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The Use of Indicators for Communicable Disease Control at District Level

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INTRODUCTION

Provision of health care services to the population at district¹ level is a set of integrated activities. Some of these activities are part of categorical programmes for disease control; others reflect a response to common individual health needs. All should be planned, monitored and evaluated. The responsibility for planning, monitoring and evaluation; for ensuring regular supplies and staff training; and for adequate functioning of the system to serve the needs of the community and reduce the burden of disease falls on the district health management team.

The district team responsibilities have different weight for individual care - given by public and private health providers - and for public health interventions to improve the health of the community, which are mainly provided by the public system. These public health interventions deal mainly with infectious diseases, which represent a risk of epidemic or endemic transmission, and with common causes of disease and death such as dehydration and pneumonia in young children. The interventions must be effective, accessible to the community (particularly the poorest sectors of the population), efficient and affordable for the community to ensure sustainability. The district team must select the pertinent interventions and ensure resources, quality of delivery, coverage and health impact.

To carry out these functions the team must collect and analyse standard data and use indicators of process, quality and outcome. Some categorical programmes dealing with tuberculosis, leprosy, immunisation, and control of diarrhoeal and respiratory diseases in children have developed very detailed data collection and monitoring systems, which are applied in many countries. However, those systems are specific for each disease control programme and at district level may, depending on the organisation of the health system, result in duplication of administrative work, large number of forms to be filled and difficulties to evaluate the performance of primary health care (PHC) as a whole.

A core group of indicators, useful to evaluate the integrated PHC services and including indicators for triggering action, are essential for the district team to function effectively. According to needs and capacity of the district level other indicators could be added. The core would be also useful for planners during health sector reform, to ensure that the reform process does not result in deterioration of the public health interventions addressing the priority health problems of the country or district.

The present document aims to help health officers responsible for managing district level activities to select appropriate indicators and information required for the main health interventions, and to focus on a limited package of high priority problems to monitor the impact of district activities on public health in the district.

THE HEALTH DISTRICT

The health district is “a self-contained segment of the national health system, comprised of a well-defined population living in a clearly delineated administrative and geographical area, whether urban or rural. It includes all institutions and individuals providing health care in the district, whether governmental, social security, non-governmental, private or traditional” (WHO Global Programme Committee, 1986). Districts receive various names in different countries:

¹ A district may correspond to a municipality, a political, geographical or health area, depending of the characteristics of the country. It may be defined as the lower managerial level of the health system.

areas, blocks, thanas, municipalities, prefectures, SILOS, etc. The population covered varies widely, but is usually 50 000 - 500 000 inhabitants.

Functions of the district management level

The main functions of the management team at district level are:

- ❖ To analyse the health situation, priority problems and network of health services delivery in the district
- ❖ To co-ordinate and evaluate health services delivery and co-ordinate institutions providing health care
- ❖ To implement health policies and programmes defined by the national and intermediate levels
- ❖ To ensure quality, quantity and opportunity of services to individuals and environment
- ❖ To promote and facilitate community participation in health care delivery
- ❖ To develop the human resources required
- ❖ To develop and maintain a district information system for decision making at district, regional and central level.
- ❖ To interact with non-government organizations, the private sector, traditional healers, etc. to ensure that common goals are achieved.

The district may or may not have financial capacity and delegation for budgeting and reallocation of resources, depending on the degree of decentralisation achieved by the country. Although financial autonomy is desirable to improve and facilitate the use of resources, many of the district level functions to improve health care delivery and effectiveness of disease control programmes can be done without it. District autonomy does not mean that the higher levels can abdicate their responsibility for redistribution of resources from richer to poorer communities to protect the less developed populations or their responsibility to ensure essential resources for programmes of national interest in addition to issuing technical guidelines and evaluating district activities.

Delivery of health services includes:

- a) general health care, provided on individual demand, and
- b) planned actions for mortality reduction and for disease control to reduce problems of public health importance.

The first is provided both by public and private facilities; a major characteristic is that the patient is responsible for complying with prevention or treatment and returning for controls (as it happens in private practice). Examples are curative care for illness and accidents, surgery, treatment of non-communicable diseases and other conditions for which there are no categorical programmes. Many of these conditions require medical professionals, diagnostic radiology and laboratory technology.

The second type is mainly provided by the public health system, aims to reduce the risks for the community, is mostly a government function, and the responsibility for implementation and for individual compliance is mainly of the health system. Procedures are standardized through technical and operational guidelines and training, specific financial resources are provided to ensure universal and equitable access, and implementation of activities is monitored and

evaluated. Examples of programmed activities aimed at mortality reduction are the safe motherhood programme (pregnancy and delivery) and IMCI (particularly case management strategies for diarrhoea and pneumonia). Models of planned actions for disease control to prevent mortality, morbidity and transmission of infection are the programmes of tuberculosis, malaria, expanded programme of immunization, leprosy, sexually transmitted diseases and HIV/AIDS.

The separation between satisfaction of patient demand and planned control interventions is not clear-cut and is often artificial. Some planned public health programmes aim mainly to reduce the risk of severe disease and death for the individual, improve quality of care and reduce health costs for the community. There is no direct objective to reduce the transmission and disease burden in the community, and responsibility for compliance with therapy rests mainly with the individual patient or the family, adequately informed. Examples are the control of acute respiratory infections and diarrhoeas in children, which aim to reduce mortality, rationalise the use of drugs and simplify case management to make it more accessible to the population. Management of respiratory diseases in adults aims to improve and simplify diagnostic and treatment algorithms so they can be applied in primary health care, improving quality of care and incidentally contributing to identify infectious pulmonary tuberculosis, a risk to the community. Malaria diagnosis and treatment aim to reduce the risks to the individual - particularly death in children and wage loss in adults-, and also to reduce transmission.

In addition to direct activities on the population, planned actions on the environment contribute to risk reduction. Examples are the programmes of vector control, safe water and sanitation. These are often directly or partially under the responsibility of the district level team.

Implementation and monitoring

There are several obstacles to achieve full effectiveness of primary health care activities. Among them are that data collected is often inadequate to make decisions at district level, insufficient district capacity for analysis, lack of logistical support and transport for monitoring and supervision of health facilities, limited resources and priority given to training, and the difficulty to integrate categorical programmes which often have their own central or external resources (WHO, 1988a). In addition planning, priority setting and decision making are seldom done solely on the basis of the information obtained and of common values and objectives. The rigidity of the system and pressures from stakeholders (donors, health providers and users, professionals and community leaders) plus a limited capacity for recognition and handling of the political process, result in ad-hoc decisions and at best a very gradual process of change (Conn, 1996).

Systematic monitoring and evaluation at district level is not common in practice, although it is advocated in manuals. Evaluation of clinical services and planned activities for particular diseases is now seen as an important part of assessing quality of care by the health system (Conn, 1996). Monitoring and evaluation of activities of communicable disease control programmes which have developed their own planning, monitoring and assessment process can serve as useful model for measurement of the efficiency and quality of integrated health care at district level. These programmes address the main diseases controllable with present affordable technology. Their activities can serve as the core of primary health care if they are well co-ordinated at district level, and simplified and integrated at health facility level.

The content of programmed care provided by primary facilities should respond to the pattern of disease and demand for services by the community, and should include those priority interventions for which there is appropriate control technology (simple, affordable, feasible). The district level team, based on a proper assessment of priorities, should select a few programmed interventions for communicable diseases to follow as markers of effectiveness, responding also to national or regional priorities. We will call these “selected” diseases or interventions. Co-ordination between interventions (leading to integration of common activities) can improve delivery and reduce staff cost and time. Examples of linkages for malaria are IMCI case management, Reproductive Health for prevention in pregnancy, TB microscopy and Essential Drugs availability.

BASIC INFORMATION

A minimum of essential data is required to define the population to receive health care and for monitoring. Data should be easily accessible to all health staff and not only to the health planner, to ensure general knowledge regarding the priorities and to promote commitment of the health workers. Information should be presented in simple and practical format, and it is desirable that all health staff can use and interpret the data, and follow the results of their work.

- ❖ Population, by age and sex
 - Distribution of the population, in maps of the area, easily accessible and visible. Health facilities will have more detailed maps of their area of responsibility to identify addresses, mark cases of major communicable diseases and identify high risk areas or population groups. District level maps will identify the type of health facilities, area of influence, overlapping of facilities of different institutions, concentrated population and areas of higher risk or rapid growth. Communication (roads, public transport) should be easily identifiable.
- ❖ Health facilities: list of addresses, by institution (public, private, etc) and level of complexity (hospital, policlinic, health centre, post).
 - Health facilities (represented in the area maps)
 - Approximate number of outpatient attendance to each health facility, by age and sex
 - Number of beds, for hospitals
 - Laboratory facilities (microscopy, other) of importance for selected programmes
- ❖ Essential equipment for diagnosis and treatment of key diseases, place and working state
 - Microscopes
 - X-ray
 - Cold chain (refrigerators) for vaccines
- ❖ Essential supplies: reserve stock and average consumption
 - Drugs for treatment of selected diseases
 - Vaccines
 - Microscopy slides, reagents, sputum containers, X-ray films
 - Forms, registers

- ❖ Staff
 - Trained staff (medical and paramedical) for the selected programmes
 - Supervisory staff

- ❖ Vehicles for supervision, or arrangements for mobilisation

USE OF INDICATORS

Indicators are markers of health status, service performance or resource availability. They are used to diagnose the health status of a population and to plan, monitor and evaluate activities related to disease control efforts and/or health care delivery. At district level the team must carry out and monitor activities that are relevant to public health, either for the district or for the region or country. Many of the categorical programmes have established sets of indicators and specific recording and reporting formats, with data produced by the health facilities for transmission, with or without consolidation at district level. The district team should analyse the information to monitor implementation and quality of care, and for surveillance, both before and after consolidation for reporting. The capacity of the district team to interpret and assess quality of data can be developed through supervisory visits from the regional level for joint evaluation and monitoring exercises.

Often the number of programme-specific indicators is excessive for systematic analysis at district level and some national indicators are not appropriate for the size of the population in a district. Two measures are proposed to reduce and simplify the work: the use of selective indicators (1-3 per area of work or programme) and the consolidation of data for some areas, such as supplies, in forms and procedures common to several specific programmes. Examples of indicators will be discussed below, and the main indicators for some specific programmes are included in the annexes.

Data to calculate indicators may be collected through regular activities (registration, notification, reporting), and through supervisory visits or periodic surveys, according to the purpose of the indicator and feasibility. It is preferable to reduce systematic reporting as much as possible and to use supervision visits and occasional surveys whenever feasible, as the capacity for analysis is limited and too much time is lost in filling out forms. Data that is needed infrequently can be recorded and used at the health facility but reported, collected or requested by the district health authority only occasionally and for a limited period when analysis is planned. Unfortunately higher levels (region, country, and international) request much data, often of limited value, through regular reporting. Examples are the history of BCG vaccination and the socioeconomic and civil status for TB cases in treatment.

The district level, based on national and regional priorities and the main health problems of that particular district, should select a limited number of indicators for priority disease interventions. For instance, malaria activities and indicators may be included only in an area with malaria, while all districts should include the immunisation component. Essential drugs and supplies will depend on the programmes selected. The References documents with international recommendations on indicators for communicable diseases and for specific interventions, but districts should base their work on the respective national norms.

The district level should analyse the information collected before reporting to higher levels; and should follow the indicators for the selected interventions. Data should be presented in graphs and displayed to highlight the achievements and health status of the district, both for supervisors and for the local staff and authorities. For example, the proportion of children with complete vaccination with DPT and the detection and cure/completion rates of TB cases should be analysed periodically (every quarter or month) and be permanently updated and in view.

Data analysis does not end with calculation of the indicators. The team should evaluate if the results are plausible, accurate and complete. Analysis also implies comparing the indicators with targets or expected outcomes, with past results (trends) and with other districts or regions; determining the causes for discrepancy or for not reaching the optimal levels and selecting and implementing corrective actions. Different types of indicators or families of indicators can be adopted according to the purpose.

Indicators are often classified as input, output and impact (or process, outcome and impact). The separation is not always clear cut. Each of the indicators should have an ideal level of achievement indicated in the plan of work; for instance all facilities should provide directly observed TB treatment (which can be given by any staff or trained community volunteer), but only a limited number should have TB microscopy, which requires sufficient demand to maintain quality and cost-effectiveness.

Input (administrative, process) indicators measure the critical resources required to carry out activities and maintain quality: health facilities providing specified services, staff trained/retrained, supervisory visits, drug stocks/regular supplies, communication/education activities and opportune, accurate and systematic reporting. The regular availability of diagnostic supplies and particularly of drugs for treatment (malaria, tuberculosis, leprosy, HIV/AIDS) and vaccines is essential for effective disease control programmes, and to maintain the confidence of the population so they attend the health facilities.

Output (or outcome) indicators measure the immediate results and quality of activities at facility level for a particular intervention, such as population covered, use of health services, number of vaccinations applied/planned or the number of immunised children/population, and proportion of diagnosed and cured individuals for a particular disease. Indicators for planned care activities are useful as a measure of the use of health services such as the outpatient attendance, number of hospitalisations and duration of stay. For disease control, indicators are different according to the categorical programme. Output indicators are used to monitor and evaluate performance but the optimal level of achievement should not become a fixed mandatory "target", which may lead to falsifying data or carrying out one function in detriment of other priorities.

A particular type of output indicators relates to the outcome of activities. They measure the direct effect or impact on the individuals, i.e. number and proportion of patients cured, or case-fatality. Due to the difficulty of measuring the epidemiological impact, outcome indicators are often used as a surrogate for indicators of impact. For instance, it can be assumed that an increase in TB cases cured and decrease in case-fatality will reduce TB mortality and also prevalence, transmission and prevalence of chronic drug resistant cases; and that a high number and proportion of immunised children will result in a reduction of transmission, incidence and mortality due to the respective diseases.

It is important to measure not only quantity but also quality of some activities. Direct observation of health delivery by supervisors is difficult and impractical (observed procedures may not correspond to the routine reality) but for some activities it can be done through systematic sample surveys or supervisory visits. Some indicators measure the technical quality of activities carried out, such as the proportion of discordance in reading of sputum smears for TB (quality of smear microscopy for AFB), the proportion of pulmonary TB cases diagnosed with bacteriological confirmation (indicates the use of bacteriology for diagnosis and indirectly the quality of diagnosis), and the safety of injections. The managerial performance of a facility is reflected in output/quality indicators such as the dropout rate in vaccinations and the proportion of outpatients with prolonged cough examined by smear microscopy.

Impact (epidemiological) indicators measure the level and trends of occurrence and death due to a particular disease in the community. Reduction is expected following a public health intervention. It is usually difficult to attribute a direct cause/effect to specific interventions, as there are multiple factors. In addition, the interpretation of trends depends heavily on the coverage and quality of case registration and reporting, and certification of causes of death is generally unavailable or very poor in most of the developing world. Epidemiological indicators are often difficult to apply at district level when the size of the population is small, so the main impact indicators are direct (number and proportion of patients cured, case-fatality).

Examples of input (process or administrative) indicators:

- 1. Proportion of facilities (by dependency, at least government facilities) providing services for selected programmes (vaccination, IMCI, TB treatment/microscopy, malaria diagnostic confirmation, prevention and care for STD/HIV-AIDS, etc). Source: regular reporting and surveys. Presentation: list and maps.**
 - Indicates coverage of programme activities in the health facilities, as an indicator of access. The first priority is to provide services in the existing facilities, then expand the facilities if necessary and incorporate community activities.
- 2. Proportion of health facilities with at least one staff in place trained in each of the selected disease control activities. Source: supervisory visits, periodical surveys.**
 - The information is used to plan training, both in courses and on the job. A measure of training is the correct performance of duties, e.g. correct monitoring of patient management, filling of records, evaluation and reporting.
 - Often the number of staff trained during a time period is used - this does not show use of the trained staff or how many were required.
- 3. Number of laboratories with trained staff for the main disease control activities. Source: supervisory visits, periodical surveys.**
 - Used to plan training and plan implementation.
- 4. Stock-outs at district level of one week or more of essential drugs, vaccines and supplies for the selected programmes during the last year. Source: records**
 - As indicator of quality of delivery and organization of the system. Supplies should include reserve stocks at district and facility levels.
- 5. Number/proportion of health facilities and laboratories with stock-outs of over one week of essential drugs, vaccines and supplies for selected programmed activities during the last year. Source: supervisory visits, periodic surveys.**
- 6. Proportion of health facilities supervised during the period (quarter, year). Proportion of supervisory visits done/planned.**

7. **Proportion of facilities providing periodical reports (monthly, quarterly). Proportion of reports received on term/ expected. Proportion completed by district and sent/planned (last year).**
8. **Proportion of private and NGO institutions using the national guidelines for the main district programmes and reporting as required. Source: surveys.**

Examples of output (outcome) indicators (more can be found in the Annexes).

1. **Provision/use of health services: total outpatient visits to health facilities (by institutional affiliation), number of hospitalisations. Source: routine reporting.**
 - Data is often collected by age and sex, and by first visit to that facility for a particular reason or all visits. Only some programmes need age in small groups (e.g. immunization); for most programmes children/adults is enough (12 or 15 as a cut off point). Gender is not often required for regular monitoring, only for special studies on access to health care. The number of outpatient visits indicate the use of the services, guiding planning on strengthening health facilities (e.g. expansion, implementing microscopy), and can be an indicator of coverage. The information is used as denominator for control activities, for instance in case detection of infectious TB.
2. **Quality of service delivery.**
 - E.g. number of laboratories with systematic external quality control; proportion of discordant results in sputum smear microscopy in tuberculosis); proportion of cases satisfying agreed diagnostic criteria, such as proportion of TB cases confirmed by sputum smear examination among pulmonary cases diagnosed.
3. **Number of cases/episodes diagnosed (or treated) for selected diseases, by category and type of treatment.**
 - To estimate drug requirements and monitor case detection activities and trends.
 - To detect epidemiological changes indicating epidemics (e.g. cholera) or as a result of control interventions (e.g. polio, tuberculosis), if the diagnostic activity and case registration have not varied.
4. **Number of cases cured (or treated) / number of cases diagnosed**
 - For specific diseases or conditions. It is an indicator of quality of delivery, of process (for instance, as a step to reduce tuberculosis transmission) and of direct effect of the intervention (for instance, in reducing case fatality in pneumonia, dehydration, tuberculosis)
5. **Number of children vaccinated / population under 1 year old, for specific products or combination of products.**

Examples of epidemiological indicators:

1. **TB meningitis in children under 5.**
 - Reduction due to BCG and TB control.
2. **Incidence of vaccine-preventable diseases.**
 - Reduction due to immunisation.
3. **Case fatality due to diarrhoea / acute respiratory infections in children.**
 - Reduction due to IMCI interventions.
4. **Prevalence of grade II disabilities in new cases of leprosy.**
 - Reduction due to early detection and treatment of cases.

TUBERCULOSIS CONTROL

<i>Main indicators (markers)</i>	<i>Comments</i>
<ol style="list-style-type: none"> 1. Successful treatment (cure + completion) of new smear positive cases of pulmonary TB 2. TB case detection: proportion of adults attending outpatient facilities with prolonged cough who were examined with sputum microscopy. 3. Trend of notified incidence of new smear positive pulmonary TB cases 4. Diagnostic quality: ratio of new sputum positive PTB to all new cases. 	<ol style="list-style-type: none"> 1. Output and quality. Smear positive PTB are sources of infection, and it is assumed that other cases cure easier. 2. Detection of smear + sources is a public health activity, in addition to diagnosis of all forms of TB by physicians. 3. Varies with case detection. At full programme coverage and constant detection, it is an indicator of incidence 4. With all diagnostic resources, sputum positive PTB are over half of the TB cases, and over 65% of PTB.
<p><i>Output indicators (trend)</i></p> <ol style="list-style-type: none"> 1. % of adults attending outpatient facilities for any reason who present cough over 2-3 weeks examined with sputum smear microscopy Alternatively, the number of smears done for TB diagnosis among outpatients. 2. % of individuals examined by microscopy of sputum which was smear positive. Alternatively, % of positive sputum smears among all smears for diagnosis. 3. Proportion of new smear positive pulmonary TB patients put on treatment which have negative smear examination at 2-3 months (cohort analysis). 4. Outcome of treatment in cohorts of TB patients diagnosed (mainly new smear positive PTB, also smear positive re-treatments): cure, completed, transferred, defaulted, failed, and died. 5. (Complementary). Proportion of contacts of smear positive TB cases examined. 	<ol style="list-style-type: none"> 1. Indicates the case-detection activity. It can be calculated from facility data, on first outpatient visits or all visits, adults or all patients. The real proportion of outpatients with prolonged cough can be observed for a short period, or estimated (2-10%). 2. Data from the laboratory register. % varies with the amount of screening in OPD and the prevalence of TB in the community. At constant case detection it is an indication of impact in reducing TB. 3. Early surrogate indicator of successful treatment. 4. Indicator of effect of treatment: prevention of death and chronic cases and reduction of transmission.
<p><i>Output quality indicators</i></p> <ol style="list-style-type: none"> 1. Laboratory: Proportion of discordant results in quality control of smear examination by microscopy 2. Diagnosis: % of smear positive PTB cases among all new PTB cases diagnosed (should be over 65%). Alternatively, % of smear positive PTB over total TB cases (should be over 50%). % of adults with PTB without sputum smear examination (should be 0). 	<ol style="list-style-type: none"> 1. Usually done by a reference laboratory, on samples of all positive and a proportion of negative smears. 2. Indicate the use of smear examination for the diagnosis of PTB and the medical criteria for diagnosis of smear negative patients (use of X-ray lesions as basis for diagnosis)
<p><i>Epidemiological indicators (trend)</i></p> <ol style="list-style-type: none"> 1. Trend and age/sex distribution of notified TB incidence (total new cases, smear positive PTB) 2. Notified TB meningitis in children under 5 years old (BCG, TB transmission) 3. TB mortality, by age (from death certification where available) 	<ol style="list-style-type: none"> 1. With constant TB control measures the notified trend and age/sex distribution are surrogate for incidence. 2. Numbers may be used to estimate drug requirements The mode of the age distribution increases with reduction of transmission

INTEGRATED MANAGEMENT OF CHILDHOOD ILLNESS (IMCI)

<p><u>Main indicators (markers)</u></p>	<p><u>Comments</u></p>
<p>1. Index of integrated management</p> <p>2. Proportion of children needing oral antibiotic and/or anti-malarial who are prescribed the drug(s) correctly</p> <p>3. Child aged 6-9 months receives breast milk and complementary feeding.</p>	<p>1. Reflects the completeness of assessment made to sick children, measured through household survey.</p> <p>2. Quality of case management of sick children presenting at health facilities, measured through health facility survey.</p> <p>3. Measured through household survey.</p>
<p><u>Output indicators</u></p> <p>1. Proportion of health facilities with at least 60% of health workers managing children trained in IMCI.</p> <p>2. Index of availability of essential oral drugs and vaccines in first-level facilities.</p> <p>3. Rational use of antibiotics (child not needing antibiotic leaves the facility without antibiotic).</p> <p>4. Caretaker of child who is prescribed oral treatment (ORS, antibiotic, antimalarial) who can describe correctly how to give the treatment when she leaves the facility.</p> <p>5. Proportion of sick children who received increased fluids and continued feeding.</p> <p>6. Proportion of caretakers of children less than 5 years old who know at least two signs for seeking care immediately.</p>	<p>1. Measured through health facility survey, proxy indicator for access to correct case management (IMCI)</p> <p>2. Measured through health facility survey.</p> <p>3. Measured through health facility survey.</p> <p>4. Measured through health facility survey.</p> <p>5. Measured through household survey.</p> <p>6. Measured through household survey.</p>
<p><u>Epidemiological indicators (trend)</u></p> <p>1. Annual number of deaths in children under five years of age.</p> <p>2. Underweight prevalence. Proportion of children who are below -2SD from the median weight (WHO/NCHS reference pop).</p> <p><u>3.</u> Anaemia prevalence. Proportion of children aged 6-59 months with an haemoglobin level below 11.0g/dl.</p>	

IMMUNIZATION SYSTEM

<u>Main indicators (markers)</u>	<u>Comments</u>
<ol style="list-style-type: none"> 1. % coverage with DPT3 2. % coverage of measles vaccine 3. Trend in incidence of vaccine preventable diseases by age group 	<p>1,2. Health facility information on number of children immunized and the number of children receiving vitamin A supplementation is an approximation of coverage (for both immunization and vitamin A supplementation) in the community. Periodic surveys of children 12-23 months of age supplement this information.</p>
<p><i>Output indicators</i></p> <ol style="list-style-type: none"> 1. % coverage of children by type of vaccine and by age group (<1, 1 year old): <ol style="list-style-type: none"> 1.1. % of children immunised with a third dose for diphtheria, pertussis and tetanus (DPT3), poliomyelitis (OPV3), hepatitis B (HepB3), BCG and measles before the first birthday (and yellow fever vaccine in countries with risk). 2. % dropout for DPT [$100 \times (DPT1 - DPT3) / DPT1$] 3. % coverage of pregnant women with two or more doses of tetanus toxoid (TT2+). 4. % of children under 1 year old covered with vitamin A. 	<ol style="list-style-type: none"> 1. Health facility information on number of doses administered (numerator) allow estimates of coverage in the community. The recommended denominator is children surviving the first year of life for all antigens except BCG and the birth dose of HepB (for these, the recommended denominator is births). 2. If HepB or Hib are part of the routine immunization schedule, coverage with the third dose of each (HepB3 or Hib3) can be compared with DTP3 coverage to assess missed opportunities. Similarly, in countries giving yellow fever (YF) vaccine and vitamin A supplementation routinely, YF coverage and Vitamin A coverage (with at least 1 dose) can be compared to measles coverage. 3. Data from health facilities on two or more doses of tetanus toxoid (TT2+) administered to pregnant women. The denominator is the number of births, a surrogate for the number of pregnant women.
<p><i>Epidemiological indicators</i></p> <ol style="list-style-type: none"> 1. Trend in reported incidence of vaccine-preventable diseases by age group 2. Trend in reported deaths of vaccine-preventable diseases by age group 	<p>Death reporting is recommended if feasible (e.g. existence of a system of in-patient facility reporting of deaths by cause). It is usually not feasible in outpatient facilities.</p>

MALARIA

<u>Main indicators (markers)</u>	<u>Comments</u>
<ol style="list-style-type: none"> 1. Malaria death rate among target groups 2. Number of cases of malaria cases, severe and uncomplicated, among target groups 3. Proportion of households having at least one treated bed net 4. % patients with uncomplicated malaria getting correct treatment within 24 hours of onset of symptoms 	<ol style="list-style-type: none"> 1,2. Probable and confirmed deaths and cases, in under 5 years old and other target groups. 3. Through periodic surveys 4. Quality: indicates recognition of symptoms and access to care.
<p><i>Output indicators</i></p> <ol style="list-style-type: none"> 1. % pregnant women who have taken chemoprophylaxis or preventive intermittent antimalarial treatment 2. % patients with uncomplicated malaria getting correct treatment at community level within 24 hours of symptoms 3. % mothers/caretakers able to recognise signs and symptoms of a febrile disease in children under 5 years old. 4. Proportion of households having at least one treated bed net 	<ol style="list-style-type: none"> 1. Through community surveys. 1-3 indicate quality: recognition of symptoms and access to care 2. Through community surveys. 3. Through community surveys. 4. Through community surveys
<p><i>Epidemiological indicators</i></p> <ol style="list-style-type: none"> 1. Trend in malaria deaths 2. Reported incidence of uncomplicated malaria (clinical or confirmed) per 1000 population. 3. Reported incidence of cases with parasitaemia (Annual Parasite Incidence, API) for low-transmission areas, by age, sex and parasite species, per 1000 population 	<ol style="list-style-type: none"> 1. Requires data from death registration 2. Source: health facility data. Useful also for estimating drug requirements 3. It is practical only when laboratory or testing facilities are available

HIV/AIDS AND STD

<p><i>Main indicators (markers)</i></p> <ol style="list-style-type: none"> 1. % of health facilities having and providing condoms and/or providing advise on use. 2. % of health facilities providing HIV/AIDS counselling and voluntary testing. 3. Prevalence of HIV infection in selected groups: STD clinics, new TB patients; pregnant women 15-24 attending ante-natal clinics; voluntary blood donors 	<ol style="list-style-type: none"> 1-2. Periodical survey 3. Periodic surveys or surveillance, sentinel sites.
<p><i>Other output indicators</i></p> <ol style="list-style-type: none"> 1. % of anti-natal care facilities providing HIV/AIDS counselling and voluntary testing 2. N° of STD patients presenting at health facilities who received advise on HIV and condoms/Individuals presenting with STD 3. % of health facilities with the capacity to provide appropriate HIV/AIDS/STD care according to defined standards 4. Availability of blood bank and blood screening at district level 5. % of health facilities with guidelines and practising prevention of accidental HIV transmission 6. % facilities with no stock of drugs, condoms 7. N° of health workers trained in managing HIV/AIDS/STDs 8. % of secondary schools providing regular education on AIDS during last year. 	<ol style="list-style-type: none"> 1-5. Periodical surveys. 3. National or, if not available, international standards
<p><i>Epidemiological indicators</i></p> <ol style="list-style-type: none"> 1. Prevalence of HIV infection in selected groups <ol style="list-style-type: none"> 1.1. high risk: STD clinics, new TB patients; 1.2. general population: pregnant women 15-24 attending ante-natal clinics; 1.3. blood: voluntary blood donors. 2. Incidence of AIDS: new HIV/AIDS patients diagnosed 3. Prevalence of syphilis in pregnant women 15-24 attending antenatal clinics. 	<ol style="list-style-type: none"> 1. Source: Periodic prevalence surveys. The target population depends on the expansion of the epidemic: initially in high-risk groups, later general population (when over 1x 1000); or sentinel sites. 2. Reporting (numbers) by health facilities. Useful to estimate trend in general population, usually gross underreporting. 3. Useful to estimate trend in general population, may be used at district level Source: screening, surveys

LEPROSY

<u>Main indicators (markers)</u>	<u>Comments</u>
<ol style="list-style-type: none"> 1. Newly detected cases (total, multi-bacillary, childhood, single lesion) 2. Proportion of cases with grade 2 disabilities in newly detected cases 3. Number of cases on treatment at year's end / population 4. Proportion of health facilities providing MDT among all health facilities 	<ol style="list-style-type: none"> 1. Indicates case detection activity, transmission (children) 2. Indicates delay in diagnosis 3. Prevalence on treatment 4. Indicates accessibility to MDT services
<p><i>Other output indicators</i></p> <ol style="list-style-type: none"> 1. Number/proportion of drop-out (defaulters) 2. Proportion of cases cured (MDT treatment completed) 	<ol style="list-style-type: none"> 1. Quality of treatment compliance 2. Treatment outcome by cohort
<p><i>Epidemiological indicators</i></p> <ol style="list-style-type: none"> 1. Newly detected cases (total, multi-bacillary, childhood, single lesion) 2. Proportion of cases with grade 2 disabilities in newly detected cases 	

SCHISTOSOMIASIS / SOIL-TRANSMITTED HELMINTHS

<u>Leading indicator</u>	<u>Comments</u>
1. % of school-age children at risk of morbidity covered with regular chemotherapy.	1. School age children represent the most important risk group for schistosomiasis and STH. The target established by the WHA is 75% of these children.
<p><i>Other operational indicators</i></p> 1. % of schools participating to control activities 2. % of pre school children at risk treated in health units 3. % of woman of child bearing age treated during MCH activities 4. Number of adults treated for schistosomiasis by health facilities	1-2. Schools offer an effective opportunity to reach and treat significant numbers of children and so reduce the morbidity caused by STH and schistosomiasis. 3. Other risk groups (pre-school children and woman of child bearing age) could be reached through MCH activities 4. Assesses performance of the health system.
<p><i>Epidemiological indicators</i></p> 1. Prevalence (in schoolchildren) 2. % of heavy intensity infections	1-2. Collected through survey: data routinely reported from health units underestimate the problems since the symptoms for the two diseases are scarce.

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