

5 Planning immunization sessions to reach every infant

About this module...

This module explains how to plan immunization sessions at the district (3rd administrative level) involving all health facilities in the planning process. Special planning issues for mobile teams and urban populations are discussed in this module.

The module also discusses how to estimate vaccines and supply needs and manage stocks. Involving the community in the planning process is discussed in the last section of this module.

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1

Planning at district level involving all health facilities

The key to improving immunization services is a district plan, which aims to provide immunization sessions to reach every infant and woman in the district. Making such a plan needs teamwork, with close collaboration between district and health facility staff. In this section, we describe the steps leading to a good quality district plan.

Stage 1 – Initial planning by district

The first stage is for the district staff to make an operational map of the whole district and prepare a draft district plan to provide sessions to reach the whole population.

Stage 2 – Joint planning by district and health facility staff

Ideally this stage can be carried out during a **meeting** between the district staff and staff from all health facilities, during which:

- The district and health facility staff work together to make individual maps and session plans for each health facility catchment area.
- The district and health facility staff put all information together and revise the draft district session plan based upon the practical details provided by the session plans of each health facility.
- Every health facility makes a workplan based upon its session plan.
- Finally all the health facility workplans are consolidated into a single district workplan showing when and where each health facility session will be held.

Stage 3 – Regular review of plans

Once the district workplan has been consolidated it can be used to plan supervisory visits, to take corrective action and to adjust session plans according to need.

1.1 Stage 1: Initial planning by district

1.1.1 Creating an operational map of your district

To plan sufficient sessions to reach all infants and women in your district, you will have to know your area well. The best way to start is to draw a map of the area served by your district. This will help you determine which populations will be served by fixed sessions and which ones will require outreach and/or other strategies such as mobile sessions. Drawing a map is a simple tool that will help you plan how to reach all the infants and women in your area.

1 Draw a simple map of your district. It does not have to be to scale, but it should contain all the important features of the district. Mark the following information on the map:

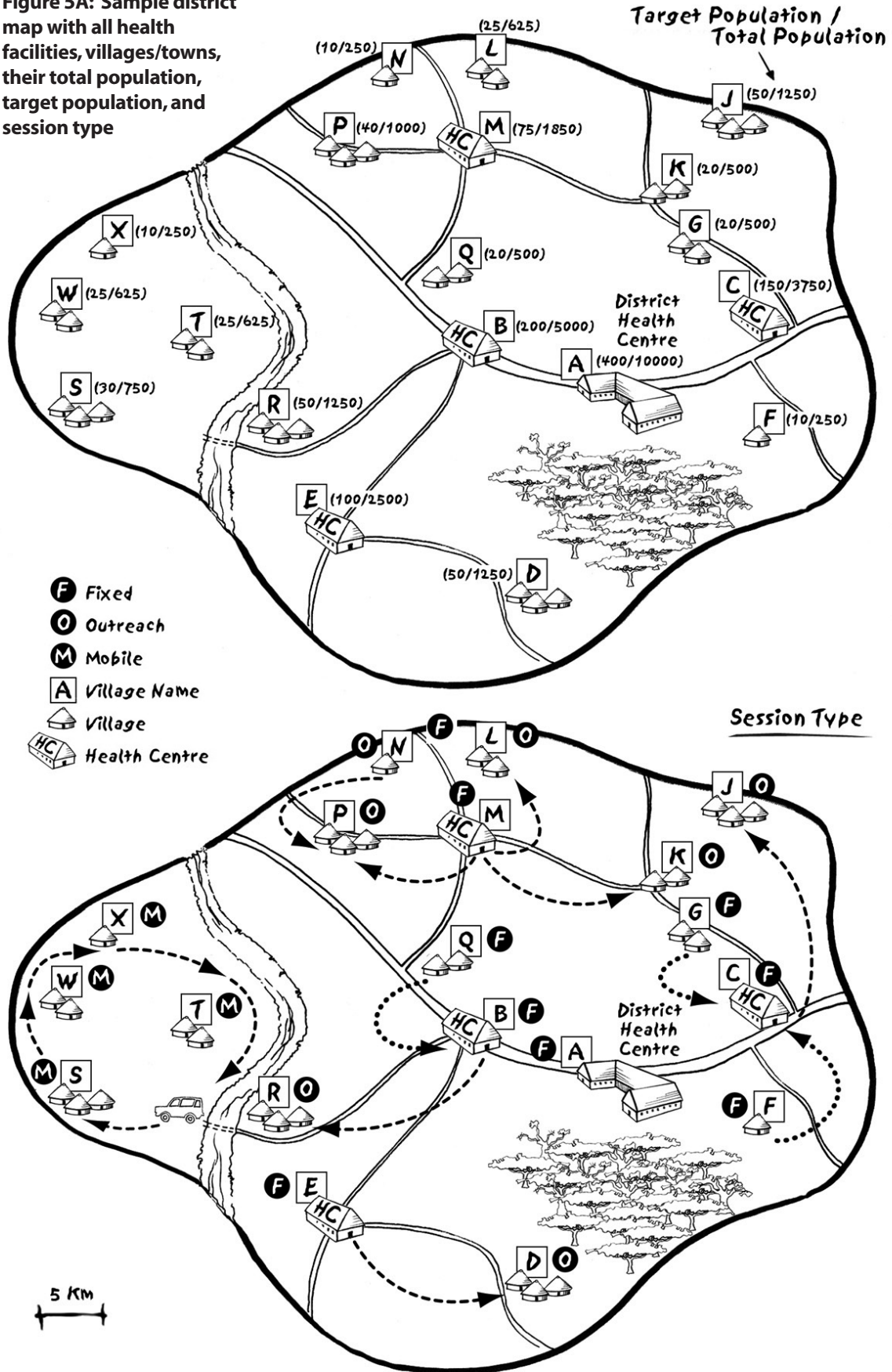
- each village, town and health facility;
- the total population and target population¹ of each village and town;
- all known high risk or priority areas;
- roads;
- geographical landmarks (rivers, streams, mountains).

2 Using the district map, decide the type of session suitable for each village/town in your district (fixed, outreach, mobile).

On the map, mark what kind of session will be used to reach each village or town using the letters F (fixed), O (outreach), M (mobile). For outreach and mobile, use arrows to show how they will be reached. Figure 5A shows an example of a district map drawn in two stages for the purpose of this module. In real situations you will need one map which shows all the information together – populations, features and session types. Figure 5A shows a rural area. For an urban area however it is still useful to have a map showing population distribution and location of health facilities.

¹ In this example, for the target population we use 4% of the total population, but this will vary from country to country. If population data is not available, try looking at the records from past NIDs. The tally sheets and reports from NIDs often list the total number of children under age 5 reached by village for each round. Dividing this total by 5 will give an approximate number for the infant population, i.e. your target population

Figure 5A: Sample district map with all health facilities, villages/towns, their total population, target population, and session type



1.1.2 Making a district session plan including all health facilities and populations in the district

1 ▶ In Table 5.1, complete columns I, II, III, IV, V from the data on the map

Create a table listing each village and town, its population and target population (see Table 5.1). On the table and map, against each village/town, write down the type of session needed and which health facility will serve that village/town, following the map (Figure 5A). Annex 1 gives some simple guidelines to select the type of session needed.

This example has been drawn in two stages, the first showing population and major features, the second showing session types needed to reach the population. In a real situation all the information should be displayed on one map.

2 ▶ Calculate number of injections needed per year (column VI)

In this module we use number of injections as a measure of the workload during an immunization session. First, decide how many injections are needed to fully immunize an infant in your district. At a minimum an infant will need five injections (BCG, DTP/DTP-HepB multiplied by three, measles). In addition, two TT doses are needed to immunize pregnant women. This makes a total of five infant injections, plus two injections of TT for pregnant women² which makes up seven injections in all for full immunization of an infant and pregnant woman. However, the total of seven injections is only a minimum and some countries may use up to 10 injections (e.g. adding monodose HepB, yellow fever). For this example we will use seven injections.

To calculate the minimum number of injections per year multiply the annual target population by seven.

3 ▶ Calculate number of injections needed per month (column VII)

To calculate the monthly total, divide the yearly total by 12.

4 ▶ Calculate number of sessions needed per month at each fixed and outreach site (column VIII).

You now need to decide how many injections can reasonably be given by health staff during one fixed session and one outreach session. For this module, we assume that a fixed session in a health facility can reasonably deliver at least 70 injections per session, and an outreach session at least 35 injections per session. However this number may vary depending on your local conditions, i.e. number of staff, availability of vaccines and other supplies etc. As a general rule at least four sessions per year will be needed at each outreach or mobile team site to fully immunize all infants.

To calculate the number of sessions per month:

Divide number of injections needed per month by 70 for a fixed site.

Divide number of injections needed per month by 35 for an outreach site.

² In most countries pregnant women are targeted for routine TT immunization. While not every pregnant woman will require two doses of TT, this module assumes that all planning will have to include two doses of TT for each pregnant woman. It is acknowledged that in some countries routine TT immunization targets all women of childbearing age. In such cases, appropriate changes to this text will be needed.

Table 5.1: Example of district session plan

Village/ town	Total pop. II	Target pop. (4% of total population for this exercise) III	Health facility providing service IV	Session type: Fixed/outreach/mobile V	Injections / year (target population X 7) VI	Injections / month (injections per year divided by 12) VII	Sessions / month (divide by 70 for Fixed and 35 for Outreach) VIII	Sessions / month (rounded) Fixed ≥ 70 injections per session, or Outreach ≥ 35 injections per session IX
A	10 000	400	DISTRICT HC	Fixed	2800	233	3.33	4
B	5000	200	HC	Fixed	1400	117+12= 129	1.84	2
C	3750	150	HC	Fixed	1050	88+6+12= 106	1.51	2
D	1250	50	outreach from E	Outreach	350	29	0.82	1
E	2500	100	HC	Fixed	700	58	0.83	1
F	250	10	can reach C	Fixed at C	70	6 (add to C)	-	-
G	500	20	can reach C	Fixed at C	140	12 (add to C)	-	-
J	1250	50	outreach from C	Outreach	350	29	0.82	1
K	500	20	outreach from M	Outreach	140	12	0.34	1
L	625	25	outreach from M	Outreach	175	15	0.43	1
M	1875	75	HC	Fixed	525	44	0.63	1
N	250	10	share outreach at P	Outreach at P	70	6 (add to P)	-	-
P	1000	40	outreach from M	Outreach	280	23 + 6 = 29	0.82	1
Q	500	20	can reach B	Fixed at B	140	12 (add to B)	-	-
R	1250	50	outreach from B	Outreach	350	29	0.82	1
S	750	30	river passable in dry season	Mobile	210	At least four mobile team visits per year in dry season to serve villages S, T, W and X.		
T	625	25	river passable in dry season	Mobile	175	Workload (no. of injections) per mobile team visit = (Annual workload S, T, W, X) / 4 i.e. 158 injections per mobile team visit.		
W	625	25	river passable in dry season	Mobile	175			
X	250	10	river passable in dry season	Mobile	70			
TOTAL	35 250	1410			9870			

• If population data are unknown, use recent polio NIDs results. Divide the number of under 5 children by five to get the approximate number of infants.

• Fixed site if health facility is within easy reach, maximum five km.

• Outreach: beyond reach of fixed, but can be reached by health facility staff using existing resources.

• Mobile team if population cannot be reached by regular outreach. Will need extra resources for transport and supplies. Minimum four times per year.

If the result of these calculations is not practical then you can increase or decrease the workload accordingly. For example, four sessions per month (one per week) is easier to manage than five.

1.1.3 Making a session plan for each health facility based on district session plan

Once the draft district plan is ready, the district should provide each health facility with a session plan for their catchment area (extracted from the district plan). Table 5.2 shows an example of a session plan for health facility M.

Table 5.2: Example of session plan for health facility M

Village/ town	Total pop.	Target pop. (4% of total population for this exercise)	Session type: Fixed/outreach/mobile	Injections / year (target population X 7)	Injections / month (injections per year divided by 12)	Sessions / month (Fixed >=70 injections per session, or Outreach >=35 injections per session)	Transport for outreach	Person(s) responsible
M	1875	75	HC	525	43	1	None	
K	500	20	outreach from M	140	12	1	motorbike	
L	625	25	outreach from M	175	15	1	bicycle	
P and N ^a	1000+250	40+10	outreach from M	280+70	23+6	1	motorbike	

^a according to the map, village N shares outreach with village P

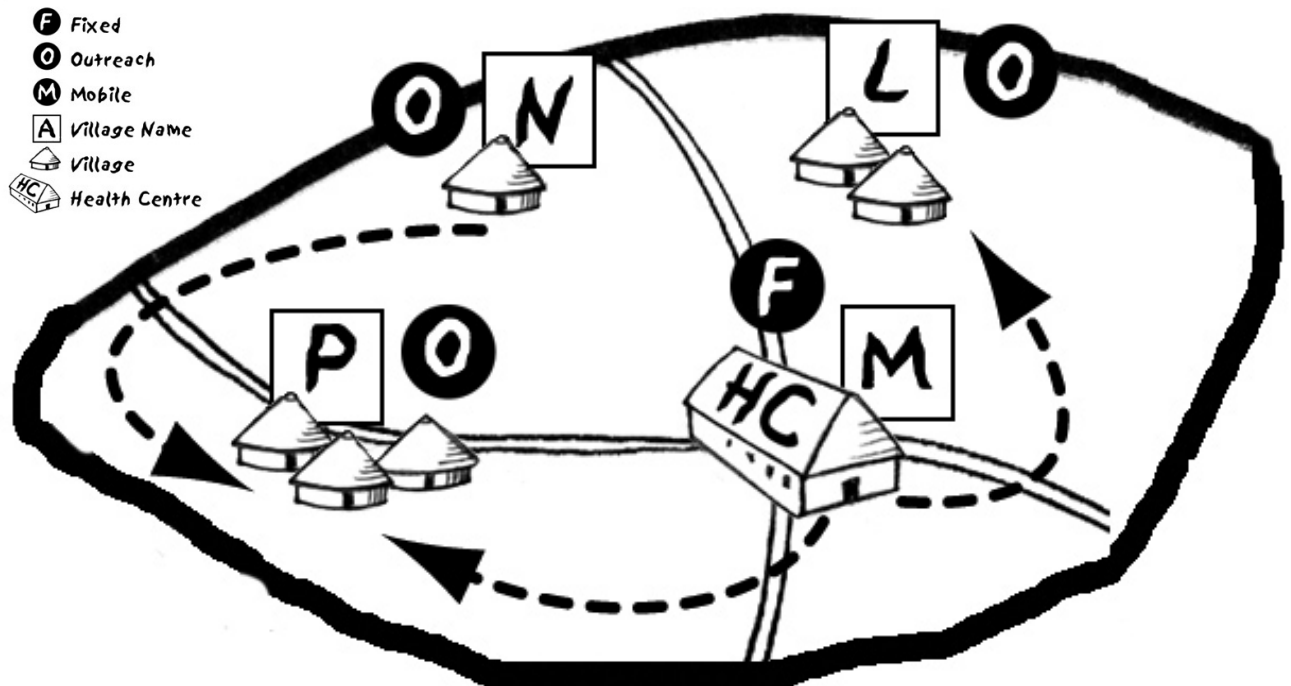
1.2 Stage 2: Joint planning for district and health facility staff

Once the district has an operational map and a **draft** session plan (Stage 1), the next stage will be to make maps and session plans with each health facility during a planning meeting. The district map and session plan will provide the basis for this process, but each health facility should provide its own information, even if this differs from the district plan. After this has been done, the differences can be discussed and incorporated into a **revised** district session plan and workplan.

1.2.1 Creating an operational map of each health facility catchment area

Every health facility should have a map that shows the distribution of population in its catchment area, in the same way as the district map. Having established the catchment area for each health facility, the district level should help health facility staff draw up a map of their catchment area. Here is a simple example of a health facility map extracted from the district map. Figure 5B shows how health facility M provides a fixed site service (F) and outreach sessions to villages L and P. Village N joins the outreach session held at P.

Figure 5B: Example of map for health facility M



1.2.2 Discussing and revising district session plan based on feedback from each health facility

The district staff should individually discuss with health facility staff, their specific session plans. Health facility staff may be able to provide important changes to the session plan based on their local knowledge of the community (for example the health facility may not be able to provide a regular outreach session for a particular village because the distance had been underestimated by the district). The district session plan may need to be amended based on discussions with health facility staff. Once the district session plan has been finalized, each health facility can prepare a workplan to show how the sessions will be conducted.

1.2.3 Making a workplan for each health facility

Every health facility should make its own workplan showing how every village or community will receive immunization services throughout the year. The immunization workplan should be integrated with other health activities provided by the health facility. The workplan should not be considered as something which is fixed at the beginning of the year. It will need updating and changing based upon data obtained through regular monitoring and problem-solving activities (as discussed in Module 7). Table 5.3 shows a quarterly workplan which can be updated with new activities each quarter.

Table 5.3: Example of immunization workplan for first quarter 2003: Health facility M conducting outreach at K, L, P

Village	Session plan	Jan	Feb	Mar
M	Fixed session 1st Wednesday	Date scheduled <u>1 Jan</u> Date held _____	Date scheduled <u>5 Feb</u> Date held _____	Date scheduled <u>5 Mar</u> Date held _____
K	Outreach every 2nd Wednesday at community facility	Date scheduled <u>16 Jan</u> Date held _____ Transport: motorbike	Date scheduled <u>12 Feb</u> Date held _____ Transport: motorbike	Date scheduled <u>12 Mar</u> Date held _____ Transport: motorbike
L	Outreach every 3rd Wednesday at community facility	Date scheduled <u>22 Jan</u> Date held _____ Transport: bicycle	Date scheduled <u>19 Feb</u> Date held _____ Transport: bicycle	Date scheduled <u>26 Feb</u> Date held _____ Transport: bicycle
P and N	Outreach every 4th Wednesday at community centre at village P	Date scheduled <u>29 Jan</u> Date held _____ Transport: motorbike	Date scheduled <u>26 Feb</u> Date held _____ Transport: motorbike	Date scheduled <u>26 Mar</u> Date held _____ Transport: motorbike
Activities planned for this quarter				
		1. Training in AD syringe use 2. Meet community leaders monthly	1. Supply safety boxes for every session 2. Ensure pregnant women get TT at outreach	1. Quarterly meeting 28 March 2. Training in VVM use
New activities to solve problems (based on data analysis and monitoring)				
		1. Report staff shortages, request help from district 2. Visit migrant community	1. Reschedule outreach at K 2. Request extra resources for migrant community	1. Plan outreach for migrants 2. Follow up defaulters in village M
Monitoring of session implementation				
		Number of sessions held in Jan: _____ Number of sessions planned in Jan: _____	Number of sessions held in Feb: _____ Number of sessions planned in Feb: _____	Number of sessions held in Mar: _____ Number of sessions planned in Mar, same in previous two cells

Steps to prepare a workplan for a health facility

1. In the first column write the names of the villages served by the health facility.
2. In the second column write how often it is planned to reach each village and what strategy will be used. This is based upon your revised “district session plan” (Table 5.1) and your own session plan (Table 5.2) which shows the number of sessions per month, and whether these will be fixed, outreach or mobile, and where they will be held.
3. In the “month” columns write the date scheduled, and the date held, for each session, and the transport required for the outreach sessions.
4. Under each month write down what other activities you plan to carry out, for example community meetings, training sessions, monthly meetings, scheduled campaigns.
5. At least every quarter, review and analyse the data you are collecting, and modify the workplan by adding activities needed to solve problems encountered (see Module 7). Add these new activities to the next quarter workplan.
6. In the last row, monitor the completeness of the monthly sessions planned by totalling sessions held and sessions planned.

1.2.4 Consolidating health facility workplans into a comprehensive district workplan

Annex 2 shows an example of a district workplan. The district workplan is compiled from all the separate health facility workplans (Table 5.3). This way it is possible to see in one table the immunization sessions being held in your district on a day by day basis. It is best to update the district workplan every three months.



Check the quality of your planning

- Are *all* villages covered by the session plan and workplan with at least four sessions per year?
- Are all temporary settlements, minorities, underserved groups covered by the session and workplan with at least four sessions per year?
- Is there any overlap/double booking (e.g. mobile team scheduled to be at two places at the same time)?
- Is there enough staff time to implement all the planned sessions? If not where can the sessions be combined?
- Is it clear who will consult with communities and inform them of the date/ place of next sessions?

1.3 Stage 3: Regular review of plans

1.3.1 Adding supervisory visits to the district workplan

You can use the district workplan to plan supervisory visits. These should be scheduled to coincide with immunization activities in each health facility. Annex 2 shows how supervisory visits can be scheduled on the district workplan. In this example the letter “S” is added to a scheduled session to indicate a supervisory visit.

You should make at least one supervisory visit to one site each week and plan to supervise both fixed and outreach immunization sessions.

1.3.2 Taking corrective action every quarter based on data analysis

Planning immunization sessions is one step in a cycle that includes regular monitoring, analysis and problem-solving to improve the service. Module 7 shows how to collect, monitor and analyse data.

In addition to revising your session plans regularly, you should also revise your workplan. This is often done during a district meeting of health facility staff. Module 7 discusses how to identify problems and solutions and how to take corrective action based upon that information. The corrective activities by month can be added to the health facility workplan.

At district level too, new activities can be added to the workplan, based upon regular analysis of data. Activities can be planned to correct problems, such as including training in specific areas during supervisory visits.

1.3.3 Reviewing and adjusting session plans

You must regularly (i.e. every three to six months) review the plan for sessions (fixed/ outreach/mobile, frequency and quality) in your area.

You should look at how the quality of the sessions can be improved, for example by making sure people know the dates and sessions happen on scheduled dates, ensuring there are enough vaccines and supplies (Section 4) and safe injection practices are observed (Module 4).

Also see if the current sessions are sufficiently used by the community. If sessions in some areas have very low attendance, see if better communication is needed, or if it is better to change the time or location of a session, or make it less frequent and/or add another session elsewhere. Module 7, Annex 6, provides guidelines on obtaining feedback from the community.



Any change in the session plan (frequency, change of date or location) should be done in consultation with the community, and mothers should be informed well in advance about the changes.

2

Special planning issues

2.1 Special planning for mobile teams in hard-to-reach areas

In almost every country there are areas that cannot be reached regularly throughout the year. This may be due to many factors, including remoteness, and seasonal factors such as flooding in the rainy season. Under these circumstances, using mobile teams may be the best way to provide immunization services (see Annex 1).

Mobile teams provide outreach services but work like a small regular campaign. They can visit several sites over the course of one or more days during the dry season. Since mobile teams will only have a few days in which to do their work, careful planning is needed.

Mobile teams will need extra resources. Therefore, planning should be carried out in consultation between health facility, district and other levels.

1. Decide which areas need mobile teams.

Refer to the map and session plan in Section 1. When making the plan indicate which areas need mobile teams.

2. Decide how many times per year the mobile team should visit these areas.

A minimum of four visits will be needed to fully immunize infants and pregnant women.³

3. Consider what other interventions can be added to immunization when the area is infrequently visited, e.g. malaria control, vitamin A supplementation, anti-parasitic control.

Annex 1 describes the special function of mobile teams in contrast to fixed site and outreach sessions. A mobile team session offers a special opportunity to add other interventions to the immunization service. These may include vitamin A and other nutritional supplementation, provision of insecticide-treated mosquito nets (ITNs), and antihelminthiasis treatment etc. according to local need and operational feasibility.

4. Estimate resources needed and submit the plan to the next administrative level.

These include vehicle, driver, fuel, extra staff, extra supplies for other interventions.

³ Ideally all infants should receive BCG at birth. In addition, in many countries birth doses of OPV and HepB vaccine are included in the national policy. However, many infants have no contact with health facilities at birth, therefore in this section we state that an infant can be fully immunized with a *minimum* of 4 contacts:

Contact 1: BCG, DTP1, HepB1, OPV1; Contact 2: DTP2, HepB2, OPV2; Contact 3: DTP3, HepB3, OPV3; Contact 4: Measles, vitamin A

(Of course, in each session all vaccines due should be given, i.e. in session 2, not only DTP2, HepB2, OPV2).

TT immunization can be given at any contact.

5. Request vaccine and supplies for mobile teams.

Request the province level for vaccine, cold box and other immunization supplies. It is easier to bring these from the province with the mobile team vehicle than to use district supplies.

6. Carefully plan the route and notify the communities in advance.

Mobilization of the communities is vital when mobile team visits are infrequent. Ideally, plan the visits well in advance and communicate the time and place of each site to each community well in advance.

7. Look for opportunities for joint planning and pooling of resources with other teams, to deliver various interventions.

The opportunity to deliver other interventions with immunization to under-served areas will be welcomed by other teams (malaria, nutrition etc). Planning and implementing together will ensure efficient use of resources.

8. Make a schedule for mobile team visits.

Table 5.4 shows an example of a schedule for mobile team visits. You should decide first what other interventions are needed and how these will be provided. The schedule for mobile teams needs to be discussed with the various other teams (malaria, nutrition etc.) and be approved by the appropriate level, since additional resources, e.g. vehicle, driver etc, are required.

9. Use polio plans, data, and results of NIDs to make detailed mobile team plans.

Mobile teams do *not* usually work “house-to-house” as in some polio NIDs. However the information on population size and distribution from polio NIDs done in the area will be very useful for planning.

10. Consider increasing the target group to under 24 months, since four contacts may not be sufficient to fully immunize the whole birth cohort.

Table 5.4 shows an annual schedule for reaching all four villages S, T, W, X four times a year.

Table 5.4: Sample mobile team schedule for the year (taken from Table 5.1)

Villages	Target population	Injections per year (target population X 7)	Workload per session	Other interventions planned	Planned dates	Vehicle needs	Staff needs
S, T, W, X	90	630	158 injections per mobile team visit	1. Vit. A 2. Malaria bednets	6 Jan. 5 Mar. 4 May 6 Oct.	Province car	Health Workers + driver

2.2 Special planning issues for urban immunization services

High population density, poor sanitation and poor nutrition often found in urban areas, lead to higher transmission of diseases, infection of younger children and higher mortality.

Providing immunization services in crowded urban areas differs from rural areas for many reasons, including the following:

- Poor primary health care infrastructure in some urban areas.
- High mobility of the resident population.
- The existence of “illegal” settlements that are not officially recognized by the government.
- The existence of marginalized populations (religious or ethnic minorities, refugees).
- Absence of information on the size of the population living in “slum” areas.
- Inadequate government planning and budget to provide primary health care services to these areas.

The key to provision of adequate immunization facilities to the urban areas is regular, high quality, uninterrupted service at accessible delivery points.

Urban immunization services may be operationalized in the following way:

- 1. Fixed site, fixed time provision of services. This should include:**
 - All fixed sites including dispensaries, clinics and maternity homes in the public sector.
 - All NGOs engaged in providing health care in urban areas.
 - Any private practitioner willing and able to be part of this network.
- 2. Communication through health workers, NGOs active in the area, print media, television, radio about the following:**
 - the timing of local immunization services;
 - local service delivery points;
 - the vaccines and schedule of immunization;
 - the benefits of immunization.
- 3. Urban outreach: expanding the network of urban service provision points from the health facility:**
 - Establish contact with the local leader and obtain support.
 - Estimate size of population and frequency of sessions (same as with rural areas).
 - Set up a site in every urban slum, with a team of two trained vaccinators, to provide immunization services on a regular (weekly or monthly) basis.
 - Use the same principles for creating a session plan and workplan (described in previous section) for the expanded network of urban outreach.

- Plan location of sites, frequency, and timing of service, to suit the local population.
- Communicate time and dates of sessions to the community (using existing channels in the community like loudspeakers, religious or mothers' groups etc.).
- Ensure a regular uninterrupted service to gain the trust and cooperation of the community.



Careful planning is absolutely necessary to achieve high immunization coverage rates. Planning ensures that adequate supplies, vaccines, staff etc. can be made available. But good planning also entails that recipients know *in advance* when the next immunization session will be held.

Remember: Do not blame the community for low attendance at sessions. Low attendance is often caused by poor planning and/or poor communication by service providers.

3 Estimating vaccine and supply needs

At each session – whether fixed, outreach, or mobile – it is essential to have sufficient supplies immediately available. Remember that mothers may be making great efforts to attend immunization sessions with their infants. If there are not enough vaccines or syringes at the session and mothers have to return home with their children not immunized, the community will lose confidence in the service.

This section deals with how you can make sure that, at the district and health facility level, you have sufficient vaccine and supplies available for each session on your monthly workplan.

3.1 Estimating the vaccine and supply needs for a session

Fixed session

Table 5.5 shows the minimum level of vaccine and supplies which should be available at the time of a fixed session of 70 injections, plus OPV and including TT for pregnant women. Note that these calculations do not need any allowance for wastage, since the session is being conducted at a fixed site (in a health facility by definition), where there is access to additional vials and supplies in the health facility. You should have access to at least one extra vial of each vaccine plus diluent, and 10% extra syringes during the fixed session.

Outreach session

Table 5.6 shows the minimum level of vaccine and supplies which should be available for an outreach session of 35 injections, plus OPV and including TT for pregnant women. These figures can help when deciding how much vaccine and supplies to take before leaving the health facility to do an outreach session. In addition to this minimal supply it is safer to take an extra vial of each vaccine and some extra syringes as a safeguard against running out of vaccine. If you think there will be more than 35 injections to be given at a single outreach session, it is easiest just to double the supplies you take. As previously stated, these are assumptions used for this module; you may need to increase or decrease the number of injections, and therefore the supplies needed, according to your circumstances.

Table 5.5: Vaccines and supplies needs for a 70 injections session for infants and TT for pregnant women (and the option of HepB monovalent)

Fixed session	BCG (20 dose vials)	OPV (10 dose vials)	DTP or DTP-HepB (10 dose vials)	(HepB) (10 dose vials)	Measles (10 dose vials)	TT (women, 10 dose vial)	AD syringes for BCG	AD syringes for other vaccines	Mixing syringes 5ml: 1 BCG, 1 measles	Safety boxes
Number of injections	10	30	30	(30)	10	20				
Session needs	1 vial + 1 diluent ampoule	3 vials	3 vials	(3 vials)	1 vial + diluent ampoule	2 vials	20	60 (+30)	2	1

Table 5.6: Vaccine and supply needs for a 35 injections session for infants and TT for pregnant women

Outreach session	BCG (20 dose vials)	OPV (10 dose vials)	DTP or DTP-HepB (10 dose vials)	(HepB) (10 dose vials)	Measles (10 dose vials)	TT (women, 10 dose vial)	AD syringes for BCG	AD syringes for other vaccines	Mixing syringes 5ml: 1 BCG, 1 measles	Safety boxes
Number of injections (vials/syringes)	5	15	15	(15)	5	10				
Session needs (vials/syringes)	1 vial + diluent ampoule	2 vials	2 vials	(2 vials)	1 vial + diluent ampoule	1 vial	20	40 (+20)	2	1

Assumptions about sessions:

- If seven injections are needed to fully immunize an infant and pregnant women: BCG will be one seventh (1/7), measles one seventh (1/7), DTP or DTP/HepB three seventh (3/7), and TT two sevenths (2/7), making seven in all. Of course other non-injectable antigens (OPV) and interventions (vitamin A) will also be given.
- This table shows the minimum requirements for a session of 70 injections for a fixed session or 35 injections for an outreach session (only an estimate).
- If monovalent HepB is provided the number of injections will increase from seven to 10 (70 to 100 injections per session). In yellow fever-endemic countries, yellow fever vaccine will need to be added. The session needs for yellow fever vaccine are the same as for measles vaccine.
- Note that the needs at service delivery level are shown as number of vials, not number of doses.
- Always take sufficient AD syringes to match the number of doses in each vial.

Estimating vaccine needs for routine tetanus toxoid for women

Some countries provide TT for pregnant women only, others provide TT for all women of childbearing age as well. The number of women requiring TT immunization during any given session can vary greatly. Therefore it is better to ensure that at every infant immunization session there are additional TT vaccine vials and syringes to immunize all eligible women. A simple rule to follow is to initially assume a maximum of 20 TT injections are included in every 70-injection session, and 10 TT injections in every 35-injection session, and add sufficient supplies accordingly.



These are simple operational calculations that can help you to ensure a minimum level of vaccine and supplies for any session. However they are not meant to be an alternative means of calculating national vaccine supply needs since this is done on a population basis.

3.2 Estimating the vaccine and supply needs for each health facility and for the entire district for one month

At the district level you will receive vaccine on a monthly basis from the province level. The amount of vaccine you receive will be based upon the doses needed for the population you serve, with a wastage multiplication factor. It is the district's job to distribute the vaccine and other supplies to every health facility to enable it to conduct its planned fixed and outreach sessions.

The best way to provide vaccine from district to health facility level is according to the number of vials required for each session, rather than doses required. This is because the exact number of infants attending each session will not be known in advance, and opened vials often have to be discarded at the end of a session (this applies to all reconstituted freeze-dried vaccine vials, and other vaccines where the multi-dose vial policy is not feasible).

The following steps describe a simple operational method of estimating first how much vaccine and supplies are needed by each health facility and secondly how much are needed for the whole district.

3.2.1 Making an operational estimate of the needs for one health facility for a month

1. Refer to Tables 5.5 and 5.6 to make operational estimates of vaccine vials and supplies needed for a single fixed and outreach session.
2. Refer to the district session plan (Table 5.1 and Table 5.2), which shows the total planned sessions by health facility according to type of session – fixed and outreach.
3. Calculate the needs for each health facility by multiplying the needs for each type of session by the number of sessions planned.

Table 5.7 shows how this is done for health facility M. This operational estimate will be accurate enough for most sessions according to the estimated workload (70 injections for fixed site, 35 injections for outreach). If some sessions are expected to be larger, add one or more extra vials and the equivalent numbers of syringes.

3.2.2 Making an operational estimate of the needs for all health facilities in your district for one month

To make an operational estimate of monthly supplies needed for distribution to all health facilities, multiply the individual session needs by the total number of sessions of each type (fixed and outreach), and then add all session needs to get monthly needs, as in Table 5.8.

The *operational* estimate of district monthly supplies in Table 5.8 will tell you the approximate amount of vaccine vials and supplies you will need to have in your district store to meet the requirements for distribution to all the health facilities for their planned fixed and outreach sessions.

You should ensure that the monthly level of supplies received into the district – which is based upon population numbers and doses with a standard wastage rate – is not lower than this operational estimate. If there is a considerable difference between the amounts you consume and the amounts you receive, discuss the issue with the higher level to identify the causes (difference in population estimates, higher wastage rates than anticipated, non-adherence to MDVP etc.) to find a solution. Annex 3 discusses this in more detail. You should also avoid over-stocking vaccines by adjusting your monthly order according to the existing stock balance.



Special issues for AD syringes supply

The AD syringes' supply must match the supply of vaccine available at every session. AD syringes are usually ordered with a 10% wastage factor. This wastage factor takes into account normal handling problems, but it is very important to ensure that the AD syringes supply intended for immunization is not used for other purposes.

3.2.3 Making the best use of vaccine and supply stocks

Vaccines and AD syringes should be used as well as possible. Here are some tips to help ensure that optimal levels of supplies are available, while reducing wastage.

1. When ordering vaccine and supplies always adjust for the amount in stock.
2. Use multi-dose vial policy whenever applicable.
3. Try to maximize attendance at every session: Follow up on defaulters; good communication of session dates, times and locations; reliable sessions according to the plan; monitor attendance and combine small sessions where feasible.
4. Use the most accurate population estimates to avoid shortage of supplies.

Table 5.7: Operational method of estimating needs of health facility M

	Needed for one fixed session (Refer to example in Table 5.5)	Number of fixed sessions (Refer to example in Table 5.2)	Total	Number needed for one outreach session (Refer to example in Table 5.6)	Number of outreach sessions (Refer to example in Table 5.2)	Total	Grand total
Vaccine vials	A	B	C=A*B	D	E	F=D*E	G=C+F
BCG 20 dose vials plus diluent	1	1	1	1	3	3	4
DTP/HepB 10 dose vials	3	1	3	2	3	6	9
OPV 10 dose vials	3	1	3	2	3	6	9
Measles 10 dose vials plus diluent	1	1	1	1	3	3	4
TT 10 dose vials	2	1	2	1	3	3	5
BCG AD syringes	20	1	20	20	3	60	80
Standard AD syringes	30+10+20 = 60	1	60	20+10+10 = 40	3	120	180
Mixing syringes	1+1=2	1	2	1+1=2	3	6	8
Safety boxes (100 per box)			1			2	3

Table 5.8: Operational estimate of district monthly vaccine and supply needs

	Needed for one fixed session (Refer to example in Table 5.5)	Number of fixed sessions (Refer to example in Table 5.1)	Total	Number needed for one outreach session (Refer to example in Table 5.6)	Number of outreach sessions (Refer to example in Table 5.1)	Total	Grand total
	A	B	C=A*B	D	E	F=D*E	G=C+F
Vaccine vials							
BCG 20 dose vials plus diluent	1	10	10	1	6	6	16
DTP/HepB 10 dose vials	3	10	30	2	6	12	42
OPV 10 dose vials	3	10	30	2	6	12	42
Measles 10 dose vials plus diluent	1	10	10	1	6	6	16
TT 10 dose vials	2	10	20	1	6	6	26
BCG AD syringes	20	10	200	20	6	120	320
Standard AD syringes	30+10+20 = 60	10	600	20+10+10 = 40	6	240	840
Mixing syringes	1+1=2	10	20	1+1=2	6	12	32
Safety boxes (100 per box)			8			3	11

4 Stock management

4.1 Stock management at district level and health facility level

Wherever vaccines are stored, a system of stock management must be in place to record vaccines received, and vaccines dispatched or used. This will make sure that vaccines are used before their expiry date, that the status of VVM is recorded at receipt and issue, and that there are no stock-outs, or over-stocking.

Two simple and practical methods are described below. These methods take into account that different batches of vaccine and supplies will be received on a regular basis and dispatched to the network of health facilities, or issued to health workers for immunization sessions.

It is important to distinguish between different batches of vaccine because they may have different expiry dates and should be used accordingly. Also, in the rare situation that there is a serious adverse event, it will be useful to know the exact description of the vaccine (manufacturer, batch number⁴ etc).

Method 1: Using a simple exercise book for stock management each year (see Figure 5D).

1. Divide the book into separate sections of several pages for each type of vaccine (or other supplies/equipment) used.
2. Prepare tables for each vaccine and label columns as shown in Table 5.9. Facing pages of the exercise book are used to record the details of each vaccine or AD syringes or diluents or other supplies/equipment.
3. For each supply of vaccine received or issued, all details including batch number, date of expiry, VVM status, quantity etc. should be recorded. Quantities of other supplies should be recorded in the same way.
4. After each receipt or issue, the balance in stock should be calculated and recorded. The balance recorded should be physically checked and verified at periodic intervals (e.g. once every quarter).

⁴ Batch number, also called Lot number or serial number

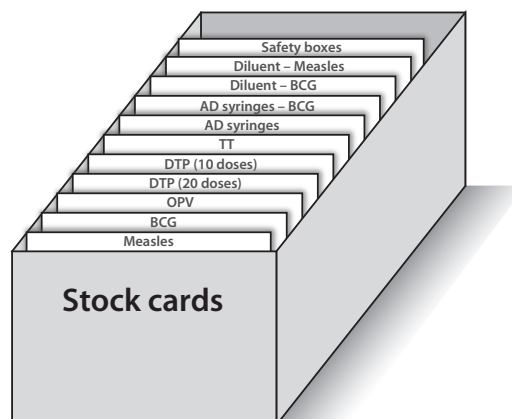
Figure 5D: Simple exercise book to keep records of stock received and issued



Method 2: Using stock cards (see Figure 5E).

1. Take a box (this should preferably be of durable material like aluminium sheet or plastic, but a good shoebox can work temporarily) and divide it into separate sections, which can take several stock cards for each type of vaccine (or other supplies/equipment) used.
2. Prepare a card for each vaccine and label columns as shown in Table 5.9. A separate card is used to record the details of each type of vaccine or AD syringes (including a different card for different vial sizes) or diluents or other supplies/equipment.
3. Between each bunch of stock cards (for each type of vaccine or other equipment) a separator should be placed which is slightly bigger than the stock cards and indicates the vaccine or other material whose stock cards are immediately behind it. As shown in Figure 5E.
4. For each supply received or issued, all details including batch number, date of expiry, VVM status, quantity etc. should be noted.
5. After each receipt or issue, the balance in stock should be calculated and recorded. The balance recorded should be physically checked and verified at periodic intervals (e.g. once every quarter).

Figure 5E: Simple box to keep stock cards



5 Involving the community in planning

To make sure that your plan will be effective you will need to involve the community you serve. For detailed information, see Module 8 on building links with the community.

5.1 Spend time with local government officials and community leaders

Local officials and community leaders can help you decide:

- when to hold immunization sessions;
- where to hold outreach sessions;
- who can help you mobilize the community; and
- who can help you during sessions.

Local leaders play an important role in their communities. They can help you reduce resistance, deal with rumours, and handle other situations that may affect the success of immunization sessions. They should be well informed about your activities. In some areas they maintain a complete register of the community. Ask them to help you reach people who do not normally use immunization services.

5.2 Identify a local contact person

A local contact person is someone who can help you:

- remind mothers when to bring their children for vaccines;
- alert mothers that the vaccination session will take place on the following day;
- spread the word in the village that the outreach team has arrived;
- encourage women to obtain their tetanus toxoid injections;
- organize sessions beyond the health facility, and
- help set up an immunization session and, in some countries, administer oral polio vaccine (OPV) and vitamin A supplements after being trained to do these tasks.

5.3 Train local people

Local persons should be trained on the following:

- to follow up on clients who do not return for second or third doses;
- to follow up on newborns who have not begun their immunization;
- to organize patient flow;
- to complete immunization cards;
- to administer OPV and vitamin A supplements;
- to provide health education;
- to distribute written information.

Local volunteers are critical in identifying newborns and reaching mothers who have not immunized their children. Consider recognizing the contributions of your volunteers by giving them a hat or a badge.

5.4 Give feedback to people in the community

Keep people informed and involved by continually sharing with them information on:

- whether the incidence of disease is going down because of immunization services;
- the number of children fully immunized against diseases;
- the number of newborns protected from neonatal tetanus;
- immunization coverage in percentage terms, and
- how close your health facility is to reaching your immunization goals;
- any outbreaks of diseases nearby for which they need to be vigilant (and encourage people to get vaccinated).

Feedback encourages people to become involved in identifying their own problems and finding solutions.

Guidelines to determine the immunization strategy

Table 5.10: Guidelines to determine the immunization delivery strategy

Type	Definition	Area served	Advantages	Disadvantages
Fixed site	<ul style="list-style-type: none"> delivery of vaccination services in a health facility on a regular basis 	<ul style="list-style-type: none"> distance which mothers are prepared to travel to reach service approx. five km 	<ul style="list-style-type: none"> reliable regular service, minimum one staff, low cost, no transport problems 	<ul style="list-style-type: none"> cannot reach much of the population in rural areas
Outreach	<ul style="list-style-type: none"> delivery of vaccination services from a health facility on a regular basis. sites are usually not fully equipped health facility staff carries the needed equipment to the "outreach site" 	<ul style="list-style-type: none"> area around the Health facility (catchment area) that Health facility staff can easily visit in a day approx. 15 to 20 km depending on geographic barriers 	<ul style="list-style-type: none"> regular service can reach populations beyond the fixed range 	<ul style="list-style-type: none"> needs good communication with communities higher costs (transport, more than one person per site)
Mobile team	<ul style="list-style-type: none"> delivery of vaccination services in areas beyond the "outreach area" (normal catchment area of a Health facility) on less frequent basis. more than one site visited per session health facility staff carries all the needed equipment to the "mobile site" 	<ul style="list-style-type: none"> area beyond the outreach area especially for difficult to reach areas/populations may be conducted over several days 	<ul style="list-style-type: none"> can reach difficult to reach areas/populations, previously unreached populations If transport adequate, can include other interventions e.g. Malaria 	<ul style="list-style-type: none"> high costs (transport, fuel, per diem) less reliable subject to availability of extra resources

Reducing vaccine wastage

Some degree of vaccine wastage is expected in any immunization service. Wastage can occur at any stage. It can occur in the cold store at central level, at various intermediate levels, at the point of use at an immunization session and during transportation. Reducing wastage depends upon better management at all levels. The factors associated with vaccine wastage can be classified as unavoidable and avoidable.

1. Unavoidable vaccine wastage factors

The most important unavoidable wastage factors involve:

- The use of reconstituted vaccines that have to be discarded at the end of the session.
- Other vaccines used in situations under which conditions for the multi-dose vial policy cannot be met.

2. Avoidable vaccine wastage factors

The following are some factors that can be controlled by improving vaccine management:

- Poor stock management resulting in over-supply and vaccines reaching expiry before use
- Cold chain failure that exposes vaccines to unacceptably high or low extremes of temperature.
- Incorrect dosage, e.g. the administration of three drops of OPV instead of two, or the injection of 0.6 ml of vaccine instead of 0.5 ml.
- Failure to comply with the multi-dose vial policy.
- Vials lost, broken or stolen.

3. Reducing vaccine wastage

In many countries where outreach is needed to reach all infants, vaccine wastage rates will need to remain at relatively high levels, especially for freeze-dried vaccines, in order to maintain and increase immunization coverage. Many factors influencing wastage are not associated with the point of use, therefore a change in existing policies for immunization staff is not needed.

However, at all levels measures to control and reduce avoidable vaccine wastage are very important. These include:

- At district level and above, regular reporting on stock levels, improved estimation of requirements and effective stock management.
- Improving district planning, with special regard to reliability of services.
- Planning sessions efficiently to balance session size and convenient opportunities.

- Using the multi-dose vial policy when appropriate.
- Establishing systems to monitor and regularly report vaccine wastage at all levels.

The corrective measures, however, should not be introduced at the expense of coverage (see Module 7).

4. Example of unavoidable wastage at outreach session

The following example (Table 5.12) shows the expected level of wastage when a single outreach session of 35 injections is conducted. Note that the wastage for freeze-dried vaccines is very high. Wastage for other vaccines can be greatly reduced by using the multi-dose vial policy provided the cold chain is maintained throughout, from point of use back to the health centre refrigerator. However careful management of stocks, the session plan and workplan can help reduce wastage.

Table 5.12: Vaccines required and wastage for one session of 35 injections including OPV and TT for pregnant women

Vaccine	Vial size	Vials used	Doses wasted	Wastage rate
DTP (3/7 of 35) = 15 doses	10 doses	2	(2 x 10) – 15 = 5 wasted	5/20 = 25% ^a
Measles (1/7 of 35) = 5 doses	10 doses	1	10 – 5 = 5 wasted	5/10 = 50%
BCG (1/7 of 35) = 5 doses)	20 doses	1	20 – 5 = 15 wasted	15/20 = 75%
OPV (21 doses) 3/7 of 35 = 15 doses	20 doses	1	20 – 15 = 5 wasted	5/20 = 25% ^a
TT (2/7 of 35) = 10 doses	10 doses	1	none	none

^a Multi dose vial policy applicable



Remember:

The goal is to immunize the maximum number of infants and women. Reducing wastage should not be allowed to compromise this goal.

The opportunity to immunize may be more valuable than a dose of vaccine.

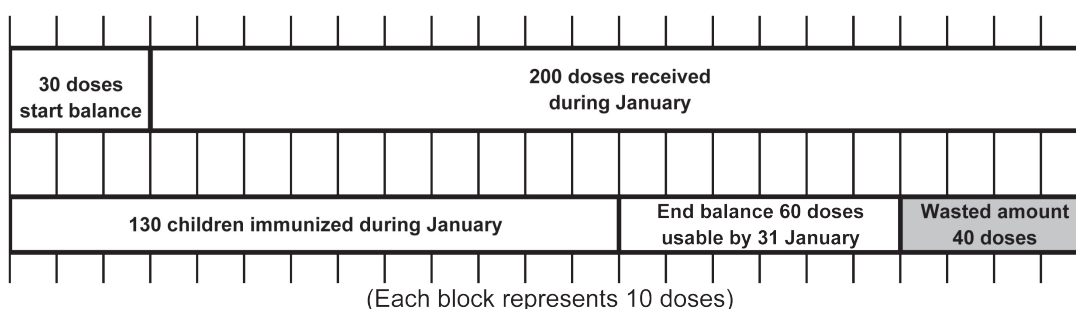
Vaccine wastage calculations at health facility level

$$\text{Vaccine wastage rate} = 100 \text{ minus vaccine usage rate}$$

$$\text{Vaccine usage (rate)} = \frac{\text{Number of infants immunized during the period}}{\left\{ \begin{array}{l} \text{Number of} \\ \text{usable doses at} \\ \text{beginning of} \\ \text{period} \end{array} \right\} + \left\{ \begin{array}{l} \text{Number of doses} \\ \text{received during} \\ \text{period} \end{array} \right\} - \left\{ \begin{array}{l} \text{Number of usable} \\ \text{doses in stock at} \\ \text{end of period} \end{array} \right\}} \times 100$$

The example below explains how to calculate vaccine usage and wastage step by step:

Yenice district received 200 doses of DTP vaccine in 10 dose vials in January. During monthly reporting, 130 children were found to be recorded as immunized. They had 30 doses as a start balance on 1 January and by 31 January their stock level was 60 doses.



1 Calculate the number of doses used during the month

In the beginning of the month the facility had 30 doses and had received 200 doses during the month. This makes a total of 230 doses available for use. End balance showed 60 doses at the end of the month. Subtracting the end balance from available doses gives us the number of doses used during the month, which 230 minus 60 is 170 doses.

2 Calculate your vaccine usage during the month

Divide number of children immunized with number of doses used during the month, which is 130 divided by 170 = 0.764. Multiply this with 100, which gives you 76.4%. We can round this up as 76%.

3 Calculate your vaccine wastage

As indicated in the above formula 100 minus vaccine usage (100 minus 76) = 24% vaccine wastage.

For further details on vaccine wastage and calculations please refer to “*Monitoring vaccine wastage at country level: Guidelines for programme managers. WHO/V&B/03.18*”

