# Table of Contents

Acknowledgements ........................................................................................................5  
Foreword ..........................................................................................................................6  
List of Acronyms .............................................................................................................7  
A. Background ..................................................................................................................9  
   A.1 Introduction ..........................................................................................................9  
   A.2 Policy development process ............................................................................9  
   A.3 Context ......................................................................................................... 10  
B. Purpose of the Document ...................................................................................... 11  
C. Guiding Policy for Immunization ........................................................................... 12  
D. Goal and Objectives of the Immunization Programme ........................................ 14  
   D.1 Programme goal ............................................................................................. 14  
   D.2 Overall objective .......................................................................................... 14  
E. Technical Policies of Routine Immunization .......................................................... 15  
   E.1 Target population and vaccines ................................................................. 15  
   E.2 Routine immunization schedule .................................................................... 16  
   E.3 Administration of vaccines ............................................................................ 16  
   E.4 Intervals between doses of the same vaccine ............................................. 17  
   E.5 Simultaneous administration of vaccines .................................................... 17  
   E.6 Contraindications to immunization ............................................................. 18  
   E.7 HIV infection and immunization ................................................................. 19  
   E.8 Open multi-dose vial policy .......................................................................... 19  
   E.9 Cold chain .................................................................................................... 20  
   E.10 Management and use of vaccines & safe-injection materials ............... 23  
   E.11 Reduce missed opportunities .................................................................. 26  
   E.12 Side effects & adverse events ..................................................................... 27  
   E.13 Injection safety .......................................................................................... 29  
F. Immunization Programme Operational Approaches .............................................. 30  
   F.1 First Approach: Provision of Routine Immunization Services .................. 30  
   F.2 Second Approach: Accelerated Routine Immunization Activities ............ 31  
   F.3 Third Approach: Accelerated Disease Control Activities .......................... 32  
G. Guiding Principles of Programme Implementation .................................................. 34  
   G.1 Strong political commitment ....................................................................... 34  
   G.2 Coordination of technical and resource inputs ......................................... 34  
   G.3 Functional programme structure .................................................................. 35  
   G.4 Organization of routine immunization activities ...................................... 37  
   G.5 Integrated services ........................................................................................ 39  
   G.6 Transport support for RI activities .............................................................. 40  
   G.7 High quality of service ................................................................................. 40  
   G.8 Non-government and private sector immunization services .............. 41
Table of Contents

G.9 Community participation and social mobilization ...............42
G.10 Assignment and support of staff .................................42
G.11 Capacity building (including supporive supervision) ...........43
G.12 RI programme monitoring ........................................44
G.13 EPI coverage-achievement reporting and feedback ..........45

H. RI Implementation Strategy ........................................47

I. Key Documents Reviewed ...............................................49

Table of Annexes ................................................................50

ANNEX 1 – Administration of Vaccines ..................................51
ANNEX 2 – Contraindications to Immunization ......................54
ANNEX 3 - Side Effects and Adverse Events ............................56
ANNEX 4 – Open/Multi-Dose Vial Policy .................................58
ANNEX 5 - Cold Chain, Vaccine & Safe-Injection Supplies ........60
ANNEX 6 – Safe Injections & Safe Disposal ............................68
ANNEX 7 - Provision of Vitamin A Supplements ....................71
ANNEX 8 - Disease Control Methodologies & Tasks ................73
  8.1 Poliomyelitis eradication ............................................73
  8.2 Accelerated control of Measles ....................................74
  8.3 Maternal and neonatal tetanus (MNT) elimination ..........76
ANNEX 9 - Basic Package of Health and Nutrition Services RI Guidelines ..........................................................79
ANNEX 10 - REC Implementation Guidelines ..........................82
  10.1 Establish static & outreach routine immunization services .................................................................82
  10.2 Conduct support-supervision ......................................87
  10.3 Link services with communities ..................................89
  10.4 Monitor and use data for action .................................91
  10.5 Plan and manage resources ......................................94
ANNEX 11 – Organizational Structure of EPI ...........................95
Acknowledgements

The development and review of this policy document “Expanded Programme on immunization (EPI) policy and strategy of the Government of Southern Sudan” is based on the inputs, both technical and managerial, received from individuals, international organizations, UN agencies and partners.

First, I would like to take this opportunity to express my thanks to H.E the Minister of Health, Government of Southern Sudan, Dr. Joseph Manytuil Wejang, for participating in the review process of this policy and strategy document, giving comments and recommending the necessary changes to ensure finalization.

I commend the effort of my predecessors who started the development of this document, including all individuals, international organizations and UN agencies who contributed in the development of this document.

I would also like to acknowledge and thank the Director Generals, especially Dr. Atem Nathan Riak of primary Health Care for his constructive comments during the revision of the draft document and to Dr. Anthony Laku Stephen EPI director, for his technical assistance in moving forward the finalization process. Thanks to the states Ministers of Health, Director Generals and directors of primary Health care, for contributing in the review process and finalization of this policy and strategy document through the EPI policy and strategy consensus workshop held in June 2009 in Rumbek.

Many thanks and gratefulness is due to Department of the Health USAID in southern Sudan for the technical and financial support for the development of the document.

The ministry appreciates the role of partners, WHO and UNICEF in contributing technically in the development and finalization of the document.

In conclusion, I kindly request all Expanded Programme on Immunization (EPI) implementers, public health facilities, private health sector and partners working in immunization to use this EPI policy and strategy as a guide in implementing Immunization activities in Southern Sudan.

_________________
Dr. Majok Yak Majok
Undersecretary
Ministry of Health
Government of Southern Sudan
Foreword

The "Health Policy for the Government of Southern Sudan" states that the mission of the Ministry of Health (MOH/GOSS) is to improve the health status of the population and ensure quality health care to all the people of Southern Sudan, especially the most vulnerable women and children. The MOH/GOSS recognizes the crucial role that immunization plays in reducing child morbidity and mortality and it affirms its responsibility to ensure that every child is protected from vaccine preventable diseases.

To fulfil this mission, the MOH with partners in primary health care developed the immunization policy document to guide the program in order to achieve its intended objectives and contributes to the achievement of the Millennium Development Goals (MDG 4 and 5).

The policy document provides policies and strategic guidance for the implementation of the immunization programme in Southern Sudan. It builds on the direction and planning of the Government’s Basic Package of Health and Nutrition Services (BPHNS), the Comprehensive Multi-Year Plan (cMYP), the Reach-Every-County (REC) immunization strategy, experience gained during the last few years of implementing routine and supplemental immunization activities, and global technical immunization guidelines.

The document details the core MOH/GOSS immunization policies, strategies and standards for implementing the immunization programme. It is designed to provide a technically sound basis for vaccination procedures according to proven international standards and norms adapted to Southern Sudan conditions. In addition to general policy and strategy statements, selected technical guidelines are annexed for reference.

Therefore, it is very crucial to re-orient all immunization services in Southern Sudan based on the policies, strategies, norms and guidelines incorporated in the immunization policy.

_________________

Dr. Joseph Manytuil Wejang
Minister of Health
Government of Southern Sudan
List of Acronyms

AccRI Accelerated Routine Immunization
AD Auto-Disable (syringe)
AEFI Adverse Event Following Immunization
AFP Accute Flaccid Paralysis
AIDS Acquired Immune Deficiency Syndrome
BCG Bacillus Calmette-Guerin
BPHNS Basic Package of Health and Nutrition Services
CH County Hospital
CHW Community Health Worker
CPA Comprehensive Peace Agreement
cMYP Comprehensive Multi Year Plan
DPT Diphtheria, Pertussis and Tetanus vaccine
EPI Expanded Programme on Immunization
GAVI The Global Alliance for Vaccines and Immunization
GOSS Government of Southern Sudan
HHP Home Health Promoters
ICC Inter-agency Coordination Committee
ILR Ice-Lined Refrigerator
IMCI Integrated Management of Childhood Illnesses
LLITNs Long Lasting Insecticides Treated Nets
MLM Mid-Level Management
MNT Maternal & Neonatal Tetanus
MOH Ministry of Health
NIDs National Immunization Days
NGOs Non-governmental Organizations
NNT Neonatal Tetanus
OJT On-the-Job Training
PHC Primary Health Care
PIS Product Information Sheets
OPV Oral Polio Vaccine
PHCC Primary Health Care Centre
PHCU Primary Health Care Unit
REC Reach-Every-County
RED Reach–Every-District
RI Routine Immunization
RPD Research and Planning Directorate
SIAs Supplementary Immunization Activities
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TT</td>
<td>Tetanus Toxoid</td>
</tr>
<tr>
<td>TTBA</td>
<td>Trained Traditional Birth Assistant</td>
</tr>
<tr>
<td>tOPV</td>
<td>Trivalent Oral Polio Vaccine</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
<tr>
<td>VHV</td>
<td>Village Health Volunteer</td>
</tr>
<tr>
<td>VVM</td>
<td>Vaccine Vial Monitor</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
</tbody>
</table>
A. Background

A.1 Introduction

The decades-long civil war severely affected the health service infrastructure in Southern Sudan. Following the conclusion of the Comprehensive Peace Agreement (CPA) on January 9th, 2005, and the subsequent ending of the war, the Government of Southern Sudan (GOSS) issued its health policy in August 2007 to guide the redevelopment of the health delivery system (“Health Policy for the Government of Southern Sudan, 2007-2011”). The Ministry of Health then produced the “Basic Package of Health and Nutrition Services for Southern Sudan.”

On the basis of these policies, the Ministry of Health and partners prepared a “Comprehensive Multi-Year Plan (CMYP) for the Expanded Programme on Immunization (2007-2011)” to begin the effort to revitalize immunization services.

As a further step in the revitalization effort, the Primary Health Care Department of the Ministry of Health (MOH) has prepared this “Immunization Policy” document to guide implementation of immunization services.

A.2 Policy development process

The development of the immunization policy involved wide consultations with all health partners. It was drafted by the Primary Health Care (PHC) Directorate using partner inputs, MOH/GOSS policy and planning documents and immunization technical documents of WHO, USAID and UNICEF. The preliminary draft was revised by the Technical Sub-Committee of the Inter-agency Coordinating Committee (ICC) and members of the Research and Planning Directorate (RPD). The document was again revised and enriched during a “Stakeholder Consultative Meeting” that included GOSS officials, state health officials, non-governmental organizations (NGOs) and international partners. Finally, the document was endorsed by the Executive Board of MOH/GOSS.
A.3  Context

The Expanded Programme on Immunization (EPI) was launched in Sudan in 1976 and the coverage had been improving slowly, however, the coverage in the area of Southern Sudan was lower than any other country because of the long civil war. By the end of 2004, DPT3 coverage of children less than one year of age in Southern Sudan was reported to be 10% (see table below).

### Southern Sudan: reported coverage and dropout, 2004 to 2008

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>% DPT3 coverage (of children &lt;1)</td>
<td>10%</td>
<td>13%</td>
<td>15%</td>
<td>20%</td>
<td>22%</td>
</tr>
<tr>
<td>% Dropout DPT1 to DPT3 (of children &lt;1)</td>
<td>56%</td>
<td>54%</td>
<td>44%</td>
<td>36%</td>
<td>44%</td>
</tr>
</tbody>
</table>

Source: Southern Sudan EPI data unit

After the Comprehensive Peace Agreement (CPA) in 2005 the MOH/GOSS and partners have worked to re-establish the immunization programme in all parts of Southern Sudan. By the end of 2007 reported DPT3 coverage of children less than one year of age reached 20%.

In early 2008 the MOH/GOSS introduced accelerated routine immunization activities, supported by new funding from the Global Alliance for Vaccines and Immunization (GAVI). With the new funding, and continued support of its traditional partners, the MOH/GOSS intends to reach 90% DPT3 coverage of children less than one year of age in Southern Sudan by 2012.
B. Purpose of the Document

The purpose of the “Immunization Policy” document is to provide policies and strategic guidance for the implementation of the immunization programme in Southern Sudan. It builds on the direction and planning of the Government’s Basic Package For Health and Nutrition Services (BPHNS), the Comprehensive Multi-Year Plan (cMYP), the Reach-Every-County (REC) immunization strategy, experience gained during the last few years of implementing routine and supplemental immunization activities, and global technical immunization guidelines.

The document details the core MOH/GOSS immunization policies, strategies and standards for implementing the immunization programme. It is designed to:

- Provide a technically sound basis for vaccination procedures according to proven international standards and norms adapted to Southern Sudan conditions;
- Ensure that children and women receive good quality, safe immunization services using potent vaccines;
- Ensure that disease control, elimination and eradication programmes, which include immunization and vaccine preventable diseases surveillance strategies, are carried out according to established norms and procedures.

In addition to general policy and strategy statements, selected technical guidelines are annexed for reference. Further guidance can be found in WHO “Mid-Level Management Course for EPI Managers,” the WHO “Immunization in Practice” modules for service providers and the “Reaching Every District” guideline.
C. Guiding Policy for Immunization

The "Health Policy for the Government of Southern Sudan" states that the mission of the Ministry of Health (MOH/GOSS) is to improve the health status of the population and ensure quality health care to all the people of Southern Sudan, especially the most vulnerable women and children. It goes on to state that the main objective of the health policy is to reduce mortality and morbidity through a strategic approach that takes into consideration the following:

- Strengthen health systems and services
- Scale up communicable and non-communicable disease prevention and control programmes
- Mobilize and effectively use adequate sustainable resources
- Develop effective partnerships with local communities and relevant institutions nationally, regionally and internationally
- Strengthen and scale up programmes to reduce the burden of conditions related to pregnancy and childbirth

The MOH/GOSS recognizes the crucial role that immunization plays in preventing child morbidity and mortality. It affirms its responsibility to ensure that every child is protected from vaccine preventable diseases. It is the policy of the GOSS that:

- All children in Southern Sudan, regardless of where they live, are reached and provided complete, high quality immunization for protection from six vaccine preventable diseases.
- All children are protected at birth from neonatal tetanus.
The Ministry of Health directs that:

1. The first priority for children is primary immunization against the vaccine-preventable diseases. All children should be fully immunized against six diseases (tuberculosis, poliomyelitis, diphtheria, pertussis, tetanus and measles) by their first birthday.

2. All women of child bearing age will be protected from tetanus. The first priority is appropriate immunization of pregnant women to ensure that every newborn is protected at birth from neonatal tetanus.

3. Special accelerated disease control activities will be implemented for early:
   - Eradication of poliomyelitis,
   - Elimination of measles, and maternal/neonatal tetanus.

4. Immunization campaigns will be organized in response to outbreaks of vaccine preventable diseases (yellow fever, meningitis, etc.).

5. Immunization services will use only potent vaccines, be safe, and of high quality in accordance with MOH/GOSS guidelines.

6. Other critical public health interventions (e.g., vitamin A supplementation, de-worming, long-lasting insecticide treated nets distribution, etc.) will be integrated with immunization services whenever feasible.
D. Goal and Objectives of the Immunization Programme

The Ministry of Health, together with its partners, will strengthen the Expanded Programme on Immunization (EPI) to ensure sustained routine immunization services for children and women reinforced by accelerated routine immunization activities and accelerated disease control activities.

D.1 Programme goal

To reduce morbidity and mortality caused by vaccine-preventable diseases in Southern Sudan especially among women and children.

D.2 Overall objective

To expand immunization services and achieve high immunization coverage of eligible women and children using potent vaccines and safe immunization procedures.

D.3 Quality of Service and Safe Immunization Objectives

- All immunizations will be given with potent vaccines by qualified health personnel and according to the administration guidelines of the MOH/GOSS (see Annex 1).
- All injectable vaccines will be prepared and given with a sterile auto-disabled (AD) syringe and needle according to MOH/GOSS guidelines (Annex 6).
- All injection materials will be disposed safely according to the guidelines of the MOH/GOSS (Annex 6).

D.4 Integrated Service Objective

Every routine immunization session should be accompanied by at least one additional health intervention (e.g., distribution of vitamin A supplements, de-worming tablets, long-lasting insecticide treated bed nets (LLITNs), iron/folate tablets etc.).
E. Technical Policies of Routine Immunization

E.1 Target population and vaccines

The target populations and vaccines provided through routine immunization are as follows (see also Annex 1):

- Children less than one year of age. All children should complete the primary immunization series by their first birthday. The primary series consists of:
  - BCG (Bacillus Calmette-Guerin vaccine) – one dose, to reduce severe clinical forms of childhood tuberculosis
  - tOPV (trivalent oral polio vaccine) – the birth dose plus three consecutive doses, to prevent poliomyelitis
  - DPT (diphtheria, pertussis, tetanus vaccine) – three doses, to prevent diphtheria, pertussis and tetanus
  - Measles vaccine – one dose, to protect against measles

- Children who have not completed the primary series by their first birthday will be eligible to finalize the series. The programme will generally not start the primary series for children who have passed their first birthday. However, when the caretakers insist children 12 to 23 months will be vaccinated. Additional doses of selected vaccines (e.g. measles) will be provided as part of special accelerated disease control, elimination and eradication activities or as boosters in older age groups (see Annex 1 for details).

- All women of child-bearing age (15-49 years of age) to prevent maternal and neonatal tetanus:
  - Pregnant women (priority for immunization): two doses of Tetanus Toxoid (TT) in the first pregnancy if not previously immunized. A single dose of TT in each subsequent pregnancy if the woman has already received two doses of TT (up to a total of five doses).
  - All women of child-bearing age (15 to 49 years of age): a total of five doses of TT (immunized any time according to schedule whether pregnant or not pregnant)
E.2 Routine immunization schedule

The immunisation schedule for a child under one year is (see Annex 1 for detail):

<table>
<thead>
<tr>
<th>Age of administration</th>
<th>Antigen</th>
</tr>
</thead>
<tbody>
<tr>
<td>At birth</td>
<td>BCG, tOPV-0</td>
</tr>
<tr>
<td>At 6 weeks</td>
<td>tOPV1, DPT1</td>
</tr>
<tr>
<td>At 10 weeks</td>
<td>tOPV2, DPT2</td>
</tr>
<tr>
<td>At 14 weeks</td>
<td>tOPV3, DPT3</td>
</tr>
<tr>
<td>At nine (9) months</td>
<td>Measles</td>
</tr>
</tbody>
</table>

The immunization schedule for women 15 to 49 years of age is (see Annex 1 for detail):

| TT-1     | At first contact, or as early as possible during pregnancy |
| TT-2     | At least 4 weeks after TT1                                |
| TT-3     | At least 6 months after TT2 or during next pregnancy     |
| TT-4     | At least one year after TT3 or during next pregnancy     |
| TT-5     | At least one year after TT4 or during next pregnancy     |

E.3 Administration of vaccines

The following is a summary of administration guidelines (see Annex 1 for detail)

- BCG is administered intradermally on the left outer forearm.
- DPT is administered intramuscularly in the outer aspect of the mid-thigh.
- tOPV (trivalent oral polio vaccine) is administered by mouth.
- Measles vaccine is administered subcutaneously in the right upper arm.
- TT is administered intramuscularly in the deltoid muscle of the woman’s arm.

**NOTE:** the buttock must not be used as an immunisation site for infants, children or adults because of the risk of injury to the sciatic nerve.
E.4 Intervals between doses of the same vaccine

DPT and tOPV require administration of more than one dose for development of an adequate antibody response. A minimum interval of 4-weeks (28 days) will be maintained between each dose. There is no maximum interval between doses.

- If a vaccine dose is given at less than the recommended 28 days (4-weeks) interval, it should not be counted as part of the primary series, and should be repeated at the appropriate time.

- A longer-than-recommended interval between doses does not reduce final antibody response although it extends the time when the child is at risk of contracting the diseases. Interrupted immunisations will not be restarted. If the recommend time for a dose of DPT or tOPV is missed, the vaccination series on the next occasion should be continued (no extra dose is needed).

TT immunization of women of child bearing age has specific minimum intervals between doses. There is no maximum interval. The minimum intervals for TT are:
  o Between TT1 and TT2: four (4) weeks
  o Between TT2 and TT3: six months
  o Between TT3 and TT4: one year
  o Between TT4 and TT5: one year

E.5 Simultaneous administration of vaccines

All EPI vaccines are safe and effective when administered simultaneously, that is during the same vaccination session but at different injection sites.

- For routine immunisations two or more viral vaccines may be given simultaneously. If not given simultaneously, they should be separated by at least 4 weeks to avoid interference. However, scheduled doses of live viral vaccines can be given even within four weeks of a mass campaign.
If a child comes for the first time at nine months of age it is safe to give the vaccines as follows:

- BCG – left outer forearm
- OPV1 – oral
- DPT1 – thigh
- Measles – right upper arm

E.6 Contraindications to immunization

There are few contraindications to immunization. All infants should be immunized except in these rare situations (Annex 2):

- Anaphylaxis or a severe hypersensitivity reaction is an absolute contraindication to subsequent doses of a vaccine. Persons with a known allergy to a vaccine component should not be vaccinated.

- Do not give BCG (or Yellow Fever vaccine) to children who exhibit the signs and symptoms of Acquired Immune Deficiency Syndrome (AIDS).

- If a parent strongly objects to an immunization for a sick child, do not give it. Ask the mother to come back when the child is well.

The following children should be routinely immunized:

- Children with mild illnesses (e.g. diarrhoea, respiratory infections), children with fever less than 38.5 degree centigrade, and malnourished children should be immunized.

- Children having serious illness should be vaccinated as soon as their general condition improves and before discharge from hospital. Premature newborns should be vaccinated on discharge.

- All children 9-59 months of age should be vaccinated against measles upon admission to hospital, regardless of prior vaccination or disease history (to prevent them from acquiring the diseases while in the hospital).
E.7 HIV infection and immunization

If a sterile syringe and needle are used for each injection, there is no risk of transmitting HIV or any other blood-borne infection through immunisation.

- Individuals with known or suspected asymptomatic HIV infection should receive all EPI vaccines as early in life as possible, according to the immunisation schedule described in section E.2.

- Individuals with symptomatic HIV infection (e.g. AIDS) should receive all EPI vaccines except BCG and Yellow Fever.

- Because of the risk of early and severe measles infection, these infants may receive a dose of standard measles vaccine at 6 months of age and the second dose at 9 months.

E.8 Open multi-dose vial policy

The guidelines for use of open vials are summarized below (see also Annex 4):

Multi-dose vials of tOPV, DPT, and TT vaccines, from which one or more doses of vaccine have been removed during a static immunisation session, may be used in subsequent immunization sessions for up to a maximum of 4 weeks, provided that all of the following conditions are met:

- the expiry date has not passed;
- the vaccines are stored under appropriate cold chain conditions;
- the vaccine vial septum has not been submerged in water;
- aseptic technique has been used to withdraw all doses;
- the vaccine vial monitor (VVM) has not reached the discard point; and
- the vial has been marked with the date-of-opening.

Multi-dose vials of vaccine opened at outreach sites must be discarded at the end of the session.

Multi-dose vials of BCG and Measles vaccine (which are reconstituted before use) must be discarded at the end of each immunization session or at the end of 6 hours, whichever comes first.
E.9 Cold chain

The system used for keeping and distributing vaccines in good condition is called the cold chain (see details in Annex 5).

The cold chain consists of a series of storage and transport links, all designed to keep vaccines within an acceptable temperature range until they reach the user. The equipment used in the cold chain (from cold rooms to vaccine carriers) is specialized. All cold chain equipment procured for EPI will be listed in the WHO Product Information Sheets (PIS) and obtained through the UNICEF supply system.

An up-to-date inventory of all cold chain equipment and transport, provided for immunization activities, will be maintained at each administrative level (central through facility levels).

E.9.1 Vaccine Cold Stores at central and state levels

The vaccine cold stores at central and state levels contain significant quantities of vaccine. These stores must have the capability to store all vaccines, except OPV, in cold rooms and/or refrigerators that maintain temperatures between +2° and +8° Centigrade (see table below). The MOH/GOSS will ensure that the necessary number of ice-lined refrigerators (ILR) is procured for state cold stores. All central and state stores will be connected to the electrical grid and have at least two operational standby generators.

Vaccine Storage: Duration and Temperatures of Storage

<table>
<thead>
<tr>
<th>Vaccine Stock</th>
<th>Central Cold Store</th>
<th>State Cold Store</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>Store for maximum 12 months</em></td>
<td><em>Store for maximum 3 months</em></td>
</tr>
<tr>
<td>OPV</td>
<td>-15° to -25° C</td>
<td></td>
</tr>
<tr>
<td>BCG Measles</td>
<td>Store these vaccines at +2°C to +8°C. Under exceptional circumstances they can be temporarily stored at -15° to -25°C (e.g. if there is a temporary shortage of storage space).</td>
<td></td>
</tr>
<tr>
<td>DPT TT</td>
<td>+2° to +8° Centigrade (must never be frozen)</td>
<td></td>
</tr>
</tbody>
</table>

*Note: never freeze diluents.*
E.9.2 Cold chain for routine immunization at county level

a. Where electricity is available at county level for at least 8 hours per day, the ILR is the appropriate equipment for storage of routine immunization (RI) vaccines. Where electricity is not available, kerosene refrigerators are preferred to store RI vaccines and generate enough icepacks for the county hospital itself (MCH/outpatient services).

In selected, very isolated counties, solar systems that produce at least 8 frozen ice packs per day will be supplied (see Annex 5 for issues related to solar units).

b. Freezing of ice-packs for distribution of vaccine throughout the county is a critical requirement. One freezer or ice-pack freezer is normally sufficient to provide icepacks for routine immunization in most counties. Icepack freezing is only required for a few days in a month if RI activities are planned for simultaneous implementation throughout the county on a set schedule (e.g. last week of the month). A single freezer can be operated by grid-electricity and/or small generator for the limited time required per month.

c. Distribution of vaccine and icepacks to the Primary Health Care Centres (PHCCs) once per month is by local transport (where available), by supervisor using a motorcycle or by paid courier using a private bicycle. This distribution system depends on:

- The availability of appropriately sized smaller cold boxes, and
- Routine transport costs (seat in a local commercial vehicle, or fuel/maintenance for the supervisors motorcycle, or courier payments)

The MOH/GOSS and partners will provide appropriate sized cold boxes for expansion of routine immunization services.
E.9.3 Cold chain systems at health facility level

There are two types of cold chain systems at sub-county level. The EPI implements the appropriate type depending on local conditions as follows:

- **System 1**: at hospitals, large clinics in urban centers, and at well-developed PHCCs with a high population living within one mile of the centre, the EPI advocates the use of electric or kerosene refrigerators (depending on the reliability of electricity). For equivalent facilities, located in very difficult access areas, the EPI advocates the use of solar refrigerators. In all cases, the refrigerators must have a freezing compartment that will be capable of freezing at least 8 icepacks per day.

- **System 2**: at most health facilities (PHCCs, Primary Health Care Units [PHCUs] and clinics) in areas without reliable electricity, refrigerators are not recommended. A “cold-box system” with regular supply and storage of vaccines for short periods offers some advantages over trying to provide continuous refrigeration. Vaccine can be periodically (for example monthly) supplied to health facilities in cold boxes with conditioned ice packs and used over a period that depends on the cold life or holdover time of a cold box. This will be sufficient to provide an adequate number of immunization sessions in many areas.

Depending on population and scheduling vaccines are transported either by cold box or vaccine carrier to a health facility once or twice a month on a fixed schedule.

Using appropriate sized cold chain equipment (usually medium or small cold boxes and vaccine carrier) health workers will provide immunization services on a pre-arranged day in a month at specific static and outreach sites.
E.9.4 Maintenance and repair of cold chain equipment

Cold chain equipment (generators, freezers, refrigerators, cold boxes and vaccine carriers) require continues maintenance and periodic repair services. Assigned cold chain officers and assistants at each level are responsible for routine maintenance.

For advanced maintenance and basic repair services, the MOH/GOSS advocates the use of local-market technicians. Reliable mechanics/technicians will be identified in commercial centers and agreements reached to provide “on-demand” services on a fee-for-service basis, which will be paid by the government.

E.10 Management and use of vaccines & safe-injection materials

E.10.1 Procurement

Procurement of vaccines, injection equipment and safe-disposal boxes will be done by the MOH/GOSS in consultation with the UNICEF and WHO offices. The following factors guide the procurement process:

- Annual requirements of EPI vaccines and materials specified in Southern Sudan EPI 5-year plan and adjusted by the EPI Annual Plan;
- Actual consumption and balances available from the previous year.

Only WHO pre-qualified vaccines will be used in the EPI. EPI vaccines and safe-injection materials will be ordered centrally through the UNICEF supply division.

E.10.2 Storage and distribution of vaccines & safe-injection materials

The MOH/GOSS, with support from partners, is responsible for storage and distribution of vaccines and immunization supplies (see also Annex 5):

1. Distribution of vaccines (with respective diluents) that have been maintained at appropriate temperatures
2. Provision of sharps disposal boxes and three types of sterile syringes and needles:
   - Auto-disabled (AD) syringes/needles for BCG
   - Auto-disabled (AD) syringes/needles for the other injectable vaccines
   - “Reconstitution” syringes and needles

3. Provision of operational supplies:
   - EPI recording and reporting formats (e.g. registers, forms and cards)
   - Fuel (kerosene or gas) for refrigeration equipment
   - Spare parts and supplies for refrigeration equipment (e.g. wicks for kerosene refrigerators)

It is MOH/GOSS/EPI policy that the receipt, distribution/use and balance of each of the vaccines and all supplies will be accurately recorded in standard Stock Control Books at every administrative level (central, state, county, payam and facility).

**Storage of vaccines**

**At central level** vaccines will be stored at the vaccine cold store under the responsibility of the MOH/GOSS/EPI Department supported by UNICEF.

- The central vaccine cold store will maintain a minimum vaccine stock of three months’ supply for all EPI vaccines.
- All EPI vaccines, except tOPV, will be stored at central level in temperatures between $+2^\circ$ and $+8^\circ$ Centigrade.
- Vaccines will be distributed to State Vaccine Cold Stores based on annual estimates, programme performance and request.

**At state level** vaccines will be stored and distributed by the SMOH/GOSS/EPI Office to counties.

- A state vaccine cold store will maintain a minimum vaccine stock of one months’ supply for all EPI vaccines,
- All EPI vaccines, except tOPV, will be stored at state level in temperatures between $+2^\circ$ and $+8^\circ$ Centigrade.
At **county level** vaccines will be stored and distributed by the county health department

- A county vaccine cold store will maintain a minimum vaccine stock of **two weeks** supply for all EPI vaccines.
- All RI vaccines, *to include tOPV*, will be stored in an ILR or the main compartment of the refrigerator between $+2^0$ and $+8^0$ Celsius (i.e. no vaccines will be kept in the freezing compartment of a refrigerator).

At **health facility level**, where a refrigerator is provided:

- A minimum **one week**’ supply of all EPI vaccines will be kept at all times.
- All RI vaccines, *to include tOPV*, will be stored in the main compartment of the refrigerator between $+2^0$ and $+8^0$ Celsius (i.e. no vaccines will be kept in the freezing compartment of a refrigerator). **Note:** *at a minimum also store, in the bottom of the main compartment, sufficient diluents for the reconstitution of vaccines to be used during the next day’s sessions.*
- All static service will be provided in the health facility using a vaccine carrier with *conditioned* icepacks and foam pad.
- Outreach teams will carry vaccines in vaccine carriers with conditioned frozen ice packs to health posts and other vaccination points.
- At all levels, there should be a contingency plan (alternative cold storage when the refrigerators breaks down).

**Transport of vaccines**

At every stage of the cold chain, vaccine will be transported at temperatures between $+2^0$ and $+8^0$C using special EPI cold boxes and vaccine carriers. Vaccines will be transported by health workers and other personnel trained on cold chain and vaccine management.
E.10.3 Use of vaccines

- Vaccines will be managed, reconstituted and administered as per instruction on the vial and MOH/GOSS guidelines (see Annex 1, 5 & 6)

- The following vaccines must not be used:
  - Vaccines beyond the expiry date
  - Vaccine vials with a vaccine vial monitor (VVM) at stage 3 or stage 4
  - Vaccine vials without a readable label and/or VVM
  - Any vial of DPT and TT that is suspected of having been frozen (see “shake” test information in 5 Annex)
  - Vaccine that was reconstituted more than 6 hours previous to time of immunization
  - Opened vials of tOPV, DPT, and TT that have not been marked with the date of opening
  - Vaccine not WHO pre-qualified and not procured through UNICEF

E.11 Reduce missed opportunities

A missed opportunity occurs when a child or woman who is eligible for vaccination visits a health facility, where immunization services are available, but is not vaccinated by the health staff. To reduce missed opportunities and provide vaccination at every opportunity, staff at health facilities providing routine immunization will:

1. Routinely screen women and children during every service (e.g., outpatient, ante natal care, treatment) and ensure that they are vaccinated when eligible:
   - Check the road-to health cards (vaccination cards) and/or question the client at clinic to determine eligibility.
   - If services are available on that day, give the child/woman all the vaccinations for which he/she is due
   - If services are not available on that day, remind them where and when they should go to receive the doses they are due.
2. All newborns will be immunized with BCG and tOPV-0 before leaving the health facility.

3. Open a multi-dose vial of vaccine even for a small number of eligible children or women.

E.12 Side effects & adverse events

There will be side effects (reactions) to immunization. They range from mild fever and slight swelling at the site of injection (DPT), to a small sore in the case of BCG, and sometimes a light rash after measles vaccination (Annex 3). These side effects are normal and show that the vaccines are working. It is the responsibility of the health worker to:

- Explain to caretakers about potential side effects of immunization, and
- Advise them what to do should they occur.

In very rare cases an “adverse event following immunization” (AEFI) may occur. An adverse event following immunization (AEFI) is defined as a medical event or incident that takes place after an immunization, but is not necessarily caused by immunization.

Generally an AEFI falls into one of five categories.

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Vaccine reaction</td>
<td>Event caused or precipitated by the inherent properties of the vaccine (active component or one of the other components e.g. adjuvant, preservative, stabilizer) when given correctly.</td>
</tr>
<tr>
<td>2 Programme errors</td>
<td>Event caused by an error in vaccine preparation, handling, or administration.</td>
</tr>
<tr>
<td>3 Coincidental</td>
<td>Event that happens after immunization but is not caused by the vaccine. This is due to a chance temporal association.</td>
</tr>
<tr>
<td>4 Injection reaction</td>
<td>Event arising from anxiety about, or pain from, the injection itself rather than the vaccine.</td>
</tr>
<tr>
<td>5 Unknown</td>
<td>The cause of the event cannot be determined.</td>
</tr>
</tbody>
</table>
Each reported AEFI should be followed-up by supervisory staff:

- Investigated to determine the cause
- Treated appropriately by clinical health staff
- Clear information given to the caretakers, community and other health workers about the AEFI

If the adverse event was determined to be due to programme error, operational problems must be solved by appropriate refresher training and frequent, active supervision.
E.13 Injection safety

The Southern Sudan Health Service pursues the policy that 100% of injections given in the public and private sectors for any purpose must be safe (see Annex 6).

MOH/GOSS/EPI policy is to use auto-disable (A-D) syringes for all immunization injections and to dispose of used injection equipment in puncture-proof “safety boxes”.

- No immunization injections are to be given using equipment (glass or plastic) designed for re-sterilization.

- All used injection equipment must be safely disposed of:
  o All disposable syringes and needles, including auto-disable equipment, should be disposed of immediately following use in to a designated safety box.
  o The needle should not be recapped or removed from the syringe; the combination is to be inserted into the safety box directly after use.
  o Safety boxes should never be emptied and reused, nor should they be kept in areas accessible to the public.
  o Additional waste from injections (syringe packaging, cotton wool, etc) should be placed in trash containers and burned in a pit.

- All injection equipment will be safely destroyed (Annex 6):
  o The method of choice for destruction of full safety boxes is incineration, preferably in a high temperature incinerator.
  o Alternatively, full safety boxes may be incinerated in small numbers by open burning in a dug pit.
  o Residue from incineration (needles, vials etc) should be buried in a pit.

Under no circumstances will used syringes or needles (or safety boxes) be disposed in normal garbage, dumped randomly, thrown in a pit latrine, or found lying around the grounds of a health facility.
F. Immunization Programme Operational Approaches

The EPI uses three operational approaches to reach and immunize eligible women and children:

1. Provision of routine immunization services as part of the Basic Package of Health and Nutrition Services (BPHNS)
2. Accelerated routine immunization activities (or “pulse” immunization)
3. Accelerated disease control activities:
   - For poliomyelitis
   - For measles
   - For maternal and neonatal tetanus

Each operational approach has a specific purpose and method of implementation. Each is designed to address different situations/needs. Each compliments the others so that together they achieve the overall MOH/GOSS goal (reduction of morbidity and mortality from vaccine preventable diseases).

F.1 First Approach: Provision of Routine Immunization Services

Implementation and expansion of routine immunization activities through the BPHNS is the priority approach of the MOH/GOSS for developing sustainable immunization services (see also Annex 9).

MOH/GOSS policy requires implementation of RI services through all BPHNS facilities and in all referral hospitals (county, state, and teaching).

As described in the BPHNS, routine immunization services are provided at two types of facilities (PHCU and PHCC) and consist of both static and outreach activities. The definitions of these activities are:

- **Static site services**: routine immunization services, providing all RI antigens, performed on scheduled days at a health facility by health facility staff.

- **Outreach services**: routine immunization services, providing all RI antigens, conducted on fixed days in selected
communities by the staff of the responsible health facility using locally available means of movement (walking, bicycle, locally arranged transport).

- **Mobile**: Mobile teams visit a number of locations over a short period, four or more times a year.

Health staffs (nurses, community health workers etc.) assigned to the facilities are responsible to provide routine immunization static and outreach services.

The BPHNS document\(^1\) specifically states that . . . “while the BPHNS does not address services from County, State, Teaching Hospitals, or the National reference laboratories, the services provided by these institutions will be developed in a way that directly supports and adds on to the outcomes of BPHNS to cater for clients with more serious or relatively rare health needs. County hospitals will be directly responsible for oversight, technical support and capacity building for all clinical and diagnostic related services at PHCCs, PHCU’s and household levels.”

F.2 Second Approach: Accelerated Routine Immunization Activities

The MOH/GOSS and its partners recognize that the implementation and expansion of routine static and outreach immunization services, through the BPHNS, will not be sufficient to provide access to all eligible women and children in Southern Sudan for a number of years.

To provide coverage, in those areas where no BPHNS immunization services are available, the MOH/GOSS has introduced a second operational approach. The second approach is “Accelerated Routine Immunization Activities” (AccRI). The definition of “Accelerated Routine Immunization Activities” (AccRI) is:

- Provision of routine immunization antigens on a pulse basis (minimum of **three** times per year) at fixed locations in areas not yet covered by BPHNS static or outreach immunization services.

\(^1\) Basic Package of Health and Nutrition for Southern Sudan (3\(^{rd}\) Draft—February 2008), page 6
The AccRI approach will be used in three situations:

i. To cover designated communities in a health facility catchment area whose women and children are un-able or un-willing to access either the available BPHNS/RI static or outreach services for reasons of distance, natural obstacles, culture or misconceptions.

ii. To temporarily cover health facility catchment areas where the MOH/GOSS has not yet implemented BPHNS/RI services.

iii. To cover areas that for geographic, security or cultural reasons cannot be covered for the foreseeable future by any other approach (e.g. nomadic areas, areas accessible only for a few months of the year, areas which require special transport support).

It is MOH/GOSS/EPI policy to:

- Establish BPHNS/RI services as rapidly as possible in the catchment areas of eligible health facilities and reduce the number and size of areas where accelerated routine immunization (pulse) activities are conducted.

- Generally not use accelerated routine immunization (pulse) activities in communities already covered by BPHNS/RI static and outreach services.

- Focus accelerated routine immunization activities (pulse activities) on areas that for geographic, security or cultural reasons can not be covered for the foreseeable future by any other operational approach.

**F.3 Third Approach: Accelerated Disease Control Activities**

In addition to (1) the provision of routine immunization services through the Basic Package of Health Services and (2) the use of accelerated routine immunization activities in selected areas, the GOSS also implements (3) accelerated disease control activities in response to national and international disease eradication and elimination goals.
The MOH/GOSS accelerated disease control approach has three main components:

- Intensified disease surveillance of the selected diseases.
- Supplemental Immunization Activities (mass immunization campaigns targeting the selected disease either in the entire country or selected areas where the disease is known to be prevalent)
- Outbreak response (when appropriate)

The GOSS has identified three vaccine preventable diseases for accelerated disease control activities. They are:

- Poliomyelitis
- Measles
- Maternal and neonatal tetanus (MNT)

Each of these diseases requires the implementation of a specific set of tactics and activities if eradication or elimination is to be achieved (see Annex 8 for summary). It is the policy of the MOH/GOSS to implement accelerated disease control activities according to the following:

- Achieve elimination of a disease within the established time-frame
- Use accelerated disease control activities to strengthen and expand:
  - The Basic Package of Health and nutrition Services (BPHNS)
  - Routine immunization services (RI) through the BPHNS
  - An effective disease surveillance system.
G. Guiding Principles of Programme Implementation

The guiding principles and practices of programme implementation include:

G.1 Strong political commitment

The GOSS requires State Governors and County Commissioners to ensure high levels of immunization coverage in their jurisdiction.

It encourages government, civic and religious leaders at all levels, international partners, NGOs and communities to take an active role in the expansion of routine immunization (RI) service delivery and increased coverage.

The main indicators of political commitment include:

- Provision of free immunization services to all eligible women and children;
- Regular review of programme achievement (with appropriate action) by the highest political and health-system leaders in Southern Sudan;
- Achievement of established immunization coverage targets. **Note:** the GOSS will use RI achievement (% DPT3 coverage) as a primary indicator of health system development;
- Budget line-items for RI in the MOH/GOSS annual budget and state health budgets;
- Budget line-items for RI running-costs at county level.

G.2 Coordination of technical and resource inputs

The EPI is both a global and national programme with significant technical and resource support from many partners. To coordinate technical and resource support from all partners the MOH/GOSS has formed an immunization advisory group called the EPI Inter-agency Coordinating Committee (ICC) composed of GOSS and partner officials.

The MOH/GOSS document “Terms of Reference for the Interagency Coordination Committee for Immunization in Southern Sudan” (MOH/GOSS, April 2007) declares the ICC to be the coordinating mechanism for all immunization activities, details its functions, spells out the membership, and establishes three ICC subcommittees.
(Technical, Social Mobilization and Logistics) for day-to-day coordination.

In September 2008, the Primary Health Care Directorate directed the formation of a “State EPI Committee” in each state to coordinate immunization activities at state level.

### G.3 Functional programme structure

Expanded Programme on Immunization (EPI) is organized by MOH/GOSS through the Directorate of Primary Health Care (PHC).

**Roles and Responsibilities are outlined as follows:**
The MOH/GOSS EPI Director and staffs are responsible for providing technical leadership and support for immunization in Southern Sudan. The three major operational areas assigned to the EPI Department are:

1. **Routine Immunization Services**
   (including accelerated routine immunization activities)
2. **Disease Control Initiatives**
   (poliomyelitis, measles and maternal & neonatal tetanus)
3. **Community-Based Health Care**
   (including social mobilization)

**Specifically the MOH/GOSS EPI Department executes the following activities:**
- Prepares guidelines and procedures
- Prepares the multi-year EPI plan for the GOSS
- Procures vaccine and other EPI logistics with the support of partners
- Conducts high level in-service trainings and facilitate international trainings and experience sharing
- Conducts supportive supervision to all levels
- Mobilizes resources from partners and distributes to the states based on the agreed micro plan
- Introduces new vaccines to the national immunization program
- Instructs any recollect, withdrawal, not use or suspension of any vaccine or EPI material when problem arises in consultation with experts in the field (mainly WHO)
Conducts investigation for any suspected AEFI and communicates to public media
Coordinates partners working on immunization
Coordinates the Accelerated Diseases Control (ADC) activities (supplementary immunization activities [SIAs] and vaccine-preventable disease surveillance)
Represents the national program in international meetings
Advises state MOH on the recruitment and assignment of qualified and experienced EPI staff at state level when needed

At state level, the Department of Primary Health Care in the Ministry of Health is responsible for overall coordination of immunization services.

Specifically the state MOH performs the following functions:
- Develops and coordinates implementation of EPI annual plans
- Collects from MOH/GOSS and distributes vaccines and other logistics to the counties
- Conducts supportive supervision, monitoring and evaluation
- Recruits, trains, orientates and deploys EPI staff to counties and health facilities
- Mobilizes resources for EPI activities and manage the financial and other resources allocated from the government and partners.
- Conducts preliminary investigation of AEFI and immediately reports to the MOH/GOSS
- Coordinates partners working on immunization
- Conducts vaccine preventable diseases surveillance

At the county level, the following shall be the roles and responsibilities of the county Health Department in the provision of immunization services.
- Prepares and implements EPI plans
- Collects and collates EPI reports
- Collects vaccines and other logistics from the state and distributes to health facilities
- Supervises health facilities in the county
- Coordinates stakeholders working on immunization
- Manages resources allocated for implementation of EPI activities.
- Conducts vaccine preventable diseases surveillance
At payam level, under the leadership of the payam administrator, the payam health office shall perform the following functions.

- Collects data and information for county micro plans
- Collects and collates reports from all health facilities
- Organizes and coordinates community mobilization activities
- Supports health facilities to organize outreach services
- Facilitates establishment of the Boma health committee

At health facility level, the MOH/GOSS requires staff (clinical officers, medical assistants, nurses, midwives, public health officers and inspectors, and community health workers, etc.) to provide routine immunization services as part of their job responsibilities. Where no such staff is available, the county health department assigns, trains, supervises, and pays incentive to immunization service providers.

G.4 Organization of routine immunization activities

MOH/GOSS policy requires that the method used to provide immunization services in each community is identified (see also Annex 10). The method used will depend on population density, access, staffing, type of cold chain equipment and available resources. The MOH/GOSS/EPI organizes services and activities as follows.

G.4.1 Static site routine immunization services (PHCU, PHCC, hospitals)

Facilities with refrigerators

Health facilities with high catchment area population that live within two (2) kilometres of the health facility, and a functioning refrigerator, will provide immunization services on a daily basis using all five EPI antigens.

For health facilities with a smaller catchment population base, immunization days will be based on designated maternal and/or child health service days conducted at least once a month (more
often if population base requires). All children and women eligible for immunization will be vaccinated on the designated day(s).

Health care workers will follow the “Open Multi-Dose Vial Policy” as described in section E8.

In all facilities which provide delivery services and have refrigerators, newborns will be immunized at birth with tOPV and BCG vaccines.

In facilities with refrigerators that provide integrated management of childhood illnesses (IMCI), eligible children and mothers will be immunized at clinic according to IMCI protocols.

The state/county EPI will support the transport of vaccine and immunization materials and provide assistance for refrigerator’ running-costs and repairs.

**Facilities without refrigerators**

Health facilities without refrigerators will routinely pick up (or be supplied) with vaccine in a vaccine carrier or small cold box. All children and women eligible for immunization will be vaccinated on a designated maternal and/or child health day at least once a month depending on the catchment area population and logistics arrangements. All five EPI antigens will be available.

The state/county EPI will support the transport of vaccine and immunization materials to the facility.

**G.4.2 Outreach site routine immunization services**

Outreach services provide immunization services (all five antigens) to selected communities in a health facility catchment area that are beyond a reasonable walking distance from the health facility for mothers with young children.

- Outreach sessions are usually not provided at the same location more than one time per month. For example if a health facility with a refrigerator conducts one outreach session per week it can reach four different outreach locations in a month. Note: the number of outreach sessions at any one location depends on the population base of the outreach
site and the number of outreach sites in the catchment area. For example, if there are 8 suitable outreach sites (and staff conduct outreach once a week), the schedule could be to visit each site once every two months.

- Sessions are planned and organized with the community and occur on regular scheduled days. Notice must always be sent to the community at least one day prior to the service day.

- Village Health Committees are expected to prepare the immunization site, mobilize caretakers to come for service, and assist the health worker with service delivery.

- Outreach services are normally conducted by at least two staff from the health facility and should include other health interventions (e.g. distribution of vitamin A supplements, de-worming tablets, etc).

- The state/county EPI will support the movement of staff, vaccine, immunization materials, and other supplies through provision of a bicycle and/or transport costs for motor bikes, bicycles, canoe, donkeys, and porters (where commercial service is available).

G.4.3 Accelerated routine immunization activities (pulse activities)

Accelerated routine immunization activities (pulse campaigns) will be used to cover areas not served by routine immunization services.

Pulse campaigns are normally conducted from the county level. Special arrangements for sufficient frozen icepacks, cold chain equipment, vaccine and immunization supplies, staff incentives and transportation will be made by the MOH/GOSS. Social mobilizers will make announcements about the vaccination dates and provide information about benefits of immunization.

G.5 Integrated services

Routine immunization services should be the platform for provision of additional services. It is MOH/GOSS policy to provide vitamin A supplementation to children over six months of age when they come
for immunization. The specific age, dose and interval guidelines for routine vitamin A supplementation are given in Annex 7.

**G.6 Transport support for RI activities**

The GOSS, supported by partners as needed will provide transport (vehicles, motorcycles, bicycles) to central, state, county and facility levels for EPI operations. The transport is assigned through a “Memorandum of Understanding” (MOU) to specific positions (e.g. County EPI Supervisor) for vaccine distribution and supervision. It is MOH/GOSS policy to withdraw the assigned transport if the terms of the MOU are not met.

The most efficient transport for vaccine distribution and supervision is organization of local transport. MOH/GOSS will provide:

- Commercial transport costs (seat in a local commercial vehicle) for vaccine distribution and supervisory tasks.
- “Courier payments” for transport of vaccine by commercial vehicle or bicycle.
- Fuel/maintenance costs for a supervisor’s motorcycle, when used for scheduled vaccine distribution and supervision.

**G.7 High quality of service**

The MOH/GOSS will achieve high-quality service through:

Distribution of clear policies, service guidelines and job-aids:

- A policy document available at each administrative level
- Service guidelines available at all administrative and supervisory levels
- Immunization job-aids available at all static immunization sites

Regular training of health workers in all aspects of immunisation service management and service delivery (see section G.11).

Support-supervision of EPI management and service delivery using objective checklists and comparative checklist summaries (see Annex 10, section 10.2).
Routine collection and analysis of RI quality-assurance data at each level (central, state and county) for feedback and corrective action.

Routine collection and analysis of coverage data at each administrative level for feedback and corrective action

G.8 Non-government and private sector immunization services

The MOH/GOSS recognizes the role of non-government organizations (NGOs) and the private sector in the provision of immunization services. Vaccines and safe-injection materials will be made available free of cost to GOSS-approved NGOs and GOSS-approved private health facilities provided that:

- All NGOs providing PHC services will provide EPI services
- NGOs and the private sector use the same policies, programme guidelines, monitoring procedures, programme formats and training materials as those used by the government services
- Only vaccines received through the MOH/GOSS/UNICEF procurement are used
- Only AD vaccination equipment provided through the MOH/GOSS/UNICEF procurement system are used
- Immunizations are given with vaccine handled according to MOH/GOSS guidelines and according to MOH/GOSS administration guidelines
- Used immunization materials are discarded as per MOH/GOSS guidelines
- Immunizations given are recorded and reported on MOH/GOSS registers, tally sheets, immunization cards and reporting formats
- Immunizations administered are reported through the County Health Department of the area in which the NGO/private sector health facility operates
- Immunizations are administered free of charge to the public.

NGO and private immunization programme management and services are subject to the same supervisory process and checklists as used for government services.
G.9 Community participation and social mobilization

Communities are the main stakeholders and partners in the routine immunisation programme. The MOH/GOSS engages communities in support of immunization activities through:

- The Health Promotion Department of the PHC Directorate,
- The Community-Based Health Care initiative, and
- The EPI’s Reach-Every-County strategy (Annex 10)

The policies and procedures of the MOH/GOSS Health Promotion Department will guide communication and social mobilization activities. Communication materials will be designed centrally.

State Governors, County Commissioners, religious and civic leaders, boma and village leaders are critical to programme success. It is MOH/GOSS policy to involve these leaders in programme development and provide regular feedback to them for action:

State Governors and County Commissioners will receive graphic feedback of EPI performance in their jurisdiction twice a year (see section G.3).

At the community level, leaders and village health committees will be empowered and directly involved in the planning, organization and mobilization for static, outreach and mobile immunization service delivery.

G.10 Assignment and support of staff

All BPHNS cadre of health staff (including clinical officers, medical doctors, medical assistants, nurses, health visitors, midwives, public health officers and inspectors, and community health workers) are to provide immunization services as part of their normal duties in all health facilities in Southern Sudan. At least two persons in each health facility will be assigned to give vaccinations at any given time.

Where no staffs are available the State Ministry of Health (SMOH/GOSS) will identify and assign volunteers to work as vaccinators. Volunteers may be previous staff of NGOs, health staff not yet employed by the MOH/GOSS or other competent local
community members who are capable of providing routine immunization services.

All persons providing routine immunization must be trained prior to starting work, be regularly supervised and provided with periodic refresher training. They will receive remuneration according to their terms of service.

**G.11 Capacity building (including supportive supervision)**

Training on routine immunization will be continuous and implemented at all levels. Training includes pre-service, in-service and on-the-job training:

**Pre-service training** on immunization will be given in health training schools including institutions for nursing, medical assistants and community health workers. The primary material used in pre-service training is WHO’s “Immunization in Practice” modules.

**Regular in-service** training will be given to health workers in all aspects of immunisation management and service delivery: RI supervisors and RI vaccinators are i) trained using the “Immunization in Practice” modules and ii) receive a minimum of two-days refresher training two times year

Cold Chain operators/assistants receive i) initial training using the cold chain module (Immunization in Practice) and receive ii) a minimum of two-day refresher training per year.

State EPI Officers receive initial training using the “Immunization in Practice” modules and Reach-Every-County (REC) materials. They attend a Southern Sudan review and refresher training activity at least three times per year using policy, technical guidelines, selected mid-level management (MLM) materials and REC guidelines.

MOH/GOSS EPI staffs and selected State EPI Officers will receive periodic technical up-dates and training at central and international levels.

**On-the-job training (OJT)** of vaccinators and supervisors, with particular emphasis on the quality of service delivery, is a standard task for management and higher-level supervisors. The content of OJT is the issues identified by supervisors using objective management and service delivery support-supervision
checklists (see Annex 10, section 10.2). Training-needs will be routinely identified using checklist summaries.

**G.12 RI programme monitoring**

“Monitoring” is the regular review/calculation of selected data for measuring performance and taking action. Monitoring of EPI performance data takes place at all levels (central, state, county, service delivery point). There are three major data-areas (and processes) for measuring immunization programme performance:

Monitoring “immunization coverage” through the PHC/EPI reporting system:

- Each routine immunization administered must be recorded in three places (immunization register, tally sheet and immunization card)
- All data will be reported monthly on a standard MOH/GOSS/EPI reporting form (routine coverage data and accelerated routine coverage data reported separately)
- Data is collated, analyzed and used at each administrative level

Monitoring EPI “management and service-delivery quality” through the PHC/EPI support-supervision system:

- Support-supervision must be scheduled at each level
- Standard checklists and checklist summaries, which collect/collate objective quality-assurance data, used for each level
- Data analyzed and used at each administrative level
- Defaulter tracking mechanism will be strengthened to reduce drop-out rate.

Monitoring disease incidence through the Department of Preventative Medicine/Disease Surveillance system:

- Standard forms used for recording and reporting
- Action taken at each level based on surveillance guidelines
The minimum EPI monitoring indicators are (see Annex 10, section 10.4.2):

**Immunization coverage indicators:**
- Immunization coverage figures for all antigens/doses
- DPT1, DPT3 and measles coverage of children less than one year
- DPT1 to DPT3 dropout rates in children less than one year of age
- TT 2+ coverage of pregnant women

**Quality of management and service delivery indicators:**
- Quality-of-service at RI service delivery sites
- Quality-of-management and cold chain/vaccine handling at each administrative level (health facility, county and state)

**Disease incidence indicators:**
- Confirmed poliomyelitis cases
- Outbreaks and/or cases of measles, maternal and neonatal tetanus etc.

**G.13  EPI coverage-achievement reporting and feedback**

The MOH/GOSS will report EPI performance at least twice per year as follows:

- Send to the Office of the President a comparative and ranked % DPT3 cumulative-coverage graph of 10-State performance with an explanatory paragraph (as an indicator of state health system performance)

- Publish in the major newspapers a comparative and ranked % DPT3 cumulative-coverage graph of 10-State performance with an explanatory paragraph (as an indicator of state’s ability to protect its women and children)

- Give the State Governors:
  - A comparative and ranked % DPT3 cumulative coverage graph of 10-State performance
  - A comparative and ranked % DPT3 cumulative coverage graph of their counties’ performance

- Give County Commissioners:
  - The comparative and ranked % DPT3 cumulative coverage graph of counties’ performance in the state
In addition, County Commissioners should have a cumulative EPI coverage line-graph on the wall of their office that is maintained by the County EPI supervisor.
H. RI Implementation Strategy

The Ministry of Health (MOH/GOSS) and partners have selected the RED (Reach-Every-District) strategy to implement routine immunization services. In adapting RED for the Southern Sudan, the strategy has been modified and renamed the Reach-Every-County (REC) strategy. The REC strategy is the basis for organizing and managing the two complimentary routine immunization approaches:

- Expanding BPHNS routine immunization static and outreach services
- Implementing periodic accelerated routine immunization pulse activities

The REC strategy divides health facility catchment areas (and the County) into areas where routine immunization services should be conducted and areas where pulse campaigns must be used for the present.

REC also details the process for building and expanding BPHNS/RI services. The County EPI Supervisor, supported by the County Medical Officer and assisted by the State EPI Officer, implements five “operational components” which are the core practices needed to strengthen RI. The five REC components are:

1. Establish [static and] outreach services
2. Conduct support supervision
3. Link services with communities
4. Monitor and use data for action
5. Plan and manage resources

The five REC operational components are implemented and/or strengthened through a defined set of activities and tasks at each planning level:

- Primary Health Care Centre (PHCC) catchment area with its constituent Primary Health Care Units (PHCUs).
- County management level
- State support level

Guidelines for implementation of the major steps and tasks of the REC strategy are summarized in Annex 10.
The MOH/GOSS/EPI policy document will be formally reviewed three years from the date of its approval by the Executive Board of MOH/GOSS.
I. **Key Documents Reviewed**  
(for the development of the immunization policy)

1. CPA, 2005, Comprehensive Peace Agreement.
10. WHO/IVB/08.01, Cold chain, vaccines and safe-injection equipment management, Training for mid-level managers (MLM).
12. WHO/IVB/08.03, Immunization safety, Training for mid-level managers (MLM).
<table>
<thead>
<tr>
<th>ANNEX</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Administration of Vaccines</td>
</tr>
<tr>
<td>2</td>
<td>Contraindications to Immunization</td>
</tr>
<tr>
<td>3</td>
<td>Side Effects and Adverse Events</td>
</tr>
<tr>
<td>4</td>
<td>Open/Multi-Dose Vial Policy</td>
</tr>
<tr>
<td>5</td>
<td>Cold Chain, Vaccine and Safe-Injection Supplies</td>
</tr>
<tr>
<td>6</td>
<td>Safe Injections and Safe Disposal</td>
</tr>
<tr>
<td>7</td>
<td>Provision of Vitamin A Supplements</td>
</tr>
<tr>
<td>8</td>
<td>Disease Control Methodologies and Tasks</td>
</tr>
<tr>
<td>9</td>
<td>Basic Package of Health and Nutrition Services RI Guidelines</td>
</tr>
<tr>
<td>10</td>
<td>REC Implementation Guidelines</td>
</tr>
<tr>
<td>11</td>
<td>Organizational structure of EPI</td>
</tr>
</tbody>
</table>
ANNEX 1 – Administration of Vaccines

The Expanded Programme on Immunization (EPI) is aimed at the following target populations:

- All children under 1 year of age (0-11 months)
- All women of childbearing age (including pregnant women)

The recommended EPI vaccines are the following:

- **BCG**  Bacillus Calmette-Guerin
- **tOPV** (Trivalent) Oral Polio Vaccine
- **DTP**  Diphtheria, Tetanus and Pertussis
- **Measles**  Measles
- **TT**  Tetanus Toxoid (for women of child-bearing age)

1. **CHILD IMMUNIZATION**

a. Child immunization schedule:

### Immunization Schedule for Children less than one year of age

<table>
<thead>
<tr>
<th>Type of vaccine</th>
<th>When administered</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCG</td>
<td>At birth (or as soon as possible after birth) up to 1st birthday</td>
</tr>
</tbody>
</table>
| tOPV-0          | At birth (or as soon as possible after birth) *
| OPV1, DTP1      | At 6 weeks (or as soon as possible after 6 weeks of age) |
| OPV2, DTP2      | At 10 weeks (or 4 weeks after OPV1, DTP1) |
| OPV3, DTP3      | At 14 weeks (or 4 weeks after OPV2, DTP2) |
| Measles         | At nine months (or as soon after 9 months as possible) |
Notes:

- Give tOPV-0 within 2 weeks of birth. If given later, it delays the first dose of tOPV1 to be given at 6 weeks of age along with DTP1.
- BCG should be given at birth or as early in life as possible normally up to the 1st birthday.
- The first dose of DTP should not be given when an infant is less than 6 weeks of age due to sub-optimal antibody response.
- tOPV1 and DTP1 should be given at 6 weeks of age or as soon as possible after 6 weeks of age.
- The interval between doses of DTP and tOPV should be at least 4 weeks. In cases where the next dose of DTP and/or tOPV is delayed there is no need to repeat the (previous) dose. Give the next dose no matter how long the interval.
- All EPI antigens are safe to be given simultaneously on the same day, but should be administered at different injection sites (do not give two antigens in the same limb).
- Measles vaccine should be given at 9 months or as soon as possible after 9 months of age.
- All child immunizations should be recorded on a tally sheet, in the register with date of immunization, and on an immunization card.
- If a child fails to come back for his/her subsequent dose of DTP or tOPV as scheduled, or if he/she fails to return for the Measles immunization at nine months of age, it is the responsibility of the health staff to follow up and give the appropriate dose as soon as possible until the child completes the full course of the immunization.

b. Children over one year of age:

- Children who have not completed the primary series by their first birthday will be followed-up to finalize the series.
- The programme will generally not start the primary series for children who have passed their first birthday.
2. **WOMEN OF CHILD-BEARING AGE**  
(15-49 years of age)

The immunization schedule for women of child-bearing age, for immunization with Tetanus Toxoid (TT) vaccine is given in the table below:

<table>
<thead>
<tr>
<th>Dose</th>
<th>When Administered</th>
<th>Duration of Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>TT-1</td>
<td>At first contact, or as early as possible during pregnancy</td>
<td>None</td>
</tr>
<tr>
<td>TT-2</td>
<td>At least 4 weeks after TT1</td>
<td>3 years</td>
</tr>
<tr>
<td>TT-3</td>
<td>At least 6 months after TT2 or during next pregnancy</td>
<td>5 years</td>
</tr>
<tr>
<td>TT-4</td>
<td>At least one year after TT3 or during next pregnancy</td>
<td>10 years</td>
</tr>
<tr>
<td>TT-5</td>
<td>At least one year after TT4 or during next pregnancy</td>
<td>Life-long</td>
</tr>
</tbody>
</table>

3. **VACCINATION DOSES AND SITES**  
(CHILDREN & WOMEN)

Each vaccine has its specific dose, site of immunization and method of administration. The following chart summarizes MOH guidelines for administration of the EPI vaccines:

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Dosage</th>
<th>Site</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCG</td>
<td>0.05 ml</td>
<td>Left outer forearm</td>
<td>Intradermal</td>
</tr>
<tr>
<td>tOPV</td>
<td>2 drops</td>
<td>Mouth</td>
<td>Oral</td>
</tr>
<tr>
<td>DTP</td>
<td>0.5 ml</td>
<td>Outer thigh</td>
<td>Intramuscular</td>
</tr>
<tr>
<td>Measles</td>
<td>0.5 ml</td>
<td>Right upper-arm</td>
<td>Subcutaneous</td>
</tr>
<tr>
<td>TT (Women)</td>
<td>0.5 ml</td>
<td>Upper arm</td>
<td>Intramuscular</td>
</tr>
</tbody>
</table>
ANNEX 2 – Contraindications to Immunization

There are few valid contraindications to immunization. All infants should be immunized except in these rare situations:

1. Anaphylaxis or a severe hypersensitivity reaction is an absolute contraindication to subsequent doses of a vaccine. Persons with a known allergy to a vaccine component should not be vaccinated.

2. Do not give BCG (or Yellow Fever vaccine) to any child who exhibits the signs and symptoms of AIDS.

3. If a parent strongly objects to an immunization for a sick child, do not give the immunization. Ask the mother to come back when the child is well.

Immunize Sick Children

It is safe and effective to immunize children even if they are ill. Young children have many illnesses, and immunization is often delayed. Many children catch one of the target diseases because they missed being immunized due to illness.

Children with a mild illness: immunize them as usual.

Children with a fever: immunize them as usual. You can give any vaccine, including DTP — there is no danger from adding the reaction to vaccine to a moderate fever (fever <38.5 degrees centigrade).

Children who need to be hospitalized or children with a very high fever: immunize them when the general condition improves. A senior health worker should decide for each individual child. Remember that sick children need protection against diseases that they may catch in hospital, especially measles.

Malnourished children: they must be immunized — they can develop good immunity although they are malnourished. They are more likely than other children to die from the diseases (especially from measles).
The following conditions are **NOT** contraindications to immunization:

- Allergy or asthma (except if there is a known allergy to a specific component of the vaccine);
- Any minor illness, such as respiratory tract infections or diarrhoea;
- Illness with temperature below 38.5 °C;
- Family history of adverse events following immunization;
- Family history of convulsions, seizures, or fits;
- Treatment with antibiotics;
- Child being breastfed;
- Chronic illnesses (e.g. chronic diseases of the heart, lung, kidney, liver);
- Stable neurological conditions (e.g. cerebral palsy or Down’s Syndrome);
- Premature or low birth-weight (vaccination should not be postponed);
- Recent or imminent surgery;
- History of jaundice at birth.
ANNEX 3 - Side Effects and Adverse Events

Potential Side Effects

There can be side effects (reactions) to immunization. Always explain to caretakers about the potential side effects of immunization and what to do about them. Advise the caretakers on how to tell when they need to bring a child to the health centre or hospital in case of a rare, serious side effect (“adverse event”). When giving immunization, EPI guidelines require that the vaccinator:

- Explain which disease or diseases the vaccine prevents.
- Reassure the parent that reactions are common and not a threat to the child (the normal reactions show that the child is responding to the vaccine).
- If the child suffers fever, pain, or swelling at the injection site, or is irritable, loses his or her appetite, or is “off colour”:
  - Give extra fluids (more breastfeeds if child is under 6 months; additional breastfeeds and clean water to drink if child is over 6 months of age).
  - Paracetamol may be given — one 100 mg tablet crushed, three times in 24 hours (every 8 hours).
  - Keep pressure off the injection site(s).
  - Place a cloth dampened with cool, clean water on the injection site.
- Tell the parent to bring the child to the health centre if its’ condition gets worse or the reaction continues for more than a day or two.

Potential side-effects after giving BCG vaccine:

- Explain to the parent that the flat-topped sore on the child’s arm is normal and indicates that the vaccine is working.
- Ask the parent to bring the child back if he or she develops any side effects such as abscesses or enlarged glands.

Potential side-effects after measles vaccine:

- A rash or fever may develop after 6–12 days.
- Other people will not catch the rash and it goes away.
- Give extra fluids and keep child cool.
Adverse Events Following Immunization (AEFI)

An “adverse event” following immunization (AEFI) is defined as “a medical incident that takes place after immunization which causes concern and is believed to be caused by immunization.”

An AEFI is not necessarily a vaccine reaction. It can be coincidental (simply happening some time after immunization) but have absolutely nothing to do with the vaccination. Each adverse event should be investigated and efforts made to determine its cause. The detection of adverse events should be followed by appropriate treatment and communications with parents, health workers and the community. If the adverse event was determined to be due to programme errors, operational problems must be solved through appropriate training and supervision. The immunization programme in all counties and states should monitor at least the following AEFIs:

- All injection site abscesses
- Cases of BCG lymphadenitis
- Severe or unusual medical incidents that are thought by health workers, or the public, to be related to immunization
- All cases requiring hospitalization that are thought by health workers, or the public, to be related to immunization
- All deaths that are thought by health workers, or the public, to be related to immunization.

All reported AEFIs should receive immediate attention and should be reported as soon as they are detected through the County Medical Officer to the State EPI Officer (and in turn to the EPI Director).

Investigations of AEFI should begin within 24 hours of detection. The preliminary investigation can be made by the health worker who detected the AEFI and information forwarded to his/her supervisor for follow-up using a standard AEFI reporting form.
ANNEX 4 – Open/Multi-Dose Vial Policy

The open-multi dose vial policy has the potential to reduce vaccine wastage rates by up to 30%, resulting in a significant savings in vaccine costs. The policy is as follows.

**tOPV, DTP and TT**

1. Multiple-dose vials of tOPV, DTP, and TT from which one or more doses of vaccine have been removed during an immunization session at a **static immunization site (health facility)** may be used in subsequent immunization sessions for up to a maximum of 4 weeks, provided that all of the following conditions are met:
   - The expiry date has not passed.
   - The vaccines are stored under appropriate cold chain conditions (between +2 °C and +8 °C).
   - The vaccine vial septum has not been submerged in water.
   - Aseptic technique has been used to withdraw all doses.
   - The vaccine vial monitor (VVM) is attached and has not reached the discard point.
   - The vials have been marked with the date they were opened (in order to track the 4-week use-period).

2. Multiple-dose vials of tOPV, DTP, and TT vaccines from which one or more doses of vaccine have been removed during an **outreach immunization session** MUST BE DISCARDED at the end of the day.

**BCG and Measles vaccines**

Reconstituted vials of BCG and Measles vaccines MUST BE DISCARDED at the end of each immunization session or at the end of six hours (whichever comes first).

**All vaccines**

An opened vial of any vaccine MUST BE DISCARDED immediately if:
   - Sterile procedures have not been followed OR
   - The presence of floating particles or a change in the appearance of the vaccine shows that it has been contaminated OR
• It is suspected that the vaccine has been contaminated OR
• It is suspected that the vaccine in the vial has been exposed to unacceptably high temperatures (or has been frozen in the case of DTP and TT)
• If the vaccine vial monitor on a vial shows that the vaccine has been exposed to unacceptably high temperature (stage 3 or 4).

REMEMBER:

• Opened vials that are kept after an immunization session at a health facility must be dated (the date the vial is opened is to be written on the label). The vial will be kept in a special box marked “returned” in the refrigerator. This vaccine should be used before any others during the next session.

• Do not store reconstituted vaccine in the refrigerator (discard after session).
ANNEX 5 - Cold Chain, Vaccine & Safe-Injection Supplies

A. Vaccines

All vaccines are sensitive to heat; they need to be stored within recommended temperature ranges. Vaccine should be stored with 25% buffer stock at each level. The First-in First-out rule must be followed. However, if any vaccine is nearer expiry date or the VVM is darker than the others, it should be used first. Maximum storage times for vaccines and minimum stock levels are:

<table>
<thead>
<tr>
<th>Administrative Level</th>
<th>Maximum Storage time</th>
<th>Minimum Stock level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central cold store</td>
<td>12 months</td>
<td>3 months supply</td>
</tr>
<tr>
<td>State cold store</td>
<td>3 months</td>
<td>1 month supply</td>
</tr>
<tr>
<td>County cold store</td>
<td>1.5 months</td>
<td>2 weeks supply</td>
</tr>
<tr>
<td>Health facility fridge</td>
<td>1 month</td>
<td>1 week supply</td>
</tr>
</tbody>
</table>

Vaccine storage temperature

<table>
<thead>
<tr>
<th>Vaccine Stock</th>
<th>Central Cold Store</th>
<th>State Cold Store</th>
<th>County Cold Store</th>
<th>PHCC/PHCU (if fridge is available)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPV</td>
<td>-15°C to -25°C</td>
<td></td>
<td>Store at +2°C to +8°C.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OPV is the only vaccine that can safely be frozen and unfrozen repeatedly.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCG, Measles</td>
<td>Store these vaccines* at</td>
<td></td>
<td>Store at +2°C to +8°C.</td>
<td></td>
</tr>
<tr>
<td>DTP, TT</td>
<td>+2°C to +8°C Centigrade (must never be frozen)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* In exceptional circumstances they can be temporarily stored at -15°C to -25°C (e.g. if there is a temporary shortage of storage space). Never freeze diluents.
B. Diluents

Diluents must NEVER be frozen.

- When a manufacturer supplies a freeze dried vaccine packed together with its diluents, always store the combined products at between +2°C and +8°C.
- Where space permits, separated diluents may safely be stored in the cold chain at between +2°C and +8°C.
- If space does not permit, it is safe to transport and store the separated diluents outside of the cold chain.
- Prior to use of the diluents for reconstitution, diluents must be cooled to between +2°C and +8°C.
- The vaccine should always be reconstituted with the diluents provided by the manufacturer for that same vaccine.

C. Vaccine Storage at the County, Payam and Facility level

The upper compartment of an “upright” refrigerator is the freezer compartment. It is used only for freezing and storing icepacks. The middle compartment of the refrigerator compartment is for storage of vaccine.

- No EPI vaccines should be placed or stored in the freezing compartment of a refrigerator.

- The middle compartment of the refrigerator is for storage of vaccines and diluents. Temperature in this compartment should be between +2°C and +8°C.

- All RI vaccines (tOPV, DTP, BCG, Measles, and TT) should be kept in the main compartment of the up-right refrigerator at a temperature between +2°C and +8°C. (see illustration that follows)

- If an ice-line refrigerator (ILR) is available at the county, payam or facility level, all RI vaccines should be kept in the ILR. Even if a deep freezer is available, do not use the deep freezer for storing RI vaccines.
Proper vaccine storage in an upright, front loading refrigerator

D. Dos and Don’ts

Refrigerator/Freezer

1. Front-loading refrigerators usually have the cooling unit on the top. The top of the refrigerator is the coldest part:
   - Store tOPV and Measles vaccine on the top shelf of the main compartment.
   - Store freeze-sensitive vaccines (DTP, TT) and BCG on the middle shelf in the refrigerator.
   - Keep unfrozen icepacks in the bottom shelf of the main compartment.

2. The temperature at the bottom portion of top-loading refrigerators and ice-lined refrigerators (ILR) sometimes falls below 0 °C.
   - Store tOPV, BCG, and Measles vaccines at the bottom of the ILR.
• DTP and TT vaccines should not be stored in the bottom part or touching the inside wall of ILRs. Store these vaccines in the baskets at the top.

3. All vaccines will be stored by kind (not mixed together) with air space around the boxes/vials to allow the circulation of cold air.

4. In the case of refrigerators to which vaccines are returned after use, there will be a separate, marked box in which to keep the returned vials.

5. Never freeze diluents. Diluents do not need to be stored in the refrigerator. However, they should be between +2°C and +8°C at the time of reconstitution. Place the required quantity of diluents in the refrigerator/ILR one day ahead of the immunization session.

6. The following vaccines may not be stored in cold chain equipment:
   • Expired vaccine
   • Vaccine with VVMs at Stage 3 or Stage 4
   • Vaccines without readable labels or VVMs
   • Vaccines suspected of having been frozen
   • Reconstituted vaccines (BCG, Measles)

7. Do NOT keep any food, drinks or drugs in a vaccine refrigerator.

8. Do not store vaccines on the door shelves of a refrigerator.

**Cold Boxes**

1. Temperature in a cold box is to be kept between +2°C and +8°C.
2. DTP and TT vaccines are sensitive or damaged by freezing. Ice packs should be conditioned before loading vaccines in a cold box and vaccine carrier. **NOTE: Conditioning means leaving ice packs out of the freezer until you can hear a slight amount of water inside when you shake the ice pack.**
3. Avoid opening the lid when not necessary.
4. Keep a thermometer with the vaccines.

**Vaccine Carriers**

1. Temperature in a vaccine carrier (VC) is to be kept between +2°C and +8°C.
2. “Condition” icepacks before using in a vaccine carrier
3. Vaccine carriers are provided with a foam pad with slits which safely hold opened vials in use during a session and protect the unopened vials inside the carrier. All VCs used in RI must have an undamaged foam pad.

E. Use of solar refrigeration equipment

Solar powered refrigerators are useful for remote areas that have no access to power grids, gas or kerosene. The GOSS/MOH will procure only a limited number of such units based on the following global experience:

- High initial cost: purchase price and installation costs;
- High cost of battery and regulator replacement: batteries need to be replaced every two to three years;
- Daily attention that must be given to battery condition and cleaning the solar panels;
- High maintenance repair costs: specialized technical support is needed.

F. Use of vaccine vial monitors and vaccine quality tests

The MOH will train health workers and use vaccine vial monitors and tests to improve quality of services and reduce costs due to vaccine wastage.

Vaccine Vial Monitor:

The vaccine vial monitor (VVM) is a heat-sensitive device attached to vaccine vials which gradually and irreversibly changes colour, from light to dark, as the vaccine is exposed to heat. It warns the health worker when a vial of vaccine should be discarded because the vaccine is likely to have been degraded by exposure to heat. Vaccine vials that have VVMs at Stage 3 and Stage 4 must be discarded.
Reading the Vaccine Vial Monitor (VVM)

| Stage 1: the inner square is much lighter than the outer ring (and the expiry date has not passed) | ✓ Ok to use |
| Stage 2: the inner square is somewhat lighter than the outer ring (and the expiry date has not passed) | ✓ Ok to use |
| Stage 3: the inner square is the same color as the outer ring | ✗ Do not use |
| Stage 4: the inner square is darker than the outer ring | ✗ Do not use |

"Shake Test" to identify vaccines that have been frozen

The "shake test" is used to test if DTP and TT have been frozen during storage or transportation. If the "shake test" indicates that vaccine has been frozen it should not be used and the vaccine discarded. The procedure to conduct a "shake" test is given below:

To perform the shake test, take a vaccine vial of the same type, manufacturer and batch number as the vaccine vial you want to test. Freeze the vial until the contents are solid (store at -10°C for 10 hours) and then let it thaw. This vial is the "control" sample and should be labelled "frozen" to avoid confusion.

Then take a vaccine vial from the batch you suspect has been frozen (this is the "test" sample). Vigorously shake the test and control vials for ten seconds, place both on a flat surface, and observe them over the following 20 minutes.

View both samples against the light and compare the rate of sedimentation (see the picture that follows):
• If the test sample shows a much slower sedimentation rate than the control sample, the test sample has probably not been frozen and may be used.

• If the sedimentation rate in the two vials is similar and the test sample contains flakes, the test sample has probably been damaged by freezing and the vaccine should be withdrawn from use.

**Shake Test Procedures**

<table>
<thead>
<tr>
<th>Deliberately Frozen Control Vial</th>
<th>Suspect Test vial</th>
</tr>
</thead>
<tbody>
<tr>
<td>almost clear</td>
<td>USE THIS VACCINE</td>
</tr>
<tr>
<td>thick sediment</td>
<td><em><strong>DO NOT USE</strong></em></td>
</tr>
</tbody>
</table>

USE THIS VACCINE
If the sediments in the suspect vial settle more slowly, the suspect vaccine may be used.

DO NOT USE THIS VACCINE
If the sediments in the suspect vial settle at the same rate, the suspect vaccine may NOT be used.

**G. Cold chain and vaccine management**

At each level of the cold chain at least one person (plus an alternative person in case the first is absent) will be assigned to manage vaccine storage.

• Storage temperature will be recorded twice a day, once in the morning and once in afternoon, for all refrigerators/freezers containing vaccine.
• A vaccine stock register will record all vaccine transactions (receipt, issue, return and balance). The register will be kept up-to-date and reflect the actual number of vials in the refrigerator/freezer.

If the cold chain equipment is not functioning, the responsible person will report verbally and in writing to the next supervisory level. The county/state will inform the GOSS/MOH EPI unit in writing for necessary action.

EPI cold chain technicians and assigned supervisors will conduct regular supervision in the field to assess (and document) the status of all cold chain equipment. An up-to-date inventory will be kept of all cold chain equipment (generators, ice-pack freezers, freezers, ILRs, refrigerators, cold boxes, vaccine carriers and icepacks) and their functional status.

MOH/EPI repair technicians will assist states to identify and arrange local repair services for cold chain equipment on a fee-for-service basis. The EPI repair technicians will provide quality-assurance and advanced technical assistance to states as required.

H. Management of immunization supplies

Syringes/needles used to give injections are to be auto-disable (AD) type. They are supplied in two formats—one for BCG injections and the other for all other EPI injectable vaccines. These two types of ADs will be stored in separate places on a shelf or in boxes.

In addition, the EPI will supply sterile “reconstitution” syringes/needles to be used for safe reconstitution of freeze-dried BCG and Measles vaccines with their specific diluents (one new sterile syringe/needle for each vial). These syringes/needles will also be kept neatly in their separate place.

Other immunization supplies (safety boxes, registers, forms, cards, etc.) will be stored neatly with the syringes/needles.

The person responsible for the cold chain will:

• Maintain a stock record of the three types of syringes/needles (by receipt, issue and balance).

• Maintain a stock record of the other main supplies (safety boxes, registers, forms, cards, etc.).
ANNEX 6 – Safe Injections & Safe Disposal

An injection is considered safe for the:

Mother or child, when a health worker uses an AD sterile syringe and sterile needle, correct injection technique and potent vaccine for each immunization.

Health worker, when he or she avoids needle-stick injuries.

Community, when waste created by used injection equipment is disposed of correctly and does not cause harmful pollution and injuries.

A. Safe injections for mothers and children

Wash hands before the immunization session. Wash hands between clients when possible.

Prepare injections in a clean area where there has been no blood or body fluid. Prepare each dose immediately before administering (do not prepare several syringes in advance).

Never leave the needle in the top of the vaccine vial.

Follow safe procedures to reconstitute vaccines.

Make sure you have the CORRECT diluents for each freeze-dried vaccine — check that both diluents and vaccine come from the same manufacturer.

When reconstituting, both the vaccine and the diluents must be at the same temperature (between +2 °C and +8 °C).

Use a new sterile syringe and needle to reconstitute each vial of vaccine. Use the amount of diluents specified by the manufacturer to reconstitute the vaccine provided for the vial. After use, dispose of the reconstitution syringe and needle into a safety box without recapping.

NOTE: all reconstituted vaccines should be discarded at the end of the session or after six hours, whichever happens first.

When giving an immunization, use a sterile AD syringe and needle for every injection.

When giving an immunization, any part of the syringe that you touch becomes contaminated. Do not touch the adaptor, shaft or bevel
of the needle. Discard a needle that has touched any non-sterile surface.

Position each child correctly for injections and ensure the caretaker controls the movements of the child. Unexpected motion at the time of injection can lead to accidental needle-sticks.

B. Prevent needle-stick injuries and infections

Needles frequently injure health workers. Small amounts of blood infected with hepatitis B, hepatitis C, HIV, or other viruses can be transmitted by needle-stick injuries. Simple steps health workers can follow to reduce the risk of needle-stick injuries include:

1. Allow only one woman/child at a time in a health worker’s workspace.
2. Place a safety box close to where vaccinations are given so used syringes and needles can be put directly into a safety box without setting them down.
3. Do not recap the needle after immunization. Immediately after the immunization, place the used syringe/needle into the safety box.
4. Close the safety box securely when it is three-quarters full (about 100 AD syringes).

C. Dispose used syringes & needles

1. All used injection equipment should be placed in a safety box immediately after use.
2. Used syringes and needles must NEVER be dumped in open areas where people might step on them or children find them. They should never be disposed of along with other kinds of waste.
3. The following methods can be used to destroy filled safety boxes or to keep them away from people. Make sure a qualified staff member supervises the process. Do not leave this vital task to unqualified people.
**Incinerate**

Where possible, use an incinerator to destroy syringes and needles. Properly functioning incinerators ensure the most complete destruction of syringes and needles. The area in which incineration takes place must be fenced off from the rest of the compound. Staff conducting the incineration should wear gloves.

**Burn and bury in a pit**

Used injection equipment may be burned and buried in a disposal pit. Choose the site carefully and dig a pit large and deep enough for bulky boxes. Choose a site where people will not dig or establish latrines in the future.

- Clear the area. Fence the area if possible.
- Dig a pit **at least two meters** deep.
- Take the filled safety boxes to the pit site just before burning. Do not open or empty the boxes.
- Place the filled safety boxes in the pit and burn until all boxes are completely destroyed.
- Cover the boxes with at least 30 cm of soil.

**Note:** the top of the burned material in a pit should always be at least 0.5 meters below ground level.
ANNEX 7 - Provision of Vitamin A Supplements

Supplementation with Vitamin A is important to prevent blindness and dramatically increases the chances of survival of children aged 6-59 months. There is a wide range of ways children can receive adequate supplementation of vitamin A. One of the ways is to link supplementation to immunization activities during:

- Routine immunization services
- Supplementary immunization activities, such as national immunization days,
- Treatment of measles and xerophthalmia.

The following are the recommended activities for vitamin A supplementation:

1. **Target group for vitamin A supplementation during routine contacts**

All lactating mothers should receive a dose of vitamin A (200,000 IU), irrespective of their mode of infant feeding, up to eight weeks post-partum if they have not received vitamin A supplementation after delivery. Health workers should ask mothers regarding her vitamin A intake when she brings her child for BCG vaccination and provide supplementation when appropriate.

Children at 6–11 months of age should receive vitamin A (100,000 IU) given once every 4-6 months. To monitor the dose given to the child and avoid multiple dosing, the health worker must record vitamin A supplement administration on the road-to-health card. The correct dose for vitamin A is age-specific as follows:

<table>
<thead>
<tr>
<th>Age group</th>
<th>Dose to be given</th>
<th>Amount of vitamin A</th>
<th>If 100,000 IU capsules are used give:</th>
<th>If 200,000 IU capsules are used give:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 6 months</td>
<td>DO NOT GIVE</td>
<td>DO NOT GIVE</td>
<td>DO NOT GIVE</td>
<td>DO NOT GIVE</td>
</tr>
<tr>
<td>6–11 months</td>
<td>100 000 IU</td>
<td>All drops in one capsule</td>
<td>Half of the drops in one capsule</td>
<td></td>
</tr>
<tr>
<td>12–59 months</td>
<td>200 000 IU</td>
<td>All drops in two capsules</td>
<td>All drops in one capsule</td>
<td></td>
</tr>
</tbody>
</table>

**Recommended age-specific dose of vitamin A supplementation**
2. Supplementary Immunization Activities

During SIAs, only screening for age is necessary, to determine the correct dose for the age of the child.

3. Vitamin A supplements to measles cases

It is important that measles cases, whether isolated or in outbreaks, receive vitamin A supplementation as part of the measles treatment. Administration of vitamin A during measles episode reduces case fatality and the severity of the disease.

Vitamin A should be given to all measles cases, two doses of 200,000 IU two consecutive days or one on admission and the second dose before discharge from the hospital.
8.1 Poliomyelitis eradication

The Government is committed to eradicate poliomyelitis (polio) and certify Southern Sudan polio-free by the year 2010. The strategies to achieve this include:

- increasing routine immunization coverage;
- conducting regular National Immunisation Days (NIDs);
- strengthening acute flaccid paralysis (AFP) surveillance; and
- mopping up campaigns.

8.1.1 Routine vaccinations

Trivalent Oral polio vaccine (tOPV) is used for routine vaccination of children < 1 year of age. tOPV is a balanced mixture of three types of attenuated (non-harmful) polioviruses: 1, 2 and 3. Four doses of tOPV administered at least 4 weeks apart give full protection to about 85% of vaccinated children. Oral polio vaccine is administered by mouth (two drops or as per package insert).

8.1.2 Supplemental Immunization Activities (SIAs)

National immunization days (NIDs) are complementary to OPV routine vaccinations and are conducted in rounds, 4-6 weeks apart, covering all children 0-59 months of age. During NIDs all children are given vaccine without consideration of their previous vaccination status.

8.1.3. Poliomyelitis surveillance requirements

In order to achieve polio free certification, Southern Sudan will conduct AFP surveillance activities based on certification standard surveillance targets which are summarized in the table below. The two most important indicators of AFP surveillance are:

<table>
<thead>
<tr>
<th>Indicators of surveillance performance</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annualized non-polio AFP rate per 100,000 children under 15 years of age</td>
<td>≥ 2/100,000 children under 15 yrs. of age</td>
</tr>
<tr>
<td>% of AFP cases with two adequate stool specimens collected 24-48 hours apart and &lt; 14 days of onset</td>
<td>&gt; 80%</td>
</tr>
</tbody>
</table>
Other AFP surveillance indicators include:

<table>
<thead>
<tr>
<th>Key indicators of surveillance performance</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of AFP cases investigated within 48 hours</td>
<td>≥ 80%</td>
</tr>
<tr>
<td>% of specimens arriving at the laboratory in &quot;good&quot; condition</td>
<td>≥ 80%</td>
</tr>
<tr>
<td>% of specimens arriving at a WHO-accredited laboratory within 3 days of being sent</td>
<td>≥ 80%</td>
</tr>
<tr>
<td>% of specimens with laboratory results sent within 28 days of specimen receipt</td>
<td>≥ 80%</td>
</tr>
<tr>
<td>% of all expected monthly reports that were received (completeness &amp; timeliness)</td>
<td>&gt; 90%</td>
</tr>
</tbody>
</table>

8.2 Accelerated control of Measles

Government of Southern Sudan is committed to reduce measles deaths by 95% and cases by 90% compared to 1999 level and interrupt measles virus transmission by 2012. To achieve this target Southern Sudan will use the following strategies:

- Increase routine vaccination coverage
- Conduct supplementary measles immunization campaigns
- Strengthen case based surveillance
- Conduct outbreak investigation and response
- Provide vitamin A supplementation

8.2.1 Increase Routine Immunisation Coverage

- All children in Southern Sudan should receive one dose of measles vaccine at 9 months of age. This single dose produces immunity in about 85% of children.

- In addition to the first dose, all children must be given a second opportunity for measles vaccination either through routine activities or supplementary immunization campaigns (SIAs):
  - The 2nd dose will raise immunity to 95-98%.
  - It provides a first dose of vaccine to children previously missed by routine services or a second dose to children who failed to respond to their first dose.

- Reduce drop outs and missed opportunities through proper monitoring.
8.2.2 Supplementary measles vaccination campaigns

In SIAs, the mass measles campaigns are organized as follows:

- The lower limit of target age group is lowered to 6 months (from the 9 months in the routine EPI):
  - All children 6 months to less than 15 years of age are immunized in “Catch up” mass measles campaigns without consideration of their previous vaccination status.
  - All children from 6 months to under five years of age are immunized in “Follow-up” campaigns without consideration of their previous vaccination status.
- The interval between “catch up” and “follow up” campaigns must be three years (due to the accumulation of susceptible children as the routine immunization system is still weak).

8.2.3 Strengthen case-based surveillance

- Measles surveillance should collect basic information to document disease burden and guide program planning:
  - Measles case counts by month and geographical area
  - Age and vaccination status of cases by area
  - Completeness and timeliness of reporting
- Surveillance information should be reported and analysed regularly at all levels.
- Feedback is critical for maintaining the surveillance system and guiding control efforts.
- Reporting units should report weekly suspected measles cases using the weekly surveillance form.
- Zero reporting should be reinforced monthly by all counties.
- Surveillance for measles should be integrated into the existing AFP surveillance.
- Sentinel site surveillance must be introduced and then extended to all health facilities in Southern Sudan.

8.2.4 Outbreak investigation and Response

- An outbreak response plan should be available at all levels.
- All outbreaks to be thoroughly investigated and followed up (detection, confirmation and response).
- During an outbreak, suspected measles cases should be confirmed by serology on the first 5-10 cases in each cluster; then use the epidemiological link for further classification.
- The priority during outbreak is to provide appropriate treatment (including vitamin A) to reduce mortality.
• As a response to a measles case or an outbreak, mass vaccination of all children 6 months to 14 years must be conducted in as wide an area as possible, starting from the surrounding areas proceeding to where the index case came from.
• The outbreak must be evaluated and response plan updated accordingly.

8.2.5 Vitamin A Supplementation (see Annex 7)
Vitamin A supplements should be provided;
• With routine measles vaccination
• During measles campaigns and during response to measles outbreaks
• For the management of measles cases and complications.

8.3 Maternal and neonatal tetanus (MNT) elimination
The Government of Southern Sudan is committed to MNT elimination by the year 2012. Elimination will be certified if every county in Southern Sudan registers less than 1 neonatal tetanus (NNT) case per 1,000 live births. To achieve this goal the following strategies are adapted:
• Immunization (routine and supplemental)
  o Increase routine immunisation DTP3 coverage of children less than one year of age to at least 90%
  o Increase routine immunisation coverage of women of child bearing age, and especially pregnant women, with at least 2 doses of tetanus toxoid (TT2+)
  o Conduct supplemental immunisation activities among women of child-bearing age and school girls in high risk counties to achieve at least 80% coverage for TT3
• Clean deliveries
• Surveillance

8.3.1 Routine immunization of children and women
• All children <1 year of age in Southern Sudan should receive at least 3 doses of DTP, combining three different antigens: diphtheria Toxoid, tetanus Toxoid and pertussis vaccine.
• All women of child-bearing age are to be immunized with TT: two doses of TT (0.5 ml intramuscularly) one month apart, one dose after 6 months or during subsequent pregnancy; two more doses with one year intervals after TT3.

8.3.2 Supplemental immunisations among women in childbearing age:

TT is provided to women of child-bearing age in high risk counties with three rounds:
• First two rounds- one month apart
• The third round - 6months to one year following the second round.
  *Note: a minimum of 80% coverage is expected*

8.3.3 Clean deliveries

Deliveries should be attended either by health staff in a health facility or by trained birth attendants at home using hygienic practices (clean hands, a clean surface and clean cord cutting). Clean delivery kits (CDK) should be provided to them.

8.3.4 Neonatal tetanus surveillance requirements:

• Number of confirmed NNT cases should be included in the routine monthly surveillance report. WHO case definitions are:

  **Suspected case:**
  • Any neonatal death between 3 and 28 days of age in which the cause of death is unknown; **or**
  • Any neonate reported as having suffered from neonatal tetanus between 3 and 28 days of age and not investigated.

  **Confirmed case:**
  • Any neonate with normal ability to suck and cry during the first 2 days of life **and**
    - who, between 3 and 28 days of age, cannot suck normally **and**
    - becomes stiff or has spasms (i.e. jerking of the muscles).
Note: the basis for case classification is clinical and does not depend on laboratory confirmation. NT cases reported by physicians are considered to be confirmed.

- Case investigation to be conducted to identify the cause;
- Zero reporting should be introduced at all levels;
- Active surveillance for suspected NNT cases to be carried out in major hospitals;
- Community surveillance should be initiated in remote areas where routine reporting is weak.
ANNEX 9 - Basic Package of Health and Nutrition Services RI Guidelines

The Ministry of Health Basic Package of Health and Nutrition Services (BPHNS) describes service delivery levels and their respective activities. The four service levels where routine immunization activities occur are:

1. Community level
2. Primary Health Care Unit (PHCU)
3. Primary Health Care Centre (PHCC)
4. County Hospital

The description below is taken from the March 2006 MOH BPHNS document and pertains only to the “preventive care and health promotion” sections relating to routine immunization services.

9.1 Community-based health activities

The peripheral official MOH structure with salaried staff is the Primary Health Care Unit (PHCU). The BPHNS foresees three structures/functions in the community that co-operate with and are to be supported by, the MOH:

- Health Committee
- Home health promoters
- Trained Traditional Birth Attendants

Health Committee

The Health Committee consists of elected community representatives. Its main functions are:

- Liaison between the MOH, the service provider and the community
- Assist planning and providing quality PHC to the community
- Mobilize the community in support of health development
- Create awareness of community responsibility for health

Home health promoters (HHP)

Home Health Promoters (HHPs) are residents of their community who are trained by the County Health Department to act as focal points and resource persons in their place of residence.
Trained Traditional Birth Attendants (TTBAs)

Although not part of the MOH system and staff, TTBAs will continue to exercise their functions for many years to come.

9.2 Service Profile of Primary Health Care Unit (PHCU)

The Primary Health Care Unit (PHCU) as the first-line health facility offers basic preventive and curative services. One PHCU covers a population of roughly 15,000. It is staffed by two Community Health Workers (CHWs), a Mother and Child Health Worker or a Community Midwife, plus three support staff. Key preventive care and health promotion activities of a PHCU are:

- Conduct EPI activities (facility-based outreach on fixed days, plus outreach)
- Growth monitoring and micronutrient supplementation for children under 24 months
- Health education sessions for users
- Training sessions for HHPs (and refresher training for trained TBAs)
- Organise health promotion activities

9.3 Service Profile of Primary Health Care Centre (PHCC)

One Primary Health Care Centre (PHCC) covers a population of roughly 50,000. It offers a wider range of services than a PHCU, notably laboratory diagnostics, an observation ward and 24-hour basic Emergency Obstetric Care. The PHCC serves as a reference facility for about three PHCUs. People living in the vicinity will of course use the PHCC as a first-line health service. Key preventive health and promotion activities of a PHCC are:

- Conduct EPI activities (fixed and outreach)
- Conduct antenatal care (ANC) sessions
- Growth monitoring and micronutrient supplementation...
- Health education sessions for users
- Hold training sessions for CHWs, VHV (and refresher training for TBAs)
- Organise health promotion activities
9.4 Service Profile of County Hospital

The County Hospital (CH) is the first-line referral hospital, with 80-100 beds. Although it is called County Hospital, there will not be one in every single county, owing to the high number of counties in Southern Sudan (>90). The BPHNS foresees one CH for about 300,000 population i.e. roughly one CH for 2-3 counties. In the CH, patients are diagnosed, treated, referred back to the PHCU/Cs and also referred up to state and tertiary hospitals.

Key preventive care and health promotion activities of a County Hospital are:

- Conduct EPI activities (fixed and support to outreach)
- Conduct ANC sessions
- Growth monitoring for children under 24 months
- Micronutrient supplementation
- Health education sessions for users
- Support training for Home Health Promoters
- Support health promotion activities
ANNEX 10 - REC Implementation Guidelines

The five Reach-Every County (REC) operational components are implemented and/or strengthened through a defined set of activities and tasks at each planning level starting from the Primary Health Care Centre (PHCC) catchment area with its constituent Primary Health Care Units (PHCUs). Major steps and tasks in the implementation process are described below:

10.1 Establish static & outreach routine immunization services

To establish or strengthen routine immunization services at a health facility, the following tasks will be implemented at the facility, county and state level:

10.1.1 Health facility level tasks (selected)

Each Primary Health Care Centre (PHCC) providing RI will:

1) Identify their catchment area (generally the payam) including the established Primary Health Care Units (PHCUs)

2) List the population of the catchment area by villages (or Bomas)

3) Divide the catchment area into three operational areas:

- **Area-A:** area inside the catchment area boundary (list of villages) close to a health facility from which mothers with small children can come to the health facility for static immunization services;

- **Area-B:** areas inside the catchment area boundary (list of villages) that are too far for women carrying young children to conveniently come to the health facility BUT can be covered through regular outreach services by staff coming from the PHCC (by walking, bicycle or arranged local transport);

- **Area-C:** area inside the catchment area boundary (list of villages) that cannot be reached by health facility staff without special support from the county or state (transport and resources)
4) Map the catchment area to include:
   - spotting villages on the map
   - demarcation of the three operational areas

5) Develop “Session plans” that details requirements:
   - For Area-A (static services)
   - For Area-B (outreach services)

6) Develop a simple “Work plan” that describes:
   - Arrangements for receipt and distribution of vaccine/supplies
   - Transport arrangements and actual schedule of sessions
   - Community linkage

**NOTE:** both session and work plans are required planning elements:
   - A “session plan” is an estimate of workload and details the number of sessions needed to serve the target population
   - The “work plan” is based on the session plan and describes how the session plan will be implemented. It details:
     - The actual schedule of the planned sessions, and
     - Additional activities (e.g., vaccine transport, social mobilization, dropout tracking etc.) that the PHCC needs to implement to ensure effective RI services.

7) Establish and maintain regular links with the community to ensure attendance and organizational support for RI services (see 10.3 below)

8) Implement routine static and outreach services as planned (all aspects)

9) Maintain records and analyse their own data (see 10.4 below)
   - Keep stock records (vaccine and immunization supplies)
   - Use tally sheets and vaccination register (women and child) showing dates of immunization
   - Submit monthly reports
   - Keep file of past immunization reports (RI and AccRI)
   - Maintain up-to-date monitoring chart (DTP1 and DTP3)
10.1.2 County level tasks (selected)

The county level has the responsibility to assist the health facilities and to prepare a work plan, logistics plan and budget plan to reach and immunize the target population of the county. To do this, the county level will:

1) Brief and solicit the active participation of the County Commissioner and through him the support and participation of government officers and available NGOs for the planning/implementation process.

2) **Assist** Primary Health Care Centers (PHCC) to:
   - Identify their catchment area (see section 10.1.1 above).
   - List the population of the catchment area by village (or Boma).
   - Stratify the catchment area into three operational areas:
     - Area (villages) from which client can attend static services
     - Area (villages) too far for women with young children where routine outreach services should be established
     - Area (villages) outside of the reach of health workers operating from the PHCC unless special mobile/pulse activities are organized.
   - Map their catchment areas.

3) Assist PHCCs to analyze their data and prepare session and work plans based on the categorization/target population of areas A and B.

4) Review PHCC work plans and prioritize which plans the county can currently support—prioritize by population, staffing and access.

5) Establish the scope of accelerated RI (AccRI) activities:
   - Identify hard-to-reach communities in the county (Area-C villages plus difficult-access areas not currently in PHCC catchment areas).
   - Determine the schedule, staff needs and resource requirements for AccRI.

6) Work with County Commissioner and other government, civic and religious leaders to prepare communities to take an active role in the implementation of routine immunization services.
(static and outreach) and accelerated immunization pulse activities—develop a social mobilization plan.

7) Determine county training needs for immunization.

8) Establish a supervisory schedule for visits (see 10.2 below).

9) Schedule regular coordination and review meetings (government, agencies and NGOs operating in the county).

10) Prepare a County “Work Plan” that includes:
    • Consolidated health facility work plans (prioritized)
    • Accelerated RI activities for the hard-to-reach areas
    • Social mobilization plan
    • Training plan
    • Supervision plan
    • Coordination and review meetings

11) Prepare a cold chain/logistics operations plan (icepack, vaccine and supply storage and distribution system).

12) Prepare a detailed map of the County.

11) Implement support to routine immunization services and accelerated routine immunization activities as planned (all aspects).

12) Prepare and maintain a data management and analysis system:
    • Report-receipt monitoring chart
    • File with a copy of all received immunization reports
    • File with a copy of all monthly reports sent to the State
    • Coverage monitoring graph (DTP1 and DTP3)
    • Table of cumulative dropout by payam
    • File of supervisory checklists and checklist summaries
    • Quality-of-service monitoring chart

13) Provide regular monthly feedback to the County Commissioner.
10.1.3 State level tasks (selected)

The State Governor and State Minister of Health are the critical leadership for implementation of immunization activities in the state. It is they who will:

- Mobilize County Commissioners to demand and lead EPI implementation in the counties;
- Engage opinion leaders in the state to actively demand and support the availability of immunization services at community level;
- Energize the EPI implementation team.

At the technical level, the State PHC Director and EPI Officer are responsible to guide and support the counties in the planning, implementation and monitoring of all immunization activities. The major tasks for state personnel in establishing static and outreach services are:

- Create the governmental, civic, religious and community support needed to expand activities
- Train county health staff in planning for immunization activities:
  - Training for implementation of the five REC components at county and health facility level to expand RI services;
  - Training for planning and implementation of accelerated immunization activities (pulse campaigns) where needed.
- Assist the county health department and County EPI supervisors to:
  - Engage the County Commissioner
  - Form an active coordinating group (government, NGO, church etc.) at county level to assist expansion efforts
  - Develop the information and prepare the multiple plans as listed in section 10.1.2 above
  - Train health facility staff
- Consolidate and prioritize county activity plans and incorporate in the state micro plan.
- Prepare the state micro plan (consisting of the state work plan, cold chain/logistics plan and budget plan) ensuring that the two major immunization approaches to increasing
coverage are detailed separately each with its own tasks, activities and budget.

**Note:** the two approaches are:
- Expansion and strengthening of routine immunization static and outreach services;
- Accelerated RI activities (pulse campaigns to cover areas not reached through routine static and outreach immunization services)

- Conduct support-supervision (with checklist and summaries) at least four times per year in each county (see 10.2 below).
- Prepare and maintain a data management and analysis system (10.4):
  - Report-receipt monitoring chart for monthly county reports
  - File with a copy of all received immunization reports
  - File with a copy of all monthly reports sent to the central EPI
  - Monthly ranked bar chart of cumulative DTP1 and DTP3 coverage
  - Table of cumulative dropout by county
  - File of supervisory checklists and checklist summaries
  - Quality-of-service comparative monitoring chart
- Provide feedback to County Commissioners at least four times per year (every quarter) showing cumulative % DTP3 coverage (ranked bar graph)

### 10.2 Conduct support-supervision

The second component of the reach-every-county strategy is the implementation of a support-supervision system. The support-supervision system is designed to:

- Objectively assess the current quality of management and services at facility level and the quality of management at county and state levels.
- Recognize and reward improvement and good performance
- Identify obstacles and problems for early corrective action
- Provide focused on-the-job training

### 10.2.1 Support-supervision process
The MOH support-supervision process is as follows:

- Establish the set of tasks and practice standards that must be met at each management and service level
- Prepare objective checklists that measure implementation of the set of tasks and standards at each level
- Train staff to use the checklists as guides for:
  - Self-assessment
  - Support-supervision
- Conduct support-supervision
  - Together supervisors and staff use the checklist to measure status of implementation of tasks and standards
  - Whichever tasks/standards are achieved, staff are honoured
  - Whichever tasks/standards are yet to be achieved, supervisors and staff will together agree on what steps both will take to make progress. The steps are documented.
  - Supervisors provide focused on-the-job training as required
- Summarize results of support-supervision and take action
  - Prepare comparative support-supervision Summary Sheet after each round of supervision
  - Prepare ranked graph of quality of management and/or service
  - Use comparative results for feedback, to problem-solve, as training-needs assessment, and for reporting.

10.2.2 Schedule of support-supervision

Minimum support-supervision activities are as follows:

- The MOH/EPI will conduct support-supervision of the State EPI management and cold chain (with objective checklists) at least **two times per year**.
- The State EPI will conduct support-supervision of the County EPI management and cold chain (using objective checklists/summaries) at least **four times per year**.
- County EPI will conduct support-supervision of health facility RI services (using objective checklists/summaries) at least **six times per year**.
Note: in addition the MOH/EPI will conduct support-supervision visits (using checklists) to selected counties and health facilities and the State EPI will conduct support supervision visits (using checklists) to selected health facilities. It is the policy of the MOH/EPI that all designated "supervisory" visits will use appropriate support-supervision checklists.

10.2.3 Use of support-supervision data
Each programme level (county, state and central) will establish routine collection and analysis of RI quality-assurance data (in addition to the current coverage data) for feedback and corrective action:

- Prepare support-supervision summary sheets that compare:
  - facility to facility by county
  - county to county by state
  - state to state by Southern Sudan
- Graph results at state and central level (ranked bar graphs)

10.3 Link services with communities
The 3rd REC operational component is linking EPI services with the community. While rounds of accelerated immunization activities help to increase coverage temporarily, vaccine preventable diseases cannot be effectively reduced over-time without a quality routine immunization programme linked to community demand and support. The MOH/EPI REC strategy of "community linkage" includes to:

1. Plan the schedule of static immunization sessions and the place/schedule of outreach immunization sessions with community leaders (and with health committee and volunteers where they exist);
2. Maintain continuous awareness about the importance and the availability of immunization;
3. Involve the community in arrangements to immunize all children and women in the community;
4. Identify newborns and reduce dropouts.

10.3.1 Plan immunization activities with local leaders
People use immunization services when they know their importance, when community elders encourage use of the services, when
services are convenient and reliable, and when they know when and where services are available. Work with community leaders to:

- Fix the best days/times for immunization sessions in the health facility;
- Determine the most suitable locations and times for outreach sites;
- Find local resources for conducting outreach and vaccine distribution;
- Assist staff to conduct convenient services;
- Increase awareness on the importance of immunization and follow-up doses.

10.3.2 Increase awareness

- Plan with village leaders and elders how to encourage families to ensure complete immunization of women and newborns.
- Arrange with local political and government leaders to give messages on immunization during their routine activities.
- Request religious leaders to remind caretakers about immunization activities at meetings and during/after church and mosque services.
- Remind the NGOs and donor projects to give messages about immunization.
- Where available use local media to remind the public about immunization.

10.3.3 Local support

- Arrange with local leaders to:
  - Provide a shaded place with table and chairs/benches for outreach immunization site
  - Have volunteers go house-to-house (or beat drums or any other local method) to call out eligible women and caretakers/children when staff arrive in the village for outreach services
  - Use a list of newborns and “dropouts” provided by staff to remind eligible women and children to come for service
- Support local leaders to:
  - Report success and shortcomings of the service to the boma and payam leaders and County Commissioner
  - Advocate for expanded service
10.3.4 Reduce dropouts

Many children and women start their immunizations but do not come back for the required doses. Children and women who do not complete all of the required doses of the EPI vaccines are called "dropouts." Ways to reduce dropouts include:

- Check every child and mother coming to the health facility for any reason:
  - If services are available on that day, direct them to the place where they can receive follow-up doses for which they are due,
  - If services are not available on that day, remind them where and when they should go to receive the doses they are due.

- Maintain a DTP1-DTP3 coverage/dropout graph. If there is a large difference between the two lines on the graph, review the immunization register to find out where and who are the dropouts:
  - Using the register, prepare a list of dropouts by village and give the list to local leaders to remind families when and where to resume their immunizations.

10.4 Monitor and use data for action

The 4th operational component of the REC strategy is monitoring and the use of data for action. Monitoring and use of data for action involves the following:

10.4.1 Collection and organization of data

Standard recording and reporting procedures are to be followed at service delivery level and standard collation and analysis procedures followed at county and state levels (confirmed through the support-supervision process).

Service delivery level

- Accurate recording of immunizations given on three formats:
  - Immunization card
  - Tally sheet
  - Immunization registers (doses by target-group and date)
- Vaccine stock record: recording of vaccine receipt, issue, return and balance
• Supply stock record: recording of supply receipt, issue/use and balance
• Monthly Report of immunizations given and vaccine use (to county)
• File folder containing a copy of the monthly reports and tally sheets
• A cumulative line-graph showing DTP1 and DTP3 coverage and dropout

County and State management levels
• Use of a “Report-Receipt Monitoring Chart” at both county and state levels
• File of all received monthly reports
• Monthly summary (collation) report prepared from all received reports
• File of all monthly summary reports sent to the higher level
• Vaccine Stock Register for all antigens (received, issued, returned, balance)
• Supply Stock Book for all supplies (received, issued, balance)
• Cumulative graph showing DTP1 and DTP3 coverage and dropout in their jurisdiction:
  o County level: line graph (same style as used at health facility level)
  o State level: monthly, cumulative, ranked bar graphs showing percent DTP1, DTP3, and DTP1 to DTP3 dropout
• File of all support-supervision checklists and checklist summaries (county and state levels)
• Graph of comparative county management-quality (state level only)

NOTE: the MOH-GOSS/EPI will ensure that immunization registers, tally sheets, immunization cards, reporting and analysis formats, and stationary are available at each level.

10.4.2 Monitoring EPI performance

The MOH-GOSS/EPI Unit uses a specific set of indicators to monitor programme performance at each level.

• Progress toward achievement of programme targets is to be reviewed at state and county levels on a monthly basis to ensure that the programme is on track to achieve Southern Sudan targets.
The minimum monitoring indicators for EPI are:

**Immunization coverage indicators:**

- Immunization coverage numbers for all antigens/doses on a monthly basis (Southern Sudan, state, county, payam and/or health facility; and also by NGOs)
- % cumulative DTP1 and DTP3 coverage <1 year (all levels and by NGOs) on a monthly basis using the total number of <1 as denominator
- % cumulative dropout <1 (DTP1 to DTP3) at all levels and by NGOs on a monthly basis
- % cumulative TT 2+ coverage of pregnant women at all levels and by NGOs on a monthly basis using the total number of pregnant women as denominator

**Quality of management and service delivery indicators:**

- % quality-of-service and quality-of-management achieved (see 10.2)
- % of state and county cold chain facilities where vaccine is stored at the correct temperature.
- % of planned static and outreach services conducted (by facility, county and state in a designated period)
- % reporting completeness
- % of counties and states that have up-to-date cumulative DTP1 and DTP3 <1 coverage graphs displayed

**Disease incidence indicators:**

- Number of annual confirmed poliomyelitis cases
- Number of measles outbreaks reported
- Number of neonatal tetanus cases reported

### 10.4.3 Taking action

Each indicator used by the MOH/EPI has specific meaning (for example):

- Cumulative % achievement of DTP1 <1 “indicates” the proportion of eligible children who have been left-out of the programme (it focuses on issues of access, awareness and community mobilization).
- Cumulative % DTP1-DTP3 dropout “indicates” how well the service is organized and managed.
The programme will routinely monitor these indicators to take specific, appropriate action. Action based on monitoring includes:

- Feedback of results (and comparative results) for information
- Recognition of exceptional performance
- Focused capacity building
  - Training
  - On-the-job training
  - Peer assistance
- Addressing specific obstacles
- Focused motivation and support

If the performance of indicators stays below target for long periods it is generally because 1) no one is monitoring at the appropriate level, 2) staffs are monitoring but no useful action is taken, or 3) the targets set for the indicators are unrealistic.

**10.5 Plan and manage resources**

The county micro plan is the key to the REC strategy. The micro plan should be based upon a local situation analysis which involves every health facility and through them the community that they serve. At the GOSS/MOH level, there is a responsibility to ensure the needed financial and human resources are available through the state to the county, while the state and county must ensure the resources are efficiently used, through regular monitoring and continuous adjusting of the micro plan.
ANNEX 11 – Organizational Structure of EPI

The organization charts below represent the operational structure and staffing for immunization activities in Southern Sudan.

National EPI MOH/GOSS Organogram