
- Serious allergic reactions to measles vaccine are extremely rare; epinephrine should be available, however, at any location where vaccine is provided routinely or during SIA.
- Skin tests for tuberculosis, if not given simultaneously with measles vaccine, should be postponed for 4–6 weeks.

RUBELLA LIVE ATTENUATED VACCINE *(25)*

- Live attenuated rubella vaccines available on the market are based on the RA 27/3 strain of rubella virus propagated in a human diploid cell culture.
- In clinical trials, 95–100% of susceptible children who received a single dose of rubella vaccine at 12 months of age or older developed antibody *(26)* and over 90% of vaccine recipients have protection against both clinical rubella and viremia for at least 15 years *(27)*.

- Transient lymphadenopathy sometimes occurs after the administration of rubella-containing vaccines. Acute arthralgia or arthritis is rare among children who receive RA 27/3 vaccine *(28)*. In contrast, arthralgia develops among approximately 25% of susceptible post-pubertal females after vaccination with RA 27/3, and approximately 10% have acute arthritis-like signs and symptoms *(29)*. When acute joint symptoms occur, they generally begin 1–3 weeks after vaccination, persist for 1 day to 3 weeks, and rarely recur.

In September 2003, the WHO/EURO European Technical Advisory Group of Experts on Immunization (ETAGE) developed the following statement on *Rubella vaccine use during supplementary immunization activities in the European Region of WHO*.

ETAGE statement on rubella vaccine use during SIA

The substantial body of information that is available has not identified a foetus that has been damaged by the immunization of a woman with rubella vaccine either during pregnancy or within one month prior to conception; however, there are still insufficient data to unequivocally state there is no risk to the foetus when a pregnant woman receives the vaccine near the time of conception.

Therefore ETAGE recommends that:

- **Rubella vaccination of women known to be pregnant should be delayed until immediately after delivery;**
- **In view of the apparent absence of any risk of foetal abnormality following infection with rubella vaccine virus, inadvertent rubella vaccination during pregnancy or immediately before pregnancy should not represent a reason for interrupting pregnancy; and there is no need for further counselling;**
- **WHO European Regional Office should work with Member States to increase available data on the outcome of foetal exposures to vaccination, and on the frequency of congenital rubella;**
- **WHO European Regional Office should make available to interested professional groups and organizations the currently known information on the risks associated with foetal exposure to natural rubella virus and to rubella vaccine virus.**

MR VACCINE

This vaccine has the characteristics of both components listed previously.

MMR VACCINE

This vaccine includes mumps vaccine along with the measles and rubella components. There are five mumps vaccine strains currently used in the European Region: Jeryl Lynn, RIT 4385, Urabe, Leningrad-3 and Leningrad–Zagreb; commercially

available MMR vaccines use Jeryl Lynn, RIT 4385, Urabe and Leningrad–Zagreb strains *(30)*. These strains are similar in terms of immunogenicity and protection.

Adverse reactions to mumps vaccination are rare and mild – the most common are parotitis and low-grade fever. Higher rates of post-vaccination aseptic meningitis have been described for vaccines containing the Urabe and Leningrad–Zagreb strains. However, it is difficult to compare the results from different studies given the differences in methods used to monitor for adverse events, including active vs. passive surveillance, clinical vs. laboratory-confirmed cases, and prospective vs. retrospective ascertainment. Table A3.1 shows the range in incidence of aseptic meningitis following vaccination with the different mumps vaccine strains *(31)*. The WHO Global Advisory Committee on Vaccine Safety cautions that if Urabe, Leningrad–Zagreb and Leningrad-3 strain vaccines are used in SIA, national immunization programmes need to take into account the potential for clustering of aseptic meningitis cases *(32)*.

Frequency of aseptic meningitis per doses given, following vaccination with different strains of mumps vaccine *(31)*

Vaccine strain	Frequency	
	High	Low
Jeryl Lynn	1 per 950 000	1 per 1 800 000
RIT 4385	0 per 1 500 000	
Urabe	1 per 400	1 per 69 000
Leningrad–Zagreb	1 per 3 300	1 per 55 000
Leningrad–3	1 per 1 500 000	1 per 5 500 000

Cases of autism and inflammatory bowel disease were reported following MMR immunization; multiple studies, however, have not supported a relationship (*33-35*). The putative relationship was not observed with measles vaccine alone.

The health ministry/ national SIA coordinator should select only WHO/ UNICEF pre-qualified and/or National Regulatory Authority accepted vaccines and AD syringes to prevent allegations related to vaccine quality.

HANDLING OF MEASLES AND RUBELLA VACCINE

Measles-containing vaccine and rubella vaccine need reconstitution before use. Since these vaccines do not contain preservatives, multi-dose vials should be kept at between 2° C and 8° C after reconstitution and must be discarded after 6 hours, even if vaccine remains in the vial.

CONTRAINDICATIONS AND PRECAUTIONS

Absolute contraindications to receipt of MCV:

- severe allergic reaction after a previous dose of MCV or to a vaccine component;
- pregnancy; and
- known severe immunodeficiency, e.g., haematological and solid tumours, congenital immunodeficiency, long-term* immunosuppressive therapy, or severely symptomatic human immunodeficiency virus (HIV) infection.

Precaution: Vaccination should be postponed for people within the age group targeted who are hospitalized with an acute disease or are outpatients with an

* A substantially immunosuppressive steroid dose is considered to be 2 weeks or more of daily receipt of 20 mg or 2 mg/kg of body weight of prednisone or it's equivalent *(36)*.

acute febrile disease (>38.5° C). Such people should be vaccinated once the acute condition has resolved, e.g., before hospital discharge or once the fever has disappeared. See Tables A3.2 and A3.3 for guidelines for spacing vaccinations.

Not contraindications:

- minor illnesses, e.g., upper respiratory illness, diarrhoea and fever 38.5° C or less;
- allergy, asthma, hay fever or other atopic manifestations;
- malnutrition;
- family history of convulsions;
- treatment with antibiotics and low doses of corticosteroids or local treatment with corticosteroids (spray, pomade);
- dermatitis, eczema or localized skin infections;
- stable chronic diseases of the heart, lung, kidney or liver;
- stable neurological conditions; and
- symptomatic or asymptomatic HIV infection, except severely immunocompromised persons.

Table A3.2. Guidelines for spacing MCV and other live and inactivated vaccines

Antigen combination	Recommended minimum interval between doses
Inactivated vaccines and MCV	Can be administered simultaneously or at any interval between doses
MCV and other live parenteral vaccine(s)*	4-week minimum interval, if not administered simultaneously

* Live oral vaccines (e.g., Ty21a typhoid vaccine and oral polio vaccine) can be administered simultaneously or at any interval before or after MCV.

Table A3.3. Guidelines for spacing antibody-containing products and MCV

Simultaneous administration	
Combination	**Recommended minimum interval between doses**
Antibody-containing products and MCV	Should not be administered simultaneously

Separate administration		
Product administered		**Minimum interval between administration of products**
First	**Second**	
Immunoglobulin-containing	MCV	Depends on the type of product and dose given but varies between 3-6 months for products given IM to up to 11 months for high-dose IgG therapy given IV*
MCV	Immunoglobulin-containing	2 weeks

*The duration of interference with the immune response to the measles component of MCV is related to the amount of IgG received *(37)*

PRELIMINARY BUDGET REQUEST ANNEX 4

The health ministry/immunization programme manager/national coordinator should develop a preliminary budget at least 8 months before SIA. The first budget is a mixture of concrete data, estimates and approximations. Avoiding shortfalls is one of the main objectives; the checklist below includes suggestions for developing a standard SIA preliminary budget.

CHECKLIST FOR NATIONAL COORDINATORS

- ✓ Estimate targeted age groups based on the most official source (source to be communicated to all parties).
- ✓ Develop a template for SIA budget (Table A4.1).
- ✓ Draft a schedule of activities (planning/training meetings, supervision, etc. Annex 2).
- ✓ Estimate number of vaccination teams: recommended workload per team per day – 200 eligible people in urban areas and 150 eligible people in rural areas. Knowing the campaign duration one can *estimate* the number of teams needed at the national level.
- ✓ Develop estimates of average cost per team (from a microplanning exercise conducted in a typical region): average cost of vaccinators' transportation and average cost of safe disposal per team; have results of previous assessments, including:
  - extra cold-chain hardware needs; and
  - cost of standard distribution of routine vaccines (experienced staff).
- ✓ Estimate costs for:
  - social mobilization;
  - supervision;
  - training; and
  - AEFI surveillance.
- ✓ Estimate cost of relevant goods and services:
  - vaccine, needles, syringes, safety boxes;
  - alcohol preps, adrenaline, hydrocortisone;
  - office materials;
  - printing, photocopying;
  - cell phone rent;
  - fax machine cost;

- pre-contract value of cold-chain distribution; and
- pre-contract value for hiring expert panel for independent review of cases of AEFI.

✓ Estimate per diem expenses, based on local conditions and rules (in early planning, equal per diem is recommended, irrespective of personnel category: training facilitator, trainee, supervisor etc.).

Comment 1. Experience gained in previously conducted SIA indicates that the number of vaccination teams (Annexes 7 and 13) is the most cost-sensitive variable; the quality of the campaign depends on the number of teams and not necessarily on the number of people targeted. In early planning, estimating the costs to be handed over in cash to the district coordination committee for each category (transport, campaign safety, personnel, etc.) should be reflected as the *average cost per team*.

Comment 2. Social mobilization quality depends on more than the number of teams; it requires specific budgeting. Seeking expertise from UNICEF is recommended for timely planning.

Table A4.1. Suggested SIA budget template

Programme components	Budget items	Comments
Administrative costs	Standard office supplies for all level focal points. Photocopy service. Printing service.*	US $
Advocacy	Meeting(s). Material. Media spots.	US $
AEFI	Cost of hiring expert/panel for review of AEFI. Cost of investigating Cases of AEFI (per diem for team members).	US $
Cold-chain equipment	Cold rooms, diesel generator (if necessary), alarm, backup equipment (if applicable). Freezers, refrigerators, thermometers, spares. Cold boxes, vaccine carriers, ice packs.	US $
Personnel	Average cost of transportation per team × number of teams. Incentives.	US $
Planning/ training (meetings)	Per diem × No. of meeting days × No. of participants. Training materials (standard set). Developing /printing SIA guide. Printing of forms*.	US $

*Tally sheets, attendance cards, summary sheets, logistic forms, supervision checklists, and forms for AEFI case investigation, burning supervision reports, etc.

Table A4.1. (continued)

Programme components	Budget items	Comments
Post materials	Pens, clipboards, folders, stamps for attendance cards.	US $
Supervision Social mobilization	Per diem × number of supervision days × number of supervisors. Developing/printing of broadcaster's manual. Developing/printing of leaflets and posters. Printing Q&A pamphlet for health professionals. Posters and street banners. Public service announcements (TV, radio, newspapers). Opening ceremony. Closing ceremony.	US $
Surveillance	Cost of ELISA equipment at national and / or subnational laboratories. Cost of standard training of laboratory personnel. One year of ELISA IgM measles and rubella test kits.	US $
Transport	Cost of vaccine and supply distribution. Cold-chain hardware distribution. Fuel.	US $
Vaccine and injection equipment	MCV. AD syringes. 5-ml syringes with needles. Safety boxes. Skin disinfection materials. Emergency aid kits.	US $
Waste disposal	Average cost of transport and burning per team × number of teams.	US $
Other, miscellaneous	Maintaining cars. Purchasing ice.	US $

SAMPLE BUDGET ESTIMATION FORMS

Vaccines	Target Age (years)	Groups targeted	Doses required	Doses per vial	Quantity of vial	Price per vial	Cost (US $		
							Vaccines	Shipment	Total
MCV				10					
Rubella				10					
Total									

Form A4.1.
Cost of vaccines for SIA

Item	Quantity of packets	Price per packet	Cost (US $		
			Item	Shipment	Total
AD syringe, 0.5 ml with affixed 23G × 1″ (0.6 mm × 25 mm) needle - packet of 100					
Reconstitution syringes and needles					
Safety boxes for used syringes in packets of 25					
Total					

Form A4.2.
Cost of syringes and safety boxes

Form A4.3.
Operational expenses for SIA

Item	Description	Cost (US $)
1	Cold chain and logistics	
2	Training of health care workers	
3	Social mobilization	
4	Epidemiological surveillance	
5	Monitoring and evaluation	
6	Project support	
	Total	

Form A4.4.
Total financial requirements for SIA

Item	Description	Cost (US $)
1	Cost of vaccines	
2	Cost of the syringes/safety boxes	
3	Project operational expenses	
4	Extra charges	
	Total	

DISCUSSION POINTS AT NATIONAL ICC MEETING

ANNEX 5

CRITICAL ISSUES

The increase in resource requirements incurred by SIA will demand a strong partnership and stewardship with other sectors of the government, as well as developmental aid donors and agencies. Table A5.1 includes issues to be discussed and resolved through partnership.

Table A5.1. Sample of critical issues to be solved through partnership

Relevant agency or organization	Issue	Expected solution/ support
Ministry of Education.	School cohorts.	• Use the academic year schedule, including school breaks. • Plan jointly and provide school health personnel. • Awareness and understanding by teachers.
Ministry of Culture.	Ethnic minorities.	• Choose appropriate language for printed material, advertisements. • Use ethnic holidays, prayer time.
Environmental agency.	Burning syringes in open air.	• Adapt regulations for campaign needs.
Internal affairs ministry.	Personnel security, eligible prisoners.	• Assure security of field teams and health ministry property. • Joint planning.
External affairs ministry.	Immigrants, refugees.	• Joint planning and assist health ministry teams, provide health personnel and transport.
Defence ministry.	Military.	• Joint planning and provide health personnel.
Energy ministry.	Power supply at periphery of system.	• Arrange for uninterrupted power supply for the entire SIA in all peripheral health centres.
Heads of religions. Community leaders, NGOs.	Hard-to-reach and high-risk groups.	• Advocate and facilitate access to the community. • Provide volunteers, incentives.
United Nations agencies and other international organizations.	Technical expertise.	• Provide assessments and technical assistance. • Procure goods/services internationally. • Initiate social mobilization.

OTHER IMPORTANT ISSUES

Many government ministries can assist with advocacy and promotion, in addition to working with professionals in communication and public education in the public and private sectors. Partners' participation can be very useful in these areas:

Communication. Campaign planning and implementation require a pattern of communication different from normal times:

a. coordinators at all levels need to be in contact during the preparation and implementation of the campaign;

b. district focal points must ensure back-up for field teams, increasing the need for phones; and

c. districts and provinces must report daily information, increasing the demand for fax machines and/or computers. The resources required to fulfil the communication requirements may be found through collaboration with the partners.

Transport. Transportation needs are increased and transportation demands are frequently difficult to fulfil.

- *Transportation of vaccines, diluents, AD syringes and safety boxes should be provided by the health sector,* because it requires technical capacity / training to maintain the cold chain.
- *Transportation of cold-chain hardware* is best done as a package of services, including clearance from customs, temporary storage, in-country transportation, installation and commissioning.
- *Transportation of social mobilization materials and other printed items* can be shared with partners, such as a national transport company.

Cold chain. Three critical factors need to be considered with partners to ensure an effective cold chain for SIA:

1. sufficient storage space – this may be addressed with the private sector, such as with the milk or meat industry;
2. sufficient freezing capacity for ice packs; and
3. secure power supply.

Example: Province "North" (with districts A-D)

Note: *Use the same format at the district and national levels.*

- aggregate provinces' district summaries
- add provinces' supervisors and drivers.

Table A6.1. Personnel requirements

Districts	Total population[a]	Total target[b]	Urban target[c]		Rural target[d]		Human resources					
			Target number	Number of teams[e]	Target number	Number of teams[f]	Total number of teams[g]	Total number of health staff[h]	Number of volunteers[i]	Number of supervisors[j]	Number of drivers
District A											
District B											
District C											
District D											
Total district level											
Province North											
Grand total											

Notes:

[a] Total population: from the most authoritative source, to be specified.

[b] Total target = total population eligible.

[c] Urban target = total population eligible from urban settings.

[d] Rural target = total population eligible from rural settings.

[e] Urban teams = total number of teams required in urban settings.

[f] Rural teams = total number of teams required in rural settings.

[g] Total number of teams = total number of teams required per district (main denominator for estimations).

[h] Total number of health staff (i.e. two health workers per team × number of teams).

[i] Volunteers: at least two volunteers per team are recommended.

[j] Supervisors = one supervisor for 5–10 teams.

Table A6.2.
Vaccine, supplies and equipment

Districts	Target group	Total teams [a]	Vaccine doses [b]	Vaccine vials [c]	AD syringes [d]	Syringes (5 ml) [e]	Alcohol preps [f]	Safety boxes [g]	Emergency aid kits [h]
District A									
District B									
District C									
District D									
Total									

Table A6.2
(continued)

Districts	Number of vaccine carriers			Number of ice packs [j]			Vaccine storage (litres) [k]		
	Needed [i]	Available	Additional required	Needed [i]	Available	Additional required	Needed [i]	Available	Additional required
District A									
District B									
District C									
District D									
Total									

Table A6.2
(continued)

Districts	Ice pack storage (litres) [l]			Number of cold boxes [m]			Freezing performance (kg/day) [n]		
	Needed [i]	Available	Additional required	Needed [i]	Available	Additional required	Needed [i]	Available	Additional required
District A									
District B									
District C									
District D									
Total									

Notes:

[a] Target teams = numbers from Table A6.1.

[b] Vaccine doses = Number eligible × 1.177.

[c] Vaccine vials = number of vaccine doses divided by 10.

[d] Number of 0.5-ml AD syringes for administering vaccine = number of vaccine doses.

[e] Syringes (5 ml) and 18G needles for diluting vaccine = vaccine doses divided by 10.

[f] Alcohol preps = Number of vaccine doses + 10% Reserve (This is mentioned only for planning purposes; WHO does not recommend their use.).

[g] Safety boxes (5 litres) = (Number of AD syringes × 1.3)/ 100.

[h] The emergency aid kit is intended for first responder treatment of central circulatory collapse.

[i] Vaccine carrier = 1 per team.

[j] Ice packs required = 2 sets of ice packs per vaccine carrier, i.e., 4 ice packs.

[k] Vaccine storage capacity required (refrigerator or freezer) = Number of doses × Standard storage per dose (3 litres/1000 doses).

[l] Ice pack storage capacity required (freezer) = Number of vaccine carriers needed × 4 ice packs × 0.4 litre.

[m] Cold boxes = 2 per district.

[n] Freezing performance (power) = number of kilograms of ice per day OR number of ice packs per day.

Table A6.3. Operation costs*

Districts	Target group	Total number of teams	Training/planning (meetings)	Transport	Social mobilization	Other/ miscellaneous	Total
District A							
District B							
District C							
District D							
Total district level							
Province North							
Grand total							

Notes:

* Paid in local currency at district level by district coordinator

ANNEX 7 METHODS FOR COMPUTING LOGISTIC REQUIREMENTS

ESTIMATION OF SIZE OF POPULATION TARGETED

1) Calculate target population using the most recent census or yearbook based on the age-specific cohorts to be targeted in SIA.

For each "special" strategy, prepare a logistic and budget request.

2) If only the proportion of persons comprising the target population is known for the general population, multiply the proportion of the target population by the size of the general population.

3) If the proportion of persons in the targeted age group living in urban and rural areas is known, the size of the urban and rural targeted groups can be calculated (Table A7.1).

Table A7.1. Proportions of different age groups (both genders) from official country population (Romania, 1998)

Age groups targeted (years)	Proportions from general population		
	Urban	Rural	Total
1 – 14	0.097	0.084	0.181
1 – 19	0.144	0.116	0.260
1 – 24	0.193	0.155	0.347

Example: District "W" with 0.5 million inhabitants and SIA target age group of 1-14 years

URBAN POPULATION: 500 000 × 0.097 = 48 500 eligible

RURAL POPULATION: 500 000 × 0.084 = 42 000 eligible

URBAN + RURAL = 48 500 + 42 000 = 90 500

ESTIMATION OF THE NUMBER OF VACCINATION TEAMS REQUIRED

A team of four people may vaccinate:

- in urban settings: 2000 eligible people (200 eligible per day × 10 working days campaign);
- in rural settings: 1500 eligible people (150 eligible per day × 10 working days campaign).

Step 1: Urban teams = (48500/2000) = 24.3 (24 teams when rounded)

Step 2: Rural teams = (42000/1500) = 28 teams

Step 3: Total number of teams required for district "W" (24 + 28) = 52

COMPUTING MCV REQUIREMENTS (INDIVIDUAL DOSES AND 10 DOSE VIALS)

Step 1: Target population multiplied by wastage multiplier (1.177 or 15%)
Equation for Step 1: 90 500 × 1.177 = 106 519 doses of MCV required

---

Step 2: Transform doses in 10 dose vials of MCV
Equation for Step 2: 106 519/10 = 10 652 vials of MCV required

COMPUTING SYRINGE AND SAFETY-BOX REQUIREMENTS

AD syringes (0.5 ml)

NUMBER OF AD SYRINGES REQUIRED =
Total number of MCV doses required (i.e., 106 519 syringes)

Disposable 5.0-ml syringes and 19G needles for vaccine reconstitution

NUMBER OF 5-ML SYRINGES AND NEEDLES REQUIRED =
Total number of MCV vials (i.e., 10 652 reconstitution sets)

Safety boxes: 5-litre capacity

- **Planning parameter = 1 safety box should be used to hold ~80 syringes (5.0 ml or 0.5 ml) and needles**
- **Safety boxes come folded in cartons of 25 pieces each**

NUMBER OF SAFETY BOXES REQUIRED = (Number of AD syringes × 1.3)/100 or (106 519 × 1.3)/100 = 1385
NUMBER OF CARTONS REQUIRED = (1385/25) = 56

COMPUTING MATERIALS FOR SKIN DISINFECTION (ALCOHOL PREPS) REQUIREMENTS

Disinfection of the skin site where vaccination will be given is not recommended by WHO due to lack of evidence supporting the need, but it may be part of national policy. If such a policy exists, a budget for appropriate supplies will need to be calculated.

Cotton and diluted alcohol or commercially prepared alcohol preps can be used for skin disinfection. Alcohol preps are suitable for fieldwork since the wastage rate is low, and they are easy to plan and account for.

ALCOHOL REQUIREMENT =
[volume of diluted alcohol per person (0.5 ml) × 106 519)] / 1000 = 107 L
COTTON REQUIREMENT =
[quantity of cotton required per person (0.8 g) × 106 519]/ 1000 = 86 Kg

Alcohol preps come in boxes of 50 twin pieces – that is, 100 alcohol preps per commercial box.

NUMBER OF ALCOHOL PREPS =
Number of vaccine doses required (106 519 alcohol preps)
NUMBER OF BOXES OF ALCOHOL PREPS = (106 519/100) = 1066)

COMPUTING THE NUMBER OF EMERGENCY AID KITS REQUIRED FOR MANAGEMENT OF ANAPHYLAXIS

Each team should have access to one kit. A buffer stock of 10% should be added for turnover.

NUMBER OF EMERGENCY AID KITS =
Number of teams × 1.1 (48 teams × 1.1) = 53 aid kits required

COMPUTING VACCINE CARRIER, ICE PACK AND COLD BOX REQUIREMENTS

Each team should be provided with a vaccine carrier and two sets (appropriate size) of ice packs, i.e., one set in use and one set in the freezer.

Step 1: Make an inventory of available vaccine carriers.

Step 2: Calculate the number of vaccine carriers needed = Number of teams (i.e., 48).

Step 3: Subtract the amount available from that needed to obtain the number of vaccine carriers required.

Step 4: Do the same for the ice packs.

Step 5: Also, repeat the calculation for cold boxes (each district must have 2 long-range large cold boxes with the regular number of ice packs for transport of vaccine).

ESTIMATING COLD-CHAIN SPACE REQUIREMENTS

The following two calculations are needed at each level to verify whether there is sufficient cold space for campaign supplies at the district store (measles containing vaccines can be kept refrigerated between 2°C and 8°C or frozen (–15°C to –20°C).

Calculate the total cold-chain space available

Obtain an inventory of the working cold-chain equipment available and refer to Table A10.1 in Annex 10 to determine the total cold space available in the cold-chain equipment.

Subtract the space used for routine vaccines

To estimate the amount of cold chain space required for SIA vaccine, subtract the estimated amount of space used to store routine vaccines (usually 50–70%) from the total space available.

Example: Computing cold-space requirement of vaccine in district "W"

- The district vaccine store is provided with a ***MF 214 freezer*** (192 litres of vaccine storage capacity) and an ***TCW 1152/CF ice lined refrigerator*** (169 litres of vaccine storage capacity) (Table A9.1, Annex 9).
- If ¼ of the freezer (48 litres) is full of ice packs, and ¾ of the refrigerator (127 litres) is full of routine vaccines, then the remaining cold-chain space available for SIA vaccine is roughly: (192 – 48) + (169 – 127) = 144 + 42 = 186 litres.
- As each 3 litres of cold space can hold 1000 MCV doses, up to 62 000 doses of MCV can be stored in the available space [(186/3) × 1000 = 62 000 doses)] or 6200 vials of MCV.

***Conclusion*:** District "W" needs extra cold space, the recommended options being either a cold chain based on cold boxes and ice packs or borrowing the cold space from another source.

COMPUTING THE FREEZING PERFORMANCE

The operational parameter for cold-chain capacity outside of health facilities is "freezing power", defined as the quantity of ice or the number of ice packs that can be frozen per day with available equipment (Table A9.3, Annex 9).

Note: Plan and budget for the purchase of extra ice if the freezing performance of your equipment is below your needs.

FREEZING CAPACITY REQUIREMENT = Number of ice packs × 0.4 litre ice pack

ESTIMATING COSTS OF SAFE DISPOSAL

The cost of safe disposal will depend on the strategy developed for SIA.

SUGGESTED POLICY

- In a rural setting, safety boxes can be buried or burned locally.
- Urban area safety boxes are stored until the end of campaign and then collected from all health centres and transported to pre-selected places suitable for their destruction (hospital incinerators, cement plant owners, etc.).

The budget for safe disposal for the above strategy should include:

- cost of collecting and transporting safety boxes generated in urban health centers;
- cost of centralized safe disposal; and
- cost of incineration operator safety equipment (if applicable): eyeglasses, apron and heavy-duty gloves.

ESTIMATING THE COST OF TRANSPORTATION AT THE DISTRICT LEVEL

Table A7.2 gives the tabulated components that may be included in a transport budget request.

Item	Per diem × number of days	Cost of gasoline
Collect vaccine and campaign supplies from province/central store.	Driver and store keeper.	Cost of round-trip journey.
In-district distribution.	Driver and store keeper.	Distribution round trip.
Collection at very periphery: village health agent collects vaccine from communes.	Health agent.	If applicable.
Teams spending night in the field.	Health workers. Driver (if mobile team).	Cost of round-trip journey.
Supervision provided by district before and during campaign (transport by cars).	Supervisors. Drivers.	Planned route cost.
All available cars (except supervisors') are to transport field teams and supplies.	If applicable – local transport.	Planned route cost.
Subtotals.	Subtotal = Per diems + Gasoline cost.	
Other unexpected events (cars repairs, public transport tickets, etc.).	Suggested to be 15% of subtotal.	
Total transport budget request.	**Subtotal × 1.15.**	

Table A7.2. Tabulated components that may be included in the transport budget request

COMPUTING THE BUDGET REQUEST FOR TRAINING/PLANNING AT THE DISTRICT LEVEL

To calculate the training requirement at the district level, you need the following components:

- trainees: (Per diem value × Number of trainees × Number of days of training);
- trainers (local): Number of trainers × Trainer's fee;
- planning costs: Number of participants × Number of planning days × local standard fee for snack/lunch; and

- stationary costs: Standard × (Number of trainees + Number of participants at planning meetings).

Tips:

- Do *not* include the training of volunteers, if it is paid from social mobilization budget.
- Do *not* include the cost of advocacy meetings, if social mobilization budget or the province pays for them.

Aggregate costs and add 15% for unexpected training/ planning payments.

ANNEX 8 SPOT-CHECK SURVEY FORM

This may be used by supervisors to conduct a spot-check survey before SIA. The survey is useful for assessing whether social mobilization efforts are effective, particularly in high-risk or hard-to-reach populations. Spot-check surveys can be conducted during the week before SIA, allowing enough time to rectify any problems identified.

Household number:	
Attendance at a routine immunization	
Attendance of all children < 5 years of age at a routine immunization session (Circle "Yes", "No", or "Unknown")	(Child 1) Yes / No / Unknown (Child 2) Yes / No / Unknown (Child 3) Yes / No / Unknown (Child 4) Yes / No / Unknown (Child 5) Yes / No / Unknown
If any child < 5 years of age did not attend a routine immunization session, why not? (Non-prompted question, check all that apply)	○ No time ○ Unaware of need to go ○ Health centre too far ○ Too crowded ○ Dislikes immunizations ○ Fear of immunizations ○ Unimportant ○ Child not with parent ○ Don't know ○ No response ○ Other*
Awareness of upcoming campaign	
What dates? (Check all that apply)	○ Dates known ○ Dates unknown
What age group? (Check all that apply)	○ Know about: 1–5 year olds ○ Know about: 6–15 year olds ○ Know about: > 15 year olds (if applicable) ○ Unknown
How did parent in household learn about upcoming campaign? (Check all that apply)	○ Health worker or volunteer ○ Radio ○ Television ○ Microphone ○ Poster ○ Banner ○ Neighbour ○ Other sources* ○ Never heard

Note: * Specify on the back of this page.

COLD-CHAIN EQUIPMENT ANNEX 9

For the most up-to-date listing of equipment available from UNICEF, see UNICEF Supply catalogue. (http://www.unicef.org/supply/index_about.html)

Description	Manufacturer	Model	Capacity	
			Refrigerator	Freezer
Compression refrigerators only				
Ice lined refrigerator	Electrolux SARL	TCW 1152/CF	169	0
Refrigerator & icepack freezer	Electrolux SARL	RCW 42AC/CF	12	12
Ice lined refrigerator	Vestfrost A/S	MK144	45	45
Ice lined refrigerator & icepack freezer	Electrolux SARL	TCW1990	37.5	17
Ice lined refrigerator and icepack freezer	LEG Refrig. PLC	VC 139 F	107.5	0
Ice lined refrigerator	Vestfrost A/S	MK 074	20	5
Icepack freezer	Electrolux SARL	TFW 800	0	145
Ice lined refrigerator	Vestfrost A/S	MK 204	63	0
Ice lined refrigerator	Vestfrost A/S	MK 304	108	0
Refrigerator and icepack freezer	Electrolux SARL	RCW 50 AC	24	8
Vaccine/icepack chest freezer	Vestfrost A/S	MF 114	0	72
Vaccine/icepack chest freezer	Vestfrost A/S	MF 214	0	192
Vaccine/icepack chest freezer	Vestfrost A/S	MF 214	0	264
Vaccine/icepack chest freezer	Electrolux SARL	FCW 300	0	264
Vaccine/icepack chest freezer	Electrolux SARL	FCW 200	0	144

Table A9.1. Vaccine storage capacity of selected cold-chain equipment

Table A9.2. Selected cold-box manufacturers, models and vaccine capacity

Cold box, vaccine carriers	Manufacturer	Model	Vaccine capacity (litres)
Large vaccine cold box, long range	Electrolux SARL	Model RCW 25/CF	20.7
Large vaccine cold box, short range	Ina ColdMed	CB/INO/B3/90	16.2
Small vaccine cold box, short range	Ina ColdMed	CB/INO/C2/90	6.5
Large vaccine carrier	The Thermos Company	3504/UN/CF	1.7
Small vaccine cold box, short range	Ina ColdMed	CB/INO/D1/90	4.0
Small vaccine cold box, long range	Oyster Industries (Pvt.) Ltd.		9.7
Large vaccine carrier	Beijing Light Industrial Products Import & Export Corporation Ltd.	IA	1.3
Large vaccine cold box, long range	Savopak Oy P.	KR 48	20.9
Large vaccine carrier	Gio Style Spa		2.6
Small vaccine carrier	Electrolux SARL	RCW 2/CF	0.6
Small vaccine carrier	True Pack Ltd.	T.P.001	0.8
Small vaccine cold box, short range	Blow Kings	55-CF	8.6
Small vaccine cold box, long range	Electrolux SARL	RCW 12/CF	8.5
Large vaccine carrier	Apex Continental Limited	IVC-9AF	1.6
Small vaccine carrier	Apex Continental Limited	IVC-8F	0.8
Small vaccine carrier	Blow Kings	VDC-24-CF	0.9
Large vaccine cold box, long range	Apex Continental Limited	ICB-11F	23.1
Small vaccine cold box, long range	Apex Continental Limited	ICB-8F	5.0
Large vaccine cold box, long range	Blow Kings	CB/20/5U -CF	20.0
Large vaccine carrier	Blow Kings	VC/42/MOD/2/CF	1.5
Small vaccine cold box, long range	Blow Kings	CB/5/2A/CF	7.2
Small vaccine carrier	Promociones LISA S.A.		0.7
Small vaccine cold box, short range	Polyfoam Packers Corporation	390	9.2
Large vaccine carrier	Nylex Packaging PTY Ltd.		1.4
Large vaccine carrier	Blow Kings	BK-VC1.6-CF	1.7
Vaccine carrier for NID	CIP Industries PO	Frigivac for Kick Polio	1.7
Small vaccine cold box, short range	Electrolux SARL	RCW 8/CF	5.3
Large vaccine cold box, short range	Apex Continental Limited	ICB-14F	15.0
Large vaccine cold box, short range	Beijing Municipal Sanitation and Antiepidemic Cold-Chain Comp. Ltd.	LCB-8A	1.6
Large vaccine carrier	Blow Kings	CB/10-CF	10.0
Large vaccine cold box, long range	Electrolux SARL	Model RCW 25/CF	20.7

Table A9.2.
(continued)

Cold box, vaccine carriers	Manufacturer	Model	Vaccine capacity (litres)
Large vaccine cold box, short range	Ina ColdMed	CB/INO/B3/90	16.2
Small vaccine cold box, short range	Ina ColdMed	CB/INO/C2/90	6.5
Large vaccine carrier	The Thermos Company	3504/UN/CF	1.7
Small vaccine cold box, short range	Ina ColdMed	CB/INO/D1/90	4.0
Small vaccine cold box, long range	Oyster Industries (Pvt.) Ltd.		9.7
Large vaccine carrier	Beijing Light Industrial Products Import & Export Corporation Ltd.	IA	1.3
Large vaccine cold box, long range	Savopak Oy P.	KR 48	20.9
Large vaccine carrier	Gio Style Spa		2.6
Small vaccine carrier	Electrolux SARL	RCW 2/CF	0.6
Small vaccine carrier	True Pack Ltd.	T.P.001	0.8
Small vaccine cold box, short range	Blow Kings	55-CF	8.6
Small vaccine cold box, long range	Electrolux SARL	RCW 12/CF	8.5
Large vaccine carrier	Apex Continental Limited	IVC-9AF	1.6
Small vaccine carrier	Apex Continental Limited	IVC-8F	0.8
Small vaccine carrier	Blow Kings	VDC-24-CF	0.9
Large vaccine cold box, long range	Apex Continental Limited	ICB-11F	23.1
Small vaccine cold box, long range	Apex Continental Limited	ICB-8F	5.0
Large vaccine cold box, long range	Blow Kings	CB/20/5U -CF	20.0
Large vaccine carrier	Blow Kings	VC/42/MOD/2/CF	1.5
Small vaccine cold box, long range	Blow Kings	CB/5/2A/CF	7.2
Small vaccine carrier	Promociones LISA S.A.		0.7
Small vaccine cold box, short range	Polyfoam Packers Corporation	390	9.2
Large vaccine carrier	Nylex Packaging PTY Ltd.		1.4
Large vaccine carrier	Blow Kings	BK-VC1.6-CF	1.7
Vaccine carrier for NID	CIP Industries PO	Frigivac for Kick Polio	1.7
Small vaccine cold box, short range	Electrolux SARL	RCW 8/CF	5.3
Large vaccine cold box, short range	Apex Continental Limited	ICB-14F	15.0
Large vaccine cold box, short range	Beijing Municipal Sanitation and Antiepidemic Cold-Chain Comp. Ltd.	LCB-8A	1.6
Large vaccine carrier	Blow Kings	CB/10-CF	10.0

Source: Product Information Sheets

Table A9.3. Freezing power of selected standard cold-chain equipment for ice packs

Freezer and Refrigerator Models (WHO/UNICEF)	Freezing Power Practical * (# kg of ice per day)	Freezing of Ice Packs 0.3 litre (# ice packs per day)	Storage Capacity for Ice Packs 0.3 litre (# ice packs stored)
Ice packs freezer Elecrolux TFW 791	≈ 30 Kg / day (But fast freezing)	≈ 100 per day	≈ 150 to 200
Ice packs freezer Elecrolux TFW 800	≈ 20 Kg / day (But fast freezing)	≈ 60 per day	≈ 150 to 200
Chest Freezer Vestfrost MF 314 (large model)	≈ 30 Kg / day	≈ 100 per day	≈ Up to 450
Chest Freezer Electolux FCW 300 (large model)	≈ 20 Kg / day	≈ 60 per day	≈ Up to 450
Icelining Refrigerator with freezing Part Vestfrost MK 074	≈ 20 Kg / day	≈ 60 per day	≈ 10 (very small compartment)
Icelining Refrigerator with freezing Part Elecrolux TCW 1990	≈ 15 Kg / day	≈ 50 per day	≈ 20 (very small compartment)
Icelining Refrigerator with NO Freezing Elecrolux or Vestfrost	0 Kg / day	0 per day	0
Domestic refrigerator Standard Model (when properly working)	? Kg / day (could be 5 to 10 kg per day)	? per day (Could be 15 to 30 ip per day)	? (Could be 25 to 50 ice packs)
Gas Refrigerator Sibir V 240 GE	≈ 3 Kg / day	≈ 10 per day	≈ 60
Solar Refrigerator Most of Models	≈ 0 Kg / day	≈ 0 per day	≈ 0 per day
Ice packs freezer Elecrolux TFW 791	≈ 30 Kg / day (But fast freezing)	≈ 100 per day	≈ 150 to 200
Ice packs freezer Elecrolux TFW 800	≈ 20 Kg / day (But fast freezing)	≈ 60 per day	≈ 150 to 200
Chest Freezer Vestfrost MF 314 (large model)	≈ 30 Kg / day	≈ 100 per day	≈ Up to 450
Chest Freezer Electolux FCW 300 (large model)	≈ 20 Kg / day	≈ 60 per day	≈ Up to 450
Icelining Refrigerator with freezing Part Vestfrost MK 074	≈ 20 Kg / day	≈ 60 per day	≈ 10 (very small compartment)
Icelining Refrigerator with freezing Part Elecrolux TCW 1990	≈ 15 Kg / day	≈ 50 per day	≈ 20 (very small compartment)
Icelining Refrigerator with NO Freezing Elecrolux or Vestfrost	0 Kg / day	0 per day	0
Domestic refrigerator Standard Model (when properly working)	? Kg / day (could be 5 to 10 kg per day)	? per day (Could be 15 to 30 ip per day)	? (Could be 25 to 50 ice packs)
Gas Refrigerator Sibir V 240 GE	≈ 3 Kg / day	≈ 10 per day	≈ 60
Solar Refrigerator Most of Models	≈ 0 Kg / day	≈ 0 per day	≈ 0 per day

* Practical performances take into account equipments' age and maintenance.

VACCINE HANDLING, INJECTION SAFETY AND WASTE MANAGEMENT

ANNEX 10

HANDLING OF MEASLES, RUBELLA AND MEASLES-RUBELLA VACCINES

Live virus vaccines lose potency when exposed to heat or *strong ultraviolet light*, i.e., sunlight or fluorescent (neon) light.

Vaccine potency can never be restored; heat and light exposure are cumulative.

Recommended storage temperatures: Measles and rubella vaccines are freeze dried and should be stored between **2° C and 8° C**; however, at higher levels in the cold chain, i.e., at the national (central) and the regional or provincial level, they may be kept frozen (–15° C to –25° C).

Storage volume standard: maximum recommended packed volume per dose in 10 dose vials is 3.0 cm^3. In the planning process, 3 litres of storage space is needed for each 1 000 doses of vaccine.

Diluent must never be frozen to avoid cracking the glass vials, allowing it to be contaminated. Never keep diluent in a freezer or allow it to come in contact with a frozen surface.

Conditions for storing diluent: may be kept at room temperature or with the vaccine between **2° C to 8° C**. When vaccine is reconstituted, the diluent should have the same temperature as the vaccine, so sufficient diluent for daily needs should be kept between **2° C** and **8° C** at least 12 hours before use.

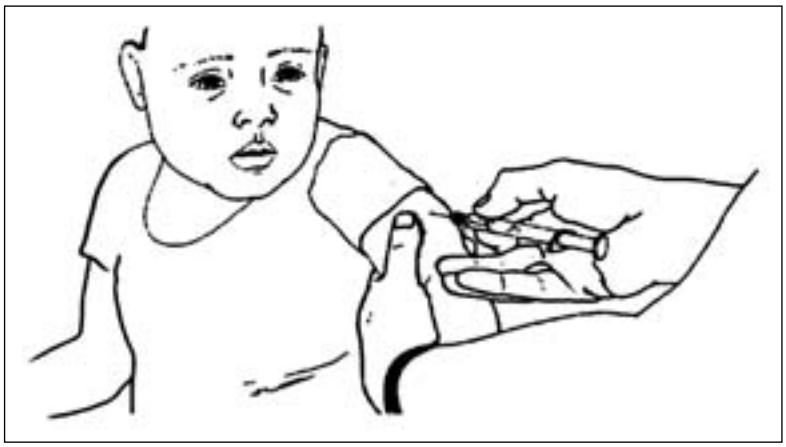
Reconstituting vaccine

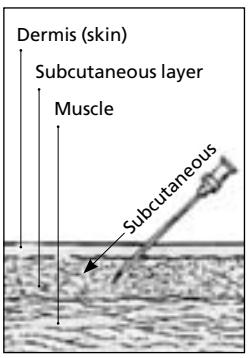
- Vaccines are provided with their corresponding diluents (same manufacturer).
- Vaccines should be reconstituted with their corresponding diluents (same manufacturer).
- A new reconstitution syringe (5 ml) should be used for each vial of diluent and vaccine.
- Never leave a needle inserted in the rubber cap (septum) of the vaccine vial.
- The reconstitution syringe should be immediately disposed of in a safety box, without recapping.
- Once reconstituted, the vaccine should be kept cool (in the foam of the vaccine carrier or in the designated hole of an ice pack) and protected from sunlight.

Using AD syringe

- Before using any AD syringe, check that the package seals are not damaged or opened.
- If required, disinfect rubber stopper of diluent vial.
- Do not inflate air into vial but draw directly the dose.

- Fill the dose (0.5 ml) accurately. If an incorrect volume is drawn into the syringe, discard the AD syringe with its content.
- Do not fill several syringes in advance during the session.
- Do not recap the needle of the AD syringe before or after the injection.





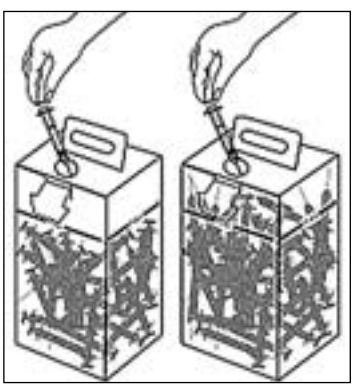
INJECTION SAFETY

Injecting vaccine

- The site of injection is the outer part of the upper arm.
- The injection is subcutaneous.
- The dose injected is 0.5 ml.
- If required, clean the skin before injecting, but do not use non-diluted alcohol, which can inactivate the vaccine.

Collecting AD syringes into safety boxes

- *Immediately after the injection, dispose of each used AD syringe into the safety box.*



SAFE: Box 3/4 full (max)

UNSAFE: Box too full to be used safely

- Do not recap syringes before disposing into safety box.
- Do not remove the needle from the syringe.
- Fill the safety box until it is about ¾ full.
- Do not put too many syringes into the box.

  The safety box supplied (5 litres) can safely hold approximately 80 used syringes.

DO NOT RECAP

- Once the safety box is filled (¾ full), seal the box by closing the lid to avoid syringes spilling out.
- Replace the full safety box with an empty one, and make sure you always have an extra safety box available.
- Do not throw empty vials into the safety box, as they may burst if incineration is used.

WASTE MANAGEMENT

Transporting and storing filled-in safety boxes

Ensure filled safety boxes are turned over to the responsible person who should put them in a safe, supervised place until their final disposal or destruction.

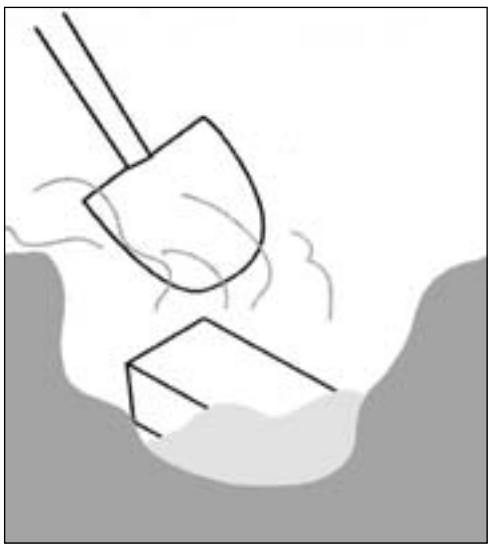
Methods for disposing of safety boxes

Five methods are commonly used to destroy filled safety boxes or to keep them away from people. Any selected method of waste disposal must be in compliance with national and subnational environmental regulations and with specific health ministry instructions. Keep written records on the number of safety boxes collected and disposed of.

DISPOSAL PIT

Used injection equipment may be buried in a disposal pit. Choose the site carefully, and dig a pit large enough and deep enough for bulky boxes. If contaminated AD syringes escape from the box and are carried into streams or fields, people may step on them or children may play with them.

- Choose a site (in the area of the health centre for supervision) where people will not dig or establish latrines in the future.
- Fence off and clear the area.
- Dig a pit at least 2-m deep (but above the water table), to make sure that the material will not escape from the pit – for example, during the rainy season. Keep the removed soil close to the pit.

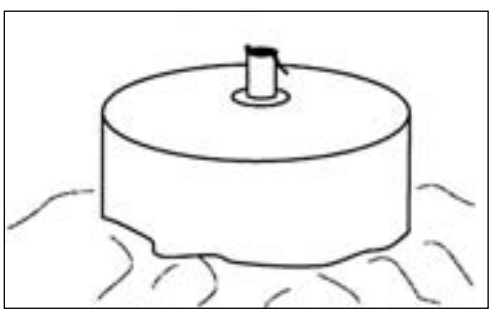


Disposal pit

- Take the filled safety boxes to the pit site just before burying. Do not open or empty the boxes.
- Place the filled safety boxes in the pit.
- Cover the boxes with at least 30 cm of soil. If possible, cover the site with concrete when the pit is full.
- Make sure a qualified staff member supervises the process. Do not leave this vital task to unqualified people.

CONCRETE BUILT PIT

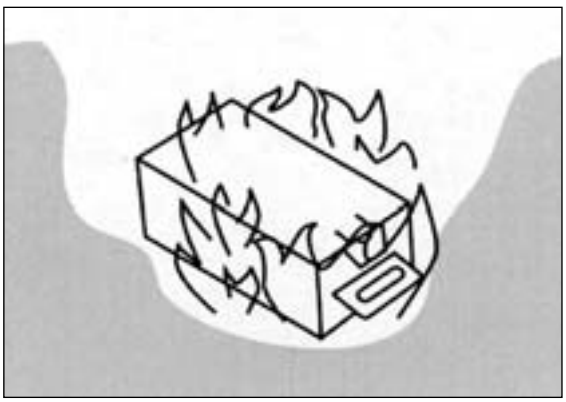
A specially built **safety pit** is another option to dispose of safety boxes without burning. A safety pit is usually 2-m deep and 1-m in diameter, so that it can be lined with a locally made concrete pipe. The pit has a concrete lid with a capped metal pipe set in it. The pipe is large enough to have a safety box dropped through it.



Safety pit

OPEN BURNING IN A PIT

Open burning of plastic syringes in a pit is not recommended if suitable alternative methods are available, because of concerns about resulting air quality.



Open burning in a pit

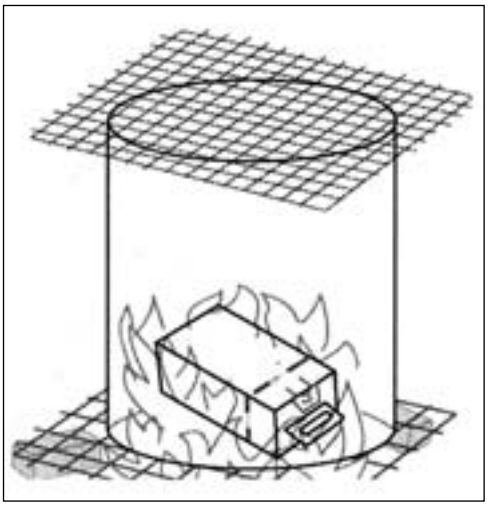
- Choose an unused area for the burning site, as far from buildings as possible. The area should be fenced and cleared.
- Choose a qualified staff person to supervise the burning process.
- Dig a pit at least 1-m deep but not so deep that one has to crawl into it to start the fire.
- Place the filled safety boxes in the pit. Mix in paper, leaves, or other flammable materials among the boxes to start them burning.
- If available, sprinkle a small amount of kerosene and ignite the materials.
- Warn people to stay away, and avoid smoke, fumes and ash from the fire.
- Burn until boxes are destroyed.
- Pay attention to the residue that has to be removed and buried or covered with soil.
- Once the burning is over, refill the pit with soil.

BURNING IN A METAL DRUM

The remains of needles and safety boxes should be buried after burning, whether burning is done in a metal drum or in an open pit. Bury them deeply in a pit, controlled landfill, or a similar location where people do not have access to them.

- Choose a burning site in an unused area as far from buildings as possible. The area should be fenced and cleared.
- Place four bricks on the ground in a square pattern.
- Put a metal screen or grate on top of the bricks.
- Remove both ends of a 210-litre (55-US gallon) steel drum. This will allow air to flow through the drum, and the contents will burn better. If a metal drum is not available, you can build a cylinder from sheet metal, bricks, or clay. A chimney may be added to the removable top of the drum or container.
- Place the drum on top of a metal screen or grate.
- Put the filled safety boxes into the metal drum. Mix paper, leaves, or other flammable material in among the safety boxes to start them burning.
- Sprinkle a small amount of kerosene, if available, on the boxes and other material in the drum.
- Place a fine metal screen over the top of the drum to reduce flying ashes.
- Put wood, paper, or other flammable materials under the drum and ignite the material.

- Warn people to stay away and to avoid smoke, fumes, and ash from the fire.
- Allow the fire to burn until all of the safety boxes have been destroyed.
- Once the fire is out and the residue at the bottom of the drum has cooled, carefully collect the residue. Bury it in an unused location (pit). Cover it with at least 30 cm of soil. If possible, seal the residue pit with cement once it is full.



Burning in a metal drum

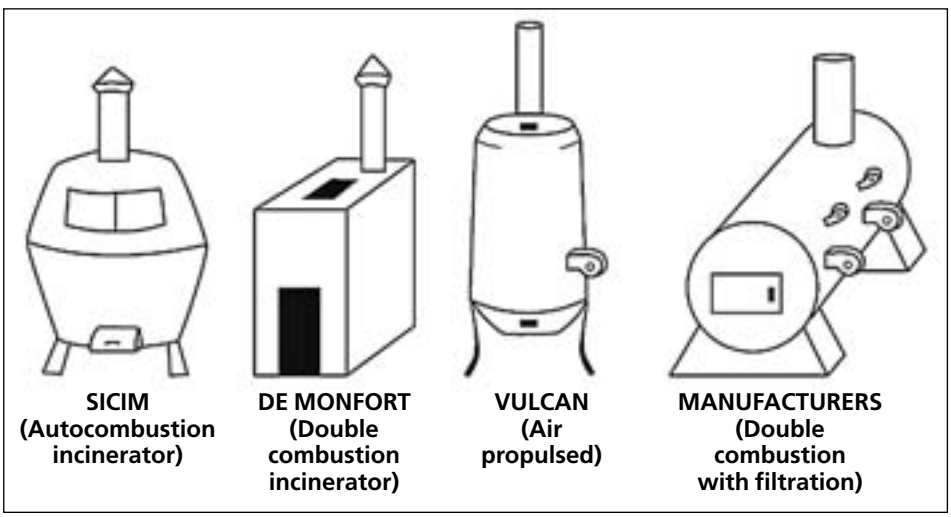
INCINERATION

Incineration can completely destroy syringes and needles. Incinerators, when functioning optimally, burn at temperatures of around 800 °C, killing micro-organisms and reducing the volume of waste to a minimum. Properly functioning incinerators ensure the most complete destruction of syringes and needles, and they produce less air pollution than open fires or furnaces, which burn at lower temperatures. Some hospitals have on-site incineration. Others use incinerators at facilities such as cement factories.

The compound in which incineration takes place must be secure. Well-trained staff members conducting the incineration should wear apron, boots, safety glasses and heavy gloves.

Main tasks for waste disposal operator

- Consider the operator's workload during SIA will be much greater than during routine immunization.
- Plan activities by estimating the number of safety boxes to be treated throughout SIA and the capacity of the equipment – incineration may have to take place every day.



Different incinerator prototypes

- Never open or empty the safety boxes.
- Always use safety equipment: glasses, apron and gloves.
- Process incineration as for routine immunization, but check if burning a large quantity of safety boxes in succession over several hours will raise the incinerator temperature too high and risk damaging it – if so, mix the safety boxes with non-plastic waste or extend the burning process over a longer period of time.
- Keep the process under constant control – do not leave the incineration unit before the process is finished.
- Clean after each session and bury residuals in a protected pit.
- Keep written records of the number of safety boxes collected and treated.

SURVEILLANCE FOR AND MANAGEMENT OF AEFI

ANNEX 11

SURVEILLANCE

Surveillance for AEFI is a critical component of a strong immunization programme in that it permits one to monitor the quality of safe immunization practices, to rapidly detect and respond to emerging problems, and to provide assurance to the public that immunization programmes are safe. In some countries, surveillance for AEFI either is not yet established or is weakly implemented.

During SIA, strong surveillance for AEFI will allow one to quickly detect problems and address them before they have an impact on vaccine acceptance by the public. SIA also provide opportunities to strengthen routine AEFI surveillance through training.

AEFI associated with SIA

- An increase in the number of reported adverse events will occur.
  - The large number of doses given over a short period of time will likely result in more vaccine-associated adverse events being detected. This may worry the public, even though the *incidence* of adverse events is less or remains unchanged.
  - Adverse events tend to be noticed more by both staff and the public during campaigns, particularly when injectable vaccines are used.
- An increase in incidence of adverse events may occur.
  - New staff unfamiliar with a given vaccine or situation result in more programmatic errors.
  - Staff are under pressure and may be tempted to cut corners, not observing normal safe injection practices.

Prevent rumours. During SIA, rumours can quickly spread and have a negative effect.

Anti-vaccination groups. In some countries, routine vaccination may generate antagonism from anti-vaccine groups. Adverse events that occur during SIA can be used by some to justify criticism of routine vaccination.

Gain experience. Vaccine may be administered to a wider age group (usually older) than during routine immunization. The programme may have less experience in dealing with reactions or adverse events expected in this older group, e.g., arthralgia appears more frequently in older females than in preschool girls after vaccinations with rubella containing vaccines.

CONDITIONS THAT SHOULD BE REPORTED

- **Toxic shock syndrome:** measles and rubella vaccines contain no preservatives to protect against bacterial infection after reconstitution. Bacterial contamination of the reconstituted vaccine may appear if open vials are used more than 6 hours after reconstitution.

WHO recommended definitions for reporting AEFI during SIA can be found in *Surveillance of adverse events following immunization – field guide for managers of immunization programmes (13).*

- **Injection site abscesses:** multiple manoeuvres are required for extracting diluted vaccine from a multi-dose vial, with the risk of improper manipulation.
- **Anaphylactic reactions and anaphylactic shock:**
  - although rare, anaphylaxis is the single serious danger associated with measles vaccine. An incidence of ~1 per 1 000 000 during SIA should be anticipated;
  - there are no specific clinical signs or laboratory tests for identifying someone at risk for a severe reaction to egg protein or other vaccine component;
  - circulatory collapse may result in permanent damage; it MUST be demonstrated that well-trained health workers responded in a timely and appropriate manner to protect the vaccinee's health.
- **High fever:** *fever is a usual concern of parents of recently vaccinated children*. Transient (2 days), mild fever is an expected sign in 5% of susceptible children vaccinated with MCV. High fever is more likely to be associated with a concurrent infectious disease (such as acute otitis, acute meningitis and pneumonia); however, it can be a problem if it is clustered.
- **Death, hospitalisation or other severe or unusual events:** they are of concern to parents. They MUST be investigated in order to:
  - demonstrate that the cause of the event was not vaccine related;
  - improve public confidence in vaccine provided routinely or during SIA.
- **Fainting episode (syncope**): it is frequent when measles vaccine is given to adolescents.

ANAPHYLAXIS

Every vaccine provider should be familiar with the symptoms of anaphylaxis and be ready to initiate management and administer appropriate medications.

Clinical description and differential diagnosis

This section is intended as a guide for the initial management of patients in a public health clinic or similar non-hospital setting *(38, 39)*.

Anaphylaxis is a rare and potentially life-threatening allergic complication of vaccination that should be anticipated in every vaccine recipient. Anaphylaxis, however, is one of the rarer events reported in the post-marketing surveillance for adverse events related to a vaccine. In routine immunization programmes, the annual rate of anaphylaxis ranges from 0.11 to 0.31 reports per 100 000 doses of vaccine distributed. Prevention is the best approach. Pre-vaccination screening should include questions about possi-

Table A11.1. AEFI reported during recently conducted SIA in WHO European Region

Event – Romania, 1998 *(15)*	Number	Rate per 100 000 doses
Syncope (fainting)	109	5.20
Allergic reaction	9	0.40
Local reaction	3	0.10
Post-vaccination measles	2	0.10
Possible anaphylaxis	2	0.10
Fever	1	0.05
Arthralgia[a]	1	0.20
Total	**127**	**6.10**

Event – Albania, 2000 *(14)*	Number	Rate per 100 000 doses
Encephalitis or encephalopathy	2	0.20
Aseptic meningitis	1	0.10
Seizure	1	0.10
Guillain-Barré syndrome	1	0.10
Anaphylactic reaction	1	0.10
Allergic reaction	10	1.20
Arthralgia	1	0.10
Fever	8	0.90
Syncope	206	23.70
Total	**231**	**26.60**

Event – Kyrgyzstan, 2001[b]	Number	Rate per 100 000 doses
Syncope (fainting)	90	4.90
Mild rash and/or fever	28	1.50
Fever (hyperpyrexia or unspecified)	9	0.50
Hypotonic/ hypo responsive episode	1	0.05
Anaphylactoid reaction (Quincke oedema)	1	0.05
Encephalomyelitis	1	0.05
Total	**130**	**7.00**

Event – Moldova, 2002[b]	Number	Rate per 100 000 doses
Syncope	50	4.50
Allergic reactions	11	1.00
Seizures	2	0.20
High fever	4	0.40
Anaphylactic shock	0	0
Total	**67**	**6.10**

[a] The denominator was the number who received measles–rubella vaccine.

[b] Source: Ministry of Health

Figure A11.1 Immediate verbal report of suspected AEFI

Notes: The information is the minimum needed for a verbal AEFI report. Each health facility and outreach vaccination point should:

- keep a record of the AEFI related to SIA after reporting by telephone; and
- include the event in the routine monthly reporting of AEFI.

1) Place: _____

2) Suspect case: _____

a. Full name: _____

b. Age: _____

c. Gender: _____

3) Date: ____/____/____ and time: _____ hour vaccinated

4) Date: ____/____/____ and time: _____ hour of onset of first symptom(s)

5) Date: ____/____/____ and time: _____ hour when case detected

(reported to, presented at or occurred in health facility)

6) Type AEFI: _____

7) Hospitalized: Y____ N____ UNK____

8) Outcome: _____

9) Other relevant information: _____

_____

_____

10) Name of reporting health care worker: _____

11) Date of report: ____/____/____ and time: _____ hour

ble allergy to any component of the product(s) being considered, to identify this contraindication.

Anaphylaxis is usually noted within 30 minutes after an injection of vaccine. Thus vaccine recipients should be kept under supervision for at least 15 minutes after vaccination; 30 minutes is a safer interval when there is a specific concern about a possible vaccine allergy. In low-risk situations, supervision can include having vaccine recipients remain within a short distance of the vaccinator, e.g., within a school being used for vaccinations and return immediately for assessment if they do not feel well.

Anaphylaxis must be distinguished from fainting (vasovagal syncope), anxiety and breath-holding spells, which are more common and benign reactions. During fainting, the individual suddenly becomes pale, loses consciousness and collapses to the ground. Fainting is sometimes accompanied by brief clonic seizure activity, i.e., rhythmic jerking of the limbs, but this generally requires no specific treatment or investigation. Fainting is managed by placing the patient in a recumbent position. Recovery of consciousness occurs within a minute or two, but patients may remain pale, diaphoretic and mildly hypotensive for several more minutes. The likelihood of fainting is reduced by measures that lower stress in those awaiting vaccination, such as short waiting times, comfortable room temperature, preparation of vaccines out of view of recipients and privacy during the procedure. To reduce injuries during fainting spells, those at risk are best vaccinated while seated.

People experiencing an anxiety spell may appear fearful, pale and diaphoretic and may complain of light-headedness, dizziness and numbness, as well as tingling of the face and extremities. Hyperventilation is usually evident. Treatment consists of reassurance and breathing into a paper bag until symptoms subside.

Breath-holding spells occur in some young children when they are upset and crying hard. The child is suddenly silent, but obviously agitated. Facial flushing and perioral cyanosis deepen as breath holding continues. Some spells end with resumption of crying, but others end with a brief period of unconsciousness during which breathing resumes. Similar spells may have been evident in other circumstances. No treatment is required beyond reassurance of the child and parents.

In anaphylaxis, changes develop over several minutes and usually involve multiple body systems – affecting the skin, respiration and circulation. Unconsciousness is rarely the sole manifestation of anaphylaxis. It occurs as a late event in severe cases.

The cardinal features of anaphylaxis are:

- itchy, urticarial rash (in over 90% of cases);
- progressive, painless swelling (angioedema) about the face and mouth, which may be preceded by itchiness, tearing, nasal congestion or facial flushing;
- respiratory symptoms, including sneezing, coughing, wheezing, and laboured breathing; upper airway swelling (indicated by hoarseness and/or difficulty swallowing), possibly causing airway obstruction; and
- hypotension, which generally develops later in the illness and can progress to cause shock and collapse.

An inconsistent early feature is swelling and urticarial rash at the injection site. This is more likely to be evident with vaccines injected subcutaneously than with those injected intramuscularly.

Anaphylaxis is described as mild or early when signs are limited to urticarial rash and injection site swelling. At this stage, other symptoms may occur such as sneezing, nasal congestion, tearing, coughing and facial flushing, but they are associated with minimal dysfunction. Features of severe anaphylaxis include obstructive swelling of the upper airway, marked bronchospasm and hypotension.

MANAGEMENT OF ANAPHYLAXIS

The following seven steps describe the management of anaphylaxis. Steps 1–4 are meant to be done rapidly or simultaneously. The priority is prompt administration of epinephrine (Step 4), which should not be delayed if earlier steps cannot be completed quickly.

1. Call for assistance, including an ambulance.
2. Place the patient in a recumbent position (elevating the feet, if possible).
3. Establish an oral airway if necessary.
4. Promptly administer 0.01 ml/kg (maximum 0.5 ml) of aqueous epinephrine 1:1000 by intramuscular injection in the opposite limb to that in which the vaccination was given. Speedy intervention is of paramount importance: failure to use epinephrine promptly is more dangerous than using it improperly.

Figure A11.2 Case investigation report form for suspected AEFI

Case number:			
Patient's last name:	First name(s):		
Address:			
Date of birth:	Gender:	Parent's name:	

IMMUNIZATION HISTORY AND PROCEDURES

Date of vaccination:	Vaccination post	Health facility	Vaccinator's name
Suspect vaccine(s)	Manufacturer	Lot/batch number	Expiration date
Details of vaccine			
Details of diluent			
Other drug(s) given at same session			
How many people received vaccine from the same batch?			

MEDICAL HISTORY (tick "Yes" wherever applicable)

Local reaction	**Yes**	**Systemic reaction**	**Yes**
• Injection site abscess		• Toxic-shock syndrome	
• Severe local reaction (swelling beyond the nearest joint OR pain, redness and swelling of more than 3 days duration OR requires hospitalization)		• Seizures (febrile/afebrile) within 3 days of vaccination	
		• Fever > 39 °C within 48 hours of vaccination	
		• Meningitis (aseptic) within 7 days of vaccination	
		• Anaphylactoid reaction/anaphylactic shock within 48 hours	
		• Encephalopathy within 72 hours after vaccination	
• Mild local clustered		• Hospitalization: dates _____ Location _____	
• Other		• Other reaction thought to be related to vaccination	
• **Death of vaccine recipient temporally linked (within 4 weeks) to vaccination**			

Details of symptoms:

Date and time of onset of symptoms:

Laboratory findings:

Any history of reactions to previous vaccinations, drug allergies, etc.:

Treatment given and outcome:

SUMMARY SECTION FOR AEFI INVESTIGATION

This section should be completed when the investigation into a trigger event* has been completed and the results are at hand; after completing this section, it should be sent to the central level.

Reaction likely to be due to immunization? (Yes/No/Unknown): ____ If yes, specify reason

Reasons	Yes	No	Unknown
• Vaccine storage or transport			
• Incorrect technique			
• Reconstitution error			
• Vaccine manufacturer error			
• Unsterile practice			
• Vaccine-associated, but not manufacturer error			

- Other error - specify:
- Corrective action taken – specify:

Name of leader of investigation team: Date of investigation:

Notes:

* A trigger event may be defined as a single serious event (that is, hospitalization or death), or a cluster § of less serious events.
§ A cluster may be defined as AEFIs that occur with unusual frequency, by vaccine, by type of reaction, or by locality/facility.

Intramuscular administration of epinephrine is recommended because higher and more rapid concentrations are achieved than after subcutaneous administration. Dosing can be repeated twice at 10–20-minute intervals, but avoiding the limb in which the vaccination was given. A different limb is preferred for each dose, to maximize drug absorption.

The epinephrine dose should be carefully determined. Calculations based on body weight are preferred when weight is known. Excessive doses of epinephrine can add to the patient's distress by causing palpitations, tachycardia, flushing and headache. Although unpleasant, such side effects pose little danger. Cardiac dysrhythmias may occur in older adults, but are rare in otherwise healthy children.

When body weight is not known, the dose of aqueous epinephrine 1:1000 can be approximated from the subject's age (Table A11.2).

5. An additional dose of 0.005 ml/kg (maximum 0.3 ml) aqueous epinephrine 1:1 000 can be injected subcutaneously into the vaccination site to slow absorption. This should be given only once, shortly after the initial dose of epinephrine, in moderate to severe cases. Injection of epinephrine into an intramuscular vaccination site is contraindicated because it dilates vessels and speeds absorption.
6. Monitor vital signs and reassess the situation frequently, to guide medication use.
7. Arrange for rapid transport to an emergency department.

For all but the mildest cases of anaphylaxis, patients should be hospitalized overnight or monitored for at least 12 hours.

Table A11.2. Dose of epinephrine 1:1000 (aqueous) for treatment of anaphylaxis according to age

Age	Dose [a] (ml)
12 months	0.10
18 months to 4 years	0.15
5 years	0.20
6–9 years	0.30
10 – 13 years	0.40 [b]
≥14 years	0.50 [b]

Notes:

[a] The dose for children is based on 0.01 ml/kg per dose up to 0.5 ml, repeated every 10-120 minutes, as indicated, for up to 3 doses.

[b] For a mild reaction, a dose of 0.30 ml can be considered.

For each case of presumptive anaphylaxis, a single form should be completed by the medical doctor responsible for the child, and sent to the district coordinator.

Patient's full name: _____ Age: _____ Gender: _____

Date: ____/____/____ and time: _____ when MCV was administered.

Date: ____/____/____ and time: _____ of onset of first symptom.

General signs

- Pallor (Yes/No): ____ Limpness (Yes/No): ____ Apnoea (Yes/No): ____
- Sweating (Yes/No): ____ Nausea (Yes/No): ____ Dizziness (Yes/No): ____
- Ringin g in the ears (Yes/No): ____ Dimmed vision (Yes/No): ____
- Weakness (Yes/No): ____

Cardiovascular signs:

- Profound hypotension (Yes/No): ____ Tachycardia (Yes/No): ____

Upper airway obstruction:

- Angioedema – swelling of lips, face, neck, tongue; difficulty in breathing, swallowing (any of these) (Yes/No): ____

Lower airway obstruction:

- Subjective feelings of retrosternal tightness and dyspnoea (Yes/No): ____
- Bronchospasm (audible expiratory wheeze) (Yes/No): ____

Skin:

- Diffuse erythema (Yes/No): ____
- Urticaria (itchy wheals with erythematous edges and pale blanched centres) (Yes/No): ____
- Peripheral oedema (Yes/No): ____

Neurological signs:

- Transient jerking movements (Yes/No): ____ Eye rolling (Yes/No): ____

Evolution in time: (excluding malaise)

- Time to regain consciousness: ____ minutes
- Time while abnormal cardiovascular signs reverted: ____ minutes

Figure A11.3 Reporting form for suspected case of anaphylaxis

Figure A11.3 (continued)

Treatment provided

Adrenaline administered (Yes/No): ____

If yes, route used:

- Subcutaneous (Yes/No): ____ If Yes, how many times: ____
- Intramuscular (Yes/No): ____ If Yes, how many times: ____
- Intravenous (Yes/No): ____ If Yes, how many times: ____

Antihistamines administered (Yes/No): ____

Nebulized bronchodilators administered (Yes/No): ____

Hydrocortisone administered (Yes/No): ____

Patient hospitalized (Yes/No): ____

If Yes, date: ____/____/____ and hour: _____ of hospital admission

Treatment in hospital (if applicable): _____

_____

_____

Date released from hospital: ____/____/____

Diagnosis when released from hospital: _____

_____

_____

Physician responsible for patient: _____

Date completed: _____

Date sent to district EPI manager: ____/____/____

* Although real anaphylaxis is extremely rare, investigation of suspected temporally MCV-associated anaphylactic reactions is encouraged to demonstrate that all provisions were taken in a timely way to prevent any damage to a patient's precious tissues (mainly brain) during circulatory collapse.

TRAINING: NEEDS AND GUIDELINES

ANNEX 12

Training should be simple and have a similar approach at all levels. Opportunities, however, should be taken to emphasize the specifics of SIA and to correct weaknesses identified by pre-campaign assessments.

TRAINING NEEDS FOR DIFFERENT LEVELS

Provincial and district coordinators training needs:

- team organization, deployment and supervision;
- the use of spreadsheets to calculate requirements and report achievements;
- how to run SIA integrated monitoring system of vaccine coverage and cases of AEFI (operation rooms, forms, communication);
- analysis and assessment of performance indicators;
- investigation of severe cases of AEFI or clusters of AEFI;
- planning and implementing special strategies;
- planning and implementing SIA safety strategy; and
- planning and conducting coverage surveys during and /or after SIA.

Supervisors' (all levels) training needs:

- planning for SIA;
- filling in the supervisory checklists (pre- and during); and
- filling in the spot-check survey form.

Vaccinators training needs:

- Best practices at vaccination post.

SCHEDULE OF TRAINING

Eight weeks before SIA. The national coordination committee should conduct a training session for at least one member from each of the provincial coordination and social mobilization committees. The national level should distribute any material needed to conduct the district training, and the participants should also develop training materials for this purpose during the session.

Six weeks before SIA. Those trained at the provincial level should in turn train district-level representatives of district coordination and social mobilization committees.

Four weeks before SIA. Trained district-level personnel should train all vaccinators / health centre coordinators in the district.

Three weeks before SIA. Post coordinators should train the volunteers and meet with community SIA committees.

METHODS AND KEY AREAS OF FOCUS

Training for SIA should be cascaded, to ensure coherence of information released.

Note: Where appropriate, key training issues have been included in each chapter of this guide.

The following recommendations are made to present training problems observed in recently conducted SIA.

- All vaccinators, irrespective of their prior experience with routine immunizations, should participate in training provided by trained trainers.
- Training for vaccinators should be pragmatic, followed by practice sessions whenever possible.
- Besides a general orientation to SIA, the following subjects need to be covered:
  - the preparation and management of an immunization post;
  - filling in tally sheets and attendance cards;
  - operating an AD syringe and assembling a safety box;
  - use of VVM and vaccine carriers;
  - management of a person who becomes suddenly unconscious;
  - safe disposal methods; and
  - explaining the reason(s) for each SIA safety rule.

TIPS

- Get partners involved in vaccinator training in situations where there are an inadequate number of trainers in the health ministry (source of valuable trainers: United Nations agencies, International Federation of Red Cross and Red Crescent Societies, United States Agency for International Development, NGOs, etc.).
- Use training sessions as an opportunity to asses the level of readiness.
- Involve supervisors as trainers.

HANDOUTS

Each vaccination team should be provided with a *Vaccinator guide* with the following information:

- ensuring good service at the vaccination post (Annex 13);
- SIA safety guidelines (Annex10); and
- anaphylaxis and fainting management (Annex 11).

HOW TO ORGANIZE IMMUNIZATION SESSIONS

ANNEX 13

COMPOSITION AND ORGANIZATION OF A VACCINATION TEAM

Four individuals organized to perform complementary tasks can function as an effective standard vaccination team. This allows vaccinators the optimum environment to vaccinate an acceptable number of children per day without compromising the quality of service; and permits flexibility to respond to situations in the field. The roles of personnel at the immunization post are shown in Table A13.1.

Table A13.1. The roles of personnel at the immunization post

Position	Roles
Nurse or student nurse	Dilute the vaccine and record hour on label. Fill AD syringes. Ensure correct storage of reconstituted vaccine while not in use and keep enough diluent cold.
Physician or qualified nurse	Assess patients before vaccination. Vaccinate. Ensure procedure safety. Provide information and respond to any questions. Monitor for and respond to reactions.
Registrar	Tally each vaccine recipient. Stamp logo and date on immunization cards (if used).
Support staff	Assist in setting up vaccination point. Organize eligible people. Screen age and write age on attendance card's back side. Maintain order in waiting zone, ensure client flow and inform the crowd of any delay.

VACCINATION TEAM DEPLOYMENT LAYOUT

Team deployment

The deployment of the teams can vary according to the geography and population distribution of the area being targeted. Examples of vaccination team deployment strategies in urban and rural settings are shown in Figure A13.1 and Figure A13.2, respectively.

The first few days of SIA are the busiest.

Figure A13.1. Vaccination team deployment in an urban setting

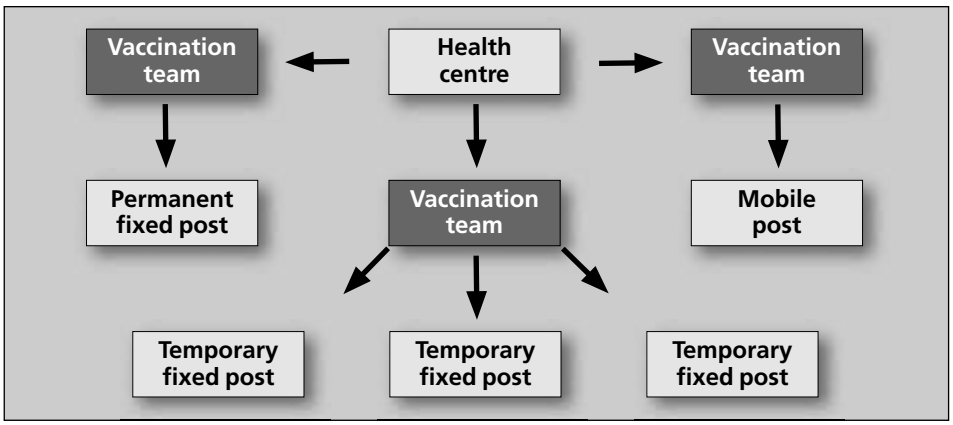
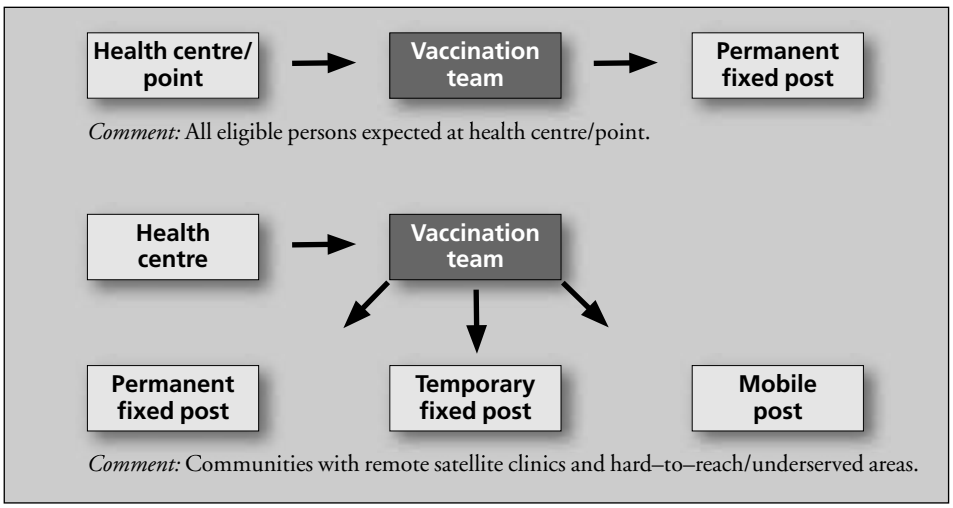


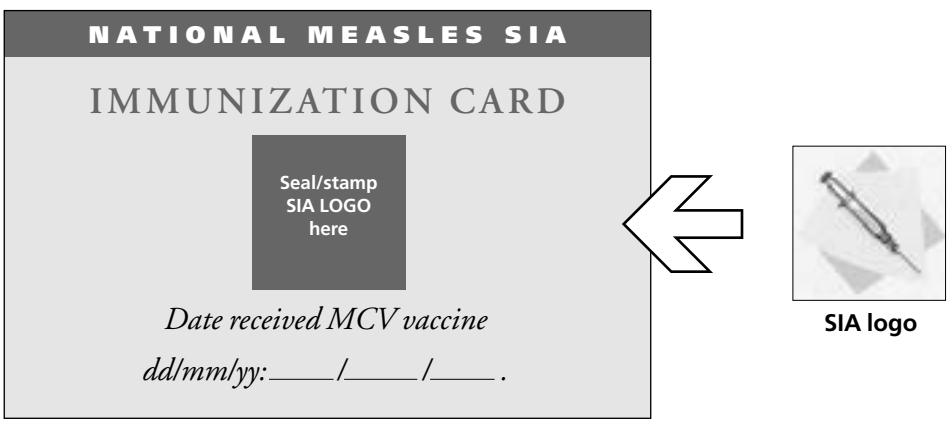
Figure A13.2. Vaccination team deployment in a rural setting



SIA IMMUNIZATION CARD

An attendance card is a document given to the vaccinee and used as written evidence of participation in SIA. They have been used to identify the vaccine recipient for monitoring and evaluation; and to serve as a referral document for people vacci-

Figure A13.3. SIA attendance card (sample)



nated at places other than their residence, if it is intended that the vaccine dose is included in the personal health file.

Some SIA have used the card only for selected, high-risk populations. When given to students during a school-based campaign, they have been discarded; alternative approaches may be needed if it is intended that parents receive a record of the vaccination.

When the cards are used, it is recommended they be completed at the vaccination post, using a seal or stamp with SIA logo and the vaccination date.

Format

The simplest model (Figure A13.3) includes two elements:

- an indelible sign as SIA logo; and
- date of vaccination.

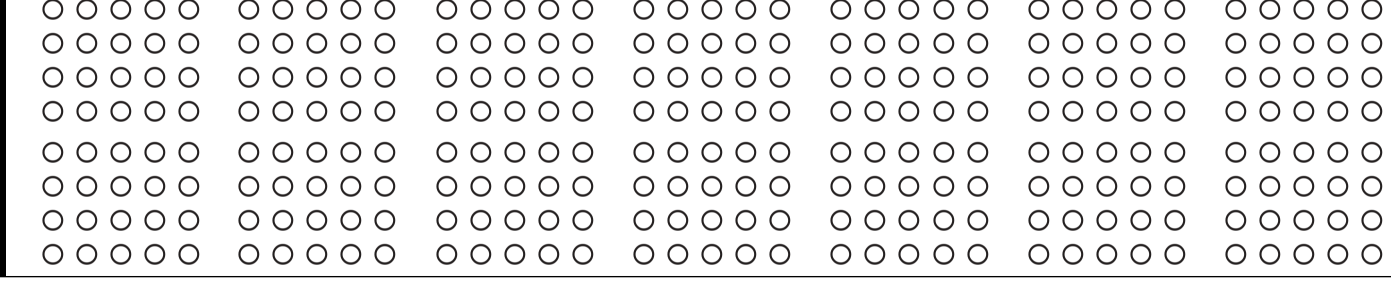
Figure A13.4. SIA tally sheet

Province: _____ District: _____ Health centre: _____

Date: ____/____/____ Post coordinator name: _____

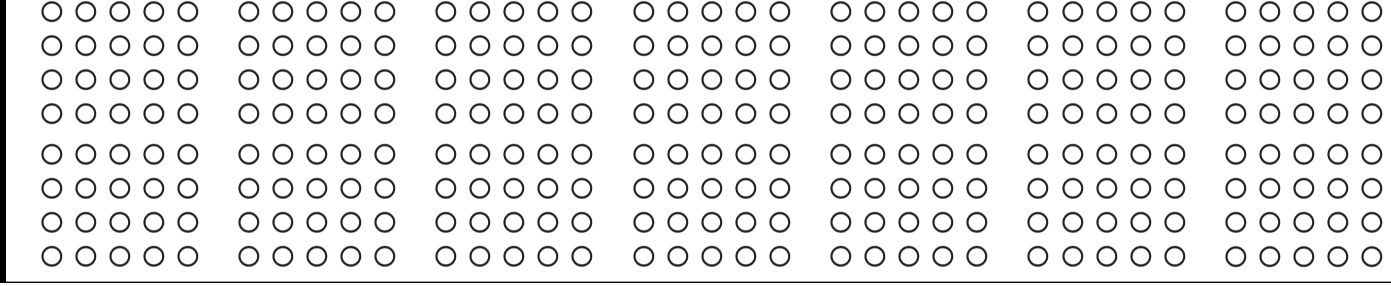
Strategy: Urban fixed post ☐ Temporary fixed post ☐ Rural post ☐ Mobile ☐.

1–5 YEARS OLD (PRE-SCHOOL)



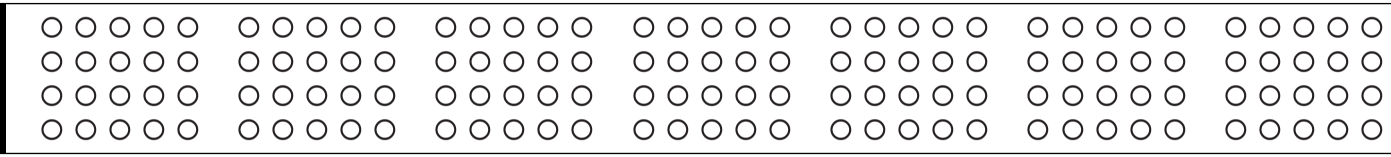
Subtotal _____

6–18 YEARS OLD (SCHOOL AGED)



Subtotal _____

19–25 YEARS OLD



Subtotal _____

TOTAL 1-25 years of age _____

	# Vials		# Syringes		
	MR vaccine	MR diluent	AD	Reconstitution	Safety boxes
Received					
Used and wasted					
Returned					

Team supervisor

_____

_____

(name & signature)

All sections to be completed

USE A SEPARATE TALLY SHEET EACH DAY

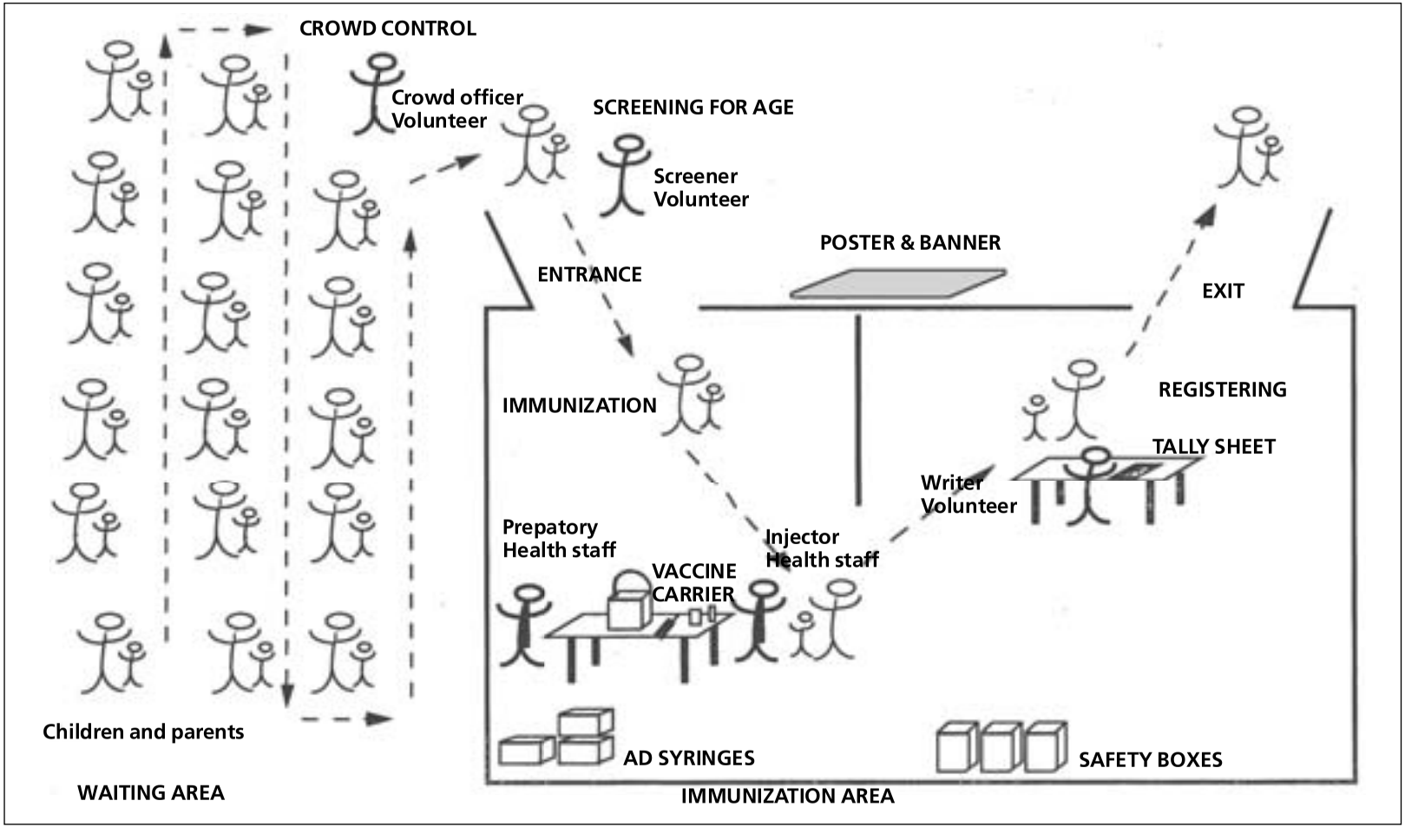


Figure A13.5. SIA site organization chart

ANNEX 14 SOCIAL MOBILIZATION: IMPORTANT ISSUES

RECOMMENDED SOCIAL MOBILIZATION ACTIVITIES

1. Develop simple key messages

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

Sample messages for social mobilization

Measles

- **Measles is a highly contagious disease that can produce permanent brain damage and death.**
- **Measles can be easily prevented in individuals vaccinated appropriately.**
- **Measles can be eliminated.**

Rubella

- **Rubella is a highly contagious disease that can have serious and sometimes fatal effects on foetuses of susceptible (non-immune) pregnant woman.**
- **To prevent foetal injury, all women of childbearing age should be protected by vaccination.**
- **Foetal injuries due to rubella can be eliminated.**

2. Proactive preparation and selective dissemination of high-quality information

Before and during SIA, one should be prepared for adverse publicity related to immunization. Appropriate media materials should be prepared in advance to facilitate a rapid response to these claims.

The public is regularly exposed to information about immunization, including second-hand information and unsubstantiated claims. In order to support a well-informed public, there is a need to prepare high-quality information about immunization and, in particular, about the vaccines to be used in SIA. This should include information about the risks and public health burden of measles and CRI. This information needs to be effectively disseminated to influential groups, such as the medical community, religious organizations and media. Recommended subjects to be reviewed include:

- real contraindications and false contraindications *(36);*
- rubella vaccine and its teratogenicity *(25);*
- MCV, autism and chronic bowel disease stories *(33-35);* and
- expected AEFI rate *(22).*

Recommended high-quality information products include:

- brochures for the medical community;
- articles for medical media;
- TV interviews with widely recognized medical personalities;
- TV/radio talk shows; and
- health ministry/SIA web page.

3. Advocacy

For building community acceptance and support, national, provincial and district social mobilization committees should contact various important people/groups/agencies, etc., inviting them to participate in specific promotional activities, such as:

- promoting SIA at key meetings – professional, political, cultural and sports;
- promoting SIA on a poster or in a TV spot (by a key public figure);
- conducting interviews with the media;
- speaking or attending the opening ceremony;
- enabling contact with "special" communities (through local leaders);
- providing transportation for promotional activities; and
- providing transportation, T-shirts, caps, meals and water for teams (by private industry).

CHECKLIST FOR A LOCAL ADVOCACY MEETING

- ✓ Plan advocacy meetings to ensure participation by the majority of key leaders, including medical leaders.
- ✓ Prepare a list of difficulties intended to be resolved with support from community leaders.
- ✓ Start meetings by explaining clearly SIA objectives and public health benefits.
- ✓ Explain difficulties expected and what kind of support is expected from leaders.
- ✓ Be prepared to respond to any question related to SIA.
- ✓ Use a competent secretarial team for taking good notes of any proposal.
- ✓ Acknowledge all offers of support, irrespective of relevance.
- ✓ Organize a post-meeting business session for receiving signed, written agreements that specify the type and duration of involvement.

4. Prepare and distribute a broadcaster's guide

Within 5 months before SIA, the national social mobilization committee should develop a broadcaster's guide for the media; it should include standard key information about SIA. Within 3 months before SIA, the broadcaster's guide should be distrib-

uted, together with other printed materials (see "Model broadcaster's guide for SIA" in this annex).

5. Preparation and distribution of written materials

Traditionally, social mobilization committees prepare posters and leaflets that address the public or individuals. The preparation of posters and street banners is also important. Moreover, a distribution plan should be developed, indicating the type and number of social mobilization items to be distributed in the districts and their dates and mode of distribution.

6. Involve mass media

A strategy should be developed by the national social mobilization committee for making announcements and releasing updated information to both the electronic and print media. SIA should be kept as a "hot" subject for the media, by providing them with updated information.

Frequently TV and radio spots are planned with media executives at maximum audience times. Involving competent agencies/partners in designing TV/radio spots is a key strategy for obtaining good, high-quality products. It is also important to develop a logo for SIA, as a means to clearly identify messages in all announcements.

7. Conduct an opening ceremony

An opening ceremony should be projected as an important event, by involving heads of state and key media contacts. During the ceremony, speeches are made and all participating groups should be acknowledged. The media should be there to photograph and broadcast the event.

8. Coordination with provinces and districts

Coordination and communications between levels of government are important, to avoid duplication and confusion. To further coordination with provinces and districts, the following actions should be taken.

- A press officer should be nominated in each district.
- Committees should agree on which materials or activities will be planned at each level.
- Local levels should actively extend the central level social mobilization interventions.

9. Seek community participation

Community participation is essential to reach SIA objectives, and the district social communications committee's role is to discover and exploit all potential resources. The following contributions are helpful in furthering community participation.

- Community and religious leaders may facilitate access in hard-to-reach communities.
- Volunteers who speak local language should be involved with ethnic communities.
- Volunteers are a key group in supporting busy teams.
- Schoolchildren and caretakers, after attending SIA, can participate by finding other eligible people in the community.

10. Conduct a closing ceremony

A closing ceremony provides an opportunity to inform everyone of the achievement, to thank all of the participants, to reiterate SIA objectives and to encourage support and commitment for routine immunization.

MODEL BROADCASTER'S GUIDE FOR SIA (ITEMS TO BE INCLUDED)

General information about the national strategic plan and the *Strategic plan for measles and congenital rubella infection in the European Region of WHO (4)* should include the following items:

1. simple explanations of measles and rubella;
2. current status of measles control in the country;
3. what is SIA;
4. objectives of SIA;
5. key messages:
   - measles is a dangerous but preventable disease that can cause brain damage and deaths;
   - Measles can be easily prevented by two doses of measles vaccine;
   - to eliminate measles from [name of country], _____ SIA will be conducted between [date] and [date]; _____ ; and
   - during this period, all persons aged [age targeted] will receive a dose of MCV either at their place of activity or at the nearest health centre;
6. Facts:
   - a vaccine dose is recommended irrespective of the person's measles history (vaccine or clinical disease);
   - there are no reasons to be excluded from receiving a dose of MCV during SIA;
   - vaccination is provided by trained, highly experienced health workers;
   - the vaccine is a licensed market product; and
   - SIA is conducted in partnership with [names of collaborators and supports].

ANNEX 15 SUGGESTED FRAMEWORK FOR SOCIAL MOBILIZATION

Levels	Targets	Objectives	Messages	Actions	Budget
Coordination.	• Health ministry. • National coordinator.	• Coordinate and oversee the work of national committees. • Seek to produce results that can be used for long-term support for routine immunization.	• This group guides messages.	• Chair coordination meetings. • Produce and disseminate minutes of meeting.	$ = Health ministry/. UNICEF recruit consultant. Select printing agency.
Political leaders/ decision-makers. Other partnerships.	• Secretary of State. • Parliament members. • Provincial and district political and administrative power representatives (governors and mayors).	• Ensure commitment of key political leaders to provide support for country's national plan of action for eliminating measles. • Commitment to mobilize government human resources, utilities and funds. • Take leadership. • Advocate.	• Need for SIA and need for high-quality immunization. • Status of measles in the country. • Global/regional measles – control/ elimination plans. • SIA should strengthen primary health system. • Economic value of measles elimination. • Political benefit of a successful SIA. • SIA results should provide evidence for broader support of routine immunization.	• Secretary of State to develop briefing package, including summary of SIA plan and key messages. • Information on SIA, posted on health ministry web site. • Meetings with members of parliament and government. • Meet the parliament health commission. • Circular from the interior ministry to governors and mayors. • National meeting of governors. • Governors hold provincial meetings.	$ = Development of briefing packages. Printing needed. Number of briefing packs (CD-ROMs!). Governors meetings.
Other partnerships.	• Other health ministry departments: mother-and-child health, curative care; information, education and communication; laboratory; etc. • Education ministry. • Interior ministry.	Advocate for SIA. • Mobilize staff to participate and support it. • Mobilize public participation. • Increase public awareness – induce public demand for immunization, including measles.	• Core of above messages where relevant and additional tailored messages – for example, for journalists and teachers. • Identify roles of each partner in SIA.	• Meetings with relevant groups. • Identify focal points for each partner. • Provide guidance for partners: for example, their role in contributing to SIA; how hey can build on core briefing materials; how they can engage social mobilization and technical committees.	$ = SIA guidelines. Cost of provincial advocacy meetings. Cost of workshop for training journalists.

	• Defence ministry. • Environment ministry. • Public sectors: TV/ radio, transport, communications. • United Nations agencies. Other relevant international agencies: Red /Green Cross. • Professional associations: medical, nurses, journalists, sports, etc. • ongovernmental organizations. • Interagency coordinating committees.	• Mobilize other resources – for example, transport, training facilities, materials and incentives.	• SIA is an opportunity to improve both existing health infrastructure and the quality of primary health care services.	• Provincial advocacy meetings with clinicians, journalists and vaccinators. • Workshops with key executive journalists debating the role of media as critical partner in accurately reflecting the national POA and SIA (provide basic facts and briefing materials; assist journalists to prepare feature stories, provide measles/ immunization related photographs, facilitate contacts of journalists with health workers, families, community volunteers and others who can provide public interest stories. • Broadcaster's guide to be developed and included in briefing package (CD-ROM). • Q&A brochure for clinicians to be developed and included at briefing.	
General public.	General public.	• Raising awareness of SIA, disease risk and vaccine benefits. • Understanding of why to vaccinate and importance of immunization. • Mobilize participation and demand.	• Need for vaccination. • Understand the national plan. • Understand purpose of SIA. • Where to seek service. • When to seek service. • Risks of disease and benefits of immunization. • Who is involved. • Vaccine safety. • Responsibility as parents or caretakers.	• At all levels, identify good communicators among committee members and encourage them to take part in TV and radio broadcasts or give interviews to newspapers. • TV and radio spots, newspaper advertisements. • Flyers for students and general public. • Develop and print posters.	$ = [ ] Cost of broadcaster's guide. Cost of Q&A brochure.

Levels	Targets	Objectives	Messages	Actions	Budget
Community leaders.	• Community leaders: religious, teachers, block leaders.	• Engage support. • Build community awareness. • Improve interaction with health authorities.	• Vaccinations are beneficial for the community. • Healthy children do better in school. • Vaccinated children are healthier and will become more productive for the community. • Promote roles for volunteers and community members. • Opportunity for partners to build relationships with the community.	• Meeting of the community committees. • Flagging immunization posts in each community. • Distribute flyers and display posters. • Use informal channels to convey basic information on SIA. • After SIA, continue meetings to asses needs for further interactions with health sector.	$ = [ ] TV/radio spots and newspaper advertisements. Cost of developing and printing flyers. Cost of developing and printing posters.
Family/ individuals.	• Vaccinators, health centres and private medical doctors, families, children, hard-to-reach kids.	• Ensure trust between vaccinator and families. • Provide quality information in a friendly manner in the appropriate language. • Build demand for vaccination.	• Vaccines are good and safe. • Possible side effects after administering vaccine and how to manage it. • Promote benefit of vaccination over its risk. • Check overall immunization status of your child. • Promote other health care interventions.	• Use available information materials (see above). • Produce SIA attendance cards with key messages. • Print letters to leave at house-to-house visits (if nobody home).	$ = [ ] Cost of attendance cards. Cost of letters.

TOOLS FOR MONITORING AND SUPERVISION

ANNEX 16

FRAMEWORK FOR INTEGRATED MONITORING OF VACCINE COVERAGE AND AEFI

Recommended timeframe for scheduled reports are:

- ***morning*** – health centres report previous days results by phone to district;
- ***noon*** – districts report by fax to province;
- ***afternoon*** – provinces report by fax to national level; and
- ***evening*** – national level reports are completed and reported to national authority.

A sequence of events to be carried out daily is shown in Table A16.1.

COMPUTING PERFORMANCE INDICATORS FOR MONITORING

Each day (exclude day 1 of campaign), the provincial/national level expects to receive a report from each subordinate level (completeness) sent on time (timeliness).

Note: In evaluation, 80% should be considered good performance for both indicators.

Equations for monitoring performance indicators

SUPERVISORY TOOLS

Purpose. To be used before SIA, but not earlier than 3 weeks before

Instruction. Completed checklist should be submitted to the national coordinator.

COMPLETENESS OF REPORTING =
(No. of reports received/No. of reports expected) × 100

TIMELINESS OF REPORTING =
(No. of reports received on time/No. of reports expected on time) × 100

Example:

Province "North" has 12 districts and therefore expects 12 reports by noon. By noon, however, only 9 reports are received; later in the evening another 2 reports arrive. Thus, performance indicators should be calculated as follows:

TIMELINESS: Nine reports received on time to prepare daily province report – that is, (9/12) × 100 = 75%

COMPLETENESS: Eleven reports received all day = (11/12) × 100 = 92%

Figure A16.1. Daily vaccine coverage and AEFI reporting form

DISTRICT/PROVINCE AEFI CASES & VACCINE COVERAGE DAILY REPORTING FORM

Reporting level: _____ Receiving level: _____ Fax No: _____

1. NUMBER OF NEW AEFI CASES* BY CATEGORY

Injection-site abscess	
Anaphylactoid reaction **or** anaphylactic shock **and** allergy	
Fever (high or hyperpyrexia)	
Hypotensive episode of fainting (syncope)	
Toxic shock syndrome	
Death in a recipient of vaccine where no other clear cause of death can be established	
Severe or unusual events	
Note: *Only cases meeting the definition	

2. DAILY VACCINE COVERAGE

Number of eligible persons reported as vaccinated on the previous day	

3. PROFESSIONAL NEEDLE-STICKS

Number of needle-sticks reported on the previous day	
Comments (if any):	

Fill in the above form with the number of new probable cases of AEFI, compiled vaccine coverage data and reported number of needle-sticks.
Send daily a filled form by fax to province/national coordinator, including when no cases of AEFI were reported (zero reporting)

Date sent: ____ / ____ / ____

District/province Coordinator: _____ Signature: _____

Table A16.1.
Synopsis of sequence of events

Reporting and feedback	Designation	Actions
	Vaccination team leader.	• Each SIA day should have a new set of tally sheets. • At the end of the daily session, completed sheets are given to the health centre coordinator, after verifying the accuracy of registration.
	Health centre coordinator.	• Each morning, teams are provided with 1–3 blank tally sheets (and ballpoint pens and clipboards, as needed). • At the end of the day, all completed tally sheets are collected and summarized, to obtain the health centre's daily number of eligible people vaccinated, by age group. • Report daily number of eligible persons vaccinated by phone to district on morning of next day. • Calculate daily health centre and cumulative vaccine coverage using health centre size of age group targeted.
	District coordinator focal point (operations room).	• Each day, receive from district health centres the number of eligible persons vaccinated. • Summarize all health centre reports, using the spreadsheet. • Each day, receive verbal reports of suspected cases of AEFI. • Complete "District AEFI cases & vaccine coverage daily reporting form" (Figure A16.1.) and send it by fax by noon to the province coordinator. • Calculate the daily and cumulative coverage for the district.
	Province coordinator operations room.	• Each SIA day, receive from subordinate districts their "District AEFI cases & vaccine coverage daily reporting form". • Summarize the districts' totals of number of eligible persons vaccinated and of new cases of AEFI, using spreadsheets. • Complete "Province AEFI cases & vaccine coverage daily reporting form" (Figure A16.1.) and send it by fax to the national coordinator by 18:00 hours the same day. • Calculate performance indicators: completeness and timelines. • Calculate the incidence of AEFI, using 100 000 doses administered as denominator. • React appropriately to districts with comparatively low vaccine coverage.
	National coordinator operations room.	• Each SIA day, receive from all provinces their "Province AEFI cases & vaccine coverage daily reporting form". • Summarize provincial totals of number of eligible persons vaccinated and of new cases of AEFI. • Using spreadsheets, calculate national daily and cumulative vaccine coverage, and cumulative incidence of AEFI per 100 000 doses administered. • Prepare daily report with coverage and incidence of AEFI to inform the Secretary of State and heath ministry press/public relations officer.

Table A16.2. Checklist for verification of preparation

Observe (O)/enquire (E)	The correct way	YES	NO
I. Planning and coordination			
Has microplan been developed at this level?	Tick "Yes" if you observe a copy of the microplan and the plan clearly addresses the populations targeted, vaccine requirements, personnel, transport, cold chain, injection safety and waste management.	◯	◯
Is this level up to date in the implementation of planned activities at this level?	Review the microplan with the coordinator at this level to see if planned activities have been or are being implemented as planned.	◯	◯
	Tick "Yes" if you are convinced that activities are being implemented as scheduled.	◯	◯
Have adequate arrangements been made for covering hard-to-reach areas and populations or groups?	Each level is expected to identify hard-to-reach areas and populations and plan specially for them. Tick "Yes" if you are satisfied that this level has identified hard-to-reach areas and populations and that plans are in place to ensure that they are adequately covered during SIA.	◯	◯
Is there an effective partner or inter-sectional coordination mechanism at this level?	Each level is expected to hold regular meetings of partners or sectors, to coordinate planning and implementation of SIA. Tick "Yes" if you observe a copy of the minutes of such a meeting held not later than 1 month ago.	◯	◯
Have all funds required been made available to this level?	Tick "yes" if after a review of the microplan budget, the coordinator at this level confirms that all funds required have been received.	◯	◯
Has a focal point been set up for SIA at this level?	Each level is expected to set up SIA focal point (operation room) with staff to coordinate preparations and implementation of SIA. Staff of the coordinating unit should not travel to the field. They are expected to remain in the unit and provide back up to field staff and to solve problems that may arise in the course of implementation. Tick "Yes" if you are convinced that the coordinating unit has been set up.	◯	◯
II. Social mobilization			
Is there a social mobilization committee at this level?	Tick "Yes" if you observe a copy of the minutes of the committee in preparation for SIA.	◯	◯
Has high-level advocacy for SIA been held at this level?	Tick "Yes" if you observe a record of any advocacy meeting with stakeholders.	◯	◯
Have SIA posters/banners been distributed to lower levels?	Tick "Yes" if you observe records of distribution of posters to the lower level.	◯	◯
Do members of the general public know SIA dates and targets?	Ask five people at random. If all five of them answer correctly by stating the dates and target population, tick "YES". If at least one of them answers wrongly, tick "No".	◯	◯

Table A16.2.
(continued)

Observe (O)/enquire (E)	The correct way		
III. Logistics		**YES**	**NO**
Have measles-containing vaccines (MCVs) and an equivalent number of diluent doses been distributed to the lower level?	Tick "Yes" if you observe records of distribution of measles vaccines and diluents to the lower levels and are satisfied that lower levels were supplied with an equal number of vials of measles vaccines and diluents.	◯	◯
Have the personnel at this level been trained?	Tick "Yes" if you observe records confirming training of all the personnel for SIA.	◯	◯
Has this level made adequate arrangements to meet the transport requirements of SIA?	Tick "Yes" if you are satisfied with the arrangements made.	◯	◯
Ice packs adequate? Cold boxes adequate? AD syringes adequate? Reconstitution syringes adequate? Safety boxes adequate? Tally sheets adequate? Attendance cards adequate? Summary sheets adequate?	Tick "Yes" in the left column for each item questioned if the number available is equal to or more than the number required.	◯	◯
Has there been adequate arrangement for the re-freezing of ice packs?	Tick "Yes" if you are satisfied with the arrangement.	◯	◯
Has this level made adequate arrangements for the disposal of used needles/syringes and other wastes?	Each level is expected to have a waste management plan. Request this plan and confirm that the site for disposal has been prepared and waste management staff assigned and trained. Tick "yes" if you are satisfied with the arrangement.	◯	◯

Remarks: _____

_____

_____

_____

_____

Signature: _____

Table A16.3. Checklist for implementation

Purpose.
To be used during SIA.
Instruction.
Completed checklist should be submitted to national coordinator.

Observe (O)/enquire (E)	The correct way	YES	NO
I. Post management			
O Is there a complete vaccination team?	The team is composed of two health workers and at least two other support staff, who may be volunteers.	◯	◯
O Is there a quality work team?	Team members know their roles in ensuring all clients are correctly registered, fully informed and vaccinated safely.	◯	◯
O Is there a systematic work team?	Each group of 10 clients is screened for age, and channeled to a vaccine desk, registration desk and watching zone.	◯	◯
O Is each vaccine recipient correctly registered?	Vaccine recipients are correctly tallied for their age.	◯	◯
O Is each vaccine recipient provided with a SIA attendance card?	Each vaccine recipient should be provided with an attendance card with the date of vaccination filled in.	◯	◯
II. Social mobilization			
O Is the post easy to find?	The post must be at least flagged with a SIA banner, to be easy to find.	◯	◯
O Is post flow sufficient?	It is expected that enough flow exists to ensure 150 vaccinations per day in rural areas and 200 vaccinations per day in urban areas.	◯	◯
O Is community aware of SIA?	3. Tick "Yes" if, based on the 20-person survey (Table A17.4), all respondents among the eligible people in the target age group in their households are aware of SIA.	◯	◯

Table A16.3.
(continued)

Observe (O)/enquire (E)	The correct way	
III. SIA safety		YES NO
O What types of syringes and needles are used for MCV administration?	AD syringes adequate for giving 0.5-ml reconstituted vaccine are used.	◯ ◯
O Preparation of AD syringes for administration	AD syringes are filled immediately before vaccination –that is, not pre-filled before the vaccination session.	◯ ◯
O Administration technique: observe at least one injection given by vaccination team.	Measles-containing vaccine is administered by a subcutaneous route	◯ ◯
	The administration site is the deltoid region.	◯ ◯
	One AD syringe is used for each dose administered.	◯ ◯
	The sterile parts of the syringes remain untouched by fingers or non-sterile objects.	◯ ◯
O Distribution of supplies and availability of syringes for each vaccination team, according to the population targeted	The team is provided with an adequate amount of AD syringes (Number of AD syringes available = Target population × 1.177)	◯ ◯
	Team provided with adequate number of reconstitution sets – that is, 5-ml syringe with a 19G needle. (The number of reconstitution sets available = the number of MCV vials.)	◯ ◯
O Reconstitution of vaccine and the temperature of the diluent at the time of reconstitution	The diluent provided by the vaccine manufacturer is used.	◯ ◯
	The diluent is kept cool before reconstitution.	◯ ◯
O Handling of the reconstituted vaccine vials at the end of the working session	Reconstituted doses are discarded at the end of the session.	◯ ◯
O Procedures followed with used syringes and needles after use are:	Used AD syringes and plastic 5-ml syringes are dropped in the safety box without recapping.	◯ ◯
	The vaccination team is provided with an adequate amount of safety boxes – that is, 1 box for each set of 80 syringes.	◯ ◯
	The safety boxes are not overfilled or wet.	◯ ◯
E Existence of guidelines to transport, store and dispose of safety boxes	Health care workers know the guidelines for transporting and storing used syringes and needles.	◯ ◯
O Provision for destruction of syringes	Filled safety boxes are stored in a safe place and protected from the public.	◯ ◯
	There is a designated site for destruction.	◯ ◯
O Capacity to treat anaphylaxis	The team is provided with adrenaline.	◯ ◯
E Reporting of adverse reaction	Health care workers know the adverse reactions that need to be reported.	◯ ◯

ANNEX 17 IMMEDIATE POST-SIA ASSESSMENT

Figure A17.1. Health Facility, coverage daily summary sheet

Please check that all sections of the form are completed before submission

Province: _____

District: _____

Health centre: _____

		Eligible persons vaccinated and coverage					
		1–5 years old		6–18 years old		19–25 years old	
		No. A	% B	No. C	% D	No. E	% F
Day 1	Daily						
	Cumulative						
Day 2	Daily						
	Cumulative						
Day 3	Daily						
	Cumulative						
Day 4	Daily						
	Cumulative						
Day 5	Daily						
	Cumulative						
Day 6	Daily						
	Cumulative						
Day 7	Daily						
	Cumulative						
Day 8	Daily						
	Cumulative						
Day 9	Daily						
	Cumulative						
Day 10	Daily						
	Cumulative						
Total							

How to calculate vaccine coverage (example: 1–5 year olds):
A: Total no. of 1–5 year olds vaccinated;
B: (A/Target group of 1–5 year olds) × 100

How to calculate wastage rate for MR vaccine:
I: Total no. of MR vials discarded × 10;
J: (I – G) / I × 100

☐ **Measles vaccine**

☐ **MR vaccine**

☐ **Rubella vaccine**

Total # of vials received: _____ Total # of vials left: _____

AD syringes: Total # received: _____ Total # left: _____

Target population: 1–5 years: _____ 6–18 years: _____

19–25 years.: _____ Total of 1–25 years: _____

		MCV		AD syringes	
Total target (1–25 year olds)		Used and wasted	Wastage	Used and wasted	Wastage
No. G	% H	No. of doses I	% J	No. K	% L

How to calculate wastage rate for AD syringes:
K: Total no. of AD syringes discarded;
L: (K – G)/K × 100

Health centre SIA coordinator (name & signature)

Figure A17.2. District, coverage summary sheet

Please check that all sections of the form are completed before submission

Province: _____

District: _____

Health centres	Population targeted				Eligible			
	1–5 years old	6–18 years old	18–25 years old	Total no. of 1–25 year olds	1–5 years old	%	6–18 years old	
	A	B	C	D	E	F	G	

How to calculate coverage:
E: Total of 1–5 year olds vaccinated
F: (E/A) × 100
G: Total of 6–18 year olds vaccinated
H: (G/B) × 100
I: Total of 19–25 year olds vaccinated
J: (I/C) × 100
K: Total of 1–25 year olds vaccinated
L: (K/D) × 100

How to calculate the wastage rate for MR vaccine:
M: [(Total doses used & wasted – Total eligible persons vaccinated) /Total doses used & wasted] × 100

How to calculate wastage rate for AD syringes
N: [(Total AD syringes U&W *– Total eligible vaccinated)/ Total AD syringes U&W) × 100

Note: *U&W = used & wasted.

☐ **Measles vaccine**

☐ **MR vaccine**

☐ **Rubella vaccine**

Total # of vials received: _____ Total # of vials left: _____

AD syringes: Total # received: _____ Total # left: _____

Target population: 1–5 years: _____6–18 years: _____

19–25 years.:_____ Total of 1–25 years:_____

people vaccinated and coverage						Wastage (%)	
	%	18–25 years old	%	Total no. of 1–25 year olds	%	MCV	AD syringes
	H	I	J	K	L	M	N

District SIA coordinator (name & signature)

Figure A17.3. Province, coverage summary sheet

Please check that all sections of the form are completed before submission

Province: _____

Districts	Population targeted				Eligible			
	1–5 years old	6–18 years old	18–25 years old	Total no. of 1–25 year olds	1–5 years old	%	6–18 years old	
	A	B	C	D	E	F	G	

How to calculate coverage:
E: Total of 1–5 year olds vaccinated
F: (E/A) × 100
G:Total of 6–18 year olds vaccinated
H: (G/B) × 100
I: Total of 19–25 year olds vaccinated
J: I/C) × 100
K:Total of 1–25 year olds vaccinated
L: (K/D) × 100

How to calculate the wastage rate for MR vaccine:
M: [(Total doses used & wasted – Total eligible persons vaccinated) /Total doses used & wasted] × 100
How to calculate wastage rate for AD syringes
N: [(Total AD syringes U&W *– Total eligible persons vaccinated)/ Total AD syringes U&W) × 100
Note: *U&W = used & wasted.

☐ **Measles vaccine**

☐ **MR vaccine**

☐ **Rubella vaccine**

Total # of vials received: _____ Total # of vials left: _____

AD syringes: Total # received: _____ Total # left: _____

Target population: 1–5 years: _____6–18 years: _____

19–25 years.:_____ Total of 1–25 years:_____

people vaccinated and coverage						Wastage (%)	
	%	18–25 years old	%	Total no. of 1–25 year olds	%	MCV	AD syringes
	H	I	J	K	L	M	N

Provincial SIA coordinator (name & signature)

TWENTY-PERSON COVERAGE SURVEY

This survey should be administered to 20 adults in households in the catchment area of the health centre or post *(40)*. Four blocks are identified, ideally far away from the health centre and in areas that are difficult to access or have underserved populations. Starting on a corner and moving door to door, one ascertains whether there is anyone of the target age in the household and if so, their vaccination status, completing the questions in Table A17.4. After five qualifying households have been identified, one moves to the next selected block.

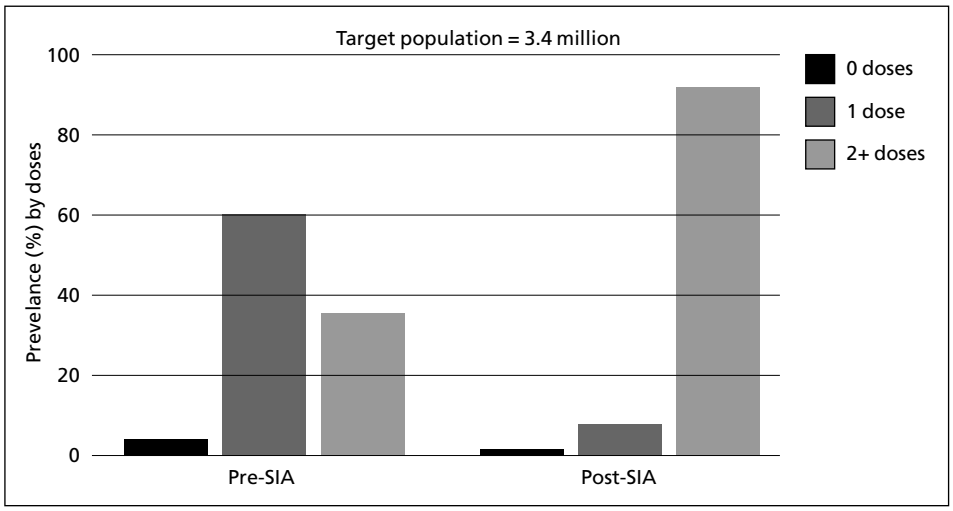
Monitoring ends when a total of 20 households with eligible persons have been visited. The finding of a total of two households with at least one nonimmunizaed person each is reason to consider that vaccination efforts in the neighborhood were ineffective.

Table A17.4. Twenty-person coverage survey data collection form

Subject number	Person's initials	Age	Sex	Hard-to-reach area?	Knowledge of SIA (Yes/No)	If "Yes", how did they find out	Number of children in target age group in household	Number of children immunized during SIA
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

ANNEX 18 EVALUATION METHODS

Figure A18.1. Improvement in immunization coverage after a well conducted SIA.



COMPUTING IMMUNIZATION COVERAGE USING ADMINISTRATIVE METHOD

Vaccine coverage can be calculated at the district, provincial and national levels, based on tally sheet counts *(41)*.

$$\text{ADMINISTRATIVE COVERAGE} = \frac{\text{Number of persons from target group tallied}}{\text{Official population in target group}}$$

Comment: Attention should be given to finding an explanation for coverage greater than 100% at subnational geopolitical units. Adjustments should be made between districts with eligible persons vaccinated in places other than their place of residence.

CLUSTER COVERAGE SURVEY METHOD TO CHECK REPORTED SIA VACCINE COVERAGE

Comment: WHO Expanded Programme on Immunization method can be used to estimate SIA vaccination coverage *(42)*.

Method in brief:

- Thirty clusters of seven children each are to be identified per district by using a two-stage sampling scheme.
- The survey agent proceeds in a systematic way from a starting point to find seven children in the selected age group.

- When a child in the age group is found, the principal caregiver is requested to show SIA attendance card and the child is then recorded as vaccinated/ unvaccinated in a standard questionnaire.
- Point estimates of coverage in the sample are then used to obtain confidence intervals with the CSAMPLE module of Epi Info 6.04d software *(43)*.

LOT QUALITY ASSESSMENT SURVEYS (LQAS)

LQAS is a method that uses stratified random sampling for data collection and one-sided hypothesis testing for data analysis. By using sample sizes of 19 per "lot", one can determine at least 92% of the time whether the coverage target has been achieved; however, this sample size does not permit one to calculate an exact coverage or small differences between "lots" *(44, 45)*.

Example: District "W" with a target group of 59 950 eligible persons in 5 health centres reported 85% vaccine coverage at the end of SIA. To assess coverage among different health centres, the district coordinator decided to conduct a survey, using the lot quality technique.

The total sample size used was 19 eligible persons from each of 5 health centres = 95 persons.

Survey teams were trained to randomly select each starting point/eligible person in the field.

After completing the interviews, the number of persons immunized is given in Table A18.1.

Table A18.1. Calculating weighted vaccine coverage based on LQAS for District W

Lot number	District name	Lot target group	Weight	Lot sample size	Number immunized	Proportion immunized	Estimated coverage (weighted)
1	Evot	14 915	0.25	19	15	0.79	0.20
2	Thomas	10 890	0.18	19	10	0.53	0.10
3	Carlisle	6 822	0.12	19	19	1	0.12
4	Izigba	13 422	0.22	19	16	0.84	0.18
5	Rakahi	13 901	0.23	19	17	0.89	0.20
Total		**59 950**	**1.00**				**0.80**

Use of an unweighted average coverage and assessment of "lot" differences is given in Table A18.2

Table A18.2. Average vaccine coverage and identification of below average lot performance

Lot number	Lot sample size	Number immunized	Coverage estimate	Decision Rule*	Equal to or above average performance
1	19	15	(Total number immunized/ Lot sample size) = **81%**	(value taken from a table, 85% coverage with "lot" sample size of 19) = **14**	Yes
2	19	10			No
3	19	19			Yes
4	19	16			Yes
5	19	17			Yes
Total	**95**	**77**			

* Decision rule identifies which "lots" were average or below average

Weighted coverage and confidence intervals can also be calculated using CSAMPLE module in Epi Info 6.04d software *(43)*.

WASTAGE EVALUATION

After SIA, district coordinators should:

- Organize the return to district storage of all unused (unopened) vaccine vials and supplies.
- Report the number of unused doses to the province.
- Calculate wastage rates from the following equations.

$$\text{WASTAGE}_{\text{MCV}} = \frac{100 \times (\text{Total doses used \& wasted} - \text{Total number of persons vaccinated})}{\text{Total doses used \& wasted}}$$

$$\text{WASTAGE}_{\text{AD SYRINGES}} = \frac{100 \times (\text{Total AD syringes used \& wasted} - \text{Total number of persons vaccinated})}{\text{Total AD syringes used \& wasted}}$$

ANNEX 19 GLOSSARY

Acute flaccid paralysis (AFP) "Floppy" or flaccid paralysis (in contrast to spastic paralysis) that occurs acutely over a few days to a few weeks. AFP is a syndrome with several possible causes; wild poliovirus is one cause.

Congenital rubella infection (CRI) Foetal infection with the rubella virus that can lead to miscarriage, foetal death or the birth of a normal infant or one with some or all of the manifestations of CRS.

Congenital rubella syndrome (CRS) One of the possible outcomes of rubella infection *in utero*, particularly during the first trimester. The birth defects associated with CRS include heart disease, blindness, hearing impairment, and development delay or mental retardation.

Effective reproductive number (R) The number of secondary cases of a disease in a population resulting from exposure to a primary case. R is dependent upon the level of population immunity acquired through natural infection and/or vaccination. An R less than one indicates an overall level of population immunity unable to sustain an epidemic; however, pockets of susceptible persons may exist, permitting outbreaks to occur.

Expanded programme on immunization (EPI) A WHO programme whose mission is to deliver vaccines against measles, polio, diphtheria, pertussis, tetanus, tuberculosis, hepatitis B and yellow fever (in countries where this disease poses a risk) to children in targeted countries.

Generations of spread The number of exposure - incubation period - infection cycles that occur following a primary case. New measles cases occurring 7-18 days following exposure to a case are part of a subsequent generation.

Health care facility A hospital, private clinic, pharmacy or public health clinic where health surveillance activities (e.g., detection, investigation, analysis and reporting) can take place.

Imported case Disease in a person whose likely exposure was in another geographical area known to have the disease, and whose disease incubation period is consistent with this exposure. The genotype of the imported case's virus should be consistent with the suggested epidemiological link.

Measles containing vaccine (MCV) A vaccine containing measles vaccine alone or in combination with rubella (MR vaccine) or rubella and mumps (MMR vaccine).

Measles control The routine, regular and ongoing use of measles vaccine to reduce measles morbidity, carried out in accordance with targets.

Measles elimination A dynamic situation in a large and well-populated geographical area in which endemic measles transmission cannot occur and sustained transmission does not occur, following the occurrence of an imported case. All isolated cases and chains of transmission must be linked to an importation.

Supplementary immunization activity (SIA) campaigns that target all persons in a defined age or risk group, with the objective of reaching a high proportion of all susceptible individuals. Each SIA is usually conducted over a wide geographical area (such as a province or country) to rapidly reduce the number of persons at risk for infection. Screening for vaccination status and/or history of prior disease is not necessary.

SIA delivery strategy A policy decision on who is eligible for the intervention and how they should be provided access to it.

Vaccine vial monitor (VVM) A label containing a heat-sensitive material placed on a vaccine vial to register cumulative heat exposure over time. At the starting point, the VVM appears as a dark colour circle with a small light colour square inside. Vaccine may be used only when the colour of the square remains lighter than that of the surrounding circle. A VVM for freeze-dried vaccines is often placed on the top of the cap, so it is discarded by the time of reconstitution. Since these vaccines must be discarded within 6 hours or at the end of the session, whichever comes first, a VVM can only be used until the time of reconstitution.

REFERENCES

1. Murray CJL et al. *The global burden of disease 2000 project: aims, methods, and data sources.* Geneva, World Health Organization, 2001. (Global Programme on Evidence for Health Policy Discussion Paper No.36).
2. Spika JS et al. Measles and rubella in the World Health Organization European Region: diversity creates challenges. *Journal of Infectious Diseases*, 2003, 187 (suppl. 1): S191–S197.
3. *Surveillance guidelines for measles and congenital rubella infection in the WHO European Region.* Copenhagen, WHO Regional Office for Europe, 2003.
4. *Strategic plan for measles and congenital rubella infection in the WHO European Region.* Copenhagen, WHO Regional Office for Europe, 2003.
5. Puvimaqnsinghe JPA et al. Measles outbreak in Sri Lanka, 1999–2000. *Journal of Infectious Diseases*, 2003, 187 (suppl. 1): S241–S245.
6. McFarland JW, Mansoor OD, Yang B. Progress in accelerated measles control in the Western Pacific Region. *Journal of Infectious Diseases*, 2003, 187 (suppl. 1): S246–S251.
7. *WHO-UNICEF policy statement for mass immunization campaigns.* Geneva, World Health Organization, 2000 (document WHO/EPI/LHIS/97.04 rev.1).
8. *Global measles mortality reduction and regional elimination: a status report. Journal of Infectious Diseases*, 2003, 187 (suppl. 1).
9. *Safety of injections. WHO-UNICEF-UNFPA joint statement on the use of auto-disable syringes in immunization service*. Geneva, 1999 (unpublished document WHO/V&B/99.25; available from Vaccines and Biologicals, World Health Organization, 1211 Geneva 27, Switzerland and on the Internet at www.who.int/vaccines-documents/DocsPDF999/www9948.pdf).
10. *"First, do no harm". Introducing auto-disable syringes and ensuring injection safety in immunization systems of developing countries*. Geneva, World Health Organization, 2002 (WHO/V&B/02.26)
11. *Ensuring the quality of vaccines at country level. Guidelines for health staff.* Geneva, World Health Organization 2002 (WHO/V&B/02.16).
12. *Safety of mass immunization campaigns*. Geneva, World Health Organization, 2002 (WHO/V&B/02.10).
13. *Surveillance of adverse events following immunization: field guide for managers of immunization programmes.* Geneva, WHO 1993 (WHO/EPI/TRAM/93.02 REV.1)]

14. Bino S et al. Measles-rubella mass immunization campaign in Albania, November 2000. *Journal of Infectious Diseases*, 2003, 187 (suppl. 1): S223–S229.

15. Ion-Nedelcu N et al. *Measles elimination: a mass immunization campaign in Romania*. *American Journal of Public Health*, 2001, 91:1042–1045.

16. D'Souza RM et al. Adverse events following immunization associated with the 1988 Australian measles control campaign. *Communicable Disease Intelligence*, 2000, 24(2): 27–33.

17. Sciberras J. Adverse vaccine events reported during the Ontario measles immunization campaign. *Public Health and Epidemiological Research Ontario*, 1996, 7:7–12.

18. Hersh BS et al. Review of regional measles surveillance data in the Americas, 1996–99. *Lancet*, 2000, 355:1943–1948.

19. Biellik R et al. First 5 years of measles elimination in southern Africa: 1996-2000. *Lancet*, 2002, 359:1564–1568.

20. Ramsey ME et al. The elimination of indigenous measles transmission in England and Wales. *Journal of Infectious Diseases*, 2003, 187 (suppl. 1): S198–S207.

21. *Aide-memoire to ensure the efficiency and safety of mass immunization campaigns with injectable vaccines.* World Health Organization, Geneva, 2003, http://www.who.int/immunization_safety/publications/en/Aide-Memoire_safety_checklist_campaigns.pdf (accessed 25 February 2004).

22. *Adverse events following measles, mumps and rubella vaccines* in *Supplementary information on vaccine safety. Part 2: background rates of adverse events following immunization.* Geneva, World Health Organization, 2000 pp 55-68 (WHO/V&B/00.36).

23. Peltola H, Heinonen OP. Frequency of true adverse reactions to measles-mumps-rubella vaccine. A double-blind placebo-controlled trial in twins. *Lancet*, 1986, 1:939–942.

24. Markowitz LE, Katz SL. Measles vaccine. In: Plotkin SA, Mortimer EA Jr, Eds. *Vaccines*, 2nd ed. Philadelphia, WB Saunders, 1994:252–253.

25. WHO. Rubella vaccines. WHO position paper. *Weekly Epidemiological Record*, 2000, 75: 161–169.

26. Balfour HH, Groth KE, Edelman CK. *RA 27/3 rubella vaccine*. *American Journal of Diseases in Children*, 1990, 134:350-353.

27. Horstman DM et al. Persistence of vaccine-induced immune responses to rubella: comparison with natural infection. *Reviews of Infectious Diseases*, 1985, 7 (suppl. 1):S80–S85.

28. Rowlands DF, Freestone DS. Vaccination against rubella of susceptible schoolgirls in Reading. *Journal of Hygiene*, 1971; 69:579–586.

29. Polk BF, Modlin JF, White JA, DeGirolami PC. A controlled comparison of joint reactions among women receiving one or two rubella vaccines. *American Journal of Epidemiology*, 1982, 115:19–25.

30. WHO. Mumps virus vaccines. WHO position paper. *Weekly Epidemiological Record*, 2001, 76: 346-355.

31. McLean M et al. Manuscript in preparation *2003*.

32. Global Advisory Committee on Vaccine Safety, 11-12 June 2003, Adverse events following mumps vaccination. *Weekly Epidemiological Record*, 2003, 78: 282-283.

33. Duclos P, Ward BJ. Measles vaccines: a review of adverse events. *Drug Safety*, 1998, 19:435–454.

34. Taylor B et al. MMR and autism: further evidence against a causal association. *Vaccine*, 2001; 19:3636–3635.

35. Madsen KM et al. A population-based study of measles, mumps and rubella vaccination and autism. *New England Journal of Medicine*, 2002, 347:1477-1482.

36. CDC. General recommendations on immunization. Recommendations of the Advisory Committee on Immunization Practices (ACIP) and the American Academy of Family Physicians (AAFP). *MMWR*, 2002, 51(No. RR-2): 1–36.

37. American Academy of Pediatrics. Measles. In: Pickering LK, ed. *Red book: 2003 report of the Committee on Infectious Diseases*, 26th ed. Elk Grove Village, American Academy of Pediatrics, 2003: 419-429.

38. American Academy of Pediatrics. Treatment of anaphylactic reactions. In: Pickering LK, ed. *Red book: 2003 report of the Committee on Infectious Diseases*, 26th ed. Elk Grove Village, American Academy of Pediatrics, 2003:63–66.

39. Thibodeau JL. Office management of childhood vaccine-related anaphylaxis. *Canadian Family Physician*, 1993, 40:1602–1610.

40. Recommendations for the monitoring of measles eradication in the American Region. *Epidemiological Bulletin / PAHO,* 2003, 24(3): 6-10.

41. Zuber PL et al. Use of administrative data to estimate mass vaccination campaign coverage, Burkina Faso, 1999. *Journal of Infectious Diseases,* 2003, 187 (suppl. 1): S86-S90.

42. Henderson RH, Sundaresan T. Cluster sampling to assess immunization coverage: a review of experience with a simplified sampling method. *Bulletin of the World Health Organization*, 1982, 60(2): 253–260.

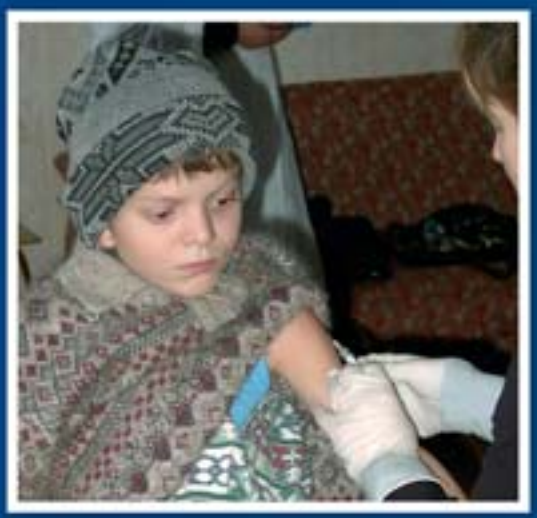
43. Dean AG et al. *Epi Info version 6.04a, a word-processing, database, and statistics program for public health on IBM-compatible microcomputers*. Atlanta, Centers for Disease Control and Prevention, July 1996**.**

44. *Monitoring immunization services using the lot quality technique.* Geneva, World Health Organization, 1996 (document WHO/VRD/TRAM/96.1).

45. Valadez JJ et al. *Assessing Community Health Programs. A Participant's Manual and Workbook. Using LQAS for Baseline Surveys and Regular Monitoring*. St Albans (UK), Teaching-aids At Low Cost, 2003.

Measles and rubella remain important causes of vaccine-preventable disease and death in the European Region of WHO. The *Strategic plan for measles and congenital rubella infection in the WHO European Region* identifies key strategies to meet the objectives of interrupting indigenous measles transmission and preventing congenital rubella infection (< 1 case of congenital rubella syndrome per 100 000 live births) by 2010. *Surveillance guidelines for measles and congenital rubella infection in the WHO European Region* is a companion document, which provides technical advice on the design and implementation of surveillance programmes for these diseases.

Supplementary immunization activities (SIA) for measles are a way to quickly reduce the number of susceptibles in the population. When measles-rubella vaccine is used for cohorts susceptible to measles and rubella and rubella vaccine for other women of childbearing age, SIA provide the opportunity to quickly meet the 2010 objectives. *Field guide for planning and implementing supplemental immunization activities for measles and rubella* is intended to assist national immunization programme managers and subnational staff in the planning, organization, implementation and evaluation of SIA that may be required to meet the objectives.



World Health Organization
Regional Office for Europe

Scherfigsvej 8,
DK-2100 Copenhagen Ø,
Denmark

Tel.: +45 39 17 17 17
Fax: +45 39 17 18 18

E-mail: postmaster@euro.who.int
Web site: www.euro.who.int