

## SESSION 5: INTRODUCTION TO MONITORING & EVALUATION

### Aim of the session:

Session 5 aims to promote understanding of key concepts in monitoring and evaluation. The links between planning, indicators and the information cycle are highlighted, with reference to the Comprehensive Plan and the national M&E Framework. While analysis of data using indicators is examined in detail in later sessions, this session introduces the idea of calculation of indicators.

### LEARNING OUTCOMES:

By the end of this session participants should be able to:

- ✧ Define the terms: **monitoring, evaluation and indicators**.
- ✧ Discuss elements of a **good M&E system**.
- ✧ Explain how **indicators** form the **link** between the **planning and information cycles**.
- ✧ **Classify indicators** in the M&E Framework into **input, process, output, outcome and impact indicators** and highlight the logical relationship between these types of indicators.
- ✧ Define the terms **data, data element, dataset and indicator set**.
- ✧ Distinguish between **proportion/percentage, ratio, rate and count indicators**.
- ✧ Calculate indicators.

### SESSION CONTENTS:

- ✧ Defining monitoring, evaluation and indicators
- ✧ Establishing the links: the planning cycle, M&E and the information cycle
- ✧ Classifying indicators in the M&E Framework
- ✧ Defining key terms
- ✧ Calculating indicators

### READING:

- ✧ Monitoring and Evaluation Unit, Department of Health, Republic of South Africa (September 2004) Monitoring and Evaluation Framework for the Comprehensive HIV and AIDS Care, Management and Treatment Programme for South Africa
- ✧ Department of Health, Republic of South Africa (2004) Part II: Technical notes indicators, numerators and denominators for the operational plan on comprehensive HIV and AIDS care, management and treatment.
- ✧ Heywood, A. & Rohde, J. Undated. Using information for action. A manual for health workers at facility level. The Equity Project.

## 5.1 Defining monitoring, evaluation and indicators

Wide-reaching plans have been made and a lot of resources are being invested to address HIV and AIDS. How do we know if the plans are working and whether the investments are paying off?

In order to find out if a plan is working, we need to ask certain questions. Then we need to decide what kind of information is needed to answer the questions. The processes of monitoring and evaluation seek to answer these questions. **We monitor the progress of the plan as it unfolds, and then periodically evaluate the achievements of the plan.** We expect challenges, unforeseen or new problems, and possibly some delays. It is important to identify these issues early and turn them into a basis for positive action. Monitoring and evaluation therefore takes place at multiple stages of the implementation of a plan. At each stage we gather different information that comes together to demonstrate how the project has been conducted, what has occurred as a result of the plan and how it can be improved.

The national M&E Framework has been designed to measure progress towards the achievement of the goals of the comprehensive plan. (Refer to M&E Framework document.)

### Objectives of the M&E Framework

(Refer to page 6 of the M&E Framework.)

- ✧ Track progress on implementation of all components of the comprehensive plan;
- ✧ Identify gaps and weaknesses in service provision;
- ✧ Support clinical management of the patients;
- ✧ Plan, prioritise, allocate and manage resources;
- ✧ Monitor the impact of HIV and AIDS on health care systems and communities; and
- ✧ Measure effectiveness of treatment.

### What is monitoring?

Monitoring is a routine process of data collection and measurement of progress towards objectives

"...Monitoring is the routine ongoing assessment of activities applied to assess:

- ✧ resources invested (inputs) in the programme,
- ✧ services delivered (outputs) by the programme,
- ✧ outcomes that are related to the programme..."<sup>10</sup>

### What is Evaluation?

Evaluation is the non-routine use of information to systematically investigate the effectiveness of a programme. Evaluation looks at outcomes and impact; for example, Who has benefited and in what way?

*Note: There may be overlap between monitoring and evaluation (refer to diagram on page 6 of M&E Framework).*

"...Evaluation is the non-routine assessment and will be concerned with the evaluation of the programmes impact on the health and lives of South Africans..."<sup>10</sup>

<sup>10</sup> Monitoring and Evaluation Unit, Department of Health. September 2004. Monitoring and Evaluation Framework for the Comprehensive HIV and AIDS Care, Management and Treatment Programme for South Africa.

### What are indicators?

#### Indicators:

- ✧ are tools used to measure the changes that resulted from the implementation of a plan.
- ✧ are "...variables that help to measure changes, directly or indirectly..."<sup>11</sup>
- ✧ "...are used to describe a situation and measure changes over time..."<sup>12</sup>
- ✧ convert raw data into information that can be interpreted and used for decision-making.
- ✧ are observable markers of progress towards targets.
- ✧ provide a yardstick for comparison with others doing similar work.

#### Working definition of indicators:

**measures of the changes that resulted from the implementation of a plan**

Some elements of good M&E System include:-

- ✧ Description of goals and objectives.
- ✧ Availability of resources and capacity to implement M&E.
- ✧ A list of clearly defined indicators with targets. Numerators and denominators and their sources.
- ✧ Data flow policy, collection and analysis plan.
- ✧ Data use and dissemination plan.
- ✧ Budget and costing.

## 5.2 Establishing the links: the planning cycle, M&E and the information cycle

This course is about monitoring and evaluation of the Comprehensive Plan. We have already looked at a framework for planning called the planning cycle. Monitoring and evaluation are a crucial part of the planning cycle framework.

We said that indicators are the tools we use for monitoring and evaluation of a plan.

As we go forward in this course, we are going to look at how we get the information to use to calculate the indicators that monitor and evaluate the plan.

In order to help us understand how to get and use this information, we use a framework called the *information cycle*.

**Indicators are the link between the two cycles which are central to M&E: the planning cycle and the information cycle.**

The following diagrams illustrate this link. (Detailed explanations follow the diagrams.)

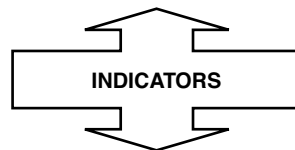
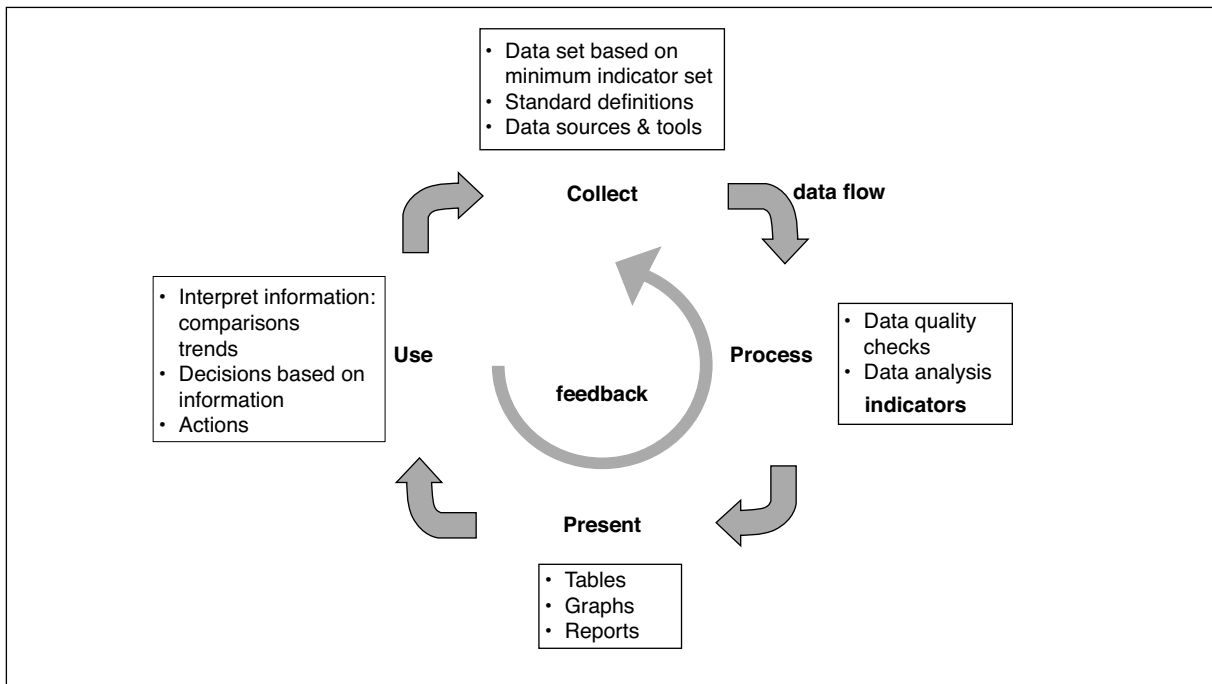
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<sup>11</sup> World Health Organization, 1981.

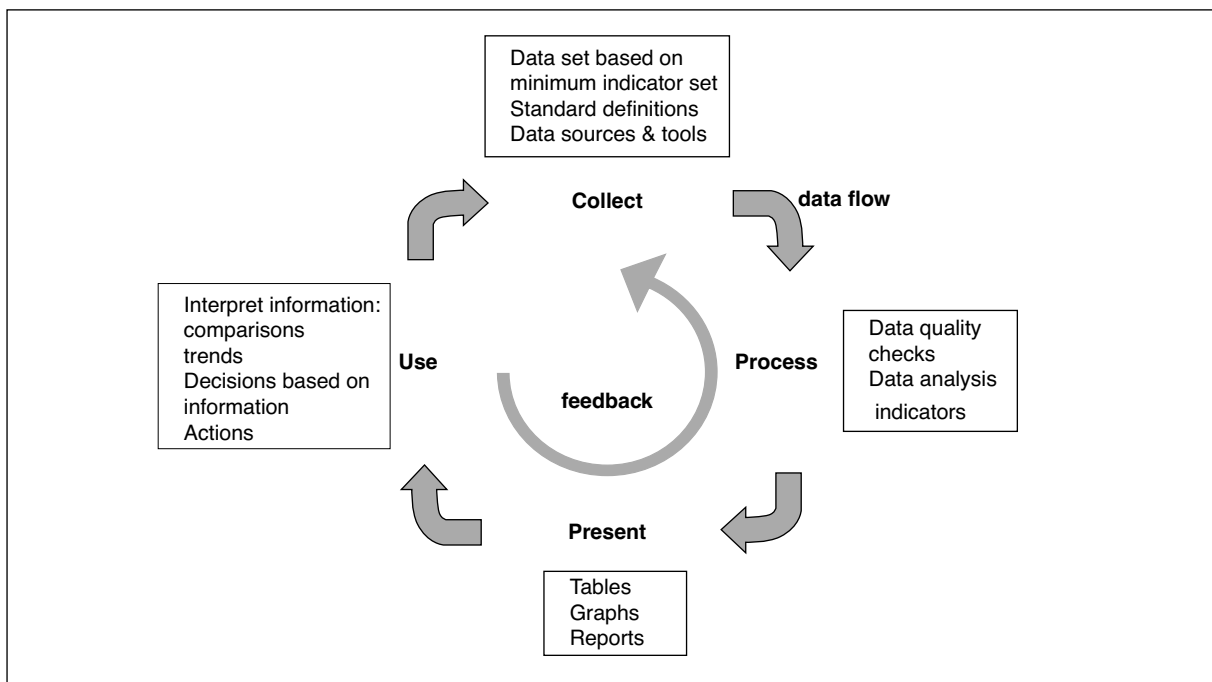
<sup>12</sup> Heywood A, Rohde J. Undated. Using information for action. A manual for health workers at facility level.

Figure 5.2: The planning and information cycles

The planning cycle



The information cycle



### Overview of the information cycle

This presentation provides a brief overview of the information cycle. The various stages will be discussed in more detail as the course progresses.

**In order for information to be used effectively, it must be relevant, of good quality and presented in a way that is easily understood. Information must also be available when and where it is needed.** In order to obtain such information, an effective information system must in place.

An **information system** consists of the practices involved in:

- ✧ collecting data,
- ✧ processing the data by checking quality,
- ✧ analysing this data to obtain information in the form of indicators,
- ✧ presenting the information in a user-friendly way, and
- ✧ using the information for decision-making at local, district, provincial and national levels.

#### 1. Collect

Data collection involves four important components:

- ✧ a defined **minimum indicator / dataset**
- ✧ **standardised definitions** for data elements and indicators
- ✧ appropriate data collection **tools**
- ✧ appropriate **sources** of data / places of data collection

The data to be collected is based on the indicators that have been chosen. The minimum amount of data to be collected reflects the minimum indicator set. It is important that staff collecting data have a uniform understanding of the meanings of data elements. Therefore, there must be standardised data element definitions. Data is collected using tools which usually consist of registers, tally sheets, forms and sometimes computer programs. The tools must be designed in such a way that they facilitate the efficient collection of the necessary data. The tools must also be located at the place most appropriate in terms of ease of access and accuracy, i.e. the sources of data must be carefully considered. Appropriate use of data collection tools is a crucial step in obtaining good quality data.

#### 2. Process

Processing involves two components:

- ✧ Checking data **quality**
- ✧ **Analysing** the data to turn it into indicators

The quality of the data is checked at various stages using a combination of methods, some manual and some computerised. Once the quality of the data is acceptable, the data is converted into indicators through a process of calculation. If data quality is not acceptable, the indicators will not provide a true reflection of the situation and the rest of the information cycle will be meaningless.

#### 3. Presenting

- ✧ **Reports**

Presentation involves compiling information into a format that is quickly and easily understood. Information may be presented as reports in the form of, e.g. raw data tables, indicator tables, graphs or maps. These reports provide comparisons, e.g. over time, among sites and against targets or benchmarks. Where relevant, reports should also provide narrative explanations of the context as well as explanations of unusual data.

#### 4. Use

Use of information includes the following:

- ❖ **Interpretation**
- ❖ **Decision-making**
- ❖ **Action**

Indicators provided in reports are assessed against targets, objectives and benchmarks. Information is also interpreted through comparisons with previous time periods, other sites and other types of information.

#### Data flow

Data or information flows through the information system along a defined path. In order for the system to work, clear **procedures, responsibilities and timelines** must be defined. This is an important aspect of ensuring data quality. The data should preferably be accompanied by interpretations and comments from the facility level and higher levels, including information about decisions and actions taken.

#### Feedback

While data flows from the points of collection through to the points of use, feedback flows in the opposite direction. **Feedback plays a vital role in promoting improved data quality and understanding of the role of information in health service management.** The most basic feedback is simply comments and views on the data submitted, while more "advanced" feedback would relate to interpretations and decisions/actions taken at higher levels.

#### Linking the information cycle to the planning cycle, using indicators as the link

Indicators form the core of monitoring and evaluation and are used to measure how well a plan is carried out, or how well a programme is performing. The information cycle is directed towards obtaining the data to calculate these indicators. As this course progresses, we are going to look at the kinds of indicators needed to monitor and evaluate the Comprehensive HIV and AIDS plan and at how to obtain the data needed to calculate the indicators. Finally, we will look at how to interpret and use these indicators.

In order to implement a plan, we need resources to perform the activities to achieve the objectives which will ultimately help us to reach the goal.

Resource → activity → objective → goal

*(Relate these to the planning cycle framework.)*

Each step of the way has measurable components associated with it. Indicators are selected to reflect these measurable components:

resource	→	activity	→	objective	→	goal
input indicators		process indicators		output indicators		outcome indicators
						impact indicators

Refer to p6 of the M&E Framework where the above are also illustrated.

Refer to p193 of the Comprehensive Plan to show the relationship between the Comprehensive Plan and the M&E Framework:

"...The M&E system will collect data relevant to all resources invested in the programme, services provided by the programme, outcomes related to the programme, and the overall impact of the programme on public health and quality of life..."

### **Input indicators:**

Measure resources needed to carry out activities  
e.g. staff, materials, equipment, infrastructure, budget

### **Process indicators:**

Measure the activities in which the programme resources are used  
e.g. training sessions conducted, availability of drugs, availability of nutrition supplements

### **Output indicators:**

Measure the products, services and systems that are put in place through activities of the plan  
e.g. staff trained, protocols developed, functional services, clients served

### **Outcome indicators:**

Measure changes that result from the outputs (usually relatively short term)  
e.g. changes in knowledge, attitudes, behaviour, skills or health status as a result of the activities of the plan. Typical examples include weight gain or adherence to treatment

### **Impact indicators:**

Measure the extent to which the goal has been achieved.  
i.e. What happened as a result of the implementation of the plan? Is the plan making a difference?  
These are usually longer term achievements and are measured at population level, assessing changes in health patterns which have resulted from the outcomes of the plan, e.g. decreased mortality and morbidity, reduced transmission of HIV, improved quality of life for people living with HIV.

## **Targets**

When talking about indicators, we also often talk about targets. Targets are **steps to aim for** (in shorter time periods) along the way to achieving the objectives.

A target is a particular level of service utilisation or service quality that we aim to reach within a specified time-frame. When a target is reached, we may want to set a new target. For example, the initial target for annual VCT uptake among adults aged 15 years and older could be 5%. Once this is achieved, the target could be shifted to 10%.

## **Benchmarks**

Benchmarks can be targets or actual indicator values from other comparable sites, districts, areas, or countries. They can also be "ideal" targets or indicator values derived from research or from epidemiological analysis. The primary use of benchmarks serves as reference values for your own indicators.

## **5.3 Classifying indicators in the M&E framework**

The indicators are set out in the Monitoring and Evaluation Framework to reflect the components of the comprehensive plan. (*Refer page (i) of the Comprehensive Plan*)

The indicators are divided into two broad groups:

### **A) Operational indicators: input, process and output indicators:**

- ✧ budget and expenditure,
- ✧ human resources and training,
- ✧ accreditation of service points,
- ✧ nutrition related indicators,

- ✧ drug procurement and distribution indicators,
- ✧ laboratory services indicators,
- ✧ implementation and/or performance of patient information systems,
- ✧ monitoring and research.

#### B) Patient output, outcome and impact indicators:

- ✧ prevention, care and treatment indicators,
- ✧ traditional medicine,
- ✧ social mobilisation and communications,
- ✧ pharmacovigilance.

## 5.4 Defining key terms and calculating indicators

- ✧ The terms "statistics" or "stats" are often used to refer to data or information. However, the word "statistics" sometimes has a negative connotation, as being difficult or boring or the responsibility of statisticians only. "Stats" in the health sector have over the years often been used to write boring annual reports of little relevance to management and planning. So we prefer to use the words "data" and "information".
- ✧ The term "**data**" implies "numbers" that count or measure particular events, factors or levels. (Sometimes the term "raw data" is used – this simply refers to data that has not yet been Processed into indicators.)
- ✧ A **data element** refers to the name of a particular event or factor that must be counted or measured.
- ✧ A **dataset** is a group of data elements.
- ✧ Data elements are used as **numerators and denominators** in the calculation of indicators.
- ✧ **Indicators** are tools used to measure the changes that resulted from the implementation of a plan. Note that indicators must be combined with an understanding of their context and dynamics or, in other words, they must be *interpreted* before they can be regarded as information.
- ✧ An **indicator set** is a group of indicators.
- ✧ **Standard definitions**  
It is essential that people who are collecting data have a common understanding of the meanings of data elements. If different people have different understandings of what they should collect, the data collected may not reflect that which should be collected. Therefore data elements must have standardised definitions. **The use of standard definitions allows information to be compared** across facilities, geographical areas and time. Indicators should also have standardised definitions, i.e. it should be clearly stated what data elements are used to calculate the indicator and in what contexts the indicator can be interpreted correctly.

For example:

- Indicator:** ART Assessment patients - Proportion medically eligible
- Numerator:** ART assessment patient - medically eligible
- Definition:** Any HIV positive patient attending an ART service point for ART assessment (medical eligibility and/or treatment readiness) who fulfils the medical inclusion criteria (clinical stage and/or CD4) according to the national ARV treatment guidelines. The patient has not yet started ART.
- Denominator:** ART assessment first visit
- Definition:** Any HIV positive patient attending an ART service point for ART assessment (medical eligibility and/or treatment readiness) for the first time. The patient has not yet started ART; transfers-in from other ART service points or from non-public sector of patients who are already on ART are therefore not counted. Can also be a first ART assessment consultation of an in-patient.

Refer to the following document:

Department of Health (2004) Part II: Technical notes indicators, numerators and denominators for the operational plan on comprehensive HIV and AIDS care, management and treatment.

This document provides definitions for Comprehensive Plan indicators.

Refer to the following table in the Annex to Session 5:

DRAFT: Data element definitions for the draft ART National Minimum Indicator/Dataset (2005)

This table provides definitions of ART data elements.

### Analysing data to obtain indicators

The process of analysis of data into indicators, to be used as information for action, involves looking at data within a **context**. When we are presented with raw numbers only, it may be difficult to make sense of the data. However, when **data elements are considered in relation to each other**, the data begins to take on meaning, i.e. the data is seen within a context.

To obtain an indicator, a data element is often placed in relation to another data element which represents a subgroup or sometimes a standardised population.

Example using a subgroup:

Facility A had 10 people default on their treatment last month. Facility B had 5 people default. Which facility has the biggest problem with defaulters?

*Answer: We cannot tell unless we assess the data in relation to the number of patients on treatment in each facility, i.e. we need to provide a context in order to make sense of the data.*

Example using a standardised population:

Male condom distribution rate =  $\frac{\text{number of male condoms distributed}}{\text{male target population: 15 years and older}}$

**Indicators place data elements in relation to each other as numerator and denominator.** The numerator is the top number and the denominator is the bottom number. The denominator provides a context for the numerator: it provides something against which the numerator can be assessed. i.e. indicators provide a context-rich picture because the numerator is related to a "common" denominator, while the numerator alone (i.e. a data element) provides a *context-poor* picture.

For population-based denominators we often use the term "**target population**" when dealing with a specific, well-defined population group that we are actively trying to reach – a typical example are immunisations for children under 1 year. When we are dealing with a broader population group where some of them might become patients but where we are not specifically targeting the whole group, we often use the term "**catchment population**".

Sometimes data elements are used alone as information, i.e. not in relation to a subgroup or standardised population. e.g. "number of registered ART patients – ART start". This information is referred to as a **count indicator**. In such

cases, there is no denominator and the context is provided by assessing the count indicator in relation to other relevant information, e.g. starting data of clinic, number of staff, location of clinic.

### Calculating indicators

Various types of indicators can be calculated:<sup>13</sup>

- ✧ **Proportion or percentage indicators:** The numerator is contained within the denominator and the indicator is usually expressed as a percentage.

$$\text{e.g. proportion of antenatal clients tested for HIV} = \frac{(\text{number of}) \text{ antenatal clients tested for HIV} \times 100}{(\text{number of}) \text{ antenatal 1st visits}}$$

- ✧ **Ratio indicators:**

The numerator is not included in the denominator. The indicator is used to express comparisons between two groups.

$$\text{e.g. ratio of males to females accessing VCT} = \frac{(\text{number of}) \text{ males accessing VCT services}}{(\text{number of}) \text{ females accessing VCT services}}$$

- ✧ **Count indicators:**

Count indicators do not involve calculation. They measure (count) the number of events without a denominator. (Sometimes the denominator is considered to be 1; sometimes it is stated as not applicable.)

e.g. Total ART assessment visits

Here an understanding of the context is still needed. For example, it is necessary to know the absolute numbers of people accessing ART treatment as time progresses, so that decisions can be made about staff allocations, drug orders and budgets.

- ✧ **Rate indicators:**

Rate indicators measure the frequency of an event during a specified time period in a specified population. They are often expressed per 1000 or 100,000 population, but also as percentages, i.e. per 100.

$$\text{e.g. incidence of new cases of STI} = \frac{\text{STI new cases} \times 1000 \text{ population}}{\text{catchment population 15 years and older}} \text{ per given year}$$

This rate could also be expressed per 100 population, which would give a percentage.

*Note: When presenting an indicator, it is important to **identify the time period** as well as **the exact location** from which the data originates.*

<sup>13</sup> Adapted from: Lippeveld T, Sauerborn R, Bodart C. (eds.) (2000) Design and implementation of health information systems. World Health Organization. Geneva.

## Session 5

### ANNEX TO SESSION 5

#### Data Element Definitions for ART National Minimum Indicator/Dataset (2005)

No	Data element	Definition
1	Blood drawn for CD4 test	Any blood drawn for CD4 test. Does not matter whether test is conducted at the facility or off-site.
2	CD4 test result turn around time of 6 days or less	Any CD4 test result for which the blood was drawn at the ART service point and the test result was received at the ART service point within 6 days after taking the blood. Turn around time is therefore defined as the time from taking the sample until the time the result was received at the ART service point.
3	CD4 test result turn around time over 6 days	Any CD4 test result for which the blood was drawn at the ART service point and the test result was received at the ART service point later than 6 days after taking the blood. Turn around time is therefore defined as the time from taking the sample until the time the result was received at the ART service point.
4	ART assessment first visit	Any HIV positive patient attending an ART service point for ART assessment (medical eligibility and/or treatment readiness) for the first time. The patient has not yet started ART; transfers-in from other ART service points or from non-public sector of patients who are already on ART are therefore not counted. Can also be a first ART assessment consultation of an in-patient.
5	ART assessment follow up visit attended	Any HIV positive patient attending an ART service point for ART assessment (medical eligibility and/or treatment readiness) excluding the first visit. The patient has not yet started ART. The visit during which ART is initialised is counted as (the last) ART assessment follow up visit.
6	ART assessment patient - medically eligible	Any HIV positive patient attending an ART service point for ART assessment (medical eligibility and/or treatment readiness) who fulfills the medical inclusion criteria (clinical stage and/or CD4) according to the national ARV treatment guidelines. The patient has not yet started ART.
7	Eligible ART assessment patient - known death	Any HIV positive patient registered at an ART service point for ART assessment whose medical eligibility (CD4 and/or clinical stage) was confirmed but died during the treatment readiness assessment period. The patient had not yet started ART.
8	Registered ART patient - ART start	Any HIV positive patients registered at an ART service point who starts ART
9	De-registered ART patient - transferred out	Any ART patient who was registered at this ART service point and was de-registered this month because of transfer out to another public or non-public ARV treatment facility
10	De-registered ART patient - known death	Any ART patient who was registered at this ART service point and was de-registered this month because of death
11	De-registered ART patient - loss to follow up	Any ART patient who was registered at this ART service point and was de-registered this month because of loss of follow up. Loss of follow up is defined as a missed scheduled collection of ART drugs AND patient not traceable within one week.
12	De-registered ART patient - ART stop	Any ART patient who was registered at this ART service point and was de-registered this month because a decision was made to stop ART. This can be for medical reasons (but not death) or a decision made by the patient (not loss to follow up).
13	De-registered ART patient - any other reason	Any ART patient who was registered at this ART service point and was de-registered this month for a reason other than death, transfer out, loss to follow up or a decision to stop ART
14	Registered ART patient on regimen 1a or 1b	Any ART patient registered at an ART service point and on ART regimen 1a or 1b at the last day of the reporting month.

No	Data element	Definition
15	Registered ART patient on regimen 2	Any ART patient registered at an ART service point and on ART regimen 2 at the last day of the reporting month.
16	Registered ART patient on any child regimen	Any ART patient registered at an ART service point and on any ART child regimen at the last day of the reporting month.
17	Scheduled dose issued ART any regimen	Any scheduled ARV dose (monthly dose or shorter) for which a patient on any ART regimen was appointed for collection (whether at ART service point or other public sector health facility) AND the dose was issued to the patient latest after 3 days of the appointment date.
18	Scheduled dose defaulted (over 3 days) ART any regimen	Any scheduled ARV dose (monthly dose or shorter) for which a patient on any ART regimen was appointed for collection (whether at ART service point or other public sector health facility) AND the dose was NOT issued to the patient latest 3 days after the appointment date.
19	ART adherence last 3 days 100%	Using recall last 3 days method: ART patient attending visit at ART service point who has taken every tablet of the ART regimen on every day the last 3 days.
20	ART adherence last 3 days less than 100%	Using recall last 3 days method: ART patient attending visit at ART service point who has failed to take every tablet of the ART regimen on each of the last 3 days.
21	Registered ART patient - viral load less than 400 (this month)	Any viral load result <400 of a registered ART patient received at an ART service point during the reporting month (excluding viral load tests at baseline).
22	Registered ART patient - viral load 400 or more (this month)	Any viral load result $\geq$ 400 of a registered ART patient received at an ART service point during the reporting month (excluding viral load tests at baseline).
23	Registered adult ART patient – weight (this month) gain over 10% compared to baseline	Any weight measured of a registered ART patient 15 years or older at the ART service point during the reporting month which is MORE than 10% higher compared to the weight at baseline (ARV readiness assessment period).
24	Registered adult ART patient – weight (this month) gain 10% or less compared to baseline	Any weight measured of a registered ART patient 15 years or older at an ART service point during the reporting month which is LESS than 10% higher compared to the weight at baseline (ARV readiness assessment period).
25	Registered Adult ART patient - WHO Staging 1 or 2 (this month)	Any WHO Staging 1 or 2 of a registered adult ART patient measured at an ART service point during the reporting month.
26	Registered Adult ART patient - WHO Staging 3 or 4 (this month)	Any WHO Staging 3 or 4 of a registered adult ART patient measured at an ART service point during the reporting month.
27	Registered Child ART patient - WHO Staging 1 (this month)	Any WHO Staging 1 of a registered child ART patient measured at an ART service point during the reporting month.
28	Registered Child ART patient - WHO Staging 2 or 3 (this month)	Any WHO Staging 2 or 3 of a registered child ART patient measured at an ART service point during the reporting month.
29	Registered adult ART patient - CD4 over 200 (this month)	Any CD4 result $>$ 200 received of a registered ART patient 15 years or older at an ART service point during the reporting month
30	Registered adult ART patient - CD4 200 or less (this month)	Any CD4 result $\leq$ 200 received of a registered ART patient 15 years or older at an ART service point during the reporting month
31	STI treated new episode - ART patient	Any new episode of STI treated of a patient on ART
32	Any ARV drug stock out at any point this month	Yes or No of any ARV drug stock out at any point during the month at the ART service point (pharmacy)
33	Any nutritional supplement stock out at any point this month	Yes or No of any nutritional supplement stock out at any point during the month at the ART service point (pharmacy)