KEY DISTRICT HEALTH INDICATORS IN PRIMARY HEALTH CARE

VOLUME 1

Acknowledgments

This publication would not have been possible without the valuable input and help of Bridget Mclou, Beth Engelbrecht, Norah Stoops and Ronel Visser.

This publication has been funded by
The Atlantic Philanthropies and the National Department of Health.

Layout and Design: Halima Hoosen-Preston,
Proof reading: Naadira Karrim

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VOLUME 1

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April 2007

Published by Health Systems Trust

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Suggested citation:

Barron P, Monticelli F. Key district health indicators. Volume 1. Durban: Health System Trust. 2007.

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INTRODUCTION

There are currently a large number of indicators being collected and used in the health system. Some of these are based on surveys carried out in selected public health facilities such as the annual antenatal HIV prevalence survey. Others are based on community surveys such as the 5 yearly demographic and household survey which assists in the estimation of infant mortality rates. Other indicators are based on research such as the measurement of client satisfaction at hospitals.

A large number of indicators are also calculated from the collection of routine data at facility level. Out of all of these facility-based indicators, ten of the most important have been selected for more in depth discussion in this document. This is done in an attempt to assist managers at all levels of the health system, from facility managers to programme managers at the national Department of Health, to use these indicators as a management tool to improve planning, implementation and monitoring of health services.

Currently there are a number of problems associated with facility-based indicators. These include:

- they are not optimally used by managers and other health workers
- they are not well understood by managers and health workers
- they are sometimes not standardised
- the data elements on which they are based are not always clear
- the data elements on which they are based are sometimes complex
- the definitions of the indicators are not always clear
- there are too many indicators.

In an attempt to demystify the indicators and to make them more accessible to managers of facilities and to those at higher levels of the system who support facility managers, this booklet has taken the “top ten” key indicators based on routine facility information and has unpacked them. It is hoped that this publication will make these indicators more easily understandable, will promote greater use of these indicators and will therefore ultimately play a role in improving their quality.

WHAT IS AN INDICATOR?

In order to manage health services well and to maximise the health of the population who use these services, managers need to know the answers to a number of questions.

These include questions about the health of people:

- Who gets sick?
- What illnesses are most common?
- Where do these people live?

They also include questions about the health services:

- What health services are provided?
- Who uses these services?
- What is the quality of these services?
- How much do these services cost?

Health indicators can help in answering these questions.

Health indicators are normally numbers or values that can be measured and that can reflect changes over time. They are yardsticks that can be used in the monitoring process. They often are used as markers as to how well the health system is performing. While indicators are useful tools for measuring change, they also have limitations. Some of these limitations are:

- Indicators are used to alert managers to potential problems, possible causes for these problems and additional questions to be asked. Indicators rarely give the cause of problems themselves.
- An isolated indicator by itself does not mean much. It needs comparison over time and across facilities and districts, to show trends in order to be useful.

For example, one indicator for monitoring the health of an individual is his/her heart rate. This can be is calculated by firstly counting the pulse of that person for 30 seconds. Let's say the count is 40 beats. The heart rate is calculated by working out how many beats there are in one minute. This simple illustration of an indicator can be used to compare an individual's health over time and it can also be used to compare the individual with other individuals.

CALCULATION OF HEART RATE

$$= \frac{\text{number of beats (numerator)}}{\text{time in seconds (denominator)}} \times 60 \text{ seconds}$$

= 40 beats/30 seconds x 60 seconds

= 80 beats per 60 seconds (or 1 minute)

Thus the heart rate is 80 beats per minute

Indicators can be compared

- over time
- with other facilities (or areas) that are using the same indicator.

KINDS OF INDICATORS

Indicators can be classified into various kinds. These generally are:

- input (related to resources put into the system, e.g. number of doctors per 100 000 people)
- process (related to the activities of the health system, e.g. bed utilisation rate in a hospital)
- output (related to how much the health system has done e.g. number of Caesarean sections carried out compared to the number of deliveries)
- outcome (what has happened as a result of the outputs e.g. number of patients cured of TB compared to all patients with TB)
- impact (what has happened to the health status of particular groups of people e.g. infant mortality. This indicator is generally obtained from survey type information rather than routine data collection)

There are no rigid boundaries between the various components in this classification and sometimes an indicator can fit more than one category, dependent upon how it is viewed.

KEY HEALTH INDICATORS

These ten indicators were deliberately selected by the authors from the currently collected routine data to span as wide a range of activity of the health system as possible.

Four of the ten are directly related to district hospitals:

- Expenditure per Patient Day Equivalent (input)
- Bed utilisation rate (process)
- Average length of stay (process/output)
- Caesarean section rate (output)

These indicators to a large extent give a suggestion of how well the hospital is being managed. They measure efficiency, management of resources and also give an indication of the quality of maternity care.

The remaining six are related to non-hospital primary level care:

- Immunisation coverage rate (output)
- Male condom distribution rate (output)
- Proportion of antenatal clients tested for HIV (output)

- Supervision rate (process)
- TB smear conversion rate (output)
- TB cure rate (outcome)

Most of these indicators, in addition to their classification above, are also markers of quality of care. They cover the key programmes of:

- Maternal Health
- Child Health
- TB
- HIV

Each of these ten indicators should be regularly monitored, monthly at facility level and at least quarterly at district, provincial and national levels.

Based on international best practice and historical trends in South Africa, the national Department of Health has developed targets and norms for various indicators. These targets are used for illustration purposes under each of the indicators.

FORMAT

This reference booklet is structured in a way so that for each indicator the following format is followed:

- Definition of indicator
- Example of calculation of the indicator
- Target for the indicator
- Purpose of indicator
- Use of the indicator by managers
- Data sources

For convenience sake, the calculations shown in the examples used in this book demonstrate calculations done on an annual basis. However, in reality facility and district managers would monitor the indicators on a monthly and quarterly basis.

DISTRICT

HOSPITAL

INDICATORS

COST PER PATIENT DAY EQUIVALENT

Definition:

This indicator measures the average cost per patient per day seen in a hospital. (expressed as Rands per patient day equivalent).

Calculation:

Total expenditure of the hospital divided by the patient day equivalent (PDE). The PDE is calculated by adding the number of inpatient days plus ½ of day patients plus 1/3 of outpatient and emergency room visits.

Example:

District hospital A has 150 usable beds. During the year (1 April 2006 to 31 March 2007) there were 34 100 inpatient days and 400 day patients in this district hospital. There were also 14 010 outpatient visits and 1 440 emergency visits during working hours and during after hours. The expenditure of the hospital included staff costs which totalled R29 450 420; drugs and other consumables which came to R3 674 000 and all other costs which totalled R4 256 000.

Total hospital expenditure for 2006/7

= R29 450 420 + R3 674 000 + R4 256 000
= R37 380 420

Patient Day Equivalent (PDE) for 2006/7

= Inpatient days + 1/2 day patients + 1/3 (OPD + emergency visits)
= 34 100 + (1/2 of 400) + 1/3 (14 010 + 1 440)
= 34 100 + 200 + 1/3 (15 450)
= 34 100 + 200 + 5 150
= 39 450

COST PER PDE

$$= \frac{\text{Total of hospital expenditure}}{\text{Number of PDEs}}$$

$$= \frac{\text{R37 380 420}}{\text{39 450}}$$

= R948

Target:

The recommended PDE for district hospitals as set by the national DOH for the 2006/7 year is R814.

Purpose:

It is an indicator of efficiency that combines elements of input and output. This indicator measures how efficiently the resources available to the hospital are being spent. It is a composite process indicator that links financial data with service related data. It requires that two data sets need to be combined. It needs the financial information from the BAS (basic accounting system vote 2.9) as well as the service related data of the hospital admissions which include inpatient days, day patients and outpatient visits.

If the PDE is much higher than the national target, the following are likely causes:

- the hospital is relatively under utilised (by patients) and has a low bed occupancy rate, or;
- there is inadequate control of costs. Over-use of expensive items such as drugs or over-servicing of patients and performing unnecessary tests (e.g. expensive lab tests) will increase costs.
- It may also mean that there is wastage and insufficient control over resources such as food, equipment, drugs and consumables.
- Another cause may be that non-hospital costs (e.g. staff working in clinics or drugs supplied to clinics) are erroneously included in the hospital costs.

A high PDE requires that the hospital management do further investigation to unpack and highlight the specific contributing factors.

If the PDE is much lower than the national target, it may indicate the following:

- there is a very high bed occupancy rate, or
- a high number of outpatients, who should ordinarily be seen at clinics and do not require the greater sophistication of the hospital, are being treated in the hospital.

Use of the indicator in the Health sector:

The PDE tells whether a particular hospital is being optimally managed. It measures and compares the inputs, i.e. the total financial resources available to the hospital, with the outputs, i.e. the volume of patients seen. It is a means of comparing a particular hospital with similar hospitals in other districts. It is a marker of efficiency of the hospital as a whole.

Every hospital manager should regularly (at least monthly) review the PDE for his/her hospital. This indicator should be fairly constant over time and any fluctuations of more than 10% requires an investigation as to the possible causes.

District and provincial managers responsible for the oversight of more than one district hospital should review these PDEs quarterly and compare individual hospitals over time to evaluate performance between hospitals.

At national level district hospitals should be compared (between provinces) to ensure that there is convergence to agreed-upon norms.

Data Source:

The sources of information for the service aspect of this indicator are:

- the daily inpatient registers;
- day-patient registers;
- the midnight census forms;
- as well as the outpatient and emergency department registers.

The financial information is obtained from the BAS (or Walker in North West Province).

AVERAGE LENGTH OF STAY

Definition:

The average length of stay (ALOS) indicator measures how long on average each patient spends in the hospital.

Calculation:

Number of inpatient days plus ½ of day patients divided by the number of separations (Expressed as number of days).

This indicator applies to acute care patients in district hospitals. Patients receiving long term chronic care, such as TB patients or psychiatric patients, who may need hospitalisation for 2 months or more, should not be included in these calculations. ALOS is not a useful indicator for specialised hospitals, such as psychiatric hospitals, where patients are sometimes hospitalised for life

Example:

District hospital A has 150 usable beds. During the year (1 April 2006 to 31 March 2007) there were 34 100 inpatient days and 400 day patients in this district hospital. There were 7 100 admissions, 6 810 discharges, 200 deaths and 80 transfers to other hospitals.[1]

Total Number of inpatient days
= Number of inpatient days + ½ day patients
= 34 100 + 1/2(400)
= 34 100 + 200
= 34 300

Total number of separations
= Discharges + transfers + deaths + day patients
= 6 810 + 80 + 200 + 400
= 7 490

AVERAGE LENGTH OF STAY (ALOS)

$$= \frac{\text{Total number inpatient days}}{\text{Total number of separations}}$$

$$= \frac{34\ 300}{7\ 490}$$

= 4.6 days

1 *For convenience sake annual calculations have been shown. In reality facility and other managers would monitor the indicators on a monthly and quarterly basis. This applies to the other indicators as well.*

Purpose:

This indicator measures how much time patients spend in the hospital. It is an outcome indicator and measures a component of quality.

If the ALOS is in line with the national target, it indicates that decisions about patients are being made quickly and that they are diagnosed, given appropriate treatment, and are rapidly discharged from the hospital.

A relatively high bed utilisation rate and low ALOS is indicative of a well-functioning district hospital.

Poor data quality (e.g. an undercount of the number of discharges) can also lead to a higher ALOS than the true value.

Use of the indicator in the Health sector:

The ALOS gives an indication of the quality of care offered at a particular hospital as a whole and is probably the easiest marker for this. It is also a means of comparing activity with similar hospitals in other districts.

A persistently high ALOS indicates that patients are being kept in the hospital for too long and the reasons for this may be the following:

- it indicates that patients are either not being treated timeously or appropriately, or that they are not being seen regularly so that discharges are not carried out at the right time. One reason for this may be a shortage of doctors to do regular rounds, or doctors not doing regular ward rounds including over weekends;
- another reason for a high ALOS is that once patients are discharged, they are unable to leave the hospital for socio-economic reasons (e.g. the patient may not be collected by relatives as there may be nobody to look after the patient at home, the relatives may not have transport to collect the patient or there may be a poor public transport system). A suggestion to remedy this problem, is to increase the number and availablility of step-down facilities.

An exceptionally low ALOS (e.g. less than 1.5 days) also requires explanation. It may mean the following:

- that, in general, patients are not being treated adequately before being discharged,
- that too many patients are being referred to other hospitals,
- a low ALOS can also be linked to the bed utilisation of the hospital which if high (e.g. above 90%) will

require the discharge of less serious cases to make room for patients that need urgent admission.

A persistently high ALOS indicates that protocols for admission and discharge need to be reviewed. The ALOS for the various wards in the hospital need to be disaggregated to see if there is any particular ward which is contributing to the high figure. In particular, the ALOS for individual services, for example, medical, surgical, maternity, paediatrics can be investigated. The ALOS for the above services differ markedly in some instances. An increasing trend in ALOS in the surgical ward could highlight a lack of adequate post surgical aftercare.

Every hospital manager should regularly (at least monthly) review the ALOS for his/her hospital. These rates should be fairly constant over time and any fluctuations of more than 10% require an investigation as to the possible causes.

District and provincial managers responsible for the oversight of more than one district hospital should review the ALOS rates quarterly and compare individual hospitals over time to evaluate performance between hospitals.

At national level, district hospitals should be compared (between provinces) to ensure that there is convergence to agreed-upon norms.

Data Source:

The source of information for this indicator is the daily inpatient and day-patient registers and the midnight census forms.

BED UTILISATION RATE

Definition:

This indicator measures on average what proportion of the usable beds in a hospital were utilised (or occupied) per month / quarter / year.

Calculation:

Number of inpatient days plus ½ of day patients divided by the usable bed days (Expressed as a %).

Example:

District hospital A has 150 usable beds. During the year (1 April 2006 to 31 March 2007) in this district hospital there were 34 100 inpatient days and 400 day patients.

The number of usable bed days
= no of usable beds x no of days[2]
= 150 x 365
= 54 750

Total number of inpatient days
= Number of inpatient days + ½ day patients
= 34 100 + ½ (400)
= 34 100 + 200
= 34 300

BUR

$$= \frac{\text{Nr. of inpatient days} + \text{½ day patients}}{\text{Number of usable bed days}} \times 100$$

$$= \frac{34\,300}{54\,750}$$

$$= 62.6\%$$

Target:

The recommended bed utilisation rate set by the national DOH for the 2007/8 year is 75%. The average rate for 2005/6 in South Africa was 64%.

2 *Depends on the period over which BUR is calculated, for a month it is multiplied by 30/31days.*

Purpose:

This indicator measures how busy the hospital is and what proportion of beds are being used. It is a process indicator and measures a component of efficiency.

If the bed utilisation rate is very low it means that either there is no need for the hospital and its beds in that area or that the community does not like to utilise the hospital, probably because of perceptions of poor quality. A low utilisation means that resources are being wasted, as there are many fixed costs in relation to each bed (e.g. staffing, electricity) and the cost per patient day will therefore increase. The undercount of inpatient days due to poor submission of midnight census forms , causes problems with data quality in databases such as the DHIS. The result is artificially low utilisation rates where the utilisation rate reflected in the official data will be lower than the actual utilisation.

If the bed utilisation is too high, it is likely that the quality of care is compromised as there will be insufficient staff to provide patients with optimal care. An average bed utilisation of over 90%, probably means that at times there was greater than 100% utilisation, which resulted in patients sharing beds or excess patients having to sleep on the floor. Such high utilisation is likely to place strain on, and impact on the morale of the staff managing these patients. It is an indication of the need for additional staff.

It is important to clarify the definition of a bed.

A bed is a unit of accommodation in a health facility. A bed is used for admitting patients, and generates a “length of stay” (counted as “patient days”).

The following are defined as beds:

- Acute care beds
- Chronic care beds
- Bassinets for admitted neonates (excluding bassinets for healthy neonates)
- Cots for admitted children
- Incubators
- Obstetric beds for postnatal care or longer-term antenatal care
- Surgical day beds
- Kangaroo Care mother beds (if no mother count bassinet)

The following are not counted as beds:

- First stage and delivery beds in labour wards
- Surgery tables
- Recovery beds

- Examination couches or beds
- Patient trolleys
- Wheel chairs and chairs (e.g. for asthma patients)
- Trauma & emergency unit trolleys
- Trauma resuscitation trolleys
- Boarding mom (or dad) beds
- Cots for normal neonates (well baby cots)
- Mattresses on the floor

Another critical component that needs to be accurate in calculating this indicator is the definition of what is a "usable bed". The terms approved / authorised / commissioned / usable beds are often sometimes used loosely.[3]

The term "usable bed" means that the bed is operational (actually available for use within the facility) and there is a budget for it. It also implies that the budget will be used to ensure that there are adequate and appropriate staff available to service the bed and its occupants.

At the beginning of each year there should be an agreement between the provincial head office, the district management team and the hospital management, on exactly how many beds are usable. This figure should then be constant for the rest of the year, unless there is an explicit written agreement to change.

Use of the indicator in the Health sector:

The bed utilisation rate is an important marker for telling us whether a particular hospital is being optimally used or not. It must always be read in conjunction with Average Length of Stay (ALOS) , which provides an indication of appropriateness and efficiency as well. BUR and ALOS therefore prove a means of comparing activity with similar hospitals in other districts. The BUR is a marker of efficiency of the hospital as a whole.

A persistently low bed utilisation rate indicates that the hospital or a number of wards probably need closure.

A persistently high bed utilisation rate indicates the need for an additional hospital in the area or the addition of wards to the current facility, as quality is compromised and hospital

3 *The approved number of beds in a facility is the number of beds that has been approved by the provincial head office for the facility. These are the number of beds that are funded. The usable number of beds is what is actually being used in a facility. For example, 100 beds may have been approved by the PDOH, however, due to the high BUR of the facility, additional beds have been purchased by the hospital and simply added to each ward to accommodate the excess. Therefore the usable number of beds in a facility may be 130 beds, with 100 being the approved number of beds. The alternative may exist, that the total number of approved beds are not used to full capacity, resulting in many beds often being empty. These additional beds are often removed from each ward. The remaining number of beds are then the usable beds.*

staff are placed in compromised situations when dealing with more patients than was intended.

Every hospital manager should regularly (at least monthly) review the bed utilisation rate for his/her hospital. These rates should be fairly constant over time and any fluctuation of more than 10% requires an investigation as to the possible causes.

District and provincial managers responsible for the oversight of more than one district hospital should review these utilisation rates quarterly and compare individual hospitals over time to evaluate performance between hospitals.

At national level the hospital cluster should be comparing hospitals between provinces to ensure that there is convergence to agreed upon norms.

Data Source:

The source of information for this indicator is the daily inpatient and day-patient registers and the midnight census forms.

CAESAREAN SECTION RATE

Definition:

This indicator measures the proportion of deliveries in which a Caesarean section was performed.

Calculation:

Number of Caesarean sections in a district hospital divided by the total number of deliveries in that hospital (expressed as a %).

Example:

During the year (1 April 2006 to 31 March 2007) in hospital A there were 1 200 deliveries. Of these deliveries 140 were via Caesarean section operation.

CAESAREAN SECTION RATE

$$= \frac{\text{Number of Caesarean sections}}{\text{Number of deliveries}}$$

$$= \frac{140}{1\ 200}$$

$$= 11.7\%$$

Target:

There is no official target for Caesarean sections in district hospitals in South Africa. A ballpark norm for Caesarean sections in district hospitals in South Africa, given the complications as a result of high levels of HIV, should be around 15%. (In 2005/6 the average for South Africa was 18.4%)

Purpose:

This indicator measures the proportion of women who needed to have an operation to deliver their baby and measures the readiness of the health system to perform such an operation. Caesarean section operations are one component of emergency obstetric care and every district hospital should be well prepared and equipped to carry out this basic operation.

Use of the indicator in the Health sector:

This is an outcome indicator. It tells us whether a particular hospital has a similar proportion of Caesarean sections compared with similar hospitals in other districts. It is a marker for maternity care as a whole and is a measure of quality within the health sector.

Too few Caesarean sections performed, is an indication that the lives and health of mothers and children are being placed at risk. Too many Caesarean sections performed is an indication of unnecessary over-servicing and expenditure by the health services. It also places the mother at risk of unnecessary complications.

One can expect that referral hospitals will have a higher Casarean section rate than the average district hospital, as they would generally deal with more complicated cases referred to them from the districts hospitals.

Every hospital manager should review the Caesarean section rates for his/her hospital on a quarterly basis. These should be fairly constant over time and any fluctuations of more than a single percentage point or two requires further investigation.

Every MCWH supervisor, district and provincial manager should review the Caesarean section rates quarterly and compare individual hospitals over time to evaluate performance between hospitals. There should be consistency between hospitals in approach and application of maternity protocols.

At national level, MCWH managers should compare hospitals between provinces to ensure that there is consistency in approach.

Data Source:

The source of information for this indicator is the maternity register.

NON-HOSPITAL PRIMARY CARE INDICATORS

IMMUNISATION COVERAGE RATE

Definition:

This indicator measures the proportion of children under one year of age who have completed their primary course of immunisation.

Calculation:

Number of children less than one year of age who have completed their primary course of immunisation divided by the total population under one year of age.

Example:

In sub-district Z there are 3 clinics. During the financial year 2006/7 at clinic A, 150 children under one year were fully immunised, at clinic B, 224 children were fully immunised and at clinic C, 99 children were fully immunised. The catchment populations of these clinics for children aged less than one were 180, 235 and 130 respectively.

Total number of children fully immunised in sub-district Z

= 150 + 224 + 99

= 473

Total catchment population of children under 1 in sub-district Z

= 180 + 235 + 130

= 545

IMMUNISATION COVERAGE RATE

$$= \frac{\text{Total number of children under 1 fully immunised}}{\text{Total number of children under 1 year of age}}$$

$$= \frac{473}{545}$$

$$= 86.8\%$$

	Clinic A	Clinic B	Clinic C	Sub-district Z
Nr. of children <1yr fully immunised	150	224	99	473
Total nr of children <1yr	180	235	130	545
Immunisation coverage %	83.3%	95.3%	76.2%	86.8%

Target:

The national DOH has set a national target of 90% immunisation coverage with all districts achieving a coverage of 80%. The national target was accomplished in 2005/6, although there were ten districts and many more sub-districts that fell below the 80% target.

Purpose:

The immunisation of children has been one of the success stories of modern medicine. Immunisation of children is the most effective way of preventing and controlling a number of diseases including tuberculosis, diphtheria, tetanus, pertussis (whooping cough), polio, measles, hepatitis B and Haemophilus influenzae (which causes pneumonia). Immunisation against these 8 diseases comprises the primary course of immunisation and these are given in the first year of life according to a standard schedule of immunisations. These immunisations either prevent these infectious diseases or decrease their severity if they are contracted.

The immunisations therefore play an important role in saving the lives of children and contribute to decreasing mortality and morbidity. Immunisations thus contribute to the achievement of one of the Millennium Development Goals (MDGs), an ambitious set of goals for the development of countries signed by South Africa and most other countries in the world. One of these MDGs is the decrease of infant mortality.[4]

Use of the indicator in the Health sector:

This is an output indicator that tells managers what proportion of the target population are being reached by, or are accessing the routine child health services.

4 *Goal 4: Reduce Maternal mortality, Target 5: Reduce by two thirds between 1990 and 2015 the under five mortality rate.*

At a facility level, the development of catchment area targets for children less than 1 year of age is difficult as the population data on which these are based are not absolutely accurate at the local level. These catchment area populations form the basis for the denominator of the indicator and if the denominator is over-estimated then the indicator will be lower than it really is and vice versa. Another problem at a local facility level is that people move from one area to another and mothers/caregivers may take their children to a facility that is not the closest one to their home.

However, facility managers should still monitor this indicator on a monthly basis and should pay more attention to the numerator (i.e. the number of children fully immunised) and trends over time should be plotted on a graph at the facility.

Sub-district and district managers should monitor this indicator on a quarterly basis and compare trends in particular clinics over time as well as comparing various clinics with each other. If there is an indication that appropriate levels of immunisation are not being reached then some interventions should be planned. Examples of these interventions include greater attention being placed on tracing defaulters (that is children who have received one or another immunisation but did not come back for their follow up visits and immunisations); and immunisation campaigns where all children in a particular area (e.g. a particular suburb or informal settlement) are encouraged to be immunised with mobile and satellite immunisation stations.

Every facility supervisor should monitor the immunisation coverage regularly (monthly) and ensure that all that is required for good immunisation coverage is in place, such as good cold chain control including working refrigerators with temperature control; sufficient vaccines in stock at all times and every child contact seen as an opportunity for immunisation by checking the road-to-health card.

Every district and sub-district management team should monitor this indicator quarterly and look for trends and consistencies. They also need to monitor associated indicators such as immunisation drop-out rates. They need to ensure that vaccines are always in stock at the district drug depot and that all facilities always have sufficient quantities available. They should check to see that hospitals are doing immunisations and that these are recorded and part of their routine monthly statistics.

The provincial and national managers need to monitor this indicator quarterly and look for trends and consistencies. They also need to monitor associated indicators such as immunisation drop-out rates. They need to consider the need for major immunisation campaigns (e.g. measles) if thought to be appropriate, by getting advice from experts.

Data Source:

The source is the daily clinic tick sheet which records the various immunisations, which are then summarised on a monthly basis into the DHIS where calculations are made. This tick sheet should be completed at community health centres and hospitals as well. The DHIS is loaded with the catchment populations at various levels (e.g. facility, sub-district, and district) and the indicator is calculated automatically by the DHIS.

MALE CONDOM DISTRIBUTION RATE

Definition:

This indicator measures the average number of condoms distributed via public health facilities by the Department of Health to males 15 years and older.

Calculation:

Number of condom distributed from public health facilities divided by the male population 15 years of age and older.

Example:

There are 3 clinics in sub-district Z. During the financial year 2006/7 at clinic A, 19 400 condoms were distributed; at clinic B, 48 650 condoms were distributed; and 37 640 condoms were distributed at clinic C. The catchment populations for these clinics for males aged 15 and older were 2 000, 3 350 and 1 900 respectively.

Total condoms distributed in sub-district Z
= 19 400 + 48 650 + 37 640
= 105 690

Total number of males aged 15 years and older in sub-district Z
= 2 000 + 3 350 + 1 900
= 7 250

CONDOM DISTRIBUTION RATE

$$= \frac{\text{Number of condoms distributed}}{\text{Number of males 15 years and older}}$$

$$= \frac{105\,690}{7\,250}$$

= 14.6 condoms per man per year

	Clinic A	Clinic B	Clinic C	Sub-district Z
Nr. of condoms distributed	19 400	48 650	37 640	105 690
Total nr. of males 15 years and older	2 000	3 350	1 900	7 250
Ave. nr. condoms distributed per male	9.7	14.5	19.8	14.6

Target:

The national DOH has set a national target of 11 condoms per male for the 2006/7 financial year. The average condom distribution rate per district in South Africa was 8.8 in 2005/6.

Purpose:

The latest HIV comprehensive plan aims at reducing the HIV incidence rate by 50% by 2011. The use of condoms is one of the key strategies to prevent the sexual transmission of HIV, as well as reducing the spread of other sexually transmitted infections. The male condom distribution rate is a marker of preventive efforts against HIV. The public health facilities are only one of the places where condoms should be freely available. Others include the workplace, and in the hospitality sector such as hotels, bars and shebeens.

The distribution of condoms does not indicate the actual use of these, but is merely an indicator of use. However, an upward trend of distribution is likely to indicate an upward trend of use.

Use of the indicator in the Health sector:

This is an output indicator that tells managers how well their HIV preventive efforts are succeeding.

A low rate, or a rate which does not increase over time, is an indication of a lack of condoms in stock or it may indicate that staff are not motivated or trained in the preventive aspects of HIV and therefore are not giving appropriate health promotion and education.

Facility managers should monitor this indicator on a monthly basis. If staff, both those based in the facility and those working at community level, are doing their jobs properly then the indicator should increase on a regular basis. Each facility should set monthly targets of how many condoms should be distributed every month. The actual number that were distributed can be plotted on a graph which would show at any time if the facility is going to achieve their intended year end target or not.

Sub-district and district managers should monitor this indicator on a quarterly basis and compare trends in particular clinics over time as well as comparing clinics with each other.

Every facility supervisor should monitor the condom distribution rate and ensure that condoms in adequate

numbers are always available at facilities and designated community outlets.

Every district and sub-district management team should monitor this indicator on a quarterly basis and look to continuously improving distribution rates as well as monitoring the indicator across facilities for inconsistencies.

The provincial and national managers need to monitor this indicator quarterly and look for trends and consistencies.

Data Source

The source for this data is the clinic stock records.

HIV TESTING RATE IN PREGNANT WOMEN

Definition:

This indicator measures the proportion of pregnant women who are tested for HIV at an antenatal clinic.

Calculation:

Number of pregnant women tested for HIV divided by the total number of women who attend the antenatal clinic for the first time (expressed as a percentage).

Example:

During the financial year 2006/7 at clinic A, 380 women were booked for the antenatal clinic. Of these women, 260 were tested for HIV. In addition, another 20 women who were not booked at the antenatal clinic came to the clinic late in pregnancy, just prior to delivery and 15 of these women were tested for HIV before delivery.

Total number of pregnant women tested for HIV
= 260 + 15
= 275

Total number of women attending clinic for first time
= 380 + 20
= 400

HIV TESTING RATE IN PREGNANT WOMEN

$$= \frac{\text{Number of pregnant women tested for HIV}}{\text{Number of women attending antenatal for first time}}$$

$$= \frac{275}{400}$$

$$= 68.8\%$$

NOTE: Each pregnant woman should only be counted once. So when calculating the numerator, keep in mind that even if the woman had more than one HIV test it should be counted as one only. Even if the woman attended the antenatal clinic 3 or 4 times, only the first visit is counted.

Target:

The national DOH has set a target that 100% of facilities in South Africa should provide antenatal HIV testing. The latest draft HIV country plan for 2007-2011 suggests that 70% of all mothers should be tested in 2007, rising to 95% by 2010.

Purpose:

This indicator is one of the most important in measuring interventions of the health services in the prevention of transmission of HIV from mothers to children. The first step in this prevention is that all HIV positive pregnant women need to be identified. Without this identification and further intervention, it is estimated that around 30% of all babies of HIV positive pregnant women will be infected with HIV.

This is an output indicator and is one measure of the quality of maternal care.

Use of the indicator in the Health sector:

The indicator is used by the health worker (nurse) to determine the intervention for both mother and baby. In the case of a HIV- negative mother, the health worker should give health education to the mother to encourage her to stay HIV-negative. In the case of a HIV-positive mother, anti-retroviral therapy should be given to the mother prior to delivery and after delivery to the baby as well. Other interventions will be determined by the health of the particular mother.

For the facility manager this indicator is a marker of the quality of care given by the antenatal care programme. It should be carefully monitored on a monthly basis with ever-increasing targets achieved.

Every district and sub-district management team should actively monitor this indicator on a quarterly basis against set targets for the facility. All facilities that are not achieving the agreed upon targets should be investigated for reasons why and additional support should be given to these facilities.

The provincial and national managers should on a quarterly basis review district based indicators to ensure that agreed upon targets are being achieved. On an annual basis they can compare district performance within and across provinces.

Data Source:

The source for this data is the antenatal record, which is summarised in the DHIS monthly collection sheet.

SUPERVISION RATE

Definition:

This indicator measures the number of primary level facilities, clinics and community health centres, which are visited by a supervisor at least once per month.

Calculation:

Number of clinics and community health centres visited by a supervisor during the month divided by the total number of clinics and community health centres in the district (expressed as a percentage).

Example:

In district A there are 40 clinics and 3 community health centres. During the month of April 2007, 20 clinics were visited twice each by a supervisor and 10 clinics were visited once each. Each of the community health centres was visited twice by a supervisor.

Total number of clinics and community health centres
= 40 + 3
= 43

Number of clinics and CHCs visited at least once during the month
= Number of clinics visited twice
+ Number of clinics visited once
+ CHCs visited
= 20 + 10 + 3
= 33

SUPERVISION RATE

$$= \frac{\text{Total number of clinics and CHCs visited at least once}}{\text{Total number of clinics and CHCs}}$$

$$= \frac{33}{43}$$

$$= 76.7\%$$

NOTE: Even if there are multiple visits to one facility during the month, it should only be counted as yes or no i.e. the facility was visited for a supervisory visit.

Target:

The national DOH has set a target that 100% of facilities should have at least one supervisory visit per month.

Purpose:

This indicator is an important measure of quality as without supervision all systems tend to decay and run down. Supervisory visits are critical to continued improvement of the quality of care rendered. This visit is intended to be supportive and assist facilities to solve problems, give feedback of where things need improvement and affirmation where things are going well. The supervisor is supposed to provide or to assist with in-service training. The supervisory visit is not meant to be disciplinary or punitive.

What happens between patients and providers at facilities ultimately impacts on how well the health system as a whole functions. The supervisory visit contributes to the support and improvment of these interactions.

Use of the indicator in the Health sector:

This is a process indicator that tells managers how many of their facilities are getting regular support in the form of a supervisory visit.

If a facility is not being visited regularly it is likely that the whole standard of care will deteriorate. Health workers will see the district and province as having one-sided communication, issuing more and more instructions and demands, without giving support in terms of feedback, assistance with problems and on-going in-service training.

Every facility manager should ensure that his/her facility is regularly visited and that problems faced in the management of the facility are reported to the supervisor. These visits should have written records so that follow up of issues and problem solving can be tracked.

Every supervisor acts as the middleman between the decisions made by management at national/provincial/district/sub-district level and the facility, where these decisions have the most impact. As such, the supervisor has to ensure that the facility has the necessary resources and support to implement the decisions and where these are insufficient, the supervisor needs to report this in writing to his/her managers. The supervisor also has the responsibility of reporting back on plans/decisions that cannot be implemented for any particular reason.

Every district and sub-district management team should ensure that the supervisory reports for each facility are regularly filed and scrutinised for issues that need their attention. They also have the responsibility of making provincial managers aware of issues and problems arising from the facilities that are unable to be solved at district level (e.g. lack of standardised guidelines for clinic committees and hospital boards).

The provincial and national managers need to take seriously the issues and problems arising from facility level and provide support and solutions to these. It may even, on occasion, require that policies be changed to ensure this.

Data Source:

The source for this data is the Regular Review which is one of the supervisory tools in the Clinic Supervisors' Manual. The clinic supervisor records the visits and leaves a copy with the facility manager. These should be filed by both the facility manager and the clinic supervisor with a record of meetings and any planned interventions. A record of the number of supervisory visits is then transferred to the PHC monthly summary sheet by the facility manager which is then captured in the DHIS.

TB SMEAR CONVERSION RATE
(New smear positive)

Definition:

This indicator measures the proportion of newly diagnosed TB patients who took their medicine for 2 months and who, at the end of this period, were reassessed and found to no longer have the TB bacteria in their sputum. This means that the infectious TB bacteria had been removed from their system and they are no longer considered to be infectious.

Calculation:

Number of new smear positive TB patients who are smear negative at 2 months divided by the number of new smear positive TB patients (expressed as a %).

Example:

During the quarter 1 April 2006 to 30 June 2006 (results are usually measured over a 3 month period), 150 people were newly diagnosed with TB in Siyanda clinic. They all coughed up sputum which was sent to the laboratory and the sputum results were all positive for TB. After the diagnosis was confirmed they immediately started their treatment.

At the end of two months, these patients had to have their sputum tested again. Unfortunately not all the patients could have their sputum tested. One of the patients had died; 5 had disappeared; and 9 were transferred to another facility. Of the remaining 135 patients, all of who had taken their TB medicines, 125 had their sputum tested and 123 were found to be clear of TB. Therefore the TB smear conversion rate in this example is:

TB SMEAR CONVERSION RATE

$$= \frac{\text{Number of new smear +ve TB patients now smear -ve}}{\text{Number of new smear positive TB patients}}$$

$$= \frac{123}{150}$$

$$= 82.0\%$$

Target:

The World Health Organization's Stop TB programme has a target of 85% which is similar to the overall strategic target of the NDOH. An interim target of 65% has been set by the NDOH.

Purpose:

This indicator measures one of the most fundamental purposes of the health system, which is to help people who are sick to get better. It is a measure of how well the system is dealing with people who have contracted TB, which is one of the priority programmes in South Africa. It is a priority because:

- it is a large and growing problem in the public health sector
- people with TB can pass the disease on to others, especially young children
- there is a fairly easy and cheap way of treating the disease
- if not treated well first time round, the bacteria become resistant to the standard treatment and secondary treatment can be extremely costly. The resulting "multi-drug resistant" (MDR-TB) is a growing public health problem.

Use of the indicator in the Health sector:

This indicator is an outcome indicator that tells one how well the health system has done in relation to the treatment of a group of patients with tuberculosis and it is a marker for the TB programme as a whole. It is largely a measure of efficiency, effectiveness and quality within the health sector. A successful outcome includes the following:

- good patient care, including following standard protocols, health education, culture of caring
- patient support through DOTS[5] or other community support structures
- adequate and regular drug supplies
- well functioning laboratory with speedy turn around times
- good record keeping and monitoring.

The smear conversion rate is an early marker of treatment success and is an earlier monitoring tool for management than the TB cure rate indicator is.

Every facility manager should have a good understanding of the TB smear conversion rate in their facility, what the target for that facility is and what the obstacles are to achieving that target. Each facility should have its own individual target based on previous results for that facility. These should be set jointly by the facility management and the supervisor of that clinic, who acts on behalf of the district management team.

5 *DOTS = directly observed treatment, short course.*

Every **supervisor** (line and TB) should have an overview of the TB smear conversion rates in the facilities that they oversee and know what the short term (current year) and longer term (five year) targets are. They should identify facilities that are not progressing and assist them with overcoming any problems that they encounter which may be stopping them from reaching their targets.

Every **district management team** should monitor the TB smear conversion rates in all their facilities on a quarterly basis and make the necessary interventions where necessary. Facility indicators should be compared over time and the performance of facilities compared with each other.

Example:

TB Smear Conversion Rates in Sub-district Z (2nd Quarter of 2006)

TB Out-come	Clinic A		Clinic B		Clinic C		Sub-district Z	
	Nr	%	Nr	%	Nr	%	Nr	%
Died	0	0	1	1.2	0	0	1	0.7
Not tested	2	5.0	7	8.8	1	3.3	10	6.7
Trans-ferred	2	5.0	9	11.3	3	10.0	14	9.3
Smear Positive	1	2.5	1	1.2	0	0	2	1.3
Smear Negative (conver-sion rate)	35	87.5	62	77.5	26	86.7	123	82.0
Total	40	100	80	100	30	100	150	100

In the example, it can be seen that clinic B has the greatest TB load (i.e. the greatest number of patients) as well as having the worst TB outcomes, compared with clinics A and C. Both of these clinics have good outcomes. The appropriate management intervention is that they should be encouraged to maintain their good standards, while clinic B needs support and other assistance to ensure that it improves.

The TB control managers at provincial and national level should be giving oversight to the system as a whole and making strategic interventions where necessary.

Data Source:

The underlying source of information for this indicator is the individual patient TB records which are gathered at clinic level and are entered into an electronic TB register (ETBR). In turn these records are based on the laboratory results. The ETBR automatically calculates a number of indicators, one of which is the TB smear conversion rate.

The aggregated patient information from the ETBR must be transferred directly and ***on a regular monthly basis*** into the DHIS, so that these two systems have identical information. Currently this is not being done in all districts.

TB CURE RATE

(New smear positive)

Definition:

This indicator measures the proportion of newly diagnosed TB patients who took their medicine for 6 months and who, at the end of this period, were reassessed and found that they no longer have TB. The infectious TB bacteria had been removed from their system and they are considered to be cured.

Calculation:

Number of new smear positive TB patients cured, ***divided*** by the number of new smear positive TB patients (expressed as a %).

Example:

During the quarter 1 April 2006 to 30th June 2006 (results are usually measured over a 3 month period), 150 people were newly diagnosed with TB in Siyanda clinic. They all coughed up sputum which was sent to the laboratory and the sputum results were all positive for TB. After the diagnosis was confirmed they immediately started treatment.

At the end of six months (the duration of the course of treatment) the patients had their sputum tested once more. Unfortunately not all the patients could have their sputum tested. Five of the patients had died; 20 had disappeared; and 15 were transferred to another facility. Of the remaining 110 patients, all of who had completed their treatment, 100 had their sputum tested and all were found to be clear of TB. Therefore the TB cure rate in this example is:

TB CURE RATE

$$= \frac{\text{Number of new smear positive TB patients cured}}{\text{Number of new smear positive TB patients}}$$

$$= \frac{100}{150}$$

$$= 66.7\%$$

One of the complications with calculating the TB cure rate is that this rate reflects what happened in the health system nine months ago. This is because you can only confirm the cure rate after the completion of a course of treatment which takes 6 months. It also takes more time to get the sputum

and test results and enter these results into the records. This is the reason why these results at the end of the first quarter in 2007, reflect on what happened to patients who entered the system in the second quarter of 2006.

Target:

The World Health Organization's Stop TB programme has a target of 85% which is similar to the overall strategic target of the NDOH. An interim target of 65% has been set by the NDOH.

Purpose:

This indicator measures one of the most fundamental purposes of the health system, which is to help people who are sick to get better. It is a measure of how well the system is dealing with people who have contracted TB, which is one of the priority programmes in South Africa. It is a priority because:

- it is a huge and growing problem
- people with TB can pass the disease on to others, especially young children
- there is a fairly easy and cheap way of treating the disease
- if not treated well first time round, the bacteria become resistant to the standard treatment and secondary treatment can be extremely costly because of the resulting "multi-drug resistant" (MDR-TB) is a growing public health problem.

Use of the indicator in the Health sector:

This indicator is an outcome indicator that tells one how well the health system has done in relation to the treatment of a group of patients with tuberculosis and it is a marker for the TB programme as a whole. It is largely a measure of efficiency, effectiveness and quality within the health sector and successful outcome includes the following:

- good patient care, including following standard protocols, health education, culture of caring
- patient support through DOTS[6] or other community support structures
- adequate and regular drug supplies
- well functioning laboratory with speedy turn around times
- good record keeping and monitoring.

Every facility manager should have a good understanding of the TB cure rate in their facility, what the target for that

6 *DOTS = directly observed treatment, short course.*

facility is and what the obstacles are to achieving that target. Each facility should have its own individual target based on previous results for that facility. These should be set jointly by the facility management and the supervisor of that clinic, who acts on behalf of the district management team.

Every supervisor (line and TB) should have an overview of the TB cure rates in the facilities that they oversee and know what the short term (current year) and longer term (five year) targets are. They should identify facilities that are not progressing and assist them with overcoming any problems that they encounter which may be stopping them from reaching their targets.

Every district management team should monitor the TB cure rates in all facilities on a quarterly basis and make the necessary interventions where necessary. Facility indicators should be compared over time and the performance of facilities compared with each other.

Example:

TB outcomes in Sub-district Z for the 2nd Quarter of 2006

TB Outcome	Clinic A		Clinic B		Clinic C		Sub-district Z	
	Nr	%	Nr	%	Nr	%	Nr	%
Died	1	2.5	4	5.0	0	0	5	3.3
Disap-peared	3	7.5	17	21.3	0	0	20	13.3
Trans-ferred	2	5.0	10	12.5	3	10.0	15	10.0
Completed	2	5.0	5	6.3	3	10.0	10	6.7
Cured	30	75.0	46	57.5	24	80.0	100	66.7
Total	40	100	80	100	30	100	150	100

In the example above, it can be seen that clinic B has the greatest TB load (i.e. the greatest number of patients) as well as having the worst TB outcomes compared with clinics A and C. Both of these clinics have very good outcomes. Therefore the management intervention needed, is that clinics A and C should be encouraged to maintain their good standards, while clinic B needs support and other assistance to ensure that it improves.

The TB control managers at provincial and national level should be giving oversight to the system as a whole and making strategic interventions where necessary.

Data Source:

The underlying source of information for this indicator is the individual patient TB records which are gathered at clinic level and are entered into an electronic TB register (ETBR). This electronic system automatically calculates a number of indicators, of which the TB cure rate is one.

The aggregated patient information from the ETBR must be transferred directly and on a regular monthly basis into the DHIS, so that these two systems have identical information. Currently this is not being done in all districts.

SUGGESTED RESOURCES AND FURTHER READING

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