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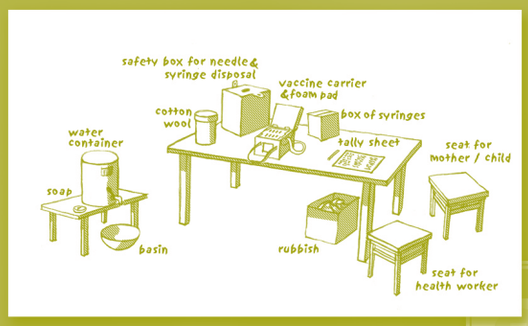
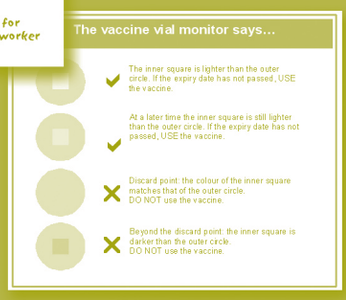
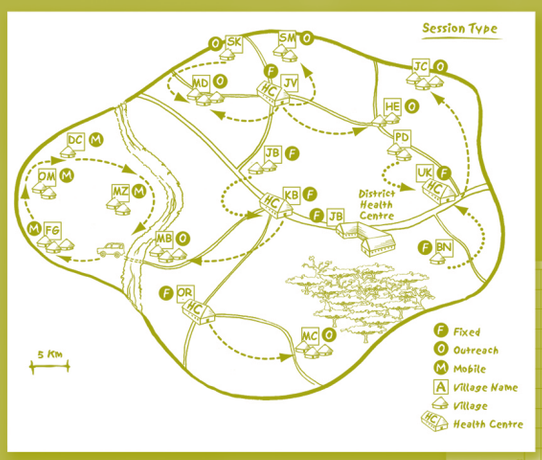
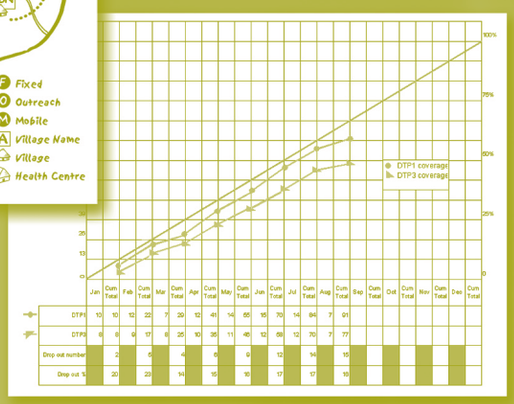
Training for mid-level managers (MLM)

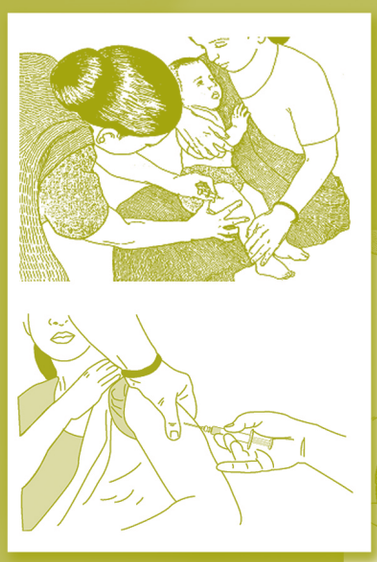
5. Monitoring the immunization system











- *The immunization system & indicators*
- *Data collection & management*
- *Data analysis & display*
- *Taking action*
- *Feedback & feed-forward*

Immunization, Vaccines and Biologicals

World Health Organization

Training for mid-level managers (MLM)

Module 5 : Monitoring the immunization system

The Department of Immunization, Vaccines and Biologicals
thanks the donors whose unspecified financial support
has made the production of this publication possible.

This publication was produced by the
Expanded Programme on Immunization
of the Department of Immunization, Vaccines and Biologicals

Ordering code : WHO/IVB/08.05
Printed : 2008
This publication is available on the Internet at :
www.who.int/vaccines-documents/

Copies may be requested from :
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Printed by the WHO Document Production Services, Geneva, Switzerland

Introduction to the series

This new series of modules on immunization training for mid-level managers replaces the version published in 1991. As there have been many changes in immunization since that time, these modules have been designed to provide immunization managers with up-to-date technical information and explain how to recognize management and technical problems and to take corrective action and how to make the best use of resources.

More and more new, life-saving vaccines are becoming available, yet the introduction of a new vaccine does not necessarily require a separate plan and separate training. This new series for mid-level managers integrates training for new vaccine introduction into each subject addressed by the modules. In this way, introduction of new vaccines is put into its day-to-day context as part of the comprehensive range of activities required to improve immunization systems.

In the context of these modules, mid-level managers are assumed to work in secondary administrative levels, such as a province; however, the modules can also be used at national level. For district managers (third administrative level), a publication on 'immunization in practice'[1] is widely available. As it contains a large amount of technical detail, it is also recommended for mid-level managers courses.

In writing these modules, the authors tried to include essential topics for mid-level managers, while keeping the modules brief and easy to use. They are intended to complement other published materials and guidelines, some of which are referred to in the text. Many more documents are available on the CD-ROM which accompanies this series. Each module is organized in a series of steps, in which technical information is followed by learning activities. Some knowledge and experience are needed to complete the learning activities, but even new readers should be imaginative and constructive in making responses. Facilitators should also be aware that the responses depend on the national context. Thus, there are no absolutely right or wrong answers, and the series does not set down new 'policies' or 'rules'. The authors hope that the readers of these modules will find them informative, easy to read and an enjoyable learning experience.

Modules in the mid-level managers series

Module 1: Cold chain, vaccines and safe-injection equipment management
Module 2: Partnering with communities
Module 3: Immunization safety
Module 4: Supportive supervision
Module 5: Monitoring the immunization system
Module 6: Making a comprehensive annual national immunization plan and budget
Module 7: The EPI coverage survey
Module 8: Making disease surveillance work

[1] *Immunization in practice: A practical guide for health staff.* Geneva, World Health Organization, 2004.

Acknowledgements

This new series of modules on immunization training for mid-level managers is the result of team work between a large number of partners including the Centers for Disease Control and Prevention (CDC), IMMUNIZATIONbasics, Program for Appropriate Technology in Health (PATH), United Nations Children's Fund (UNICEF), United States Agency for International Development (USAID) and the World Health Organization (WHO). The authors are especially grateful to the consultants from the University of South Australia who have made a major contribution to the development of the modules.

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Abbreviations and Acronyms

The following abbreviations have been used in this document.

AD	auto-disable (syringe)
AEFI	Adverse Events Following Immunization
AFP	acute flaccid paralysis
BCG	bacille Calmette-Guérin (vaccine)
CDC	Centers for Disease Control & Prevention
DO	drop-out
DTP	diphtheria-tetanus-pertussis vaccine
HepB	hepatitis B (vaccine)
Hib	*Haemophilus influenzae* type b
HMIS	Health Management Information System
IEC	Information, education and communication
IIP	*Immunization in practice*
NRA	National Regulatory Authority
NT	neonatal tetanus
OPV	oral polio vaccine
PAB	protected at birth
PATH	Program for Appropriate Technology in Health (USA)
RED	Reaching Every District
TT	tetanus toxoid
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VPD	vaccine-preventable disease
VVM	vaccine vial monitor
WHO	The World Health Organization
YF	yellow fever

Introduction to Module 5

Purpose of this module

Each month, every health facility and district sends a monthly report containing a vast amount of data. As a busy mid-level manager it is hard to look at every report, but you do need to know if there are any serious problems needing corrective action. How will you know when such problems occur?

This module encourages mid-level managers to measure the performance of all components of the immunization system, by a combination of passive data collection (monthly reports), and active data collection (supervisory visits). It describes how managers can use the data they collect to identify problems and take corrective action, in order to improve the quality and success of their immunization programmes.

Monitoring and surveillance are very closely linked and have much in common. However, for practicality and to ensure adequate focus upon the various technical issues, *Module 5: Monitoring the immunization system* and *Module 8: Making disease surveillance work* are separate. Both modules should be read in conjunction, however.

This module is organized into the following steps:

The immunization system & indicators > **Data collection & management** > **Data analysis & display** > **Taking action** > **Feedback & feed-forward**

1. The immunization system and indicators

1.1 What is monitoring and why is it important ?

Monitoring is the systematic and continuous process of examining data, procedures and practices. It is used to measure progress, identify problems, develop solutions, and guide policies and interventions.

Monitoring is an important tool for mid-level managers. It can help improve the quality of the immunization programme by ensuring :

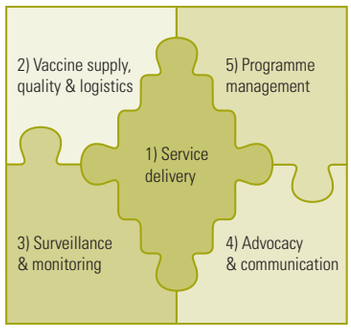
- all infants and pregnant women are immunized ;
- vaccines and safe injection equipment are delivered in correct quantities and on time ;
- staff are well trained and adequately supervised ;
- information on disease incidence and adverse events following immunization (AEFI) are collected and analysed ;
- the community has confidence in the vaccines delivered and the immunization service they receive.

1.2 Which aspects of the immunization programme should be monitored ?

For the purpose of monitoring your immunization programme it is useful to divide the immunization system into five components ; these are shown in Figure 5.1. Each component can then be broken down into smaller parts that are easier to evaluate.

For example : Component 2 (vaccine supply, quality and logistics) can be broken down into vaccine storage, distribution, quality, and disposal of safe injection equipment, as well as many other aspects. You will need to look at each of these smaller parts in order to monitor overall aspects of Component 2.

Figure 5.1 : Five components of the immunization system to be monitored



Annex 2 lists the different smaller parts of each component that you should consider monitoring. As a mid-level manager you are probably familiar with some of these smaller parts, but may have never realized that they could be used as part of an overall, systematic monitoring plan.

Key point : Five components of the immunization system must be monitored. Each component can be broken down into smaller parts to make monitoring easier.

1.3 How is the immunization system monitored ?

Now that you are familiar with the five different components and understand that each one can be broken down into smaller parts to make monitoring easier, you must decide what level of quality or type of performance you are aiming for in your programme.

For example : Drop-out rates are very important when monitoring Component 1, service delivery. But what is the drop-out rate you consider acceptable ?

A statement that describes the quality you hope to achieve in your programme is called a 'programme goal', 'benchmark', 'standard' or 'indicator'. To avoid confusion, in this Module we will use the word 'indicator'.

Developing good quality indicators is the first, and one of the most important steps in monitoring the progress of your immunization programme.

Key point : Indicators set the standard that you are aiming for in your immunization programme. Monitoring is the continuous and regular measurement of progress towards these indicators.

It is worth questioning whether the existing indicators in your programme actually measure every component of the immunization system, and whether they provide the necessary information to take corrective action. Sometimes new indicators may be formulated to monitor certain components of the immunization system that were not being previously systematically monitored.

1.3.1 Ensuring good quality indicators

An indicator should be written in such a way that you can clearly see *what* is to be monitored. This in turn will help you decide *how* it is best monitored, and therefore the kind of data that must be collected. A good quality indicator should be:

- based on data that are easy to collect;
- easy to understand;
- linked to a corrective action (that is, specific action that can be taken to improve performance).

For example: You have implemented a safe injection policy at the district level. The indicator states that all injections should be given with an auto-disable (AD) syringe and the correct injection technique used (*what* is to be measured). The best way to measure this is to identify what proportion of all injections are given in this way (*how* it is to be measured). If only 80% of injections are given in this way, then more AD syringes might need to be ordered or more training given to staff on correct injection technique (i.e. the corrective action to be taken).

Another example: To measure the standard of programme management at the provincial level the indicator states that there should be at least one supportive supervision visit to each district every quarter (i.e. *what* is to be measured). The best way to measure this is to identify how many supportive supervision visits were made during a quarter (i.e. *how* it is to be measured). If only one supportive supervision visit is made to a district in a 12–month period, then perhaps more funding is required for petrol or vehicle repair (i.e. the corrective action to be taken).

An indicator can sometimes alert us to many things in the same way that the engine oil-pressure indicator on a vehicle tells the driver the oil-pressure reading. If it is not in the normal range it suggests that something is wrong and the driver needs then to check a number of things such as: whether the oil level is correct; whether the oil pump is working correctly; whether the engine gaskets are holding. In the same way, a good immunization programme indicator will have multiple meanings and will tell a manager what problems may need to be addressed.

For example :

Indicator	Primary meaning	Additional meaning
BCG coverage in children <1 year of age is at least 80% by 2008.	Infants who have come the first time for immunization.	Level of access to services and effectiveness of community mobilization.
Drop-out rate for BCG-measles is 30%.	Infants who have not completed the primary immunization series.	Quality of service delivery and defaulter tracking mechanisms.
5% of health facilities have non-functioning refrigerators.	Equipment status.	Efficiency of maintenance and repair system.
75% of health facilities have an up-to-date coverage/drop-out monitoring chart by 2007.	Status of coverage/drop-out monitoring.	Effectiveness of supportive supervision.

1.4 Which levels of the immunization programme should be monitored ?

To ensure that your immunization programme is monitored systematically, each level of the health system should be included. For simplicity, three levels are used in this document : health-facility level ; district level ; national (and/or provincial) level.

Sometimes it is not possible to use the same indicator for each level because the data are not available, or the indicator is not relevant. In these cases it might be necessary to adapt the indicator for each different level of the health system.

Key point : A well-designed monitoring programme will measure the quality of the immunization service at each level of the health system.

Learning activity 5.1 : Assessing the quality of frequently-used indicators

You are a mid-level manager in Deep Bay Province and have been asked to review some commonly-used indicators to ensure that they are of good quality and relevant to each level of the health system.

TASK : Read each indicator and decide whether the data are easy to collect, easy to understand and linked to corrective action for the three levels of the health system. Place a tick (✓) if they are, or a cross (✗) if they are not. In the example below, the indicator data are easy to collect at national/provincial level ; however, at district and health-facility level this kind of aggregated indicator cannot be easily collected and used.

Components of the immunization system	Indicator	Quality of indicator at different levels of the health system			
		Is the indicator :	National/ Provincial	District	Health facility
1) Service delivery	By 2010, all districts have DTP3 coverage greater than 80%.	*Easy to collect (example) ?*	√	x	x
		Easy to understand ?			
		Linked to corrective action ?			
2) Vaccine supply, quality and logistics	Districts with stock-out of measles vaccine in the previous quarter.	Easy to collect ?			
		Easy to understand ?			
		Linked to corrective action ?			
3) Surveillance and monitoring	Number of reported measles cases is less than 10 per month.	Easy to collect ?			
		Easy to understand ?			
		Linked to corrective action ?			
4) Advocacy and communication	Planning meetings conducted with community.	Easy to collect ?			
		Easy to understand ?			
		Linked to corrective action ?			
5) Programme management	Percentage of vacant positions that were sanctioned.	Easy to collect ?			
		Easy to understand ?			
		Linked to corrective action ?			

Learning activity 5.2: Drafting indicators for the different components of the immunization system

In Learning activity 5.1 you reviewed the indicators for Deep Bay Province. Some were of poor quality, and some were not relevant to each level of the health system. Now you must try to write your own indicators.

TASK: For each component of the immunization system, choose one indicator and try to write it for each level of the health-care system. Remember that the data must be easy to collect, and the indicator should be easy to understand and be linked to a corrective action. An example is provided. Annex 2 lists the five components in detail and may help you choose a suitable indicator; otherwise refer to *Module 4*: *Supportive supervision* and *Module 2*: *Partnering with communities* for other possible indicators.

Components of the immunization system	**Indicator for each level of the health-care system**		
	National/Provincial level	**District level**	**Health-facility level**
1) Service delivery (example)	*By 2010 all districts have DTP3 coverage greater than 80%.*	*By 2010 all health facilities have DTP3 coverage greater than 80%.*	*By 2010 all villages have DTP3 coverage greater than 80%.*
2) Vaccine supply, quality and logistics			
3) Surveillance and monitoring			
4) Advocacy and communication			
5) Programme management			

2. Data collection and management

In Section 1 of this module we described the process for writing indicators which will help you measure the progress of your immunization programme.

To summarize, to monitor the immunization system effectively you must:

- break down the five components of the immunization system into smaller parts;
- develop good quality indicators for each of these smaller parts;
- include indicators for each level of the health system, from health facility to national level;
- measure progress towards the indicators regularly.

A good quality indicator is written so that the data needed to measure it are easy to collect. There are many sources of data available to the mid-level manager for this purpose, much of which is collected at the health-facility level and then consolidated or aggregated for forwarding to the district (and later provincial) level. Some data must be collected through regular reporting forms (passive data collection), and others must be gathered by supervision and site visits (active data collection). See Box 5.1 for a description of these two methods.

This section outlines some of the sources of data that mid-level managers can use for monitoring their immunization programmes, and also some ways to improve the accuracy of this data. Many of the following tools are displayed and described in the book *Immunization in practice: A practical guide for health staff* (Geneva, World Health Organization, 2004).

Key point: The mid-level manager must be aware that data used for monitoring may be incorrect or incomplete. Supportive supervision plays an important role in ensuring that staff are properly trained in accurate documentation and data collection.

2.1 Data collection at the health-facility level

The following tools are used for routine recording of immunization-related activities at the service-delivery level.

1) Tally sheet.

2) Immunization register.

3) Immunization card.

4) Defaulter register.

5) Stock record.

6) Refrigerator temperature chart.

7) Health-facility consultation register.

2.1.1 Tally sheets

Tally sheets are the forms that health workers use to document an immunization session, by making a record for every dose of vaccine given. Tally sheets should be used for all sessions whether fixed, outreach or conducted by mobile teams. It is always worthwhile for a supervisor to spend time reviewing tally sheets with staff to improve the quality of reporting. Table 5.1 shows some common mistakes and corrective practices which supervisors can use as examples. Also, errors can be identified and practices corrected, but tally sheets should not be edited retrospectively.

Key point: The immunization monitoring system depends upon the accuracy of tally sheets made at the time of immunization sessions.

Figure 5.2 : Sample tally sheet

Name of the health facility _____ Date of session _____

Fixed — Name of site _____ Outreach/Mobile — Name of the site _____

Children	**Less than 1 year**		**More than 1 year**	
Vaccine	Tally	Total	Tally	Total
BCG				
DTP1				
DTP2				
DTP3				
OPV0				
OPV1				
OPV2				
OPV3				
Measles				
Vit. A				
HepB0				
HepB1				
HepB2				
HepB3				
Protected at Birth (ask at DTP1)	Yes		No	
	Tally	Total	Tally	Total
Women	**Pregnant women**		**Non-pregnant women**	
	Tally	Total	Tally	Total
TT1				
TT2				
TT3				
TT4				
TT5				
Total TT				
Total TT2+TT3+ TT4+TT5				

Names of staff

Source : *Immunization in practice : A practical guide for health staff.* Geneva, World Health Organization, 2004.

To ensure accuracy of entries, the tally sheet should be structured according to:

- vaccination schedule currently in use (plus any newly introduced vaccine should be included in the updated tally sheets);
- target age groups to be immunized (as a priority target group, children under one year of age should be separated from any other age group that you may be immunizing);
- other interventions given along with immunization, e.g. vitamin A.

Table 5.1: Common mistakes in tallying

Mistake in tallying	Possible result	Correct practice
Using the same tally sheet for more than one session.	Inaccurate number of doses and/or clients per session.	Use a new tally sheet for each session.
Tallying before the vaccine is administered.	The child or pregnant woman may not receive the vaccine.	Give the dose first and then tally using the tally sheet.
Tallying at the end of a session according to number of doses contained in the used vials.	'Wasted' doses may be added to the total.	Tally only those doses actually given.
Tallying all vaccines under one age group (including those outside the targeted age).	Will result in inaccurate coverage data.	Separate tally for under one and over one year of age, and pregnant women.

2.1.2 Immunization register

While tally sheets record the doses given for each session, the immunization register records doses given to each individual and helps health workers keep track of the immunization services they offer to each infant and pregnant woman. Each dose given to every child or pregnant woman in the catchment area should be recorded against their names in the register.

In this way the immunization register is the basis for tracking individual immunization status, and defaulters.

Key point: Health workers should be urged to treat the immunization register with respect and care as it may be the only permanent record of immunization available.

Health facilities should record doses given to children and tetanus toxoid (TT) immunization to pregnant women in the appropriate register. There may be one register to record both infant immunizations and TT given to pregnant women, or two separate registers.

Figure 5.3: Important information to be included in an immunization register

What to include in the register

A register should include the following information, as well as any information required by your health facility:

- a unique identification number
- registration date (usually the date of the first visit)
- name of infant
- infant's birthdate
- infant's sex
- name and address of mother/parent
- vaccinations provided and vitamin A supplementation
- TT vaccination provided to pregnant women (depending on country policy)
- whether infant was Protected at Birth (PAB) for neonatal tetanus.

Source: Immunization in practice: A practical guide for health staff. Geneva, World Health Organization, 2004.

Learning activity 5.3: Correct practice when using immunization registers

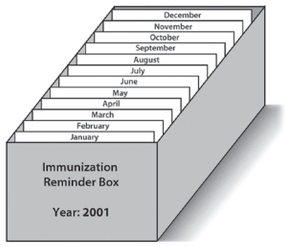
You are the mid-level manager in Gic Province and during a supervisory visit you observe the following problems with the registers.

TASK: Complete the table below by listing the correct practice that would avert each problem.

Common problems	Possible result	Correct practice
Not used at every session, especially outreach sessions.	Inaccurate recording of services provided.	
Incomplete data.	Inaccurate recording of services provided.	
Data entered twice.	Inaccurate recording of services provided (same infant or woman may be counted twice). Difficulty in tracking defaulters.	
Not used to track defaulters.	Infants drop out and do not complete the immunization series.	

2.1.3 Defaulter register or immunization reminder box

It is important to track children and pregnant women who fail to present for immunization. If many in the catchment area of the health facility are defaulting, then this may indicate a widespread lack of confidence in vaccines, poor outreach services, or problems with stock-outs. A system to track drop-outs is an integral part of the Reaching Every District (RED) strategy (See Annex 3), and is well described in *Immunization in practice : A practical guide for health staff*.



2.1.4 Immunization cards

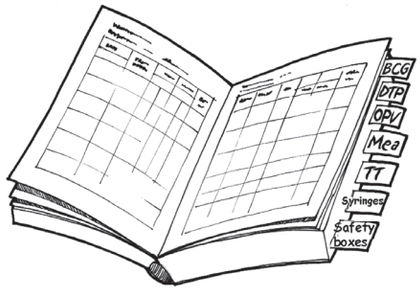
It is important that immunization cards are completed accurately so that they can be used for tracking defaulters and providing caregivers and pregnant women with information on when to return for services. Some cards include a space for recording the batch number of each vaccine administered, or an area for documenting any adverse events following immunization (AEFI).

The immunization cards should be of sufficient quality to last for several years as a record of the immunization status of a child or woman. They are often designed in the form of a small booklet the size of a purse or wallet.

2.1.5 Stock record

Wherever vaccines are stored, a system of stock management must be in place to record the movement of vaccines and safe injection equipment in and out of the storage facility, including those received, dispatched and used. This will help ensure that:

- vaccines and safe injection equipment are used before their expiry date;
- the vaccine vial monitor (VVM) status is recorded at receipt and issue of vaccines;
- there are no stock-outs, or over-stocking.



It is important to distinguish between different batches of vaccine because they may have different expiry dates and should be used accordingly; plus, in the event a certain vaccine is recalled, it is important to easily identify the location of the vaccine batch.

Stock records can be maintained using a simple exercise book or using separate cards. Stock records are discussed in more detail in *Module 1 : Cold chain, vaccines and safe-injection equipment management,* and in *Immunization in practice : A practical guide for health staff*.

Key point: Batch numbers for each vaccine should always be recorded.

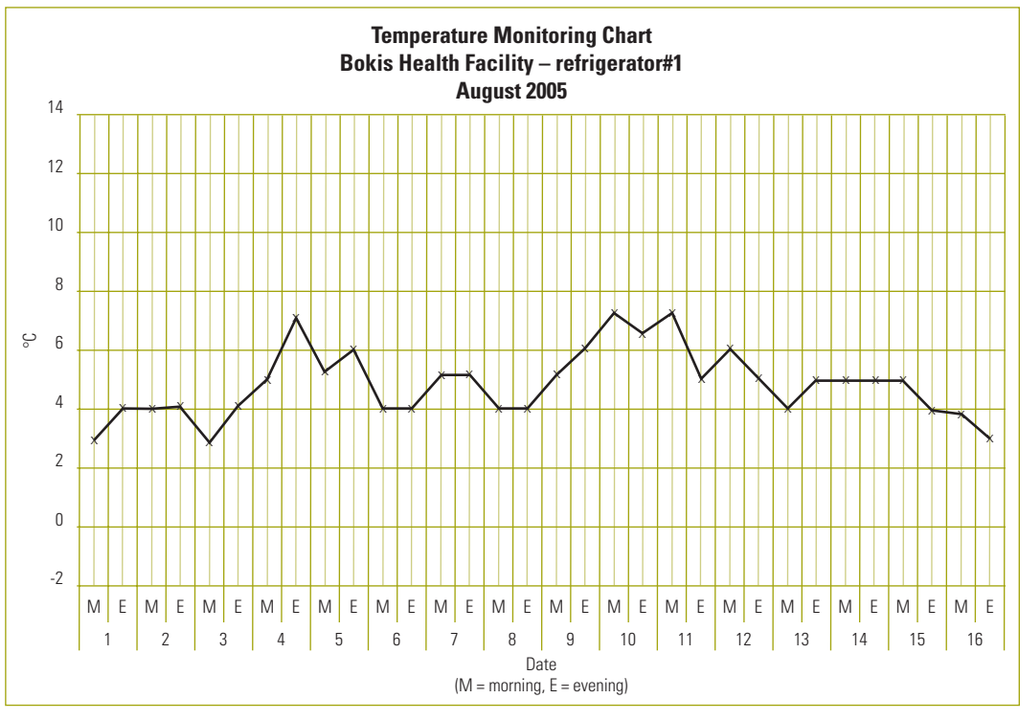
Table 5.2 : Common problems with stock records

Common problems	Possible result	Correct practice
No stock record.	Can lead to overstocking, shortage of storage space, or stock-outs.	Use stock record.
Not updated.	Can lead to overstocking, shortage of storage space, or stock-outs.	Update stock record for every transaction.
Incomplete data – expiry date, VVM status or batch number missing.	Expired vaccines in stock or vaccines with VVM status reaching the discard point might be in stock.	Complete all fields of record and discard expired vaccine.

2.1.6 Refrigerator temperature chart

Twice a day (including weekends and holidays) the temperature of every refrigerator and freezer that stores vaccines should be recorded on a refrigerator temperature chart. This information is not difficult to collect and can provide valuable information about the quality of vaccines, the training of health workers, and the availability of equipment (including thermometers) at the health-facility level.

Figure 5.4: Completed temperature monitoring chart, Bokis Province 1–16 August 2005



2.1.7 Health-facility consultation register

Every health facility should maintain a register of consultations, including both outpatient and inpatient consultations. The register usually records name, address, age, diagnosis, and treatment.

The health-facility consultation register is an important source of information on vaccine-preventable diseases (VPDs) and AEFI. These data are usually included in the monthly report (Section 2.2.1), and are reviewed during supervision visits (Section 2.2.2).

Depending on national policies, the identification of certain VPDs or serious AEFI will generate an additional and immediate report to the next level. More information about recording and reporting AEFI and VPDs is included in *Module 3: Immunization safety* and *Module 8: Making disease surveillance work*.

2.1.8 Tools for monitoring advocacy, communication, and programme management indicators at the health-facility level

The monthly workplan that outlines activities for the month can also serve as a tool to monitor Components 4 and 5. In addition to monitoring immunization sessions, the following activities can also be monitored:

- community mobilization
- community meetings
- supervisory visits
- staff meetings
- training sessions
- staff movements
- transportation schedule.

2.2 Data collection at the district or provincial level

2.2.1 Monthly report

It is very important that immunization data be collated into a monthly report at each level of the health service. The monthly report should contain critical data on most of the components of the immunization system, without being too detailed and without putting too much burden on health staff.

Most of the data collected from health facilities (Section 2.1) will be consolidated into a monthly report that is forwarded to the district level. The district then consolidates data from all the health facilities into a monthly report, and forwards this on to the provincial level. Finally, the province consolidates all the district data in a provincial monthly report, which is then sent up to the national level.

Figure 5.5 provides an example of a monthly report sent from the health facility. It shows:

- the number of vaccines administered in July, including the number of fixed and outreach sessions;
- stocks received and used, including vaccines and safe injection equipment;
- the number of VPDs and AEFI identified.

Note that this is an 'integrated' monthly report, meaning that it includes immunization data as well as disease data. In some countries, however, the disease data is completed in a separate report. As a mid-level manager, both the immunization data and the disease data are very important to help you monitor the progress of immunization services in your area, and to take action when problems are identified.

Figure 5.5 : Example of an integrated monthly report

EPI-TENGA
MoH

MONTHLY VACCINATION REPORT

PROVINCE : _____ DISTRICT : _____
Health Facility : _____ Name of the Manager : _____
Monthly target infants : _____ Fixed sessions planned : _____ No. of outreach planned : _____
Month : _____ Year : _____

1. SYNTHESIS OF MONTHLY VACCINATIONS GIVEN

VACCINATION STRATEGIES		TT VACCINATIONS TO PREGNANT WOMEN					BCG		POLIOMYELITIS VACCINATIONS							DTP/Q/P VACCINATIONS						MEASLES VACCINATIONS		YF VACCINATIONS		VITAMIN A SUPPLEMENTATION		
									< 1 year				> 1 year			< 1 year			> 1 year									
	No. of sessions	1st dose	2nd dose	3rd dose	4th dose	5th dose	0 - 11 mos	≥1 year	at birth	1st dose	2nd dose	3rd dose	1st dose	2nd dose	3rd dose	1st dose	2nd dose	3rd dose	1st dose	2nd dose	3rd dose	9-11 months	≥ 1 year	9-11 months	≥ 1 year	Mothers	0-11 months	≥ 1 year
Fixed																												
Outreach																												
Total month																												
Total doses opened																												

2. FACILITY/DISTRICT STOCK MANAGEMENT DATA

Vaccines & injection equipment	Quantity received each month	Stock balance at the end of the month	Vaccine doses discarded due to VVM change	Temperatures at which vaccines have been exposed	
				Min (°C)	Max (°C)
Vaccines & Vitamin A					
BCG					
DTP					
OPV					
Measles					
TT					
YF					
HepB					
Hib					
Vitamin A					
Injection equipment					
AD Syringes 0.05ml					
AD Syringes 0.5ml					
Reconstitution syringes, 2ml					
Reconstitution syringes, 5ml					
Safety boxes					

3. SYNTHESIS OF DISEASE SURVEILLANCE & AEFI

Targeted diseases	0-11 months		1 - 4 years		5 - 14 years		15 years &+		Total		Vaccination Status (doses received)				
	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	0	1	2	3	unknown
AFP															
Measles															
MNT															
Diphtheria															
Pertussis															
Yellow Fever															
Meningitis															
Malaria															
Others															

Type of AEFI (Events)	Total No. of cases	Vaccines-related events								Additional comments (if any)
		BCG	Polio	DTP	MSL	TT	YF	HepB	Hib	
Abscesses										
Anaphylaxis										
Other allergic reactions										
BCG Lymphadenitis										
Deaths										

INSTRUCTIONS : This template is the only monthly reporting tool for all levels.
at service & sub-district levels : the health worker fills in the form by making a synthesis of all vaccination session tally sheets of the month, the stock record book/sheets and the disease surveillance. The completed template should be sent to the higher level before the 10th of each month.
at district level : for item 1. & 3., the manager should make the summary of the data items for all peripheral vaccination units. For item 2. the status of his own stocks (qty received, stock balance at the end of month and the min/max vaccine temperature exposures) should be reported. The completed template should be sent to the higher level latest the 10th of the next month.
at provincial & national levels : provincial & national levels received the reports from districts. Managers at those levels will make the required standard analysis and feed-back to districts.

2.2.2 Supportive supervision visits

You may have noticed that the monthly reporting form did not capture much information on the advocacy and communication, and programme-management components of the immunization system.

Active supervision is one way to collect data that is not otherwise captured in passive reports such as tally sheets, or monthly reports. Box 5.1 gives an explanation of the difference between passive and active data collection.

Key point: Reliable monitoring of the immunization system requires a combination of passive and active data collection.

Supervision includes the active observation of immunization activities and discussion with health workers and the community. 'Supportive supervision' refers to the process of detecting problems and identifying solutions by working with staff, recognizing achievements, and avoiding blame and criticism. There is little benefit to be gained in conducting brief unplanned visits which do not aim to systematically monitor performance. More information on this is included in *Module 4: Supportive supervision*.

Box 5.1: What is the difference between passive and active data collection?

Passive data collection

Passive data collection implies that regular reports (e.g. monthly) are sent from the periphery to the mid-level manager. This is also known as 'routine' reporting and is usually part of a national Health Management Information System (HMIS). Usually passive data collection begins with tally sheets that are completed during immunization sessions. The tally sheets are then aggregated into a monthly report. Monthly reports are further aggregated at each administrative level. The monthly report should be designed so that it has as much information as possible on all five components of the immunization system. However, in practice, the monthly report cannot always provide the detail that is needed to obtain more complete information on progress.

Active data collection

A supervisory visit presents an excellent opportunity for monitoring the components of the immunization system, and providing details that will complement the monthly (passive) report. For example, active observation of immunization work and discussion with health workers and the community will provide information that cannot be captured in a monthly report.

Learning activity 5.4: Using active and passive data collection to monitor implementation of the Reaching Every District (RED) strategy

You are the mid-level manager in Bangay Province and wish to monitor the progress of RED implementation in one of your districts. Some information is available from monthly reports and some is not, so you will need to use other methods to obtain a full picture.

TASK: In the following table decide which information can be collected through monthly reports, and which needs to be collected by making a visit and obtaining information by observation and discussion. Refer to Annex 3 for details of RED activities.

RED operational component	Passive data collection (from monthly reports)	Active data collection (from visits, observation and discussion)
Re-establishing outreach services.		
Supportive supervision.		
Linking services with communities.		
Monitoring and use of data for action.		
Planning and management of resources.		

2.2.3 Other reports

Depending on the status of national disease control and vaccine safety policies, additional reports may be received at the district and provincial levels that could provide important data for monitoring the immunization system. These could include reports of serious AEFI, and AEFI investigations, and also case investigations of acute flaccid paralysis (AFP).

2.2.4 Monitoring timeliness and completeness of reports

The possibility of a prompt and effective response is greater when reports are sent and received on time. Ideally all data should be available and analysed on time so that information on the situation prevailing can be taken into account. However, there may be situations where data for a particular period and facility or district are late. The best way to manage a late report is to submit an addendum to the monthly report. Late incoming data should not be rejected or ignored; they must be used to update the existing data set at all levels.

Key point: Districts should not pass their own reporting deadline when waiting to receive the latest report from the delaying health facility.

The completeness of reporting for each particular period is calculated on the basis of total number of reports expected (denominator) and number of reports received (numerator) and is expressed as a percentage. If reports are not complete for a district, the cumulative immunization coverage figure will drop and not reflect the true situation. A sample form for recording timeliness and completeness of monthly reporting from the health facility to the district is included in Annex 4.

Learning activity 5.5: Monitoring completeness and timeliness of reports

You are the mid-level manager in Voletti Province and are calculating the completeness and timeliness of reporting for the first six months of the year in your 12 districts.

TASK 1: Complete the last two rows of the table by calculating the completeness and timeliness of reporting for each month (refer to the sample form in Annex 4).

Monitoring form for completeness and timeliness of district reports in Voletti Province

Reports due on the fifteenth of every month

Districts		Reports received on:					
		Jan.	Feb.	Mar.	Apr.	May	Jun.
District 1		12	23	12	24	22	22
District 2		23	15	12	25	20	22
District 3		24	13	13	25	20	22
District 4		14	14	13	25	20	24
District 5		14	20	13	22	13	25
District 6		12	23	13	22	13	24
District 7		23	23	13	22	12	23
District 8		12	23	13	22	–	–
District 9		13	25	12	22	22	22
District 10		23	25	–	–	–	22
District 11		23	24	12	12	22	10
District 12		24	25	12	22	22	23
Completeness	$\frac{\#\text{ received}}{\#\text{ districts}} \times 100$						
Timeliness	$\frac{\#\text{ on time}}{\#\text{ districts}} \times 100$						

TASK 2: What steps will you take to enhance the timeliness and completeness in Voletti Province?

Box 5.2: How do I find the right balance between too much and too little data?

A vast amount of information is sent to the provincial level. A mid-level manager will receive reports from each district, reports of supervisory visits to health-facility and outreach sites, and reports from provincial administrative, financial and cold-chain/logistics units. In addition, a mid-level manager will compile reports on his or her own supervisory visits.

To handle this volume of information, it is very important that the manager is clear about what information will be routinely analysed, based on the immunization programme indicators. These indicators should be chosen wisely so that they provide enough information about the progress of the immunization programme but do not overwhelm the manager with the volume of data to be collected.

Remember that you need enough information to make sure you can take corrective action when a problem is identified.

2.3 Data management

At the end of every month, district and provincial managers need to review all the data collected through passive and active reporting. The following steps ensure that the manager will be in a good position to take action on the data they receive.

1) **Scan incoming reports**: All reports should be reviewed for blanks, inaccuracies (such as miscalculation or misplacement of figures), and inconsistencies. Reasons should be sought and corrections made, if possible.
2) **Focus on priority indicators and areas**: Collate the data that will measure the progress of the indicators, and examine the results from priority locations that may have performed poorly in the past, or areas that have had an unexpected change in performance.
3) **Consolidate the data**: Prepare a report for forwarding on to the next administrative level. The monthly report shown in Figure 5.5 includes some of the data necessary for measuring indicators and is designed for use by all levels. Data that are not presented in the monthly report, such as results from supervisory visits, should also be consolidated.
4) **Analyse the data**: The following section describes how the data can be analysed to measure progress towards the indicators.

2.3.1 Using a computerized database

Ideally, data collected from monthly reports and other sources should be consolidated into a computer database for easy reference and to generate useful tables and graphs.

The database should be sufficiently comprehensive to include all the quantitative data provided in the monthly report; for example, immunization doses, disease incidence, AEFI, vaccine and supply and stock levels, etc.

There are many examples of computerized databases available in various countries. One example is an Excel-based database that has been developed at WHO-HQ to include the quantitative data likely to be collected in a monthly report.

Notes :

3. Data analysis and display

At every level, staff should use the data they have collected to monitor progress towards indicators for their catchment area. This will allow them to examine priority locations that may have performed poorly in the past, or areas that have experienced an unexpected change in the quality of performance.

In this section, you will be shown the most common tools to help mid-level managers analyse and display data, and identify problem areas. A number of methods are described, including coverage/drop-out monitoring charts, bar charts, maps and tables.

3.1 Common tools for displaying monitoring data

3.1.1 Coverage/drop-out monitoring chart

A coverage/drop-out monitoring chart is a simple and effective tool for visually monitoring the progress towards immunization coverage targets across a region or area. The following information is presented on a graph.

- The number of vaccines administered on a month-by-month basis compared with the number of children who should have received them (the target population).
- If the coverage rates of two vaccines are plotted on the same graph, then it is also possible to monitor the drop-out rates between the two vaccines, i.e. the number of infants that started receiving immunizations compared to the number of infants that received all doses of vaccine.

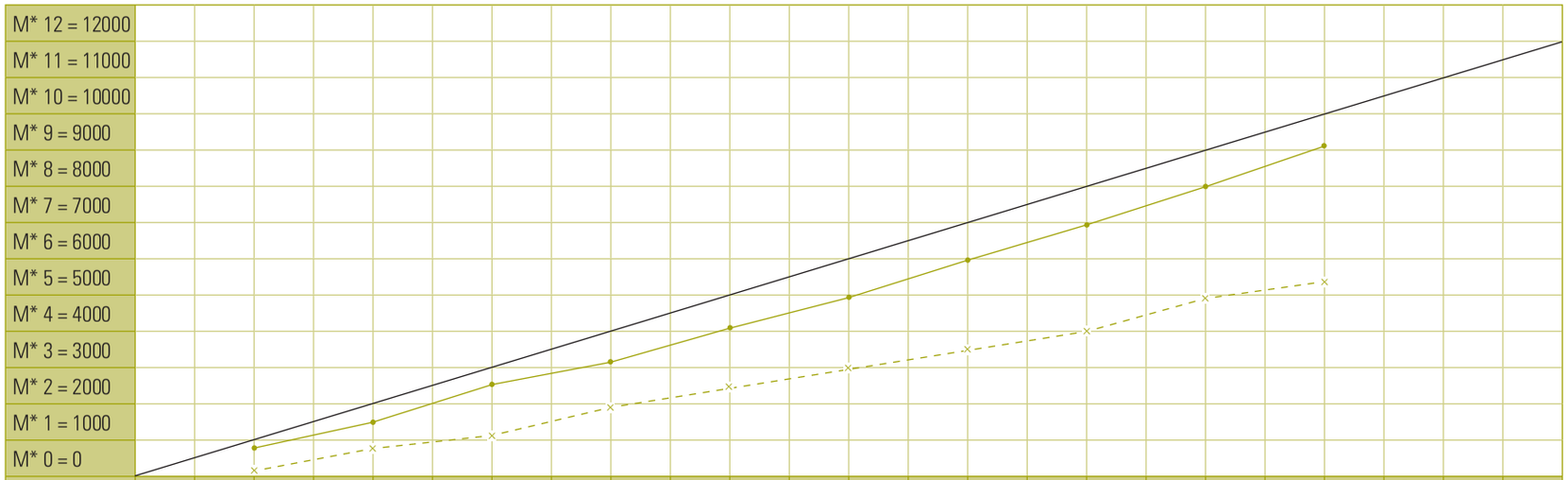
Each level, from health facility to the national level, should display a current coverage/drop-out monitoring chart on the wall, so it is important that mid-level managers are familiar with producing these. See Annex 5 for instructions and a blank chart for your use.

Learning activity 5.6: Preparing and interpreting a coverage/drop-out monitoring chart

As the mid-level manager in Braddici Province you are responsible for monitoring the coverage and drop-out in your province.

TASK 1: Complete the graph lines for diphtheria-tetanus-pertussis vaccine (DTP) DTP1 coverage and DTP3 coverage in November and December (see Annex 5 for instructions).

TASK 2: List three main interpretations of the chart.



Months	Jan.	Cum Total	Feb.	Cum Total	Mar.	Cum Total	Apr.	Cum Total	May	Cum Total	Jun.	Cum Total	Jul.	Cum Total	Aug.	Cum Total	Sep.	Cum Total	Oct.	Cum Total	Nov.	Cum Total	Dec.	Cum Total
DTP1	885	885	823	1708	916	2624	834	3458	812	4270	792	5062	916	5978	938	6916	1052	7968	1198	9166	458	9624	750	10374
DTP3	520	520	459	979	427	1406	677	2083	521	2604	583	3187	458	3645	521	4166	802	4968	552	5520	208	5728	521	6249
Drop out #		365		729		1218		1375		1666		1875		2333		2750		3000		3646		3896		4125
Drop out %		41.24		42.68		46.42		39.76		39.02		37.04		39.03		39.76		37.65		39.78		40.48		39.76

Learning activity 5.7: Deciding which coverage/drop-out charts might be useful

You are a mid-level manager deciding which coverage/drop-out charts might provide useful information about progress in your province.

TASK 1: Look at the following coverage/drop-out monitoring charts. List one piece of information from each chart that could be useful for monitoring your immunization programme indicators.

Coverage/drop-out monitoring charts	Information gained from the chart that could be helpful in monitoring immunization programme indicators
BCG and DTP3	
DTP1 and Measles	
HepB3 and DTP3	
OPV3 and DTP3	
OPV1 and OPV3	
Measles and Yellow Fever	
Measles 1 and Measles 2	

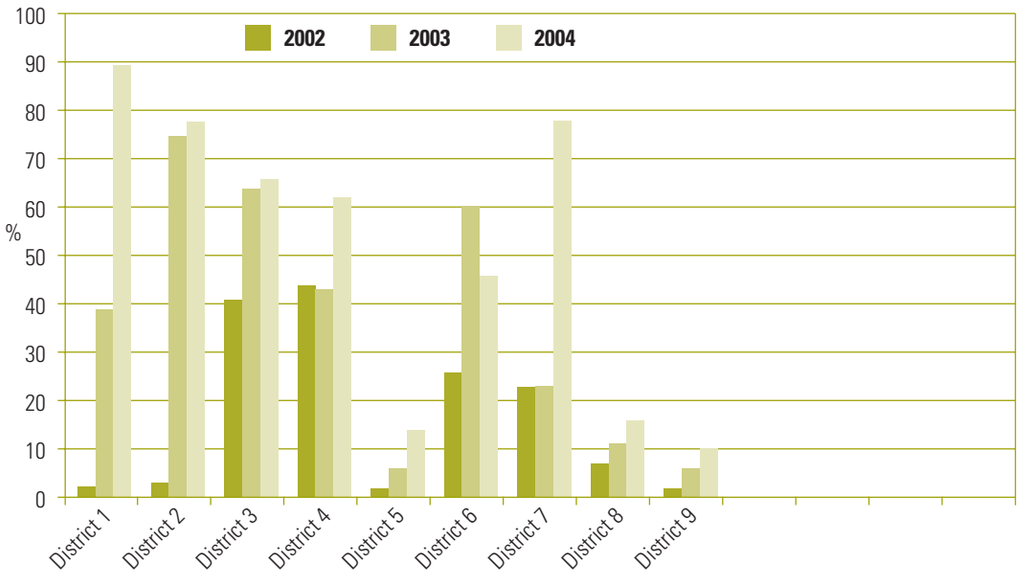
3.1.2 Bar charts

Although the coverage/drop-out monitoring chart can display information for one region such as a health facility or province, usually mid-level managers need to compare data across several areas which cannot be done using monitoring charts.

The bar chart is easy to prepare and interpret, and can be used for the presentation of simple numbers, rates, or percentages across a number of districts, or more complex analysis involving a number of different indicators. Where possible, a bar chart should include information about the time period covered by the chart, including the year.

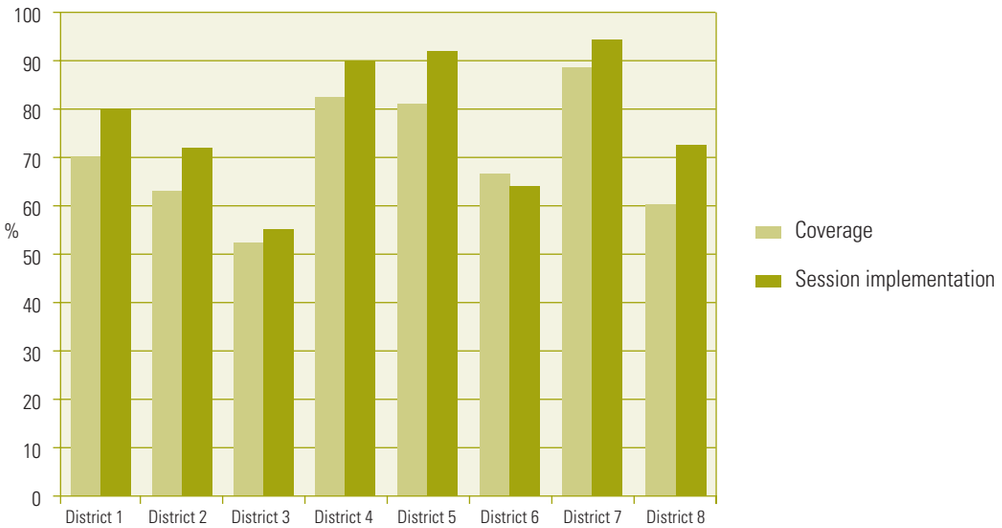
Key point: Bar charts are often easier to interpret if the columns are arranged in order of performance, rather than by name. This is called 'ranking'.

Figure 5.6 : DTP3 coverage in comparison to baseline year 2002



In the above examples, the bar charts displayed data from just one indicator; in this case DTP3 coverage. Bar charts can also be used for displaying more complex information, including change over time, although care must be taken to ensure the data can still be easily interpreted.

Figure 5.7 : Bar chart showing DTP1 coverage compared with session implementation



Key point: Always remember to look at the time period covered by the chart or map, as this may affect the way you interpret the data. For example, annual data may hide problems that occur at the same time each year (e.g. where community mobilization activities cease during the rainy season), but monthly data may overemphasize these problems.

3.1.3 Maps — spot maps, shaded maps

Mapping is a very useful tool for displaying data on the progress of an immunization programme towards indicators. Simple maps, such as spot maps and shaded maps, can illustrate the distribution of cases of vaccine-preventable diseases, or display coverage data.

Maps should be accompanied by a description of the indicator being measured by the map, and details of the time period covered, including the year.

Figure 5.8 : Spot map showing location of functioning and non-functioning refrigerators in the sub-districts of Singer District, January 2007

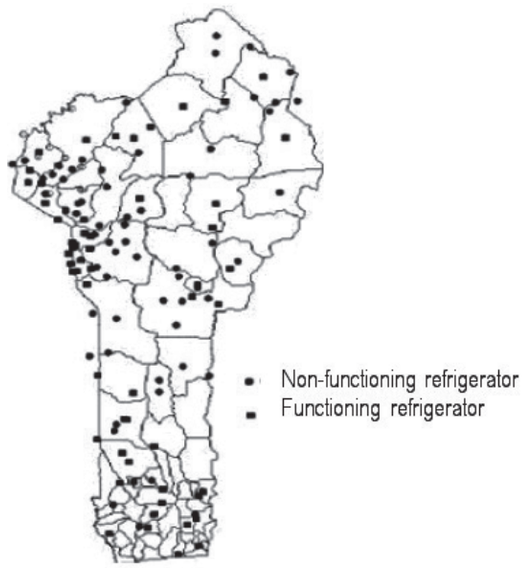
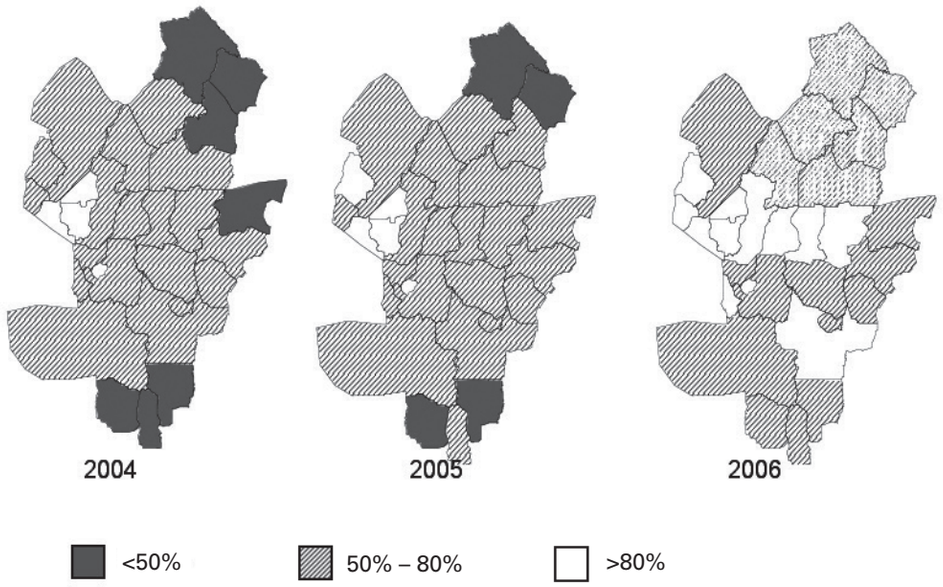


Figure 5.9 : Shaded map showing low, medium and high DTP3 immunization coverage in Garlic Province, 2004–2006



3.2 Comparing quarterly performance

An easy way of comparing quarterly performance is to divide the number of doses given during that quarter by the target population for that quarter. This method is the simplest way to compare performance within each district quarter-by-quarter and to make a real comparison between several districts. Table 5.3 shows how data from different districts can be entered into a single table for easy display and analysis by the mid-level manager.

District 1 has an annual target population of 2400 and the quarterly DTP3 coverage is calculated using the following values of numerator (i.e. number of DTP3 doses given).

	Q1 (Jan., Feb., Mar.)	Q2 (Apr., May, June)	Q3 (July., Aug., Sep.)	Q4 (Oct., Nov., Dec.)
Doses given	500	450	380	550
Quarterly coverage	83	75	63	91

Note that the annual coverage will be the total of all doses given in the four quarters divided by the annual target population.

For example : 500 + 450 + 380 + 550 ÷ 2400 = 78%

Table 5.3 : Quarterly coverage data analysis

For each district : At the end of each quarter, enter the reported coverage for each antigen in the appropriate column

	BCG				DTP1				DTP3				OPV3				Measles				HepB3				TT2+			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
District 1																												
District 2																												
District 3																												
District 4																												
District 5																												
District 6																												
District 7																												
District 8																												
District 9																												
District 10																												

Box 5.3: How accurate does my denominator data need to be?

To monitor the progress of the immunization system, mid-level managers are highly dependent upon accurate baseline data. This progress is often expressed as a percentage, and so the use of reliable denominator data is very important.

The denominator can generally be defined as the target population, be they children less than one year of age, women of childbearing age, or a hard-to-reach population.

There are many different sources of denominator data, and often several of these are available in a single country. Unfortunately, some of these sources are outdated and may not reflect the true population dynamics. Figures regarding emigration (inward or outward movement of populations) or the true birth rate may not be known. These and other factors can result in inaccurate baseline figures, with the effects shown below.

Effects of using inaccurate denominator data	
If the denominator figure is LOWER than the true target population figure	**If the denominator figure is HIGHER than the true target population figure**
For example: You think your target group is 100 000 children when in reality there are 150 000.	For example: You think your target group is 200 000 children when in reality there are 100 000.
Higher coverage (sometimes over 100%).	Lower coverage.
Inadequate supply of vaccines and safe injection equipment.	Over-supply of vaccines and safe injection equipment.
Difficulty identifying programme gaps.	Lack of motivation when coverage targets appear not to be reached in spite of good service delivery.

The following list of activities may help you calculate a realistic denominator.

1) Consult with local experts and others in your country who have been involved in calculating denominator data for other immunization activities such as polio eradication or measles elimination.
2) Review demographic data from various official and unofficial sources, including community birth registers, government census surveys, and population surveys.
3) Consider using data from previous campaigns to estimate a denominator figure (e.g. a polio campaign reaching 90% coverage vaccinated 50 000 children, so the denominator can be calculated as 50 000/0.9 or 55 556 children under five years of age).
4) Conduct local headcounts using health workers or local community volunteers (care must be taken to include remote or difficult-to-access populations).
5) Consider systematically adding or subtracting a population multiplier e.g. adding a factor of 10% in an urban area in line with recent population trends.
6) After reaching a consensus on the denominator figure to be used, ensure it is used consistently for all calculations.
7) If the figure differs from official government estimates always note this when it is used in reports, tables or graphs.

NEVER deliberately use an inaccurate denominator figure so as to over-inflate coverage figures. This will only place children and women at risk of disease.

Learning activity 5.8: Understanding over-reporting problems

You are the mid-level manager in Khalili Province and are compiling your annual coverage report based on data sent from the districts. You notice that several districts report annual coverage for DTP3 between 100% and 130%.

TASK 1: List three possible problems with the numerator that might have caused this.

1)

2)

3)

TASK 2: List three possible problems with the denominator that might have caused this.

1)

2)

3)

TASK 3: As a mid-level manager, what action can you take to understand and resolve the situation?

Key point: 120% coverage is **not** better than 100%. It just indicates that you cannot monitor the real performance of your programme, and that the quality and accuracy of the denominator needs investigation.

Notes :

4. Taking action

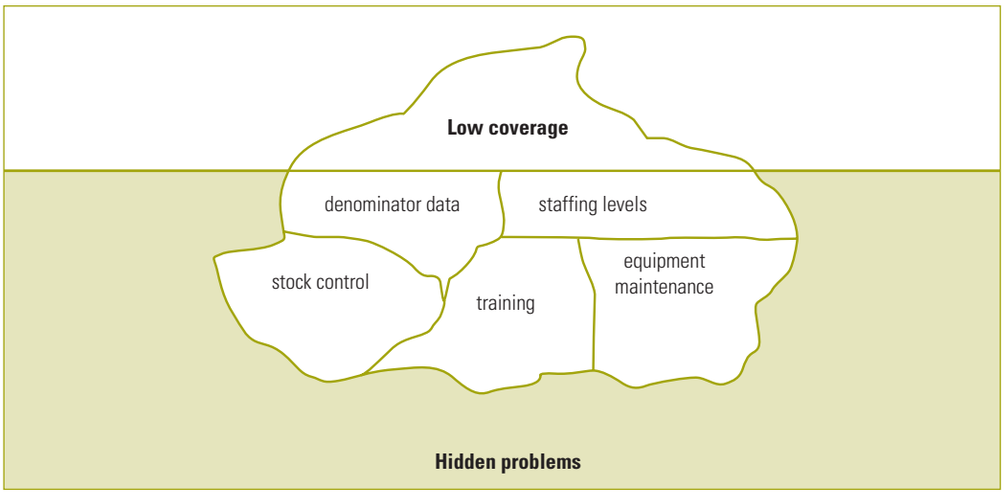
One of the key reasons for implementing a monitoring system is to identify problems and develop solutions that will improve the quality of the immunization system. Having established a reliable monitoring system, the mid-level manager must be prepared to respond to these problems and concerns.

In this section we refer to 'taking action' specifically in the context of rectifying or averting problems. Two other ways of taking action — feedback and feed-forward — form part of the routine reporting and management of a monitoring system, and as such are discussed in the following section.

4.1 Investigating problems before deciding on action

Each time you investigate a problem, it can be helpful to think of the 'iceberg effect'. As shown in Figure 5.10 below, the 'iceberg effect' means that the most obvious problem is usually identifiable (i.e. the part of the iceberg that is showing above the water), but also there are often underlying problems that are harder to see (i.e. the part of the iceberg hidden under the water).

Figure 5.10 : Illustration of the 'iceberg effect' where the main problem can be seen but other hidden problems contribute to it



Key point : Any single problem identified may just be a symptom of many underlying problems in the immunization system. Always be prepared to investigate the underlying causes of a problem.

Box 5.4: How quickly should I respond to a problem?

The speed at which you respond to a problem depends on the potential impact that problem will have on the immunization programme. In general these can be categorized into three levels of priority.

1) Immediate problems that may cause interruption to the immunization service or risk health and/or lives.
2) Trends that threaten the failure of the immunization programme.
3) General improvement in the performance and quality of the immunization service.

The table below shows how each priority level will affect the speed at which the problems should be resolved.

	Urgent action	Medium-term action	Long-term action
Purpose	Solve **immediate problems** that may cause interruption to the immunization service or risk health and/or lives.	Reverse **trends** that threaten the failure of the immunization programme.	Improve the **performance and quality** of the immunization service.
Should be solved within:	Next few days/weeks.	Next few months.	Next planning cycle: usually quarterly or annually.
Examples	Stock-out or confirmed report of polio case.	Reduced coverage or increased drop-out.	Improving the number of reports of adverse events following immunization.

Sometimes an urgent problem may also need some medium- and long-term action.

For example: If a vaccine stock-out has been identified, the urgent response will be to ensure vaccines are delivered as soon as possible to avoid an interruption to the immunization programme. A medium-term action might be to provide training and supervision regarding stock control and a long-term action might be to employ a vaccine storekeeper.

Learning activity 5.9: Taking action and solving problems

You are the mid-level manager in Nabili Province, comprising 20 districts and 200 health facilities. The table below lists some problems that have been identified during monitoring.

TASK: In each of the columns write one action you would take for the problem. Remember that one problem may be a symptom of many others in the system, and also that an urgent problem may also need medium- and long-term action.

Components of the immunization system	Problem	Urgent action	Medium-term action	Long-term action
1) Service delivery	Failure of outreach services in hard-to-reach areas last quarter.			
	Provincial coverage for measles vaccine declined last quarter compared to previous year.			
2) Vaccine supply, quality & logistics	Stock-out of AD syringes reported in three districts last month.			
	National pentavalent vaccine wastage rate exceeded expected rate last year.			
3) Surveillance & monitoring	A measles outbreak reported in two districts last month.			
	Last quarter, five districts did not send in reports.			
4) Advocacy & communication	An AEFI has resulted in all immunization activities being stopped in one district.			
	Community mobilizers not being used effectively.			
5) Programme management	20 health facilities have vacant posts.			
	At least 25% of health facilities had received no supervisory visits last year.			

4.2 Preparing an action plan

In this section we have listed the important steps a mid-level manager must take once a problem has been identified during the monitoring process.

1) Investigate the possible underlying causes.
2) Decide on the actions needed.
3) Build on this and make a plan to ensure follow-up is undertaken. An action plan is a simple way to track the decisions you have made and the people responsible for implementing the solutions.

Once complete, an action plan, such as the example in Figure 5.11, becomes part of the monitoring process and must be reviewed regularly to ensure that progress is being made.

Figure 5.11 : Example of an action plan

PROBLEM IDENTIFIED : _____

Area : _____ Year : _____

Action	Person(s) responsible	Start-date	End-date	Progress
1)				
2)				
3)				
4)				
5)				
6)				

Adapted from : *Increasing immunization coverage at the health facility level.* (WHO/V&B/02.27).

Key point : Regular review and analysis of data is important to ensure : early identification of problems ; timely action ; progress towards goals and solving problems.

5. Feedback and feed-forward

The terms 'feedback' and 'feed-forward' refer to the process of routinely sending results of data analysis to different levels of the monitoring system.

Feedback (sending information to the peripheral levels) is particularly important for those who have provided the data, so that they can see the value of collecting and reporting information, and to compare their performance in relation to others at the same level.

Feed-forward (forwarding results of data analysis to higher administrative levels) can help to promote accomplishments as well as highlight areas of concern and seek assistance with problems.

5.1 Feedback to reporting sites

The main reasons for providing feedback to reporting sites (such as district health staff and health facilities) are to:

- create a collaborative environment by acknowledging the hard work of data providers and reassuring them that their data will be analysed;
- improve the accuracy and promptness of the reports;
- verify with the peripheral levels that the data received at higher levels are correct;
- improve performance by showing national progress towards specific public health goals and comparing performances between regions;
- facilitate the use of data by providing data analysis in greater depth than can be achieved peripherally; for instance, if the peripheral level is not computerized the central level might provide computerized tables, graphs and maps to enhance the local analysis of data;
- provide the community with information on coverage, drop-out and other indicators, so they can help plan and implement better services;
- place the local data in the context of regional data, allow for comparison of data and performance and visualize the extent of coverage and drop-out.

Key point: The importance of feedback should never be underestimated. The mid-level manager should remember feedback can be a valuable tool for improving coverage and other indicators.

Routine feedback to the reporting sites should comprise a consolidated report of the provincial and district priority indicators for the five components of the immunization system. It is important to first show the overall progress made in the last quarter, and secondly to show a more detailed analysis of the location and nature of the problem areas.

At minimum, the following information should be included in routine feedback reports.

• Coverage and drop-out. • Timeliness/completeness of reports. • Cases of vaccine-preventable diseases. • Stock-outs. • Results of investigations into adverse events following immunization.	• Summary of problems identified, including underlying problems or contributing factors. • Information on actions taken and requests for further action, if needed. • Congratulations on doing a good job or encouragement to do a better job.

5.1.1 Method and frequency of feedback

There are many different ways a mid-level manager can feed back the results of monitoring. These depend on the data that are to be presented, the level at which the information is targeted, and whether a specific problem requires solving.

Every mid-level manager should have a plan for providing regular feedback, but one-off, spontaneous, or ad hoc opportunities can also be advantageous.

Although monthly newsletters or reports help to keep the peripheral levels informed and updated, a quarterly meeting can give the mid-level manager an opportunity to discuss achievements and problems face to face with staff and other interested partners.

Meetings are most effective if the relevant data are analysed and prepared in advance in the form of visual displays, such as those illustrated in Section 3. For quarterly meetings this can sometimes result in complicated data covering many districts; a table to help prepare quarterly coverage data for each antigen on a district-by-district basis has been included in Table 5.3

Key point: Prompt feedback of results should occur regularly; by monthly newsletter if possible, or at least quarterly in a meeting.

5.2 Feedback to the community

As a mid-level manager, you should encourage your staff to provide feedback to communities about immunization services, and always involve local politicians, religious leaders, community group leaders, and parents in planning, implementing and improving immunization programmes. Unfortunately mid-level managers frequently overlook the importance of feeding information back to the community, both regarding the general immunization programme and when there are specific problems that need solving.

For further information about providing feedback, and involving the community, refer to *Module 2: Partnering with communities*.

5.3 Feed-forward

Feed-forward is the process of forwarding the results of monitoring activities to more central levels. There are many formal feed-forward requirements with which the mid-level manager must comply, including a variety of surveillance reports referred to in *Module 8: Making disease surveillance work*.

Unfortunately these formal reports do not always provide a full picture of the situation. Feed-forward is therefore a very useful mechanism for both communicating issues/concerns that are affecting programme performance, and promoting successes, achievements or 'lessons from the field' from which others could learn.

Since feed-forward data is usually intended for people who make or influence decisions at the higher level, the mid-level manager should ensure that they tell an accurate story about the performance in his/her province. The manager should also remember that feeding-forward does not always have to be through formal mechanisms such as monthly reports; ad hoc opportunities such as writing newsletter articles and attending meetings can also be invaluable.

Key point: In addition to regular feed-forward reports, the mid-level manager can send ad hoc information to inform decision-makers of important changes in monitoring results, both good and bad.

Routine feed-forward (monthly or at least quarterly) should comprise a consolidated report of the provincial and district priority indicators for the five components of the immunization system.

The mid-level manager should consider feeding-forward the following information.

- Summary of the results for priority indicators.
- The most serious problems identified, including underlying problems or contributing factors.
- Areas of substantial improvement or good performance.
- Actions taken or that are recommended, and requests for assistance, if needed.
- Copies of supportive supervision reports.

Annex 1 : Key references

Immunization in practice : A practical guide for health staff. Geneva, World Health Organization, 2004.

Global Immunization Vision and Strategy (GIVS) 2006–2015 (WHO/IVB/05.05).

Excel-based database that has been developed by WHO-HQ to include the quantitative data likely to be collected in a monthly report (this tool is available separately).

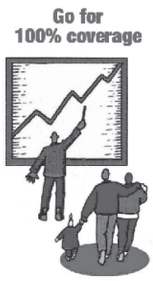
Increasing immunization coverage at the health facility level (WHO/V&B/02.27)

Annex 2 : Parameters of the immunization system

Components of the immunization system	Parameters
1) Service delivery	• Coverage with : BCG, DTP1, DTP3, OPV3, HepB3, Hib3, Measles, Yellow Fever, Vitamin A, TT2+ (e.g. <50%, 50%–79%, >80%). • Drop-out rates for BCG to DTP3 ; DTP1 to DTP3 ; DTP1 to Measles, Measles and Yellow Fever. • Existence of a national plan for immunization.
2) Vaccine supply, quality and logistics	• Availability and continuity of services (adequate supplies, equipment, consumables and transport for distribution, outreach and supervision). • Existence of guidelines on : vaccine management ; transport management ; cold chain ; waste disposal and destruction. • Cold-chain equipment operating and in good repair. • Completion and display of cold-chain monitoring charts. • Existence of inventory of immunization equipment that includes date-of-purchase, functional status, maintenance schedule, and evidence that equipment has been maintained. • Availability and sustainable access to other immunization equipment (e.g. laboratory, vehicles, computers, communication and specimen equipment, and consumables). • Vaccine forecasting, vaccine utilization and wastage monitoring (e.g. minimum, maximum and critical stocks and vaccine wastage rate). • Quality of vaccine : fully functional National Regulatory Authority (NRA) or other independent assessment of quality performed ; manufacturer viable or vaccines procured from prequalified sources. • Implementation of multi-dose vial policy. • Completion of a standardized immunization injection safety survey. • Existence and implementation of policy, plan, and budget on injection safety assessment. • Type of injection equipment in use. • Method of injection equipment disposal.

Components of the immunization system	Parameters
3) Surveillance and monitoring	• Completeness and timeliness of routine reporting. • Completion and display of coverage/drop-out monitoring charts. • Reported new cases of non-polio AFP, neonatal tetanus (NT) and measles. • Vaccine-preventable disease incidence rate. • Proportion of cases confirmed by laboratory. • Mortality rate. • Case fatality rate. • System for detecting, investigating, and reporting adverse events following immunization (AEFI). • Notified and investigated AEFI. • Non-polio AFP rate and percentage of AFP cases with two adequate stool samples. • Case/outbreak investigation initiated within 48 hours of notification. • Percentage of reported VPD cases with information on age and vaccination status. • Feedback of data to subnational levels. • Supervisory checklists completed. • Development of monitoring indicators. • Staff monitor status and stock of supplies, equipment and consumables when visiting subnational service-delivery areas.
4. Advocacy and communication	• Availability of social mobilization, advocacy or overall communication plan. • Availability of specific strategy for hard-to-reach population in immunization policy. • Existence of clinician advocacy and community mobilization. • Existence of active community health committees. • Planning meetings conducted with communities. • Community mobilizers involved in immunization sessions and outreach. • Engagement of sectors other than the Ministry of Health (e.g. Information, Education, Finance, Development, Planning). • Commitment of broad range of high-level decision-makers (demonstrated by active support and public promotion). • Budget for activities, staffing and materials. • Availability of adequate and appropriate information, education and communication (IEC) materials.
5. Programme management	• Government funding of vaccines for routine immunization and programme-recurrent costs for supplies and operations. • Multiple-year commitment to financing (government and partner). • Proportion of planned supportive supervision visits conducted. • Adequacy of personnel to carry out tasks. • Adequacy of personnel training. • Existence of microplans for each district. • Reports on implementation of the plans. • Assessment of services conducted.

Annex 3 : Reaching Every District : implementation and monitoring tools



Reaching Every District (RED) is the name given to a strategy that aims to improve immunization coverage by means of the five steps listed below. A number of simple tools have been developed to help with implementation of the RED strategy, and these are shown on the following page.

Re-establishing outreach services : In many countries a large proportion of the population can only have access to immunization services through outreach. For some communities, access can only be provided infrequently by mobile teams and may involve additional resources. Regular outreach should be incorporated in all session plans. Outreach sessions, especially mobile teams, also present opportunities to provide other interventions with immunization.

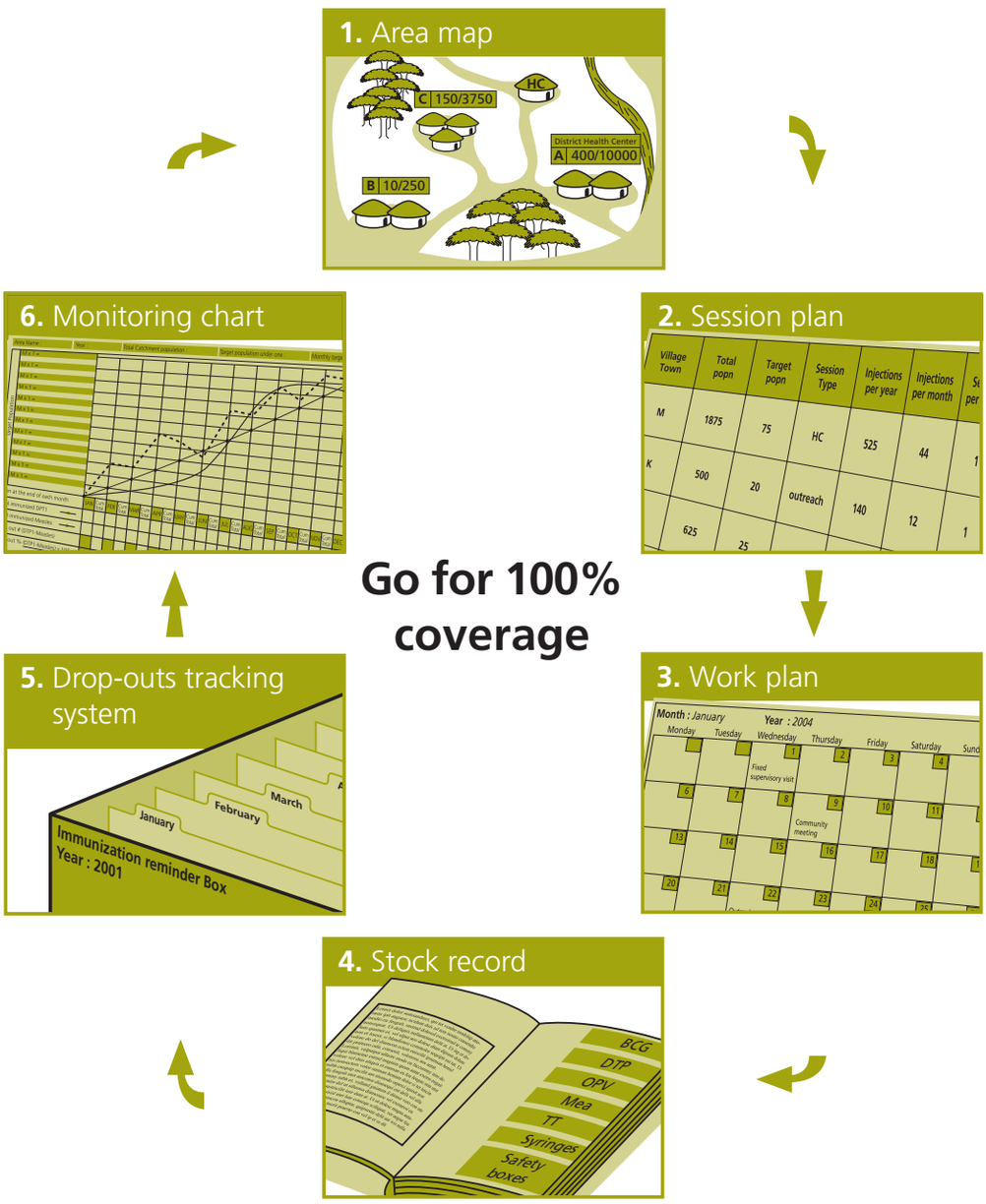
Supportive supervision : Supportive supervision implies providing on-site training to health workers at the time of a supervisory visit, or at regular district meetings. To be supportive, supervisors should make regular visits, help to solve problems locally, and follow up regularly with supply and resource issues. Supervisors will themselves need training to adapt their own approaches to supervision.

Linking services with communities : Strong links between the service and the community can be achieved by involving the community in the planning and delivery of services. Examples of activities include identifying outreach sites and convenient times, providing community volunteers with roles such as identifying newborns and defaulter tracking, and also holding regular meetings with the community.

Monitoring and use of data for action : Monitoring and use of data for action implies not only the timely collection of data at various levels, but also the use of the data to solve problems. Some simple monitoring tools, including wall charts, are available to track monthly progress. In addition, other useful information on logistics, supply, and surveillance is usually collected regularly and should be analysed, together with coverage data, to improve the immunization system.

Planning and management of resources : A district microplan is the key to RED strategy. The microplan should be based upon a local situation analysis which involves every health facility, and through them the communities they serve. At the national level there is a responsibility to ensure that the financial and human resources needed at district level are available and managed correctly, while the district must ensure that these resources are efficiently used.

Put these RED tools into action



Annex 4 : Sample form for recording timeliness and completeness

Sample form for recording timeliness and completeness of monthly reporting from the health facility to the district

Legend
T = arrived on time
L = arrived late
W = report not received
N = reports expected
Country _____ District _____ Year _____

Name of health facility	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Total number of reports expected (N)												
Total reports sent on time (T)												
Total reports sent late (L)												
Total number of reports not received (W)												
Timeliness of the reports = 100 * T / N												
Completeness of reporting = 100 * (N-W) / N												

NB : Please note that timeliness and completeness are expressed as percentages (%). When the surveillance system is good, the rates for timeliness and completeness should approach 100%. This table allows for monitoring the progress of these two indicators in the district so that action can be taken to improve timeliness for each health facility in the district.

Annex 5 : How to prepare a coverage/ drop-out monitoring chart

The following steps will help you prepare a chart for monitoring the number of doses administered and drop-outs in infants less than one year of age.

1) Calculate the annual target population to receive immunization services of infants less than one year of age.

Each health facility should aim to reach every infant in its catchment area, especially those who are hard to reach. Where possible, use the most accurate existing population figures for infants under one year of age. These can be obtained from official census data or your own community census. If precise numbers are not available, estimate by multiplying the total population by four per cent. This document uses four per cent as the estimated percentage of infants less than one year of age and of pregnant women in any population.

For example: If the total population is 3900, then the annual target population of infants under one year would be 3900 x 4/100 = 156.

2) Calculate the monthly target population of infants less than one year of age to receive immunization services.

To calculate the number of children who should be vaccinated each month (i.e. the monthly target population), divide the annual target population by 12.

For example: If the annual target under one year is 156, the monthly target is 156/12 = 13. That means each month 13 children should be vaccinated: 13 in January, another 13 in February, another 13 in March, etc.

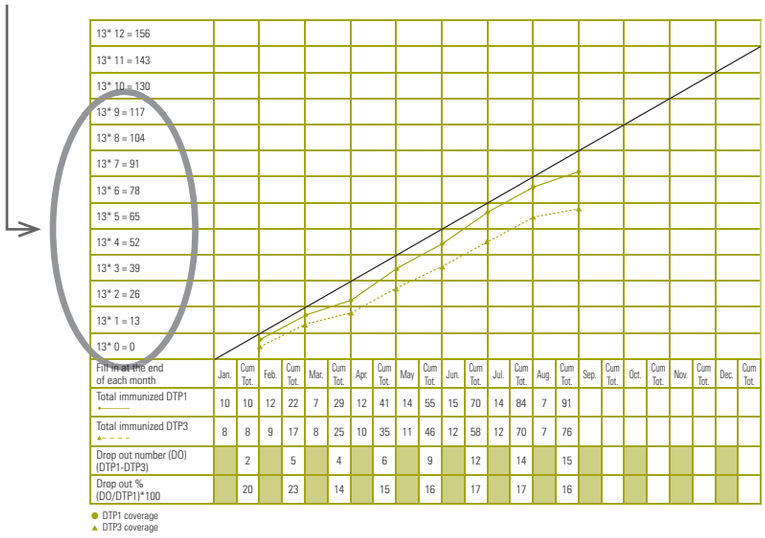
3) Label the chart.

Always ensure that the chart has a title, usually written across the very top so that it does not obscure the chart.

For example: " DTP1 and DTP3 doses administered and drop-outs in infants less than one year of age – Lorne province – 2008 "

Label the left side of the chart with the 'cumulative' monthly target, i.e. the increasing number of children that are targeted each month.

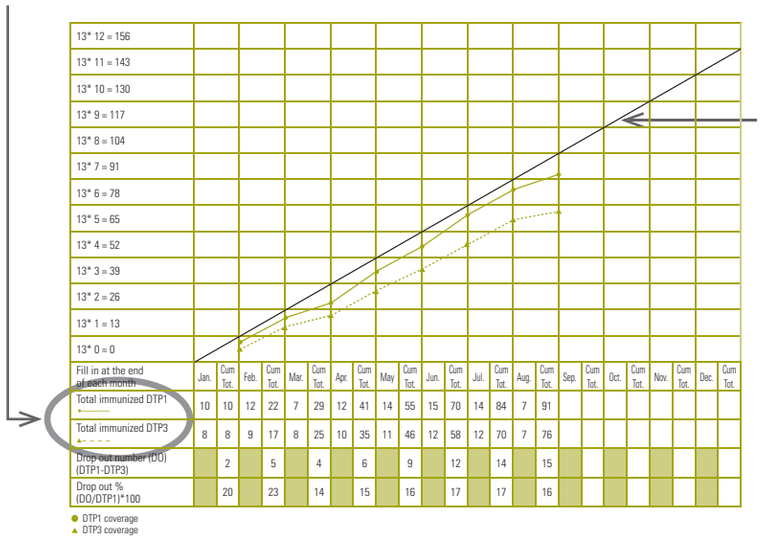
For example: If the monthly target is 13, the cumulative target for January will be 13; for February it will be 26 (13 + 13); for March it will be 39 (13 + 13 + 13); for April it will be 52 (13 + 13 + 13+ 13), etc.



Fill in at the end of each month	Jan.	Cum Tot.	Feb.	Cum Tot.	Mar.	Cum Tot.	Apr.	Cum Tot.	May	Cum Tot.	Jun.	Cum Tot.	Jul.	Cum Tot.	Aug.	Cum Tot.	Sep.	Cum Tot.	Oct.	Cum Tot.	Nov.	Cum Tot.	Dec.	Cum Tot.
Total immunized DTP1	10	10	12	22	7	29	12	41	14	55	15	70	14	84	7	91								
Total immunized DTP3	8	8	9	17	8	25	10	35	11	46	12	58	12	70	7	76								
Drop out number (DO) (DTP1-DTP3)		2		5		4		6		9		12		14		15								
Drop out % (DO/DTP1)*100		20		23		14		15		16		17		17		16								

● DTP1 coverage
▲ DTP3 coverage

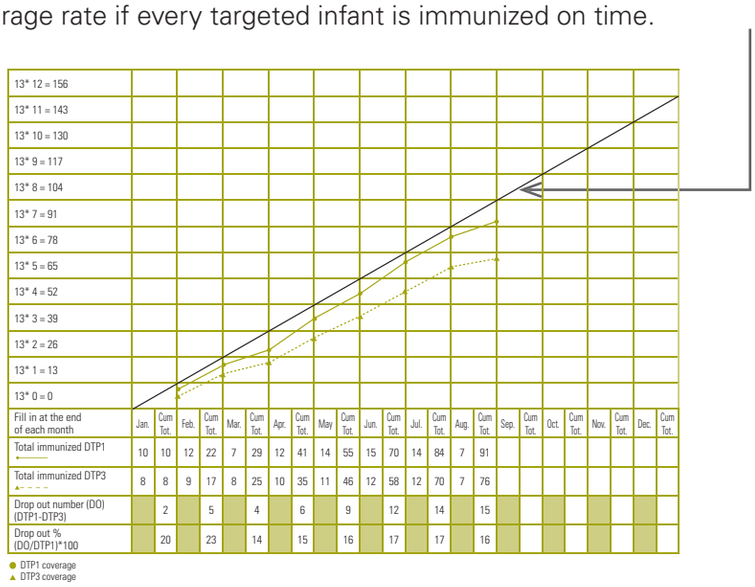
4) Label the boxes at the bottom with the name of the vaccine and dose that you are monitoring, e.g. DTP1 and measles, or DTP1 and DTP3.



Fill in at the end of each month	Jan.	Cum Tot.	Feb.	Cum Tot.	Mar.	Cum Tot.	Apr.	Cum Tot.	May	Cum Tot.	Jun.	Cum Tot.	Jul.	Cum Tot.	Aug.	Cum Tot.	Sep.	Cum Tot.	Oct.	Cum Tot.	Nov.	Cum Tot.	Dec.	Cum Tot.
Total immunized DTP1	10	10	12	22	7	29	12	41	14	55	15	70	14	84	7	91								
Total immunized DTP3	8	8	9	17	8	25	10	35	11	46	12	58	12	70	7	76								
Drop out number (DO) (DTP1-DTP3)		2		5		4		6		9		12		14		15								
Drop out % (DO/DTP1)*100		20		23		14		15		16		17		17		16								

● DTP1 coverage
▲ DTP3 coverage

5) Draw a diagonal line from zero to the top right-hand corner to show the ideal coverage rate if every targeted infant is immunized on time.



Fill in at the end of each month	Jan.	Cum Tot.	Feb.	Cum Tot.	Mar.	Cum Tot.	Apr.	Cum Tot.	May	Cum Tot.	Jun.	Cum Tot.	Jul.	Cum Tot.	Aug.	Cum Tot.	Sep.	Cum Tot.	Oct.	Cum Tot.	Nov.	Cum Tot.	Dec.	Cum Tot.
Total immunized DTP1	10	10	12	22	7	29	12	41	14	55	15	70	14	84	7	91								
Total immunized DTP3	8	8	9	17	8	25	10	35	11	46	12	58	12	70	7	76								
Drop out number (DO) (DTP1-DTP3)		2		5		4		6		9		12		14		15								
Drop out % (DO/DTP1)*100		20		23		14		15		16		17		17		16								

● DTP1 coverage
▲ DTP3 coverage

6) Plot the immunization data on the chart.

   Locate the row of boxes underneath the graph. Locate the spaces for the month you are recording. Enter the monthly total of DTP1 doses given.

   a) Add the current month's total doses to the previous cumulative total to calculate the current cumulative total, and enter it on the right side of the month column you are recording.

   b) Make a dot on the graph for the cumulative[1] total recorded on the right side of the month column you are recording.

   c) Connect the new dot to the previous month's dot with a straight line.

   d) Repeat above (a to c) every month until the end of the year.

   e) Plot DTP3 immunizations given in the same way as DTP1 (follow steps a to d).

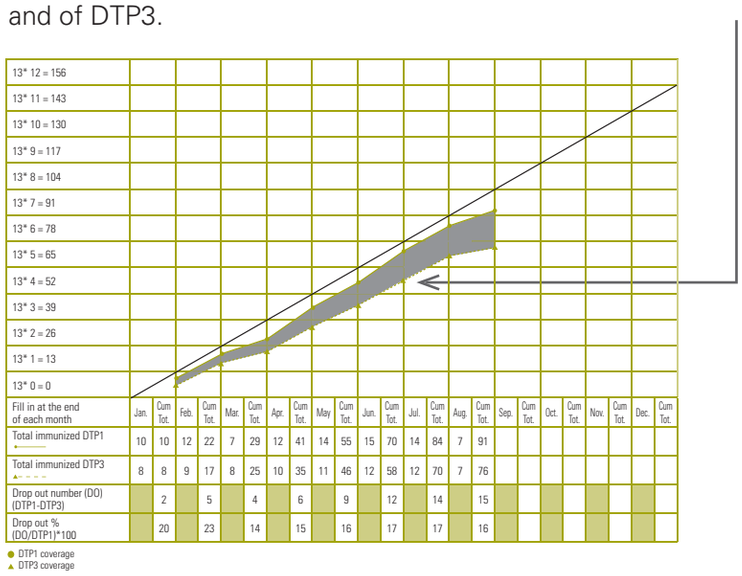
7) Calculate the total number of drop-outs between DTP1 and DTP3 (DO#) by subtracting the cumulative total for DTP3 from the cumulative total for DTP1.

[1] Cumulative means the total number of doses of vaccines given in the current month plus the monthly totals for all the previous months. Use the same time period for each dose and vaccine. For example, the cumulative number of DTP1 doses given by the end of March is the total number of doses given in January plus the total number given in February plus the total number given in March.

8) Calculate the cumulative drop-out rate (DO%) as follows:

$$DO\% = \frac{\text{DTP1 cumulative total minus DTP3 cumulative total}}{\text{DTP1 cumulative total}} \times 100$$

The drop-out rate can be easily visually monitored: it is the gap between the line of DTP1 and of DTP3.

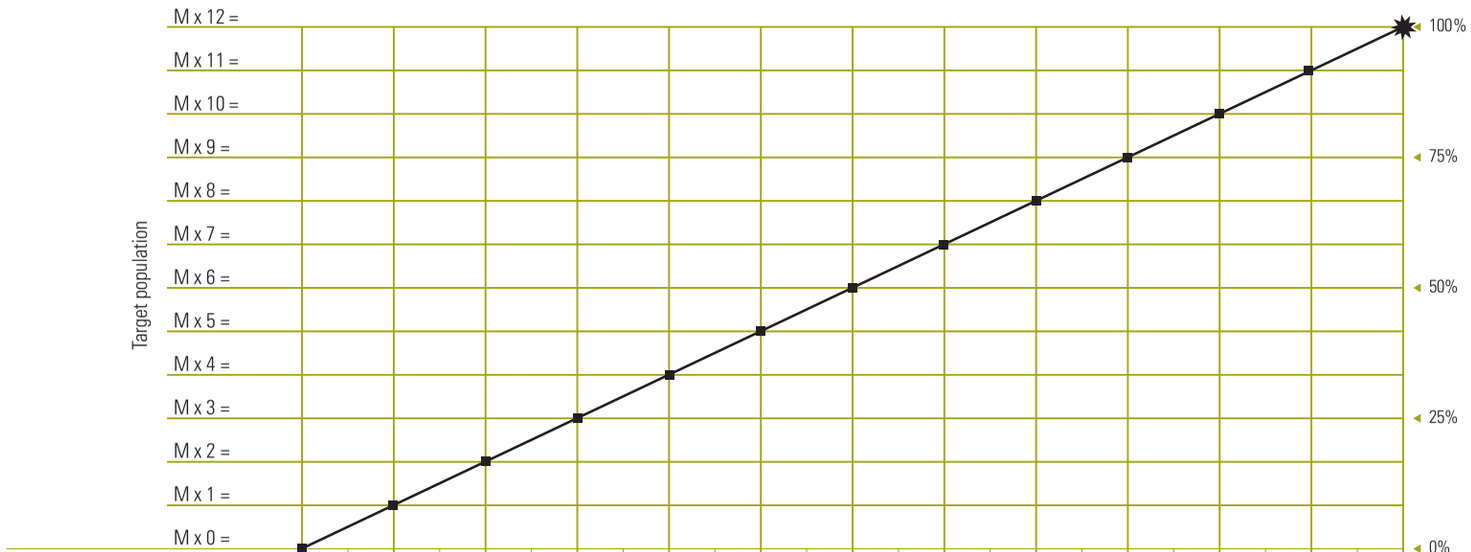


Fill in at the end of each month	Jan.	Cum Tot.	Feb.	Cum Tot.	Mar.	Cum Tot.	Apr.	Cum Tot.	May	Cum Tot.	Jun.	Cum Tot.	Jul.	Cum Tot.	Aug.	Cum Tot.	Sep.	Cum Tot.	Oct.	Cum Tot.	Nov.	Cum Tot.	Dec.	Cum Tot.
Total immunized DTP1 ●————	10	10	12	22	7	29	12	41	14	55	15	70	14	84	7	91								
Total immunized DTP3 ▲- - - -	8	8	9	17	8	25	10	35	11	46	12	58	12	70	7	76								
Drop out number (DO) (DTP1-DTP3)		2		5		4		6		9		12		14		15								
Drop out % (DO/DTP1)*100		20		23		14		15		16		17		17		16								

● DTP1 coverage
▲ DTP3 coverage

Immunization monitoring chart for DTP1 and DTP3

Area Name : Year : Total Catchment population : Total population under one : Monthly target (M) :



Fill in at the end of each month	JAN	Cum. Tot.	FEB	Cum. Tot.	MAR	Cum. Tot.	APR	Cum. Tot.	MAY	Cum. Tot.	JUNE	Cum. Tot.	JULY	Cum. Tot.	AUG	Cum. Tot.	SEPT	Cum. Tot.	OCT	Cum. Tot.	NOV	Cum. Tot.	DEC	Cum. Tot.
Total immunized DTP1																								
Total immunized DTP3																								
Drop-out # (DTP1-DTP3)																								
Drop-out % (#/DTP1)x100																								

The World Health Organization has provided technical support to its Member States in the field of vaccine-preventable diseases since 1975. The office carrying out this function at WHO headquarters is the Department of Immunization, Vaccines and Biologicals (IVB).

IVB's mission is the achievement of a world in which all people at risk are protected against vaccine-preventable diseases. The Department covers a range of activities including research and development, standard-setting, vaccine regulation and quality, vaccine supply and immunization financing, and immunization system strengthening.

These activities are carried out by three technical units: the Initiative for Vaccine Research; the Quality, Safety and Standards team; and the Expanded Programme on Immunization.

The Initiative for Vaccine Research guides, facilitates and provides a vision for worldwide vaccine and immunization technology research and development efforts. It focuses on current and emerging diseases of global public health importance, including pandemic influenza. Its main activities cover: i) research and development of key candidate vaccines; ii) implementation research to promote evidence-based decision-making on the early introduction of new vaccines; and iii) promotion of the development, evaluation and future availability of HIV, tuberculosis and malaria vaccines.

The Quality, Safety and Standards team focuses on supporting the use of vaccines, other biological products and immunization-related equipment that meet current international norms and standards of quality and safety. Activities cover: i) setting norms and standards and establishing reference preparation materials; ii) ensuring the use of quality vaccines and immunization equipment through prequalification activities and strengthening national regulatory authorities; and iii) monitoring, assessing and responding to immunization safety issues of global concern.

The Expanded Programme on Immunization focuses on maximizing access to high quality immunization services, accelerating disease control and linking to other health interventions that can be delivered during immunization contacts. Activities cover: i) immunization systems strengthening, including expansion of immunization services beyond the infant age group; ii) accelerated control of measles and maternal and neonatal tetanus; iii) introduction of new and underutilized vaccines; iv) vaccine supply and immunization financing; and v) disease surveillance and immunization coverage monitoring for tracking global progress.

The Director's Office directs the work of these units through oversight of immunization programme policy, planning, coordination and management. It also mobilizes resources and carries out communication, advocacy and media-related work.

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