Training for the Proposed Pilot Information System for the Surveillance of Major Communicable Diseases and Key Health Management Indicators in the Southern Nations and Nationalities Peoples Region, Ethiopia

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Ethiopia Ministry of Health

USAID/BASICS/ESHE

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ACRONYMS

ANC	Antenatal Care
BASICS	Basic Support for Institutionalizing Child Survival
BCG	Bacillus Calmette Guerin (tuberculosis vaccine)
EPI	Expanded Program on Immunization
ESHE	Essential Services for Health in Ethiopia
HMIS	Health Management Information System
IUD	Intrauterine Device
KAT	Kembata Alabana Tembaro Zone
MCH	Maternal and Child Health
MOH	Ministry of Health
OPD	Outpatient Department
RHB	Regional Health Bureau
RTC	Regional Training Center
SNNPR	Southern Nations and Nationalities Peoples Region
TT	Tetanus Toxoid
USAID	United States Agency for International Development
WOREDA	District

EXECUTIVE SUMMARY

In March 1997 a pilot information system was designed for the surveillance of major communicable diseases and key health management indicators in the Southern Nations and Nationalities Peoples Region (SNNPR) of Ethiopia. The pilot information system was intended to obtain a more rapid and accurate picture of the occurrence of diseases, health service activities and management data, such as supplies and financial information, than the current health management information system provides. It was designed to take place in the four BASICS focus zones in a first phase, and if proven useful, to be extended to the entire Southern Region in a second phase. In addition, the pilot system was developed to train health workers on how to use data for planning and decision making.

Prior to its implementation, training courses were envisaged for key individuals participating in the pilot system that would include teaching basic elements of surveillance, calculation of rates, ratios and proportions, and how to make graphs. Data organization and analysis for decision making would also be covered. This short-term consultancy was planned to develop relevant training materials, to initiate the training and to review the pilot information system and its proposed computerization. The visit took place from August 13-September 16, 1997.

A training plan and trainer's manual for the pilot information system have been developed and revised following completion of the first training workshop. Some of the training materials are now being used to develop an HMIS user's manual.

The first training workshop was held at the Regional Training Centre in Awassa from September 1-5. Twenty-seven health workers and one member of the BASICS team participated in the training. Participant evaluation of the workshop concluded that most learning objectives had been met, and that the degree of improvement in knowledge and skills was either "good" or had improved "a lot." The workshop also gave facilitators and other BASICS technical staff a clearer picture of the follow-up and supervision that would be required during the implementation phase. Support and supervision should be aimed at addressing the limited experience of data analysis and utilisation of information at the local level.

Following review of the pilot information system some minor modifications have been made to the pilot site report form. Two indicators related to antenatal clinic visits and family planning need to be reviewed.

Computerization of the proposed pilot information system will be limited by the shortage of skilled human resources and technical support.

It is recommended that:

1. Recognition must be given to the long-term commitment required to develop the information system during its pilot phase and possible extension to other areas.

2. Supervision during the pilot phase should focus primarily on data accuracy and the interpretation and utilization of information generated by the pilot information system.

3. An HMIS user's manual should be developed as a reference manual for health workers at the local level and a draft edition tested, if possible, during the pilot phase of the project.

4. Clarity should be sought from Family Planning Programme managers regarding the objectives for monitoring the program and, subsequently, the proposed indicator included in the pilot information system should be reviewed.

PURPOSE OF VISIT

The purpose of the consultant's visit to Ethiopia was to develop teaching materials for the training of regional/zonal/woreda and health facility staff, and to conduct HMIS training, prior to the implementation of the pilot information system in selected sites in the SNNPR. The visit took place from August 13-September 16, 1997.

The consultant's original scope of work was to:

1. Develop teaching materials for the training of regional/zonal/woreda and health facility staff prior to the implementation of the pilot information system. This was done with the health planner and the data collection officer. The development of the materials was to be based on collected materials from Dr. Serge Manoncourt, material collected from BASICS/Washington, available materials in the country and the office in Awassa. In addition, materials were collected by the consultant for adaptation.

2. Develop a training plan to train approximately 20-30 health facility staff, 20-30 woreda staff and 10-15 regional zonal staff, most likely in four different training sessions.

3. Conduct HMIS training, using the developed training materials.

4. Review the proposed pilot information system and suggest improvements/alterations within the initial parameters as developed and agreed upon by the HMIS task-force.

5. Review the proposal for the computerization of the pilot and routine information system and suggest ways for development and implementation.

6. Any additional tasks may be developed during the visit, when and if the need arises.

Upon arrival in Awassa, the consultant had meetings with the BASICS/ESHE staff. Discussions concerned the scope of the work and the date and venue for the training workshops. It was decided that two workshops would be held for training health staff. The initial workshop would

be conducted during the consultant's visit. It was also decided that the consultant should concentrate on the development of the training materials, facilitation of the workshop, and initial drafting of an outline for a user's manual for the pilot information system for health staff at woreda and zonal levels.

BACKGROUND

According to the October 1994 census results, Ethiopia has a population of approximately 55 million people with almost 20 percent of the population under the age of 5 years. According to the Central Statistical Authority, the total fertility rate was estimated to be 7.5 in 1990, the under 5 mortality rate in 1984 was reported to be 159/1000, and the infant mortality rate in 1993 was reported to be 105/1000 live births overall, with significant variation between urban and rural areas.

In 1994, the population of the Southern Nations and Nationalities Peoples Region was just over 10 million, with 18.5 percent under the age of 5 years. The total fertility rate was reported to be 4.3, the under 5 mortality rate 189/1000, and the infant mortality rate 128/1000 live births (Regional Health Bureau, 1997).

Four primary health conditions are responsible for the majority of all infant and child morbidity and mortality: diarrhea, pneumonia, malaria and malnutrition (MOH routine surveillance data, 1994). Among the total population of the SNNPR, major causes of hospital and health center morbidity and mortality are malaria, tuberculosis, pneumonia, dysentery and diarrhea (Regional Health Bureau, 1997).

A national vaccination coverage survey was conducted in 1995. BCG coverage was estimated to be 50 percent, DPT 47 percent and measles coverage in the first year of life to be 35 percent. Overall, 20 percent of women of childbearing age had received at least TT2 (MOH, 1995). In the SNNPR, BCG coverage was reported to be 81 percent, DPT3 60 percent and measles 46 percent. The proportion of women of childbearing age who had received at least TT2 was reported to be 30 percent (Regional Health Bureau, 1997).

The BASICS project, in collaboration with the Regional Heath Bureau of the SNNPR, is working in four zones in the Southern Region and focuses its activities in five woredas. The objective of the BASICS project is to improve the health status of the population by increasing the utilization of essential primary and preventive health services. One component of this program is to improve the health management information system.

In March 1997 a pilot information system was designed for the surveillance of major communicable diseases and key health management indicators in the SNNPR of Ethiopia. The pilot information system was intended to obtain a more rapid and accurate picture of the occurrence of diseases, health service activities and management data such as supplies and

financial information than the current health management information system provides. It was designed to take place in the four BASICS focus zones in a first phase, and if proven useful, to be extended to the entire Southern Region in a second phase. In addition, the pilot system was developed to train health workers on how to use data for planning and decision making.[1]

Prior to its implementation, training courses were envisaged for key individuals participating in the pilot system that would include basic elements of surveillance, calculation of rates, ratios and proportions, and how to make graphs. Data organization and analysis for decision making would also be covered. This short-term consultancy was planned to develop relevant training materials and to initiate the training.

TRIP ACTIVITIES

In Awassa, at a preliminary meeting with the BASICS team, a draft training outline was presented and discussed. The topics to be developed for inclusion in the workshop training were identified, and a decision made on the key cadres of staff to be trained. It was decided that the training would take place at the Regional Training Center (RTC) in Awassa and that two workshops would be held to complete the training for staff from the pilot sites—the first for zonal and woreda health offices and health facility personnel from Sidama and KAT Zones, and the second for Regional Health Bureau (RHB) personnel, and North Omo and Hadiya staff (no RHB personnel were available for the first workshop which coincided with the annual regional planning meeting). Both the workshops were scheduled for September, each lasting five days.

During the first two weeks of the visit, the trainer's manual was developed that comprised the training plan, timetable and session notes (see Appendix A). On-going discussions were held with the BASICS team about the training content and preparations for the workshop. Workshop facilitators were identified and briefed on the training content.

A visit was made to Alaba Woreda health office and health center to collect data for use in the workshop training exercises and case study. It was also an opportunity for the consultant to gain an understanding of the current data collection methods at a health facility.

While preparing workshop training materials, suggestions were made for minor modifications to the health facility report forms to ensure that certain data items would be clearly understood by health staff. Doubts were raised about the key indicator chosen to monitor the family planning service (see section on results, "Modification of the Pilot Information System). The latter requires follow-up.

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[1] Manoncourt S. April 11, 1997. Report on Proposal for a Pilot Information System for the Surveillance of Major Communicable Diseases and Key Health Management Indicators in the Southern Nations and Nationalities Peoples Region, Ethiopia. Regional Health Bureau, SNNPR, Ethiopia Ministry of Health USAID/BASICS/ESHE

The first training workshop was held at RTC from September 1-5. Twenty-seven health workers and one member of the BASICS team in Awassa participated in the training. Participant evaluation of the workshop concluded that most learning objectives had been met, and that the degree of improvement in knowledge and skills was either "good" or had improved "a lot." The workshop also gave facilitators and other BASICS technical staff a clearer picture of the follow-up and supervision that would be required during the implementation phase.

In the remaining week in Awassa, meetings were held with the BASICS team to discuss any further modification of the trainer's manual or adaptations to the training plan or training methods. Work was also begun on a draft for a user's manual for the pilot information system that would complement other manuals being developed by the BASICS team in collaboration with the Southern Region RHB to strengthen health management systems.

RESULTS

Introduction

The pilot information system has been designed with clear objectives and has identified the indicators to monitor major communicable diseases and key health service delivery as well as indicators to promote a linkage between health care/service activities and availability of crucial resources. Essential data to be compiled in relation to the indicators are easily identifiable from the simplified report format to be piloted during the next six months (September 1997 – March 1998). The training objectives, materials and methodology were developed to reflect the following overall objectives of the pilot information system:

1. To improve surveillance for monitoring major communicable diseases;

2. To reinforce the use of key health delivery and management indicators;

3. To improve data accuracy, report completeness and delays in reporting;

4. To increase data analysis and utilization of data for decision making; and

5. To demonstrate that surveillance and health management could be done effectively with less information.

A few modifications were made to the proposed pilot system following review of the proposal, development of training materials and the introduction of the system to workshop participants. These are described below.

Development of Teaching Materials

A trainer's manual has been developed that includes a training outline and suggested methodology and teaching aids, a timetable for the five-day workshop and session notes for facilitators. The draft manual has been modified following its use in the first workshop and after discussions with the BASICS team.

In addition, a draft outline has been developed for a user's manual that will incorporate some of the above teaching materials and further develop the concepts of interpretation and utilization of information at the woreda and zonal levels. The manual needs to be adapted to local conditions and will therefore be completed by the BASICS team to complement other manuals and training being developed to strengthen health management systems.

Training Plan

In co-ordination with the RHB and RTC, the training outline, venue and health personnel to attend the workshop were approved. The first workshop was held in Awassa from September 1-5, 1997. There were 28 participants; 27 health workers from Sidama and KAT Zones and 1 member of the BASICS team (see Appendix B, List of Participants).

The second workshop will commence on September 17,1997, and will be coordinated by the BASICS health planner, Mr. Sjoerd Postma, and Regional Health Bureau personnel. Members of the BASICS team will be facilitators.

Training Workshop

The following, general objectives were set for the training and development of the teaching materials to ensure that, by the end of the workshop, participants would be able to:

- Implement the proposed pilot information system in the selected sites;
- Understand their role in all activities related to the health management information system;
- Analyze the key data included in the pilot information system; and
- Understand the relationship between information and decision making in planning and management of health services.

The general areas covered in the training were:

- Basic arithmetic procedures;
- Data organization and analysis for decision making;

- Communication and dissemination of information; and
- Implementation of the pilot information system.

Following discussion and analysis of the problems the participants face in relation to the HMIS at the start of the workshop, participants were able to set their own learning objectives. The degree to which these objectives were met was the basis of the evaluation at the end of the training (see Appendix C).

While the majority of participants at the first workshop had fairly good, basic arithmetic skills, most had not had experience in calculating rates or other indicators and few had any experience of interpreting information and using the information for decision making. Nearly all the participants had had some experience of presenting data in graphs. Given this level of skills and knowledge at the outset of the workshop, most participants progressed well during the week and this is reflected in the final evaluation of the degree of improvement in their skills and knowledge (see Trip Activities).

From observation of participants during the week, it is obvious that support and supervision during the implementation phase will need to focus on ensuring that calculation of indicators is carried out correctly and, in particular, on interpretation and utilization of information. The poor development of skills in the latter area highlights the importance of establishing a realistic time frame for the development of the health management information system—as with all systems development.

There was a generally positive response among participants to the pilot information system initiative. Understandably, the dual reporting for the pilot and the current information systems during the pilot phase was felt by some to be a burden. A minority of participants expressed concern about the reduction in data items in the new report form for health facilities. Concerns centered on issues related to clinical decision making and this perhaps reflects the lack of experience in using information for broader areas of management and public/community health. Personnel from Yirgalem Hospital pointed out limitations of the system for the management of the referral hospital, as only a minor part of hospital activities is reflected in the pilot site form.

All participants at the workshop were worried about the lack of clear guidance regarding "catchment population" data for the health facilities. Also, a significant difference was noted between the 1994 census data and previous data, particularly regarding the "expected number of pregnancies and deliveries" (3 percent in 1994 as compared to 5 percent in the past).

Participants also noted that while the proposed indicator for "weight for age" relates to children less than 5 years of age, in practice the "road to health" card is used only for children up to 3 years of age. This may need to be reviewed when the pilot phase is evaluated.

Modifications to the Pilot Information System

Morbidity-Mortality

The morbidity-mortality data compilation table has been altered to ensure that the total of ***all*** "new cases" and "deaths" are reported and not just those listed in the table. Footnotes have been added to clarify data collection (see Appendix D, Pilot Site Report Form).

A separate table has been added to gather "total reattendance visits." Data on "total attendance" will be required for the calculation of health service management indicators.

The necessity for including the "crude mortality rate" and "under 5 mortality rate" in the list of key indicators for a primarily routine data collection system is debatable, as these rates are only likely to be derived from the census data.

Indicators-Health Service Delivery

Antenatal Attendance

The current SNNPR data report forms have three categories for compiling data from the antenatal clinic registers: first visits, second visits, and third plus subsequent visits. The pilot site forms request compilation of data in two categories only: first visits and re-attendants. No indicator had been included in the pilot system to utilize the data on re-attendants.

The workshop participants indicated that currently the data are not analysed at lower levels of the health service. To ensure that all data included in the new report form will be used, participants were taught during the workshop to calculate the "average number of visits" to an antenatal clinic. It was apparent that these participants were not familiar with this measurement.

The population fellow working in the BASICS office in Awassa has expressed a strong preference for adhering to the current three categories and for gathering information on the proportion of pregnant women who attend antenatal clinic and return for a third visit or more. The latter depends on how well visits to the antenatal clinic are recorded and the accuracy with which they are compiled into each category. This should be followed up during supervision, and a decision made on the indicator to be used in the future, following evaluation of the pilot test. Similarly, the extent to which "average number of visits" has been understood and used by workshop participants should be followed up.

However, if the principle of using only essential data is to apply to a future simplified system, it is recommended that as few categories as possible be included in the report form.

Family Planning

- It is not clear in Serge Manoncourt's proposal how the indicator "family planning coverage" is to be interpreted/used. There is a conflict in the term "coverage" when compared to other "coverage" indicators for health service delivery where this term implies a first visit to a service (antenatal coverage) or a unique event (delivery coverage). This ambiguity could be confusing to health workers, particularly as the numerator in the proposed indicator refers to new acceptors and continuing acceptors, implying "prevalence,"which would be difficult to ascertain from the routine data collection system. It is possible that "coverage" has been used to imply a different concept in this instance.

  For simplicity, this indicator was confined in the workshop to new acceptors only in the numerator. However, new acceptors are recorded by method chosen and, as the method chosen by the user could be changed, there is a strong possibility of "double-counting" in the numerator.

  There is a need for further discussion with the Family Planning Programme managers, at regional and/or national level, to ascertain the objectives for monitoring this area of health service delivery (i.e. how the information will be used). Subsequently, a decision could be made regarding the appropriate indicators to incorporate into the pilot information system using the routine data collection system.

- Data Definitions

  To ensure data accuracy, case definitions were included in the pilot information system proposal. It would be advisable to develop definitions for data items in the health service delivery categories, for example, "abnormal deliveries," "first visits," etc. These definitions could be included in the HMIS user's manual.

Computerisation of the Pilot Information System

There has been only rudimentary discussion of the proposed computerisation of the pilot and routine information system given the time constraints and the need to prioritise the development of training materials and the training of health personnel. Discussion has mostly centered on constraints at regional level related not only to problems with hardware and software, but also the limited human resources and technical support available. As with the manual system, the development of its computerisation should be assessed in relation to the above constraints and the time frame envisaged by BASICS for the project's development of the system.

CONCLUSIONS

The teaching materials developed have been satisfactorily tested during the first workshop and minor modifications have been made based on their use and on discussions with the BASICS

team. The materials have met the needs of the workshop facilitators and the pilot information system objectives for implementation.

1. The teaching materials can be easily adapted for the content of an HMIS user's manual for health workers at local level.

2. A training plan has been established and the first training workshop was held from September 1-5. Twenty-seven health workers and one member of the BASICS team took part in the training. Participant response to the workshop and the proposed pilot information system was generally positive. The consultant had the opportunity to visit Dale Woreda in the week following the workshop. There were positive signs that workshop participants had already met with colleagues to discuss the pilot information system and formation of a HIS management team.

3. Following review of the pilot information system some minor modifications have been made to the pilot site report form. Two indicators, related to antenatal clinic visits and family planning, need to be reviewed.

4. Computerisation of the proposed pilot information system will be limited by the shortage of skilled human resources and technical support.

5. The limited skills and knowledge of information utilization at the local level highlights the need for on-going support and supervision.

RECOMMENDATIONS

- Recognition must be given to the long-term commitment required to develop the information system during its pilot phase and possible extension to other areas.

- Supervision during the pilot phase should focus primarily on data accuracy and interpretation and utilization of information generated by the pilot information system.

- An HMIS user's manual should be developed as a reference manual for health workers at the local level and a draft edition tested, if possible, during the pilot phase of the project.

- Clarity should be sought from Family Planning Programme managers regarding the objectives for monitoring the program and, subsequently, the proposed indicator included in the pilot information system should be reviewed.

FOLLOW-UP ACTION REQUIRED

- The BASICS population fellow in Awassa, Ms. Melissa Woods, will contact Family Planning Programme managers to discuss appropriate and reliable indicators for monitoring the family planning service using data from the routine information system. This action will take place during the pilot phase.

- The BASICS health planner, Mr. Sjoerd Postma, will complete the draft HMIS user's manual begun by the consultant.

APPENDIXES

APPENDIX A
Training Plan and Trainers Manual

IMPLEMENTATION OF THE PILOT INFORMATION SYSTEM FOR THE SURVEILLANCE OF MAJOR COMMUNICABLE DISEASES AND KEY HEALTH MANAGEMENT INDICATORS IN THE SOUTHERN NATIONS AND NATIONALITIES PEOPLES REGION, ETHIOPIA.

WORKSHOP ON THE USE OF THE PILOT INFORMATION SYSTEM

TRAINERS MANUAL

(Draft)

August 1997

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TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
HMIS Workshop 1.9.97 – 5.9.97 8.45am – 10 am	Welcome and Introduction to HMIS Workshop Dr. Mengistu Asnake	Surveillance of major communicable diseases – data and key indicators. Angela Brown	Health Service Delivery – MCH data And key indicators. Angela Brown Dr. Mulugeta Betre	Health Service Delivery – Growth Monitoring – Family Planning – data and key indicators. Mr. Wondimu Amdie Melissa Woods	Case Study: Review of workshop indicators and other Woreda information for management. All facilitators
10am – 10. 30 am	**B**	**R**	**E**	**A**	**K**
10.30am – 12.30pm	Identification of HMIS problems. Pilot HMIS Angela Brown Mr. Wondimu Amdie	Mortality and Morbidity Indicators Dr. Mengistu Asnake	Analysis and presentation of MCH Indicators Dr. Mulugeta Betre	Interpretation, utilisation and communication of MCH information. Melissa Woods Mr. Wondimu Amdie	Discussion of Case Study All facilitators
12.30pm – 2pm	**L**	**U**	**N**	**C**	**H**
2pm – 3.30pm	Information for Decision Making Angela Brown Wondimu Amdie	Presentating data and information. Dr. Mengistu Asnake	Immunisation data and Indicators Dr. Mulugeta Betre	Health Service Management – Resources – data and key indicators. Dr. Mengistu Asnake	Implementing the pilot information system – Action to be taken. Mr. Wondimu Amdie
3.30pm – 4pm	**B**	**R**	**E**	**A**	**K**
4pm – 5.30pm	Data and Information Dr. Mengistu Asnake	Interpretation and Utilisation of information. Communicating information Dr. Mengistu Asnake	Interpretation, utilisation and dissemination of information on immunisation. Dr. Mulugeta Betre	Resources: Interpretation, utilisation and communication of information. Dr. Mengistu Asnake	Workshop Evaluation Angela Brown

PILOT INFORMATION SYSTEM: GENERAL OBJECTIVES

1. To improve surveillance for monitoring major communicable diseases;
2. To reinforce the use of key health delivery and management indicators;
3. To improve data accuracy, report completeness and delays in reporting;
4. To increase data analysis and utilisation of data for decision making;
5. To demonstrate that surveillance and health management could be done effectively with less information.

TRAINING OBJECTIVES

- At the end of the one-week course. the participants will be able to:

- Implement the proposed pilot information system in the selected sites;
- Understand their role in all activities related to the Health Management Information System;
- Analyse the key data included in the pilot information system;
- Understand the relationship between information and decision making in planning and management of the health services.

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DAY 1/SESSION 1: **WORKSHOP OPENING**

Purpose: To clarify the objectives of the workshop;
To identify the problems participants encounter in their use of the routine health information system and to define learning objectives;
For participants and facilitators to get to know one another;
To orient participants to the pilot information system.

Duration: 3 hours

Session Plan: 1.1. Orientation to the workshop;
1.2. Identification of participants' HMIS problems and learning objectives;
1.3. Overview of pilot information system.

TOPIC/TIME NEEDED	METHOD/CONTENT OUTLINE	RESOURCES
1.1. Orientation to the workshop(30 minutes)	- Welcome and introduction of participants and facilitators - Presentation of workshop objectives.	Transparencies: Workshop objectives
1.2. Identification of participants' HMIS problems and their workshop learning objectives(1 hour 30 minutes)	- Explanation of group work. - Participants work in small groups to establish a list of the main problems they encounter regarding their HMIS responsibilities - Groups to select one person to record main points on flip charts that can be displayed. - Review of flip charts by participants and facilitators. - Lead Trainer to highlight the areas that will be within the scope of the workshop. - Present training objectives and add any appropriate objectives highlighted by the above exercise. Obtain consensus on objectives.	Flip charts, markers and bluetack/masking tape Transparency of training objectives

TOPIC/TIME NEEDED	METHOD/CONTENT OUTLINE	RESOURCES
1.3. Overview of pilot information system(1 hour)	- Presentation of the broad areas included in the pilot information system. - Hand out the form as an example. - Emphasis should be placed on gaining participants' interest in working towards greater clarity and simplification of the reporting system and its contribution to improving health service delivery and management of resources. - Questions and Discussion.	Transparencies

DAY 1/SESSION 2: **INFORMATION FOR DECISION MAKING**

Purpose: To ensure that participants will be:
a) aware of all activities/responsibilities related to generating and utilising health information;
b) able to understand how information can help in decision-making for planning and management of the health services.

Duration: 3 hours

Session Plan: 2.1. Definition of HMIS and identification of activities related to generating and utilising health information.
2.2. Obtaining information from data: introduction to rates, ratios and proportions.
2.3. Practical exercises on calculating rates, ratios and proportions, followed by presentation and discussion of results.

TOPIC/TIME NEEDED	METHOD/CONTENT OUTLINE	RESOURCES
2.1. The HMIS and activities related to the information cycle(1 hour)	- Individual participants are given a few minutes to consider how they would define a HMIS. - In plenary, the Facilitator writes the participants' contributions to a definition of a HMIS. - Present full definition. - The most important aspect to clarify is the generation of information for decision-making. - With this definition as a basis, brainstorm all the activities that are associated with the information cycle (data registration, compilation, control of quality, analysis etc.) - Define each activity and discuss the importance of each activity to the eventual quality, completeness and timeliness of the information for decision making.	Flipchart and transparencies. Flipchart. Handout of activities
2.2. Data and Information/ Introduction to rates. ratios and proportions(45 minutes)	- Discussion in plenary of difference between raw data and information: ask for examples/present examples; - In succession, and using participants' knowledge, Facilitator presents how to calculate rates, ratios, proportions.	Flipchart/Board Transparencies
2.3. Practical exercises and discussion of results(1 hour)	- Participants work in pairs to complete exercise on rates, ratios and proportions. Facilitator guides participants. - Discussion of results.	Exercise sheets, paper, pens, calculators.

DAY 2/SESSION 3: **SURVEILLANCE OF MAJOR COMMUNICABLE DISEASES**

Purpose: To enable participants to:

- correctly collate the data on major communicable diseases registered at Out-patient and In-patient departments;
- calculate key indicators to monitor trends in these communicable diseases.

Duration: 3 hours

Session Plan:

3.1. Presentation and discussion of the data collection instruments.
3.2. Study of instruments in small groups.
3.3. Exercise to practice filling in reporting forms.
3.4. Presentation and discussion of morbidity and mortality indicators.
3.5. Exercise to practice calculation of key indicators.

TOPIC/TIME NEEDED	METHOD/CONTENT OUTLINE	RESOURCES
3.1 Data collection instruments for major communicable disease reporting(30 mins).	- Presentation of data collection forms for the different levels of the health service, including: - Explanation of, and rationale behind the changes introduced; - how the forms are to be filled in, focusing on accuracy related to data definitions etc.	Transparencies
3.2. Study of instruments(15 minutes)	Small group discussion. Participants are given copies of the data collection forms and guidelines for compiling data from OPD and In-patient registers.	Data collection instruments; guidelines.
3.3 Exercise to practice using the data collection instruments(30 minutes)	Individual exercise. Using the data provided on major communicable diseases, participants are expected to fill in the new data collection instruments. Facilitators should guide participants.	Communicable disease data; copies of report forms.

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TOPIC/TIME NEEDED	METHOD/CONTENT OUTLINE	RESOURCES
3.4. Morbidity and mortality indicators(45 mins)	Presentation. Building on participants' knowledge, present and discuss the key indicators to be calculated from the OPD/In-patient data on some of the major communicable diseases.	Transparencies; flip chart/board.
3.5. Morbidity and mortality indicators exercise(1 hour)	Participants to work in pairs, calculating the key indicators discussed above. Plenary discussion. On completion of the exercise, participants present their results. Discuss any remaining questions.	Copies of exercise; paper; flip charts; calculators.

DAY 2/SESSION 4 **PRESENTATION, INTERPRETATION AND UTILIZATION OF INFORMATION**

Purpose: To enable participants to:

- Present data and information in tables and graphs;
- Interpret and utilise the information on major communicable diseases.

To ensure that participants are aware of the frequency and means of transmitting reports of major communicable diseases.

Duration: 3 hours

Session Plan: 4.1. Presentation of guidelines for constructing tables and graphs.
4.2. Exercise to practice designing graphs.
4.3. Discussion: Interpretation, utilisation and dissemination of the information.

TOPIC/TIME NEEDED	METHOD/CONTENT OUTLINE	RESOURCES
4.1. Use of tables and graphs(1 hour)	Presentation Building on participants' knowledge, present and discuss the rules for constructing tables and graphs.	Transparencies; flipcharts/board.
4.2. Exercise on line graphs and bar charts(1 hour) 4.3. Interpretation, utilisation and dissemination of the information on major communicable diseases(1 hour)	Individual work. Using data from communicable disease reports, participants practice presenting the data in line graphs and bar charts. Facilitators should guide participants. In plenary, some of the graphs are presented and interpretation, utilisation and transmission of reports and information are discussed.	Transparencies; paper and pencils.

DAY 3/SESSION 5 **HEALTH SERVICE DELIVERY – MCH**

Purpose: To enable participants to correctly fill in the data collation instruments for monthly reporting of:

- ante-natal clinic attendance and TT immunisation;
- deliveries and data on the newborn.

To enable participants to calculate key indicators, present, interpret and utilise information from the above MCH data.

Duration: 3 hours

Session Plan:

5.1. Presentation and discussion of the data collection instruments and key indicators generated from the data.
5.2. Study of instruments in small groups.
5.3. Exercise to practice filling in the report forms and calculating the key indicators.
5.4. Discussion: Presentation, interpretation and utilisation of the information.

TOPIC/TIME NEEDED	METHOD/CONTENT OUTLINE	RESOURCES
5.1. Health Service Delivery – MCH data collection instruments and indicators(1 hour)	Presentation of the MCH reporting format, discussion of the key indicators generated from the data and methodology for calculating the indicators. Emphasis should be placed on ensuring that participants understand the data definitions and the numerators and denominators used to calculate the indicators.	Transparencies; copies of data collection instruments and guidelines.
5.2. Study of instruments(15 minutes)	Small group discussion of the MCH reporting format on the reverse side of the forms distributed on Day 2.	
5.3. Calculating MCH indicators and presentation of some MCH information in graphs(1 hour). 5.4. Interpretation and utilisation of MCH indicators.	Participants work in pairs and should be guided by facilitators. In plenary, results of the above exercise are presented and interpretation and utilisation of the information are discussed.	Exercise on MCH indicators; paper, pencils, calculators. Transparencies.

DAY 3/SESSION 6: **HEALTH SERVICE DELIVERY – IMMUNISATION**

Purpose: To enable participants to:

- correctly report immunisation data;
- calculate the key indicators, and present, interpret, utilise and disseminate the information on immunisation.

Duration: 3 hours

Session Plan:

6.1. Presentation of data collection instruments.
6.2. Study of instruments in small groups.
6.3. Exercise to practice filling in the report form, calculating the indicators and presenting the information in graphs.
6.4. Discussion: Interpretation, utilisation and dissemination of the information on immunisation.

TOPIC/TIME NEEDED	METHOD/CONTENT OUTLINE	RESOURCES
6.1. Immunisation: data collection instruments(45 minutes)	Presentation of modifications to the reporting format for immunisation in children < 1 year of age. Building on participants' knowledge, present and discuss the key indicators to be calculated from the immunisation data, and how the information should be presented.	Transparencies
6.2. Study of instruments(10 minutes) 6.3. Calculating indicators and presentation of the information in graphs(45 mins)	Study of report format in small groups. Working individually, participants are given an exercise to practice filling in the report form, calculating key immunisation indicators and their presentation in graphs. Facilitators should assist individuals.	Copies of data collection instruments. Copies of exercise; paper and pencils; calculators.
6.4. Interpretation, utilisation and dissemination of information on immunisation – participants practice at presenting the information (1 hour 30 minutes)	In small groups, participants discuss the results of the exercise, interpretation and utilisation of the information. One member of each group should record the main points on a flip chart to present in plenary. Presentation of results and plenary discussion, including dissemination of information.	Flip charts, transparencies

DAY 4/SESSION 7 **HEALTH SERVICE DELIVERY – GROWTH MONITORING – FAMILY PLANNING**

Purpose: To enable participants to:

- correctly report the Growth Monitoring and Family Planning data;
- analyse, interpret, utilise and disseminate the information gained from the data.

Duration: 3 hours

Session Plan: 7.1. Presentation of data collection instruments
7.2. Study of instruments in small groups
7.3. Exercise to practice filling in the report form, calculating the indicators.
7.4. Discussion: Interpretation, utilisation and dissemination of the information on Growth Monitoring, and on Family Planning.

TOPIC/TIME NEEDED	METHOD/CONTENT OUTLINE	RESOURCES
7.1. Growth Monitoring and Family Planning: data collection instruments(45 minutes)	Presentation of reporting formats. Building on participants' knowledge, present and discuss the key indicators to be calculated from the Growth Monitoring and the Family Planning data.	Transparencies
7.2. Study of instruments(10 minutes) 7.3. Calculating indicators(20 minutes) 7.4. Interpretation, utilisation and dissemination of information on Growth Monitoring and Family Planning(1 hour 40 minutes)	Small group discussion of the data instruments Working in pairs, participants calculate the key indicators. Small group discussion of the results and interpretation, utilisation and dissemination of the information. One member of each group should record the main points. Plenary discussion of results of group work.	Copies of data collection instruments. Copies of exercise; calculators; paper and pencils. Transparencies; Flip charts.

DAY 4/SESSION 8 **HEALTH SERVICE MANAGEMENT - RESOURCES**

Purpose: To train participants how to correctly fill in the report forms related to crucial resources: medical supplies, equipment, transport and finances, and to analyse and utilise the information.

Duration: 3 hours

Session Plan:
8.1. Presentation of data collection instruments.
8.2. Study of data collection instruments.
8.3. Exercise to practice filling in the report form and calculating key indicators.
8.4. Discussion: interpretation, utilisation and dissemination of the information generated from the data on resources.

TOPIC/TIME NEEDED	METHOD/CONTENT OUTLINE	RESOURCES
8.1. Resources: data collection instruments(45 minutes)	Presentation of reporting format. Building on participants' knowledge, present and discuss the key indicators to be calculated from the data.	Transparencies
8.2. Study of instruments(15 minutes)	Small group discussion of data collection instruments	Copies of data collection instruments
8.3. Exercise to practice filling in the report forms and calculate the key indicators(30 minutes)	Working in pairs, participants complete the report form and calculate the indicators. Facilitators to assist participants.	Copies of exercise; paper, pencils; calculators.
8.4. Interpretation, utilisation and dissemination of the information.	Small group discussion of the results of the exercise and interpretation, utilisation and dissemination of the information. One member of each group should record the main points. Plenary discussion of results of group work.	Transparencies; Flip charts.

DAY 5/SESSION 9 — **CASE STUDY – SETTING THE INDICATORS IN CONTEXT**

Purpose:

To review the work undertaken during the workshop.
To evaluate the information generated by the pilot information system.
To examine other factors that influence the interpretation and utilisation of the key indicators included in the pilot system.
To discuss the flow of information, and feedback, between the different levels of the health service and other sectors, and between health workers and the community.
To discuss how and where information should be stored.

Duration:

3 hours

Session Plan:

9.1. Review of the indicators calculated during the workshop.
9.2. Presentation of Case Study
9.3. Small group exercise and discussion of case study.
9.4. Plenary Discussion: Decision making and action.

TOPIC/TIME NEEDED	METHOD/CONTENT OUTLINE	RESOURCES
9.1. Review of key indicators (30 minutes)	Presentation of the indicators calculated from data included in the exercises during the week. Discussion of participants' remaining questions related to the exercises/indicators.	Transparencies.
9.2. Case Study(15 minutes) 9.3. Group exercise on Case Study(1 hour)	Presentation of Case Study In small groups, participants will analyse the information they have gained from the exercises throughout the week and discuss the interpretation and utilisation of that information now that they have other information from the case study. Participants should discuss what decisions could be made, and action taken, to improve the delivery and management of health services in the case study area. One member of the group should record the main points. Facilitators to assist.	Transparencies Copies of case study. Flipcharts.

TOPIC/TIME NEEDED	METHOD/CONTENT OUTLINE	RESOURCES
9.4. Decision making and action(1 hour)	Plenary discussion of : - results of group work on case study; - communication and dissemination of information; - storing information.	Flipcharts.

DAY 5/SESSION 10 **IMPLEMENTING THE PILOT INFORMATION SYSTEM; EVALUATING THE WORKSHOP.**

Purpose: To ensure that participants are aware of the action to be taken to implement the pilot information system.
To assess whether learning objectives for the workshop have been achieved.

Duration: 2 hours

Session Plan: 10.1. Presentation of plans for implementing the pilot information system.
10.2. Small group discussion of learning objectives and outcomes of workshop, followed by plenary discussion.

TOPIC/TIME NEEDED	METHOD/CONTENT OUTLINE	RESOURCES
10.1. Implementation of the pilot information system(1 hour)	Presentation of plans for implementing the pilot information system. Plenary discussion. Facilitators should record points/concerns etc. arising from the discussion.	Transparencies; flipchart
10.2. Evaluation of the workshop(1 hour)	Review the objectives of the workshop and the agreed learning objectives from the start of the workshop. In small groups participants discuss the objectives and the content of the sessions and decide whether their learning objectives have been met. Plenary discussion. Facilitators note comments.	Flipcharts.

DAY 1/SESSION 1

WORKSHOP ON THE USE OF THE PILOT INFORMATION SYSTEM

WORKHOP INTRODUCTION/OVERVIEW OF PILOT SYSTEM

1. Introduction

The pilot information system for the surveillance of major communicable diseases and key health management indicators comprises part of a strategy to improve rural health facility management. The pilot system is intended to obtain a more rapid and accurate picture of the occurrence of diseases, health service delivery activities and management data such as supplies and financial information than the current health information system (HIS) provides.

The system has been designed to be implemented in eleven pilot sites in the Southern Nations and Nationalities Peoples Region (SNNPR) of Ethiopia in a first phase, and was developed to train health workers on how to use data for planning and decision-making. The following objectives have been set for the system:

1. To improve surveillance for monitoring major communicable diseases;
2. To reinforce the use of key health delivery and management indicators;
3. To improve data accuracy, report completeness and delays in reporting;
4. To increase data analysis and utilisation of data for decision making;
5. To demonstrate that surveillance and health management could be done effectively with less information.

Prior to implementation of the pilot information system, this workshop has been planned to orient health personnel to the system and enable them to use it to its full potential for managing health programmes. The following objectives have been set for the workshop:

TRAINING OBJECTIVES

- At the end of the one-week course, the participants will be able to:

- Implement the proposed pilot information system in the selected sites;
- Understand their role in all activities related to the Health Management Information System;
- Analyse the key data included in the pilot information system;
- Understand the relationship between information and decision making in planning and management of the health services.

1. 2. Learning Objectives.

Whilst general objectives can be established before the workshop takes place, it is necessary to set more specific learning objectives once participants have gathered for the workshop and an assessment can be made of what participants need to gain from the training. Setting the learning objectives is the initial process that facilitators and participants undertake in order to reach a consensus on the most important areas of the information system that participants must understand and/or be able to do before implementing the system at their health institutions.

This process will involve:

- group work to brainstorm the main problems participants encounter in their use of the present health information system:
- plenary discussion to identify the most important aspects to be learnt, or improved upon during the workshop:
- agreement on learning objectives to be set for participants that can be monitored during the workshop and evaluated at the end of the workshop.

1.3.Overview of the Pilot Information System

In plenary, a brief overview of the pilot information system will be presented.

DAY 1/SESSION 2

INFORMATION FOR DECISION MAKING

2.1. Introduction

Health personnel need a combination of information to plan, manage and evaluate health programmes. Such information includes the following aspects:

- Major health problems.
- Available resources.
- Volume of work carried out.
- Quality of the work.
- Results of that work.

This information can be obtained from various sources, like:

- the routine health information system.
- supervision visits.
- surveys.

Of the above sources the health information system (HIS) can regularly supply the major part of the required information from all health sites. The HIS is therefore, one of the most important tools for planning and management available to health personnel. Problems identified by the HIS can be studied in greater depth during supervision visits and/or surveys.

The majority of health workers contribute to the functioning of the HIS, in particular by registering different types of data whilst carrying out their work. A smaller number of health personnel are responsible for compiling the registered data to send to higher levels of the health service (Woreda Office, Zonal health department and Regional health board). These same health workers analyse the data, display the information in graphs and tables and interpret and utilise the information.

Data quality will not be good whilst the majority of health workers are limited to only registering/compiling and transmitting the data to higher levels of the health service. A greater number of health workers need to be involved in other activities related to the HIS (e.g. analysis, interpretation, utilisation) at the level at which the data are collected. The purpose of the pilot information system in SNNPR is to promote a better understanding and utilisation of the HIS at all levels of the health service.

2.2. The HIS – Definition and Objectives

The HIS can be defined as a combination of instruments, norms and activities which together produce information for health workers to take decisions in the area of health care/services. The crucial concept in relation to the HIS is that:

IT DOES NOT MAKE SENSE TO HAVE A HEALTH INFORMATION SYSTEM UNLESS IT CONTRIBUTES TO DECISION-MAKING AND ACTION AT DIFFERENT LEVELS OF THE HEALTH SERVICE.

What are the instruments. norms and activities of the HIS?

The instruments:

The instruments. or tools. of the HIS are the forms and registers used to register/record, collate and transmit different data. For example, the following data are registered in the Maternity register:

- the woman's name and age,
- live births.
- stillbirths.
- weight of live born infants,
- etc.

The same data are collated and sent to higher levels of the health service in a monthly report.

Norms:

Norms – sometimes called procedures – define. for instance, who should carry out the various activities related to the HIS (for example, who is responsible for analysing the data, sending the reports to higher levels etc.): the frequency for reports to be sent (weekly, monthly, annually) and the flow of information (e.g. Health Centre to Woreda)

Activities:

The activities related to the HIS are: registering, collating, controlling data quality, processing, presentation. interpretation, communication and reception.

Taking an example of a case of measles diagnosed in the outpatients department of a health centre:

- the case is registered in the out-patient register and, therefore. becomes "data".
- the data are collated in the weekly report forms,
- the data can be processed by. for example. combining them with other data relevant to cases of measles occurring in the same area during preceding weeks,
- this information can be presented in a table or graph showing the trend of cases over a period of time,
- such information can be interpreted. for example, by checking whether the number of measles cases are increasing, diminishing or remaining the same as in previous weeks: also other factors are taken into consideration that could have contributed to the situation, or have helped predict changes, such as the measles immunisation coverage in the area,
- the data and information are sent(transmitted) to higher levels of the health service,
- lastly, reception of reports within a specified period of time, for example, within a week from the time the report was sent, or earlier if the information is transmitted by radio, or telephone etc.

HIS OBJECTIVE:

All of the instruments, norms, and activities of the HIS contribute to the taking of decisions based on facts instead of impressions, suppositions or hypotheses.

The objective of the HIS is to help to decide the objectives for a service, the distribution of resources and planning and management of relevant activities. In relation to EPI, for example:

- the HIS supplies information about the number of children aged 0-11months vaccinated in previous years in a certain community. This can help us decide how many children in this age group should be vaccinated in the current year;
- the HIS provides data on the resources available: these data are necessary to plan the distribution of new resources, or the redistribution of existing resources, i.e. where (and how many) resources, which personnel, means of transport, refrigerators, cold-boxes, fuel, vaccines, syringes and needles required. Knowledge of the distribution of resources assists the planning of immunisation activities, like the number to be vaccinated, at which health sites and/or during out-reach sessions;
- the HIS allows us to assess to what extent we have managed to carry out the planned activities – in this case, the number of children vaccinated as compared to the number in the target group;
- finally, the same system can inform us about whether health problems, such as measles, or poliomyelitis, are being reduced.

2.3. Data and Information

In relation to the HIS the terms "data" and "information" are frequently used and are defined as:

Data – an observation of facts: for example, the number of cases of neonatal tetanus observed. The number, or the observation, alone does not allow interpretation of a situation or a decision to be made.

Information is derived from data combined according to time, place and population. Such aggregations are made using a particular formula and take the name of an **indicator** – for example: the incidence rate of neo-natal tetanus in 1988 in Bonke Woreda. To obtain this rate it is necessary to aggregate the number of cases of neo-natal tetanus notified (epidemiological data) with the number of newbirths (population data) during 1989 (time period) in Bonke Woreda (place/geographical data).

During the workshop various means of obtaining information from data will be discussed. This session will deal with **proportions, percentages, ratios and rates.**

First, though, it is important to note that data recorded/registered for the routine health information system can be used for two main purposes:

1. To make decisions concerning the health of an individual. The data recorded during an outpatient appointment, for example, can be used to make a decision about an individual patients' treatment – such as signs and symptoms, age of patient, sex, diagnosis etc.
2. To make decisions about the health of a group of people or a community. Some of the data - when it is compiled and combined with other data – is needed to make decisions about groups of people to improve public/community health.

A greater amount of data is recorded on individual patients than that eventually needed for information on groups of people. Therefore, some data are retained in patient records or in outpatient/inpatient records. Data required for information on groups of people has to be selected and compiled from the records and registers and combined with other data – e.g. population figures from census data.

Example:

In the maternity ward, records are kept on the deliveries conducted at the health institution. Data are registered, for example, on time of admission, age of mother, length of labour, type of delivery etc. Most of the data are used for the clinical management of each individual woman and decisions regarding conduct of labour and delivery.

Some data are needed to take decisions about the planning and management of the maternity service for women in the community as a whole. For example: the number of births that take place in the health institution is compiled and aggregated with population data for the catchment population of that institution – that is "expected number of deliveries" to monitor the proportion of expected deliveries that actually take place in health institutions. This information is needed to take decisions related to women's access to and utilisation of the health institution.

The pilot information system and the training associated with the implementation of the pilot system are concerned with the second of these two main purposes of data collection.

Proportions

The relation of one population sub-group to the entire population; that is, a population sub-group divided by the entire population. For example, if we are interested in the proportion of families in a village who possess cattle, we can calculate this by dividing the number of families in the village with cattle by the total number of families in the village:

$$\textbf{Proportion of families with cattle} = \frac{\textbf{Number of families with cattle}}{\textbf{Total number of families}}$$

If we are interested in the proportion of children <1 year that are immunised against measles in the district, we divide the number <1 year in the district who are immunised against measles by the total number of children <1 year in the district:

$$\textbf{Proportion of children with Immunisation against measles} = \frac{\textbf{Number of children <1 yr with measles immunisation in district}}{\textbf{Total number of children < 1yr in district}}$$

If 25 children <1 yr had been immunised against measles in the district, and there were 2500 children:

The proportion immunised against measles $= \frac{25}{2500} = \frac{1}{100} = 0.01$

As it is often difficult for people to understand small numbers, like 0.01 in the above example, if we multiply the proportion by 100, we get a larger number called a percentage.

Percentages

A percentage is simply another way of expressing a fraction. It gives the amount of whatever condition we are looking at per 100 people or per 100 units. We write a percentage as %.

$$\text{Percentage} = \frac{\text{Number of cases with a condition "x"}}{\text{Total number of cases}} \times 100$$

$$= \text{Proportion} \times 100$$

So if we are to find the percentage of children immunised against measles in the district, if 25 out of 2500 children are immunised then:

$$\text{Percentage immunised} = \frac{\text{Number of children immunised in the district}}{\text{Total number of children in the district}} \times 100$$

$$= \frac{25}{2500} \times 100 = 0{,}01 \times 100 = 1\%$$

Hence 1% of children are immunised against measles in the district, or one in every hundred.

Ratio

The ratio of one thing to another, for example, the ratio of men to women in a district, tells us the amount of one thing in relation to the amount of another.

Ratio of X to Y is written as: X:Y

So the ratio of WOMEN TO MEN (called the "sex ratio") in a district is written as:

Number of Women : Number of men

If there are 25 men and 50 women, then the ratio of women to men is: 50 : 25

If we divide both numbers by 25 we can write this as: 2 : 1

This means that for every man we have two women.

Ratios are often used to show, for example, the number of families per health facility, or number of people in the community per health worker, or the number of families using one water source or one pit latrine.

So, if there are 5 taps in an area where there are 500 families, and 20 pit latrines, then the:

Ratio of taps to families is: 5 : 500 or 1 : 100

And the Ratio of Pit Latrines to families is: 20 : 500 or 1 : 25

Hence we can say that there is one tap for every 100 families and one pit latrine for every 25 families.

Rates:

In day to day language, the word "rate" is used to mean something similar to speed. We say that "the car which ran over the pedestrian came at a very fast rate", or "at this rate of drinking beer, the man will damage his liver very soon". In statistics too, the word "rate" is used to give a similar meaning. We can define rate as the speed at which a programme is implemented; or the speed at which some events occur in a given population. For example:

- In district A, pneumonia cases occurred at the rate of 108 per 1000 population per week (incidence rate per week).

When we are describing the health or ill health of a community, we often speak in terms of rates. A RATE is simply a proportion, except that we usually express it per thousand of the population. We also specify the time period over which we are measuring the rate, as if we want to compare one rate with another, the time over which it was taken is important.

$$\textbf{Rate} = \frac{\textbf{Total number with the condition}}{\textbf{Total population at risk}} \times \textbf{1000}$$

One example of a rate is the birth rate:

$$\text{Birth Rate} = \frac{\text{Number of live births in year X}}{\text{Total number of people in year X}} \times 1000$$

For example, in a district with a population in 1981 of 30,000 people, there were 3000 live births.

$$\text{The 1981 Birth Rate} = \frac{3000}{30{,}000} \times 1000 = 100 \text{ per thousand}$$

This means that for every thousand people in the community, there are 100 new births in that year.

The rate at which the population is growing is important to know – it assists in planning for the future distribution of resources in the country – this is called the ***rate of natural increase***. It will depend on two things in its calculation:

- THE RATE AT WHICH PEOPLE ARE BORN
- THE RATE AT WHICH PEOPLE ARE DYING

So the RATE OF NATURAL INCREASE =

THE BIRTH RATE minus THE DEATH RATE

If the birth rate was 100 per thousand, and the death rate was 67 per thousand, then the

RATE OF NATURAL INCREASE = 100 minus 67 per thousand
= 33 per thousand.

This is often expressed as per hundred - or as a percentage - rather than per thousand. So a growth rate of 33 per thousand is the same as saying a growth rate of 3.3 per hundred or 3.3%.

A number of other rates will be discussed throughout the workshop.

EXERCISES – SESSION 2

1. 20 cases of measles were reported in District A in June 1988. 25 cases were reported in District B. 35 cases in District C and 50 cases in District D.

a) What was the total number of cases of measles in the 4 districts?
b) What proportion of the total came from District B?
c) What percentage of the total came from District C?
d) What was the ratio of the number of cases in District A to the number of cases in District D?

2. In a village, a village health worker works with 100 families. Each family has five people. There are also 2 agricultural workers.

a) What is the ratio of village health workers to people in the village?
b) What is the ratio of agricultural workers to people in the village?

3. 100 patients attended a health station in one week. 25 of them attended on Monday. 6 had only a respiratory infection and 5 had diarrhoea. One patient had both a respiratory infection and diarrhoea.

a) What percentage of patients attended on Monday?
b) What percentage attended over the rest of the week?
c) How many of the total had neither respiratory infection nor diarrhoea?

4. A large health centre in your district has 47 full-time and 6 part-time employees.

a) What percentage of the individuals are part-time employees?
b) What is the ratio of part-time to full-time employees?

5. 25 women at an antenatal clinic were asked whether they had ever used any method of family planning. The results were:

Yes, regularly	4
Yes, but not regularly	5
Never used	16

Turn these numbers into percentages.

6. The birth rate in your district is 50 per thousand per year. Your health centre has a catchment population of 50,000. There are 500 deliveries each year at the health centre. What percentage of the total number of births in your catchment area takes place at the health centre?

7. A population of 100,000 is growing at a rate of 2.5% per year. How big will the population be:
a) After one year?
b) After two years?

EXERCISES – SESSION 2(Cont.)

8. Data from the 1988 census suggested that your dispensary has a catchment population of about 30.000. The birth rate is 45 per 1000 per year and the death rate is 20 per 1000 per year.

a) How many births were there in 1988 in the catchment area?
b) How many deaths were there in 1988 " " " " ?
c) Assuming no migration. how many more people were there in 1989 than in 1988?
d) What is the rate of natural increase in this population? By what percentage does the population grow each year?

DAY 2/SESSION 3

SURVEILLANCE OF MAJOR COMMUNICABLE DISEASES

3. 1. Morbidity and Mortality Data Collection Instruments

Distribute pilot site form to participants.
This is the form that monitors the frequency of new cases of twelve specific diseases. These diseases were chosen because they are considered to be the most important from a public health point of view.

MORBIDITY = THE AMOUNT OF SICKNESS OR ILL HEALTH

Morbidity data will be collected directly from the registers (under 5 clinic, OPD, emergency).

The following diseases are included in the new form:

- Cholera	**- Bacillary Dysentery**	**- Other Diarrhoea**
- Measles	**- Polio**	**- Neonatal Tetanus**
- Meningitis	**- Malaria**	**- Pneumonia**
- Relapsing Fever	**- Yellow Fever**	**- Tuberculosis**

The total number of ***all*** new cases seen at the consultations (under 5 and adult OPD) will also be collected for the calculation of proportional morbidity – which will be explained later.

The table in the new form has blank spaces below the list of named diseases where the person collating the data can fill in other diseases with a significant number of cases reported. There is also a box for the ***Total Reattendance visits*** on this side of the form.

Mortality data will be collected from the In-Patient Department and emergency registers.

MORTALITY = THE AMOUNT OF DEATH

Age groups:

Instead of six age group categories as in the current HMIS, age groups are limited to three categories:

0 – 4 years
5 – 14 years
15 years and older.

Any further differentiation by age group would not alter the preventative or curative actions taken in response to the above diseases.

A column "Total" is included for the addition of new cases and deaths in all age groups.

Gender:

In the pilot form, morbidity and mortality data is not differentiated by gender. The risk of suffering from the above-mentioned communicable diseases is not gender-related and thus does not lead to gender-specific interventions.

Potential Epidemic Diseases:

The weekly routine reporting of potential epidemic diseases is to be considered as an alert system for outbreak detection. In case of an epidemic, more detailed information will be recorded. In this case, more than three age group categories might be used, and gender and other information may be included.

Data Accuracy:

Outpatient and in-patient registers are the primary source of disease data collection. To improve accuracy, standard case definitions for the selected diseases should be available to health workers (See Case Definitions – Appendix 1).

Apart from understanding case definitions in order to identify and correctly record diagnoses, the remaining data in the registers must be correctly and completely filled in – and written legibly, so that the data can be understood by the people responsible for collating the data on weekly or monthly report forms. All columns in the register should be filled in.

Tally sheets are useful for collating large amounts of data from registers to monthly forms, particularly where there are several disease categories and age group categories.

Mistakes are often made when recording numbers. Write numbers clearly. If there are no new cases of a disease and/or no deaths, then record this as **zero (0) – this differentiates a zero reporting from missing data.** Do not leave blank spaces or use other symbols.

Frequency of reporting:

Morbidity and mortality data will be reported on a monthly basis.

From pilot site to woreda office:

Pilot sites will report directly to the Woreda office. Morbidity and mortality data will be reported on a monthly basis.

From Woreda health office to Zonal health department:

The pilot system forms should be submitted to the zonal health department by the 25th of the month. The zonal level should use a summary form with a list of reporting per sites per month and write the dates of reports received. In case of an epidemic, telephone should be used to communicate and inform the zonal health department.

From Zonal health department to Regional health bureau:

Communicable diseases should be reported weekly by radio, on Fridays. The monthly report should be submitted to the regional level by the 10th of the following month. The regional

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HMIS task force should also use a form with a list of all pilot sites to monitor the completeness of monthly reporting. Recording dates of reports received will allow the monitoring of delays and prompt contact with zonal health departments.

3. 2. KEY INDICATORS

From the morbidity and mortality data a number of key indicators can be calculated. The indicators included in the pilot information system are:

- **Incidence rates**
- **Proportional morbidity**
- **Mortality rates**
- **Proportional mortality**
- **Case fatality rate.**

3. 2.1. Incidence rate:

INCIDENCE = NUMBER OF NEW CASES OF A DISEASE

Incidence tells us how rapidly people are getting a disease. To know the incidence ***rate,*** we have to obtain data on the number of new cases of a disease in a particular area, during a specified period of time – ***the numerator*** – and the population at risk of getting that disease in the same area and period of time – ***the denominator***. The rate is usually expressed per thousand of the population. The incidence rate is therefore:

$$\frac{\textbf{Number of new cases of a disease in an area in a specified period of time}}{\textbf{Total number of people at risk in the area in the same period of time}} \times 1000$$

Hence, if in one year, in an area of 7.000 people we have 23 new cases of tuberculosis:

$$\text{Incidence of tuberculosis} = \frac{23}{7000} \times 1000 = 3{,}3 \text{ per thousand}$$

Incidence rates are the usual method whereby disease frequency in different populations is compared. Before making such comparisons the rates are usually standardised, to allow for the differing age/sex structure of populations. Unstandardized rates are referred to as ***crude rates*** – such as the **Crude Incidence rate.**

Often it is important to be more specific about the population at risk from a particular disease. For example, measles is an important public health problem amongst children under five years of age. So, it is essential to know the rate at which new cases of measles is occurring in the population under five years of age, rather than in the whole population that includes age groups less frequently affected by the illness.

Hence, we can calculate the **Under 5 Incidence Rate** for any disease that is an important public health risk to the under 5 population.

$$\textbf{Under 5 Incidence rate} = \frac{\textbf{Number of under 5 new cases of a disease}}{\textbf{Under 5 Woreda population}} \times 1000$$

The disease data will be registered in outpatient and in-patient registers and collated on weekly report forms for the site, zone or region. However, the denominator is obtained from population data usually derived from the census.

A CENSUS IS A COUNT OF THE PEOPLE IN A COUNTRY, THEIR AGE, SEX, OCCUPATION, EDUCATIONAL STATUS, AND LIVING ENVIRONMENT.

When you work in a health station or health centre, the population is often described as the "catchment population" - the population which that facility is supposed to serve. So, rates are calculated for that population. If you work in the woreda health office, the population refers to the whole of the woreda and is called the "Service Area".

If we want to calculate the under-five incidence rate for a certain disease, as above, then we need to know how many under 5 children there are in the population. We can estimate the number from the census data that give a breakdown of the total population in age groups and the percentage represented by each group. From the 1994 census in Ethiopia, the percentage of children under five years of age (or 0-4 years) is fifteen percent (15%).

It is important to know the percentage of children under five years of age, and certain other sections of the population, not only for the purpose of calculating mortality and morbidity rates, but also because certain health programmes are specifically targeted for those groups. For example, children of 0-11 months are the main target group that need to be vaccinated against, tuberculosis, polio, diphtheria, tetanus, whooping cough and measles (i.e. the six potentially epidemic diseases). The following are data from the 1994 census in Ethiopia that will be used during the workshop:

a.	Children under 1 year	- 2.7% of total population
b.	Children under 5 years	- 14.69% " "
c.	Women 15-49 years	- 23.75% " "
d.	Expected number of pregnancies	- 3% " "
e.	Expected number of births	- 3% " "
f.	Number of persons per household	- 4.8 persons

For example, a woreda that has a population of 150,000 will have:

4050 children under 1 year (150,000 x 2.7% i.e 150,000 x 2.7/100)
24,000 children under 5 years (150,000 x 14.69%)
34,500 women 15-49 years (150,000 x 23.75%).

3. 2.2. Proportional Morbidity

Apart from having information on the incidence of diseases, we need to know which diseases are most commonly diagnosed at the health facilities in relation to all new cases diagnosed – i.e. the proportion of patients with specified diseases.

$$\textbf{Proportional Morbidity} = \frac{\textbf{Number of new cases of a specific disease}}{\textbf{Total number of new cases of all diseases}} \times 100$$

The denominator for this calculation is the **"Total number of new cases of all diseases"**. It is important, therefore, to remember that the total number of new cases of all diseases is recorded on the new report form even though not all diagnoses are collated on that form.

If, for example, during one month, 65 new cases of pneumonia are registered at a health centre outpatient department and the total number of new cases of all diseases was 1,245, the proportional morbidity of pneumonia would be:

$$\frac{65}{1245} \times 100 = 5.2\%$$

As with the incidence rate calculated above, we can also calculate the **under 5 proportional morbidity rate.** To do this we have to collate the data on new cases of a disease diagnosed in children under 5 years of age as the numerator, and the total number of new cases of all diseases diagnosed in children under 5 years of age, i.e.:

$$\textbf{Under 5 proportional Morbidity} = \frac{\textbf{Number of under 5 years new cases of a disease}}{\textbf{Number of under 5 years new cases of all diseases}} \times 100$$

3. 2.3. Mortality Rates:

In a similar way to morbidity rates, mortality rates can be calculated where data are available on deaths. The rate of total deaths in the population of a given area over a one year period can be calculated as the **Crude Mortality Rate**, or total number of deaths under 5 years in the under 5 population of the area- the **Under 5 Mortality rate.**

Proportional Mortality can also be calculated using the number of deaths from a disease as the numerator and the data on total number of deaths as the denominator. If the proportional mortality rate is to be calculated for the under 5 age group, then once again, the data in the numerator and the denominator must be specific to that age group only.
(Each formula for calculating these rates can be found in Appendix 2)

When diseases occur in a population they may cause a high death rate. This can happen when epidemics occur, for example, like cholera. In this situation we need to know the percentage of people dying from a disease amongst all patients with the disease – **the Case Fatality Rate**:

$$\textbf{Case Fatality Rate} = \frac{\textbf{Number of deaths from a disease}}{\textbf{Total number of new cases of the same disease}} \times 100$$

Hence, if 48 people died from cholera and the total number of new cases of cholera was 124, the case fatality rate would be:

$$\frac{48}{124} \times 100 = 38.7\%$$

DAY 2/SESSION 4

SURVEILLANCE OF MAJOR COMMUNICABLE DISEASES

Presentation, interpretation and utilisation of information

4. 1. Introduction – using indicators:

Several things need to be done before indicators can be used for monitoring, surveillance or evaluation. It is convenient to break these into seven steps:

1. *Collection* of information through monthly reports, supervisory visits, census, administrative records etc.
2. *Selection* of information, particularly the definition of indicators to monitor or evaluate health services;
3. *Calculation* to obtain monthly or quarterly totals and derive values of indicators for particular health facilities and geographical areas;
4. *Inspection* of information – making comparisons with objectives, between health facilities, across time and of several indicators;
5. *Interpretation* – recognising problems and successes in delivering services, explaining why they occur and what actions can be taken to improve the situation;
6. *Prioritisation* – of all those problems that are apparent, selecting those that are most important and for which action can be taken;
7. *Taking action* – making plans, further enquiries, providing feedback – and then again monitoring the action taken.

So far, we have considered the collection and selection of information and calculation of some indicators. The process of inspection can be done when we have the results of our calculations, but this process - and interpretation - is aided considerably if we present information in tables or graphs.

4. 2. Ways of presenting information:

Presentation consists of organising information in tables and/or graphs. Tables are the essential means of presenting an organised set of analysed data, particularly numerical or quantitative data. Figures, graphs and maps are also frequently used because they can present visual information much more clearly than tables, for example when we want to show comparisons, patterns or time trends.

In this session we are going to consider only the graphs most frequently used for presenting information from the routine health information system:

- Line graphs, including cumulative frequency graphs, and
- Bar charts.

There are some important points about using graphs, as follows:

a) The title. Titles should always be concise and self-explanatory, expressing clearly all the information that is being presented – including what the graph shows, the place and the period covered. For example, "Number of new cases of TB in Bonke woreda 1980-1989".
b) The axes. The axes of graphs and diagrams should be properly defined and clearly labelled with their scales. The vertical axis of a graph is known as the Y-axis, while the horizontal axis is known as the X-axis. The horizontal axis indicates the groups of measurement, or the event or phenomenon being measured – such as a disease, - and the vertical axis the frequency or number of times the phenomenon is observed.

   The point where the two axes meet has a value of zero (0) both for the count and the event/phenomena.

c) The legend. Keys or labels are necessary in graphs with more than one line, i.e. when information on more than one group is presented. The labels identify the different groups being presented for comparison.
d) Footnotes. Footnotes are used to indicate the source of the original information, or additional detail that helps the reader to understand the graph.

Line graphs:

These are the most commonly used, particularly for showing numerical data such as deliveries per month, percentage of children immunised per year or number of new cases per month of a disease.

How to draw a straight-line frequency graph:

1. Draw the horizontal axis (the X-axis). Mark off the scale using equal units. Use the mid-point of each interval to represent all measurements lying within that interval.
2. Mark off the vertical axis to show the frequency, commonly as a number, percentage or rate.
3. For each class of the grouped data mark a point where the vertical (frequency) and the horizontal (scale) values intersect or cross.
4. Join the marked points with straight lines. The lines can be extended beyond the first and last classes to touch the X-axis. This kind of graph is called a frequency polygon (Demonstrate how to draw a frequency polygon).

No special knowledge is required to be able to interpret the graph on its own, Simply, a line that is ascending indicates an increase in the phenomenon being studied, and a line that descends, indicates a decrease in that phenomenon. However, the interpretation of the situation represented by the graph requires other knowledge and information, as the purpose of the graph is merely to help analysis.

Cumulative frequency graph

This graph expresses a cumulative distribution, often expressed as total numbers or as a percentage. This is a useful graph for showing progress in implementing a planned activity, such as immunisations.

Since the frequencies are progressively accumulated, that is, they always increase (or at least remain constant) over time, the cumulative frequency graph never dips downwards. If no occurrences are added to the cumulative frequency over a time interval, the line merely flattens out to give a plateau effect.

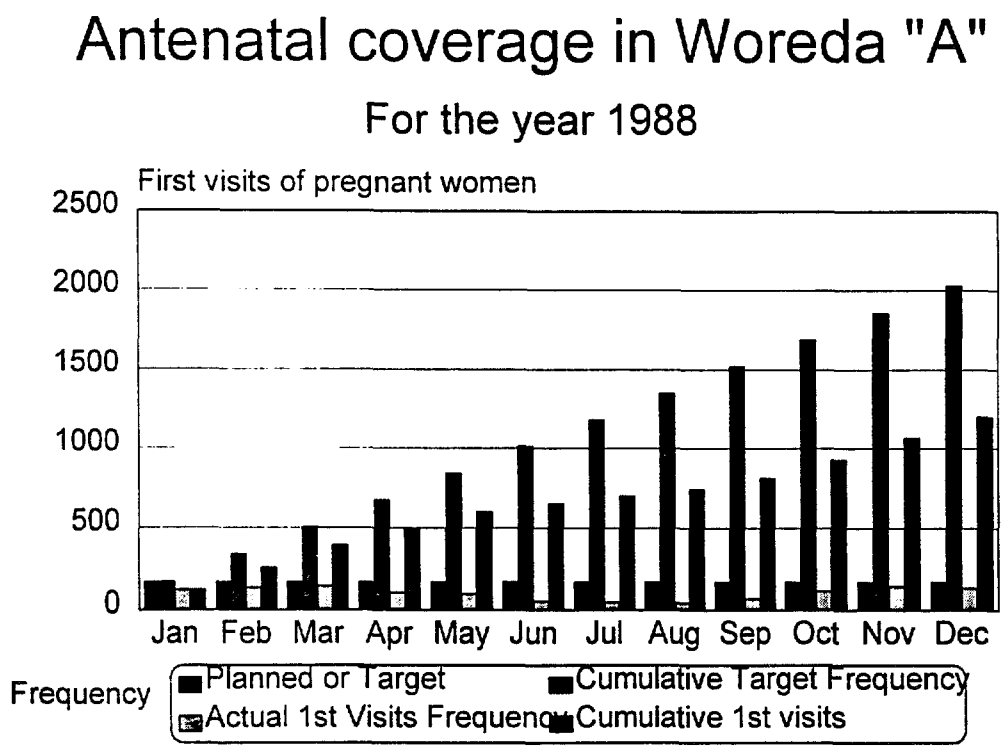
How to draw a cumulative frequency graph:

- Before drawing a cumulative frequency graph it is best to organise data in a cumulative frequency table. This is a table in which figures in each class are added to all the frequencies in all the preceding classes – this type of graph will be practised in Session 5 and therefore the cumulative frequency table will be explained in Session 5).
- For each class, plot the cumulative frequency at the ***end*** of the class interval on the horizontal axis.
- Join the points with the straight lines to produce the cumulative frequency graph.

(Demonstrate how to draw a cumulative frequency graph)

Bar Charts

Bar charts are used to compare how common events are in different groups. In bar charts we are dealing with information that is counted in named groups, such as number of household members, types of diseases, method of contraception used, etc. The bars are not joined together, but are separated by a space (See figure below – Antenatal Coverage in Woreda "A"). Demonstrate how to draw a simple bar chart.



Pilot information system workshop; Sample data: all data as

When two or more distributions involving descriptive variables need to be compared, a multiple bar chart gives a visual comparison of the two distributions.

4. 3. Inspection and Interpretation – some general points

Comparing Indicators:

Indicators often have very little meaning when looked at in isolation. Rather they need to be put into perspective by comparing with other figures. Four types of comparison are of interest:

With targets – to determine what aspects of health services are going according to plan and those that are not progressing well:

Between areas or health facilities – to determine where service provision is adequate and where problems are being faced;

Across time – to see if there have been any changes in health status or service provision:

Against other indicators – a better understanding of a situation can be gained by looking at a variety of indicators – from within the health sector, and from other sectors where appropriate.

It is important to make these comparisons as quickly and conveniently as possible. Therefore clear presentation of information is crucial.

Interpreting indicators:

Interpretation involves:

- identifying strengths and weaknesses of health service delivery;
- suggesting reasons why these occur;
- considering what actions can be taken to improve the situation.

When identifying strengths and weaknesses of health service delivery it is helpful to consider four questions:

Are particular programme areas experiencing problems or doing well?

Are particular health facilities or geographical areas experiencing problems or doing well?

Have there been important changes in the values of indicators?

Do some health facilities have unusually good or poor performance for a few indicators?

In essence, interpretation consists of identifying different factors that have contributed to causing a particular situation. The information available from the routine health information system has to be used together with other formal, semi-formal and informal sources of information in order to more fully explain often complex situations.

4.4. Morbidity/Mortality Rates – Interpretation

When the value of an indicator has been collected over a period of time we can use the information to investigate whether things are changing in any systematic way, whether they are generally steady or whether they are less predictable and erratic.

Identifying trends and changes:

There are a number of reasons why such changes occur. Some diseases (such as malaria) will rise and fall with the seasons. In other cases a gradual, or sudden increase may indicate the onset of an outbreak. Or the change in the pattern of a disease may be the (planned or unplanned) consequence of a change in management procedures; or it may simply be the result of an improvement in data-recording methods, producing more accuracy.

Somechanges are short-term and the pattern may soon return to normal; others persist or gradually grow larger and larger or smaller and smaller. We can only know which situation we are in when we have been monitoring the values over a period of time.

The process of understanding what is going on can often be assisted by plotting disease data in a line graph from month to month (or week to week).

When interpreting a line graph, you are looking for any sudden increases or decreases in the current month's data point compared to the previous months (a sudden rise or fall in the line). When this occurs, you need to investigate what caused this to happen and if it requires corrective action or if it is a sign of programme success.

You will also look for trends. A trend means the general direction of an event over a period of time. For example, the number of measles cases reported has dropped each month for the last four months. This may be due to a new immunisation programme. What are some other causes for this drop?

Trends may be repeated each year. For example, the number of cases of malaria may show peaks in May and July with a steady rise beginning in August that peaks in October and declines thereafter. There is a "*cycle*" to malaria cases.

Remember to be on guard against an individual month's high or low reading. This may be the result of a mistake in data recording, or due to circumstances which are unique to that particular reading - for example, the previous month's data may have been delayed and then carried over into the current month. Plotting data on a line graph may be a helpful way of checking the performance of reporting procedures.

In summary, some initial questions to help interpret the information presented in a line graph include:

- Is this month's data point very different from last month's. Is this month's data point drastically different from the past 3 or 4 months?
- Are the lines consistently going up or down over the last several months (showing a trend)? In what direction?
- Is the direction of the line the same as this time last year (showing a cycle?).
- Could any of the patterns you see be a result of a new programme or some problem?

- Are you surprised by the great number of events or cases? How is it different from what you expected?

4. 5. Utilisation – some general points:

The purpose of analysing the data is to make informed decisions on the prevention and control of health problems. The main uses of the information are:

- To assist in planning health programmes by showing which health and disease problems are significant and therefore worthy of specific intervention;

- To detect and investigate health problems and initiate remedial action;

- To monitor the implementation and effectiveness of a specific control programme by comparing the extent of the problem before and after the implementation of the programme;

- To identify high risk groups (e.g. by age, gender, occupation); geographical areas where a problem is common, and variations over time, and therefore effectively targeting the population most affected by the problem;

- To identify and monitor risk factors – assessment of levels and trends in exposure to factors that affect health.

- To identify epidemics and ensure that effective control measures are taken.

- To communicate effectively with decision-makers and the public.

4. 6. Communicating and Disseminating information

The most important factor in disease surveillance – as with all health information - is the timely use of the information, therefore good and speedy communication and feedback to the people responsible for reporting the diseases is required. As already mentioned there are recognised steps for the transmission of information within the health sector, i.e:

- A defined flow of information (e.g. Health Centre to Woreda; Woreda health office to Zonal health office etc.);
- established time frames for reporting routine information;
- means of transport for sending information to other levels.

Too often information is not communicated to other people and often not used by the management team at the level at which the information is gathered. At times the information related to one area of health care is not communicated to health staff working in other areas in the same health centre! Thus the full potential of the information is unexploited. Information can be very influential and persuasive and communication of reports and findings could lead to greater support from the community, other levels of the health service and organisations assisting the health sector.

Information can be communicated in three main ways:

- by writing and disseminating full reports;
- through meetings and discussions with local organisations/communities;
- through local and mass media.

At the health facility

To ensure that information is used at the health facility site, a team of health workers should meet after the weekly and monthly data have been collated. The team should be responsible for analysing and interpreting the information and to discuss exceptional cases or circumstances and the action to be taken. Inspection and interpretation of the data and information should also be the means by which to prepare feedback to other health workers at the health facility site or at other levels of the health service.

EXERCISES – SESSIONS 3 AND 4

SESSION 3:

1. a) The population of Alaba Woreda in 1989 is estimated to be 191,000. At the Alaba Health Centre during a three-month period of 1989 the following new cases of Malaria were reported :

   May - 449 new cases
   June - 480 new cases
   July - 679 new cases

What was the crude incidence rate per month? How would you interpret the result?

b) At the same health centre in the same period, the number of new cases of Malaria in children less than five years old were:

   May - 18 new cases
   June - 107 new cases
   July - 163 new cases

What was the under 5 incidence rate per month? How would you interpret the result?

2. The total number of new cases reported of pneumonia at a health centre in the month of June 1989 was 114. The total number of new cases of all diseases was 1168.

Calculate the proportional morbidity of pneumonia. How would you interpret the result?

3. Below are the data on new cases of diseases in children less than 5 years of age diagnosed at a health centre during one month:

Bacillary Dysentery	10
Other Diarrhoeas	38
Malaria	111
Pneumonia	39
Measles	10
Other new cases	444

Calculate the under-five proportional morbidity for Malaria. How would you interpret the result?

4. a) In a woreda, the population for 1988 was estimated to be 120,000. There were 200 deaths of children under 5 years of age reported in 1988.

What was the under-5 mortality rate? How would you interpret the result?

b) During March of 1988 in the same district 160 new cases of measles were reported. There were forty (40) deaths from measles.

What was the case fatality rate? What action would you take on the basis of the result?

EXERCISES – SESSION 3(CONT.)

c) During March the total number of deaths reported was 580.

Calculate the proportional mortality of measles. What action would you take on the basis of the result?

EXERCISES -SESSION 4:

Below are the data on new cases of measles and deaths due to measles in Woreda "B" during 1988

MONTH	No. NEW CASES	DEATHS
Jan	24	4
Feb	56	12
Mar	49	9
Apr	32	5
May	21	2
Jun	26	0
Jul	7	0
Aug	2	0
Sep	0	0
Oct	0	0
Nov	1	0
Dec	5	0

a) Draw a line graph to present the new cases and deaths of measles.
b) Draw a bar chart to present the same data.
c) How would you interpret the information in the graphs?
d) How would you utilise the information?
e) Who would you communicate the results to?

DAY 3/SESSION 5

HEALTH SERVICE DELIVERY
MATERNAL AND CHILD HEALTH

Antenatal clinic attendance – TT immunisation – Deliveries & New-births

5.1.Health Service Delivery Data Collection Instruments

The pilot site. health service delivery data can be found on the reverse side of the morbidity-mortality report form. Data on the following:

- **antenatal clinic attendance: first visits and all subsequent visits,**
- **number of pregnant women who have received at least TT2,**
- **number of normal deliveries at the health facility site,**
- **number of abnormal deliveries amongst the deliveries conducted at the site,**
- **number of delivery referrals,**
- **number of stillbirths, and**
- **number of live born babies with birthweight less than 2500 grams (birthweight < 2500gms)**

are to be collated in the three tables at the top of the report form.

Some minor modifications have been made to the reporting format:

1. Antenatal attendance – all second and subsequent visits should be grouped under one category: ***Re-attendants***
2. Deliveries – the number of deliveries referred to a higher level of the health service should be collated from health site records and reported in the category: ***Delivery referrals.***
3. New-born – There are only two categories in the table related to new-births: ***number of stillbirths*** and ***number of live-born infants weighing less than 2500gms (<2500gms)***. The number of live births of normal weight is not requested.

Data Accuracy:

Registers in the antenatal clinic and maternity units are the primary source of the data to be reported from this area of health service delivery. All data items requested in the registers should be filled in correctly and legibly. Maternal and child health personnel should be aware of correct definitions for the data to be registered.

Frequency of reporting:

Health service delivery data are to be collated and reported monthly.

5.2 KEY INDICATORS

Several indicators can be calculated using the data obtained from the MCH report form that can provide crucial information on the health of mothers and their children, as well as the extent to which health services are meeting particular needs of these two population groups. These indicators are:

- **Antenatal coverage**
- **Delivery coverage**
- **Proportion of abnormal deliveries**
- **Proportion of referred deliveries**
- **Still birth rate**
- **Proportion of live births with low birth weight.**

5.2.1. Antenatal coverage:

Target Group, planned activities and activities achieved

As already mentioned, a "***target group***" is used to describe a population group for which a certain type of health service is provided. For antenatal services the target group are pregnant women. From the census data we know that this target group comprises 3% of the population – "***Expected number of pregnancies***". So, we can calculate the total number of women requiring ante-natal care from the population data as in the example in Session 3(Day 2).

For example, in a population of 150,000, the expected number of pregnancies will be:

$$150{,}000 \times 3\% = 150{,}000 \times 3/100 = 4500$$

This number (4500) will also be the denominator when we calculate the antenatal coverage rate because this is the number of women eligible for antenatal care. We monitor "coverage" as we need to know what proportion of women who are the target of antenatal care actually used the service. So coverage is defined as a measurement of ***utilisation*** of the service – indicating access to a service.

The "first visit" a woman makes to the antenatal clinic during her pregnancy indicates the initial contact made by one of the target group to this health service. The number of antenatal "first visits" will, therefore, be the numerator in our formula for calculating the antenatal coverage rate:

$$\textbf{Antenatal Coverage:} \quad \frac{\textbf{Number of antenatal first visits}}{\textbf{Expected number of pregnancies}} \times 100$$

Hence, if, in our example above, 1800 women of the target group of 4500 are registered as "first visits", the antenatal coverage in this area would be:

$$\frac{1800}{4500} \times 100 = 40\%$$

Ideally, we would like all women to receive antenatal care during their pregnancy, but few health services can provide this service for 100% of the target group. We therefore have to plan – and set an objective – for the percentage of the group for which we consider we have

sufficient resources to cover (provide a service for) – human and financial resources, health facilities or outreach, transport etc. We also need to take into consideration geographical and seasonal access to services and the acceptability of the service to the target group.

On the basis of the resources we have available, and reviewing the activities we were able to achieve in the previous year, we try to work towards increasing the activities in the service for the current year. If we have sufficient resources, then, following our example above, we may plan to increase coverage of the target group from 40% to 45% in the current year. This will mean that we have to increase the number of antenatal first visits from 1800 to 2025 (4500 x 45%). These will be our ***planned activities***, or ***objective***.

Throughout the year we can now monitor the extent to which we are meeting our objective for the service, as well as coverage of the target group as a whole – i.e. monitor the ***activities achieved*** or carried out. The total of 2025 first visits in our plan is for the whole year, so per month our plan would be:

$$\frac{\text{2025 (first visits per year)}}{\text{12 (months per year)}} = \text{169 first visits per month.}$$

Monitoring antenatal clinic attendance:

From the data on first visits we can now monitor coverage in relation to the target group and to our plan for the service. We can keep track of how well, or badly, we are faring by regularly collating the monthly data and presenting our analysis in tables and graphs. The most common way of keeping track of progress towards our planned objective is to organise the data in a cumulative frequency table and/or graph (See Session 4 – Day 2: Cumulative Frequency Graph). Using the number in our plan above the following table could be constructed, for example, for one year:

Table 1: Cumulative freq. of Plan of Antenatal coverage in Woreda "A" during 1988

Month	Plan(Freq.)	Cum. Freq. Of Plan	1st Visits (Freq.)	Cum. Freq. Of 1st Visits	Relative Cum. Freq. (%)
Jan.	169	168	120	120	71%
Feb.	169	338	134	254	75%
Mar.	169	507	142	396	78%
Apr.	169	676	105	501	74%
May	169	845	98	599	71%
Jun.	169	1014	54	653	64%
Jul.	169	1183	47	700	59%
Aug.	169	1352	43	743	55%
Sep.	169	1521	69	812	53%
Oct.	169	1690	115	927	55%
Nov.	169	1859	143	1070	58%
Dec.	169	2028	132	1202	59%
Total	2028	2028	1202	1202	59%

The target group, planned activities and the extent to which the plan was achieved, can all be presented in a cumulative frequency graph. Presentation of information in this type of graph will again be practised in the exercises during this session.

In Table 1 we can see that our total of expected first visits was 2028 (cumulative frequency - Plan) and that by the end of the year the total number of first visits was 1202 which represents 59% of the planned activities. Can we interpret this as good or bad? How does the achievement of the plan compare to coverage of the target group?

The first and last quarters of the year show the best results in terms of attendance per month although it is obvious that the expected attendance was never reached. Attendance fell considerably from May to September and gradually increased from October - December. How can you account for this – interpret the result?

General points on interpretation of programme coverage and utilisation

The following table presents a "checklist" of possible reasons for changes in coverage of differing services and therefore questions that could be asked when inspecting the information on coverage. What other reasons could you add?

Trend	Possible interpretation	Possible actions to take
Increasing coverage	Outreach programmes more successful, IE&C activities are running well; Clients pleased with quality of the services; Community aware that services are well stocked with drugs, vaccines etc.	Encourage outreach workers to continue good work; Motivate staff to continue providing high quality services; Ensure that stocks are adjusted to keep up with increased demand.
Decreasing coverage	Services closed for holidays or staff illness; staff untrained in certain types of services(e.g. IUD insertion); Ineffective patient/client education. Community unhappy with quality of services; Shortage of supplies; Competition from other better supplied providers in the area; Seasonal variations – people can't attend clinics because they are working in the fields, or rains are heavy etc.	Work with staff to ensure that health services are continually staffed. Increase level of supervision in facilities where service quality appears low. Improve logistics system and financial management to enable facilities to stay better supplied. See if clinic hours or outreach can be changed to make services more convenient to the community.

Source: Management Sciences for Health

Don't forget to check the original data if there are unexpected changes in coverage – that is:

- are the data complete and correct?
- Are you using the correct population data?
- Are the data affected by use of the service by people from another area?
- Has there been increased immigration into the area or emigration from the area?

Who do you need to communicate your findings to?

5. 2.2. Antenatal re-attendance and TT2

Coverage of antenatal care only gives information about one visit made to the antenatal clinic. It is also important to monitor the average number of visits by antenatal patients and the proportion of pregnant women who received at least TT2.

To calculate the ***average number of visits by antenatal patients,*** use the formula:

$$\frac{\textbf{Number of new antenatal attenders + No. of re-attenders}}{\textbf{Number of new-attenders}}$$

Ideally, we would like women to attend the antenatal clinic several times during their pregnancy, but as this is rarely the case in many areas then, if there is no outreach service, they would need to attend at least twice during the pregnancy to have received two doses of TT.

To calculate ***the proportion of pregnant women who received at least TT2*** use the following formula:

$$\frac{\textbf{Number of pregnant women who received at least 2 doses of TT}}{\textbf{Expected number of pregnant women in the catchment area}} \times 100$$

5.3. Deliveries and New Births

Delivery coverage:

Delivery coverage refers to the deliveries that take place in health institutions. We can plan for, and monitor, coverage of deliveries in health institutions in a similar way to that outlined above for antenatal coverage. Use the following formula to calculate delivery coverage:

$$\textbf{Delivery coverage:} \quad \frac{\textbf{Number of deliveries at the health institution}}{\textbf{Expected number of deliveries}} \times 100$$

The expected number of deliveries – the denominator in the above formula - is 3% of the total population.

In addition, we can monitor what is happening within the maternity service by other indicators (See Appendix II for each formula to calculate the indicators), such as:

- **the proportion of abnormal deliveries conducted amongst total deliveries at the health institution;**
- **the proportion of referred deliveries amongst the total labour attended at the health institution**
- **the stillbirth rate.**

The proportion of abnormal deliveries conducted at the health institution will help managers decide what resources are required at the institution. A high proportion may necessitate supervision visits to find out what type of abnormalities are occurring, whether high risk cases are being referred early enough for the patient to travel to a higher level of the health

service, or if the referral system is functioning. This last aspect can also be monitored by analysing the proportion of referred deliveries.

Some women may arrive too late in the labour to be referred, or there may not be adequate, or any, transport to transfer the patient. It may be that maternity ward staff is not adequately trained to detect when complications occur.

It may be difficult to individualise the factors that contribute to a high still birth rate. These may include:

- fetal abnormalities
- pregnancy complications
- mother's ill-health
- complications during delivery.

When assessing the quality of the care given during labour it would be useful to know what proportion of stillbirths had had a positive fetal heart rate recorded on admission to the health institution. This could be investigated during supervision visits if there is a high stillbirth rate, to see whether the mother had arrived in time for health staff to intervene or whether care given had been of a good standard.

Low Birth Weight

Low birth weight is an important indicator of a mother's health as well as an indication of risk that an infant of low birth weight may face in the early years of life. Calculate this indicator using the following formula:

$$\textbf{Proportion of live births With low birth weight} \quad \frac{\textbf{Number of live births <2500gms}}{\textbf{Total number of live births}} \times 100$$

What may be the reasons for a high proportion of live births with low birth weight?
Who would you communicate your results to once you have identified the possible factors contributing to low birth weight?

Don't forget to ensure that the data are correct. For example:

- Are the scales for weighing the newborn correctly calibrated?
- Are only data on live births included in the numerator and denominator?
- Are only infants weighing less than 2500gms included in the data?

SESSION 5 - EXERCISES

1. The population of Alaba woreda is 191,000 in 1988. Calculate the number in the following target groups:

   a) the expected number of pregnancies
   b) the expected number of deliveries
   c) the number of women age 15-49 years.

2. The data below are the number of first visits to ante-natal clinics in Alaba woreda during a three month period and the number of deliveries conducted at health institutions:

MONTH	ANTENATAL 1ST VISITS	DELIVERIES
May	322	27
June	261	23
July	252	24

Using the figures for the target groups from question 1:
a) calculate the antenatal coverage for each of the above three months.
b) calculate the delivery coverage for each of the above three months.
How would you interpret these results?

c) During the month of July 5 deliveries were reported as abnormal deliveries, and 1 woman was referred to hospital during labour. What proportion of deliveries were abnormal, and what proportion were referred deliveries?

3. 1880 pregnant women in the woreda received at least 2 doses of TT in 1988.

What was the proportion of pregnant women who received at least 2 doses of TT? How would you interpret this result?

4. There were a total of 300 deliveries at the health institutions of the woreda during the year. 10 of the deliveries were stillbirths. 36 livebirths weighed less than 2500grams.

a) What was the stillbirth rate during the year?
b) What was the proportion of livebirths with low birth weight during the year?
How would you interpret these results?

5. Draw a cumulative frequency graph, plotting the following:

a) the target group: expected number of pregnancies in Alaba woreda
b) the planned target: which is 50% of the target group
c) first visits to the antenatal clinic during the first six months of 1988, which are given below:

JAN	FEB	MAR	APR	MAY	JUN
365	288	304	320	322	261

How would you interpret and utilise the information presented in the graph?
Who would you communicate the results to?

DAY 3-4/SESSIONS 6 & 7

HEALTH SERVICE DELIVERY
MATERNAL AND CHILD HEALTH

<1 yr Vaccination- Growth Monitoring – Family Planning

6.1. Health Service Delivery Data Collection Instruments

The remaining MCH data in the category "Health service Delivery" - <1 year vaccination, growth monitoring and family planning –can also be found on the reverse side of the mortality-morbidity report. Data on the following are to be collated:

In the table titled **"Growth Monitoring"**:

- **Number of children under 5 years of age (<5 yrs) weighed**
- **Number of children under 5 years less than 80% (<80%) Weight for Age**

The table on the new pilot form does not include any category for weight-for-age by first or repeat visits, or for data on children less than 70% weight for age. Therefore the numbers weighed and those less than 80% weight for age, represent all children under 5 years of age that are weighed, whether attending for a first or repeat visit.

In the table titled "**Vaccinations**":

- **Number of children under 1 year (<1 yr) that have received DPT 3**
- **Number of children under 1 year (<1 yr) who have been fully vaccinated**

Children under one year who are fully vaccinated will have received BCG, DPT 1, 2, and 3 and Measles vaccinations, therefore no data are required on individual doses of these vaccinations other than the two categories listed, or on other age groups.

In the table titled **"Family Planning"**:

- **Number of new acceptors per type of contraceptive method (new acceptors refers to first visits to the family planning service)**
- **Number of continuing acceptors per type of contraceptive methods (2nd or more visits within 1 year)**

In the new pilot form, there is no differentiation between "repeat visits" and "continuing acceptors", only "new" and "continuing acceptors".

Data Accuracy:

Registers in the MCH clinics and the Road to Health charts are the primary source of the data to be reported from this area of health service delivery. All data items requested in the registers should be filled in correctly and legibly. Maternal and child health personnel should be aware of correct definitions for the data to be registered and collated. Equipment for weighing children should be correctly calibrated and checked regularly.

Frequency of reporting:

Health service delivery data are to be collated and reported monthly.

6.2.KEY INDICATORS

The indicators in these sections refer to services for vaccination and family planning, and also to nutritional status of children less than five years of age.

6.2.1. Growth Monitoring:

Out of the children whose families have access to and utilise the health facilities with MCH services it is possible to calculate the proportion of children under five years who weigh less than 80% of the weight for their age. The following formula is used:

Proportion of children Less than 80% Weight/Age: $\frac{\text{Number of under 5 children less than 80\% W/A}}{\text{Total number of under 5 children weighed}} \times 100$

Note that the denominator refers to the children under five who are weighed and ***not*** the under-five population in the area. Hence, we need to take care when we are interpreting this indicator, as the proportion of children under five who are brought to the MCH clinic may be very small. However, if a high proportion of children seen in the clinic are less than 80% weight for age, and there have been no errors in recording weights, or data, then further study of the situation in the community may be required.

AS ALWAYS, THE INFORMATION GATHERED FROM SERVICES IN HEALTH FACILITIES IS ONLY AN INDICATION OF WHAT MAY BE HAPPENING IN THE COMMUNITY OR AMONGST THOSE WHO DO NOT USE THE SERVICES.

THE INDICATORS SHOULD PROVOKE QUESTIONS AND POSSIBLY FURTHER INVESTIGATION BEFORE TAKING ACTION

6.2.2. Vaccination:

The two indicators that are to be calculated are:

Proportion of children <1 yr Who received DPT 3: $\frac{\text{Number of children <1yr who received DPT3}}{\text{Target pop. <1yr(catchment area of health institution)}} \times 100$

Proportion of children <1 yr Fully vaccinated: $\frac{\text{Number of children <1 yr fully vaccinated}}{\text{Target pop. <1 yr (catchment area of health institution)}} \times 100$

We can plan for, and monitor the vaccination programme for the under 1 year target group in a similar way to that outlined in the session on antenatal services. However, when we are analysing the data using the above indicators we are refering to a) DPT 3, which requires a minimum of 3 visits, and b) fully vaccinated, which requires a minimum of 4 visits. This will be practised in exercises. Review the possible reasons for an increase or decrease in the proportion of children < 1 yr receiving DPT 3 or fully vaccinated. How does the proportion

of children < 1year fully vaccinated, in the woredas in which participants work, compare to the proportion required to interrupt transmission of the immunizable diseases (80% or above)?

Family Planning Coverage:

The Family Planning data are presently aggregated in the following formula:

$$\frac{\textbf{Number of new acceptors}}{\textbf{Number of non-pregnant women 15-49 years of age}} \times 100$$

What are the limitations of this indicator for monitoring the Family Planning Programme?
What are the reasons for such low utilisation of the service in Ethiopia?
How does the achievement of the planned target compare to coverage of the target group in the woredas in which participants work?
What action could be taken to increase utilisation that may not be included in the general points in the section on antenatal services and deliveries?

EXERCISES - SESSIONS 6 & 7

1. From the Alaba Woreda population of 191.000. calculate the number of children less than one year of age.

2000 children less than one year of age received DPT3 during 1988. What was the proportion of children less than one year who received DPT3?

1500 children less than 1 year of age were fully vaccinated. What was the proportion of children < 1 year fully vaccinated?

2. Draw a cumulative frequency graph, plotting the following:

a) the < 1 year target group
b) the planned target of 45% of the target group
c) children < 1 year fully vaccinated during the first six months of 1988:

JAN	FEB	MAR	APR	MAY	JUN
120	174	152	204	198	132

How would you interpret and utilise the information in your graph?
Who would you communicate the information to?

3. The following are data on growth monitoring during a period of three months

	Months		
	Jan	Feb	Mar
No of children < 5yrs weighed	164	156	273
No. of < 5yr Weighing less than 80% weight for age	57	32	93

a) What was the proportion of children less than 80% weight for age?
b) How would you interpret and utilise this information?
c) Who would you communicate the information to?

DAY 4/SESSION 8

HEALTH SERVICE MANAGEMENT – RESOURCES

8.1. Introduction

The data to be collated in this part of the pilot site form relate to material and financial resources. The resources are crucial to the effective delivery of health care.

One of the main problems in managing health programmes is the frequent shortage and/or stockouts of medical supplies. repeated malfunctioning of essential equipment and transport, as well as insufficient financial resources. Whilst, there are recognised problems with the adequacy of supplies to health units. there is also frequently inadequate, or no management, of resources that are available. The purpose of regular monitoring of crucial resources is not only to inform higher levels of the health service when supplies are out of stock, but, more importantly to draw attention to the situation at the health site and take action at that level.

However. immediate action does need to be taken at higher levels of the health service when specific shortages or broken equipment/transport are recorded in the monthly report forms.

8.2. Resource data:

The data on resources are categorised under the following headings:

a) **Medical and other supply shortage:** which includes most frequently used drugs; contraceptives. other medical supplies, like, cotton wool, gauze. syringes etc., and non-medical material. like. stationary, charcoal, soap etc.;
b) **Equipment and transport facilities out of order;**
c) **Finances.**

- It is necessary to place a tick in the box at the side of an item in the "medical and other supplies" table if that item is out of stock.

- In the "Equipment and Transport Facilities" table, describe the item out of order and action needed.

- In the "Finances" table collate the following data:

  Total Attendance at the health institution;
  Total patients exempted from user fees;
  Total amount of money collected.

8.3. Monitoring resources:

There are number of areas that need to be monitored:

1. Drugs and medical supplies:

- Which drugs and other supplies are most frequently out of stock and how quickly are these supplies expended following receipt of new supplies?
- Are there rational prescribing practices operating in the health institution – i.e. are only essential drugs prescribed and are they being prescribed correctly in relation to the diagnosis?

Some of the above information can be gathered from the analysis of the routine data, but should also be linked to supervision visits. Use of drugs and supplies should also be compared to disease patterns and trends and attendances in general at the health institution.

2. Transport and Equipment:

Maintenance of transport and equipment should be a regular activity and monitored as part of supervision. Immediate action should be taken if equipment is faulty or out of action.

3. Finances:

The following indicators will be calculated on a monthly basis:

- **average income per patient**
- **proportion of exempted patients**
- **ratio of income per health institution per total recurrent cost.**

These indicators can be calaulated using the following formulae:

Average income per patient:

$$\frac{\textbf{Total amount collected}}{\textbf{Total number of patients treated (total attendance)}}$$

Proportion of patients exempted:

$$\frac{\textbf{Number of patients exempted}}{\textbf{Total number of patients treated (total attendance)}} \times 100$$

Ratio of monthly health Institution income versus Recurrent budget

$$\frac{\textbf{Monthly health institution income}}{\textbf{Recurrent budget per month}}$$

It is important to monitor how much money is collected per patient, the ratio of income to expenditure and the pattern of exemption.

Most health services in most countries are functioning with limited, or even scarce resources, hence it is essential that the resources that are available be managed efficiently.

8.4. Other pilot information system data

Also included in the pilot form is a table for the number of all referrals from the health institution to a higher level of the health service. This number excludes the delivery referrals.

EXERCISE – SESSION 8

In small groups look at the graph of weekly income and exemption from patient payment during a ten-week period at Yirgalem Hospital.

a) How would you interpret this graph?

b) What action would you take?

In plenary, discussion of results of group work.

DAY 5/SESSION 9

SETTING THE INDICATORS IN CONTEXT

9.1. Exercise outline:

The purpose of this session is to examine the indicators calculated in some of the exercises during the workshop(See Indicator Profile below). These are the key indicators to help improve the following:

- surveillance for monitoring major communicable diseases, and
- management of health services and crucial resources.

Throughout the workshop, it has been emphasised that interpretation and utilisation of information cannot be effectively undertaken by examining ("inspecting") indicators:

- in isolation of other indicators, and
- without other knowledge and information of the, for example, health service as a whole, health, and socio-economic, status of the population, the environment in which health services function and in which the "target population" and/or "catchment population" live.

This is the context within which we now have to review the key indicators generated by the pilot information system.

- Participants have been asked to bring health information data and reports with them to the workshop from the woredas in which they work.

- Participants will be divided into groups according to each of the woredas represented.

- The indicators derived from the workshop exercises will serve as a set of "typical" results from analysis of health institution data.

- The group members are the management team and have to discuss:

a) how they would interpret the indicators in the context of other available information from their woreda, and/or compared to values of the same indicators during other times of the year/other years etc. in their area;
b) how they would interpret the indicators based on their information and knowledge of the woreda population and environment;
c) what decisions need to be taken based on the reality of the situation at woreda level, taking into consideration the resources available;
d) to whom and how they would communicate and disseminate the information;

One member of the group should be appointed to note the main points from the discussion to feedback during plenary session.

9.1.1 In plenary: discussion of the following:

- the results of group work:
- the importance of retaining original data and copies of reports, as well as the monitoring of the reception of data at the different levels of the health service;
- maintaining a system of feedback.

9.2. EXERCISE: PROFILE OF INDICATORS

Morbidity – mortality

There has been an outbreak of measles and the case fatality rate was 25%.

The proportional morbidity of pneumonia and malaria in children less than five years of age has been increasing during the year.

Drug supplies have been running out before the next supply has arrived. Mostly the antibiotics and anti-malarials have been in short supply.

Maternal and Child Health

Antenatal coverage of the target group is below 50%, but the percentage of the targeted plan has varied between 92% and 78% during the first six months of the year.

The proportion of women who received TT2 has reached 20% by the middle of the year.

Delivery coverage has continued at around 3% of the expected number of deliveries. During May 12.4% of livebirths weighed less than 2500gms which was higher than previous months but is beginning to decrease in June and July.

The stillbirth rate was around 3% in the first quarter of the year, but has risen to 5% at the end of the second quarter. The percentage of referred deliveries has remained at 4% each month.

In the immunisation programme the proportion of children less than 1year who received DPT3 is 39% and those fully immunised is 29% at mid-year.

The refrigerator at the Health Centre has not been functioning very well during the first half of the year.

At the MCH clinic, out of the children weighed in the under-five age group the proportion that weighed less than 80% weight for age has varied between 21% and 35%.

9.3.CHECKLIST OF POINTS THAT SHOULD BE RAISED IN THE CASE STUDY

Morbidity – Mortality

- The high fatality rate in the outbreak of measles and the comparison between the outbreak, mortality, and the immunisation programme. The condition of the cold chain.
- The possible nutritional status of children less than five years old.
- Other factors from the woreda data and situation analysis.

- Low drug stocks, particularly antibiotics and antimalarials – possible poor management of stocks – lack of stock control and/or monitoring of disease patterns.

- Possible poor prescribing practices, but need to assess morbidity pattern: proportional morbidity of pneumonia and malaria is rising in children < 5 years – need to check the proportional morbidity of same diseases in other age groups and trend in incidence of malaria and pneumonia in the area. Does the highest incidence occur during the normal cycle, for instance, of malaria? Is it higher than expected? There may be rational use of drugs but increase in incidence of these diseases – and/or others.

- Have there been any population changes, increase in utilisation, cross-zonal utilisation etc. Are the data correct?

Antenatal Coverage/TT2

- Has the planned coverage been realistic?
- What factors in the woreda/work of the health personnel may have contributed to the result?
- Has there been utilisation of the antenatal clinic by women from other zones or catchment areas?
- How does the coverage compare to other years? Other figures – e.g. national figures?
- How is the immunisation programme progressing?

Delivery Coverage

- Does the coverage reflect the national trend?
- How does it compare with other years etc.?
- What facilities exist in the woreda?
- What is women's attitude to delivery at health institutions?
- Are there TBAs in the area?

Low Birth Weight

- Is it recognised that this indicator reflects maternal and child health?
- How does the result compare: with other months/seasons/years, nationally, internationally?
- Are foetal factors given consideration in the interpretation of the result – e.g. prematurity? What are the maternal factors?

- Is the result compared to other indicators – antenatal coverage, delivery coverage, nutritional status etc.?

Stillbirth rate

- What circumstances have led to the rise – more high risk patients delivered – more complications;
- Possible poor quality of care – possible change of staff in the health facility: possibly less qualified;

Immunisation

- How does coverage compare with other time periods?
- What resources are available?
- Are there breakdowns in the supply of vaccines?
- Is the cold-chain well maintained? Are vaccines still potent when children are vaccinated?
- Are comparisons made with disease patterns?

Growth Monitoring

- How does the proportion of < 5 year old children with weight less than 80% weight for age compare with other periods of the year/other years etc.?
- Who is utilising the MCH clinic?
- What other factors and indicators may help interpret this indicator?

What other factors and/or indicators have been considered from participants information about the woreda – from health services, community, other sectors etc.?

What decisions have been taken and action planned on the basis of available resources?

Who has been included in the dissemination of the information?

List of Indicators

I. MORBIDITY AND MORTALITY INDICATORS

A. Morbidity:

Crude Incidence rate:

$$\frac{\text{Number of new cases of a disease}}{\text{Total Woreda population}} \times 1000$$

Under 5 Incidence rate:

$$\frac{\text{Number of under 5 years new cases of a disease}}{\text{Under 5 Woreda population}} \times 1000$$

Proportional morbidity:

$$\frac{\text{Number of new cases of a disease}}{\text{Total number of new cases of all diseases}} \times 100$$

Under 5 proportional morbidity:

$$\frac{\text{Number of under 5 years new cases of a disease}}{\text{Number of under 5 years new cases of all diseases}} \times 100$$

B. Mortality:

Crude Mortality rate:

$$\frac{\text{Total number of deaths}}{\text{Total Woreda population}} \times 100{,}000$$

Under 5 Mortality rate:

$$\frac{\text{Total number of deaths under 5 years}}{\text{Under 5 Woreda population}} \times 100{,}000$$

Case Fatality Rate (CFR):

$$\frac{\text{Number of deaths of a disease}}{\text{Total number of new cases of the same disease}} \times 100$$

Proportional mortality:

$$\frac{\text{Number of deaths of a disease}}{\text{Total number of deaths}} \times 100$$

Under 5 proportional mortality:

$$\frac{\text{Number of under 5 years deaths due to a disease}}{\text{Number of deaths under 5 years of all causes}} \times 100$$

II. HEALTH SERVICE DELIVERY INDICATORS

Antenatal coverage:

$$\frac{\text{Number of antenatal first visits}}{\text{Expected number of pregnancies}} \times 100$$

Delivery coverage:

$$\frac{\text{Number of delivery at the health institution}}{\text{Expected number of pregnancies}} \times 100$$

Proportion of abnormal deliveries:

$$\frac{\text{Number of abnormal deliveries at the health institution}}{\text{Total deliveries at the health institution}} \times 100$$

Proportion of referred deliveries:

$$\frac{\text{Number of referred deliveries}}{\text{Total labour attended at the health institution}} \times 100$$

Still birth rate:

$$\frac{\text{Number of still births}}{\text{Total number of births (live + still)}} \times 100$$

Proportion of live births with low birth weight:

$$\frac{\text{Number of live births} < 2500\text{g}}{\text{Total number of live births}} \times 100$$

Proportion of children less than 80% Weight/Age:

$$\frac{\text{Number of under 5 children less than 80\% W/A}}{\text{Total number of under 5 children weighed}} \times 100$$

Proportion of children < 1 yr who received DPT3:

$$\frac{\text{Number of children} < 1\text{ yr who received DPT3}}{\text{Target population} < 1\text{ yr (catchment area of the health institution)}} \times 100$$

Proportion of children < 1 yr fully vaccinated:

$$\frac{\text{Number of children} < 1\text{ yr fully vaccinated}}{\text{Target population} < 1\text{ yr (catchment area of the health institution)}} \times 100$$

Proportion of pregnant women who received at least TT2:

$$\frac{\text{Number of pregnant women who received at least 2 doses of TT}}{\text{Expected pregnant women in the catchment area}} \times 100$$

Family planning coverage:

$$\frac{\text{Number of new acceptors}}{\text{Number of non-pregnant women 15-49 years of age}} \times 100$$

Proportion of referrals:

$$\frac{\text{Number of patients referred}}{\text{Total new of new cases seen at OPD}} \times 100$$

III. HEALTH SERVICE MANAGEMENT INDICATORS

Average income per patient:

$$\frac{\text{Total amount collected}}{\text{Total number of patients treated (total attendance)}}$$

Proportion of patients exempted:

$$\frac{\text{Number of patients exempted}}{\text{Total number of patients treated (total attendance)}} \times 100$$

Ratio of monthly health institution income/ versus recurrent budget

$$\frac{\text{Monthly health institution income}}{\text{Recurrent budget per month}}$$

Proposed Standard Case Definitions

Cholera:

Clinical definition

Onset of acute watery diarrhoea, usually with vomiting and quickly resulting in dehydration, in a patient older than 5 years.

In an epidemic context: any patient older than 2 years with the same symptoms.

Laboratory criteria for diagnosis

Isolation of *Vibrio Cholerae* 01 from feces (only required to confirm the diagnosis at the beginning of an outbreak and to periodically monitor the outbreak over time).

Bacillary Dysentery (Shigellosis)

Clinical definition

Acute onset of diarrhoea with visible blood in the stool. (blood observed by a health worker).

Laboratory criteria for diagnosis

Isolation of *Shigella dysenteriae* 1 from feces or rectal swabs.

Other Diarrhoea

Clinical defintion

At least three episodes of diarrhoea during 24 hours, without presence of blood.

Malaria

Clinical definition

Fever with headache and sometimes pain in the joints, chills, sweats, without any other apparent infection.

Laboratory criteria for diagnosis

Identification of *Plasmodium* in the blood (thick or thin films)

Pneumonia

Clinical definition

Gradual onset of cough and fever, sometimes with chest pain, with acceleration of respiratory rate > 40 per minute (> 50 per minute for a child under one year of age).

Measles

Clinical definition

Fever with a generalized rash lasting more than 3 days, accompanied by any of the following symptoms: cough, coryza (runny nose) or conjunctivitis.

Poliomyelitis

Clinical definition

Any case of acute flaccid paralysis in a patient less than 15 years of age for which no other cause is apparent.

Laboratory criteria for diagnosis

Isolation of the Poliovirus from stool samples, cerebro-spinal fluid (CSF) or oropharyngeal secretions.

Neonatal Tetanus

Clinical definition

History or normal suck and cry for the first two days of life and between 3 and 28 days of age history of inability to suck followed by stiffness and/or convulsions and often death.

Meningitis (bacterial)

Clinical definition

In adult and children: acute onset of fever, intense headache, vomiting and stiff neck.

In infant: acute onset of fever, vomiting, irritability, bulging fontanelle and hypotonia.

Laboratoy criteria for diagnosis

Turbid CSF at lumbar punction and identification of *Neisseria meningitiditis* Group A or C or identification of *Haemophilus influenzae* or *Streptococcus pneumoniae*.

Note: only *N. meningitidis* is responsible for meningitis epidemics.

Relapsing Fever

Clinical definition

Onset of periods of fever lasting 2-9 days with alternate afebrile periods of 2-4 days. The number of relapses varies from 1 to 10.

Laboratory criteria for diagnosis

Identification of spirochete in fresh blood (*Borrelia recurrentis* in louseborne disease, many different strains in tickborne disease).

Note: only *B. recurrentis* is responsible for epidemics.

Pulmonary Tuberculosis

Clinical definition

Persistent cough of more than three weeks, with fatigue, fever, night sweats and weight loss.

Laboratory criteria for diagnosis

:Demonstration by direct microscopy of acid-fast bacilli (AFB) in stained smears from sputum.

Note: Laboratory investigation depends on local availibility. In case of an epidemic, it is of particular importance to get a laboratory confirmation, especially for the first cases of **cholera** and **bacillary dysentery**. For **meningitis**, each suspected case should have a lumbar punction and the treatment should start immediately if the CSF is turpid or purulent, prior to laboratory results.

SESSION 2 – EXERCISE RESULTS

1. a) 20 + 25 + 35 + 50 = 130

b) District B = 25 cases

$$\frac{25}{130} = 0.19\ (19\%)$$

c) $$\frac{35}{130} = 0.26\ (26\%)$$

d) 20 : 50 or 1 : 25

2. Total Number of people = 500
   VHWs : People = 1 : 500
   Agricultural Workers to people = 2 : 500 or 1 : 250

3. Total patients = 100. 25 attended on Monday
a) Percentage attending on Monday = 25/100 x 100 = 25%
b) Percentage attending the rest of the week = 75%
c) 6 had respiratory infection, 5 had diarrhoea, 1 had respiratory infection and diarrhoea = 12 patients. 100 minus 12 = 88 that had neither respiratory infection nor diarrhoea.

4. 47 full-time staff and 6 part-time staff = 53 in Total
a) Percentage of Part-time staff = 6/53 x 100 = 11.3%
b) Part-time staff : Full-time staff = 6 : 47 or 1 : 7.8

5. Yes, regularly = 4/25 x 100 =16%
   Yes, not regularly = 5/25 x 100 = 20%
   Never used = 16/25 x 100 = 64%

6. Birth rate = 50 per 1000
   Catchment population = 50.000. therefore 2.500 deliveries per year (50 x 50)
   500 deliveries at institution
   Percentage of deliveries at institution: 500/2500 x 100 = 20%

7. Population is 100.000 and growing at 2.5% per year.
   After one year: population + 100.000 x 2.5/100
   = 102,500
   Population of 102.500 and growing at 2.5% per year, after one year = 105,062.5

8. Population: 30,000 Birth rate: 45 per 1000 Death rate: 20 per 1000

No. of births = 45 x 30 = 1350 births
No. of deaths = 20 x30 = 600
1350 minus 600 = 750 more people in 1989
Rate of natural increase = 45 – 20 = 25 per 1000 or 2.5%

SESSION 3 – Exercise results

1a Crude Incidence rate of malaria:

May = 449/191.000 x 1000 = 2.3 per thousand
June = 480/191.000 x 1000 = 2.5 per thousand
July = 679/191.000 x 1000 = 3.5 per thousand

b. < 5 year population = 191.000 x 15%(191.000 x 15/100) = 28650

Under five crude incidence rate of malaria:

May = 18/28650 x 1000 = 0.63 per 1000 or 6.3 per 10.000
Jun. = 107/28650 x 1000 = 3.7 per 1000 or 37 per 10.000
Jul. = 163/28650 x 1000 = 5.7 per 1000 or 57 per 10.000

2. Proprotional morbidity of pneumonia = 114/1168 x 100 = 9.7% (10%)

3. Total of new cases of malaria in children less than 5 years = 652
   New cases of malaria in children less than 5 years = 111
   Under 5 proportional morbidity = 111//652 x 100 = 17%

4. a) Under 5 population = 18.000
   Under 5 mortality rate = 200/18.000 x 100,000 = 1111 per 100,000

   b) Case fatality rate = 40/160 x 100 = 25%

   c) Proportional mortality of measles = 40/580 x 100 = 6.8%

SESSION 5 – Exercise results

1. a) 191,000 x 3% = 5730
   b) 191,000 x 3% = 5730
   c) 191,000 x 23% = 43,930

2. Target group for antenatal service and deliveries per month = 5730/12 = 478 per month

	a) Antenatal Coverage	b) Delivery coverage
May	322/478 x100 = 67%	27/478 x100 = 5.6%
Jun	261/478 x 100 = 55%	23/478 x 100 = 4.8%
Jul	252/478 x 100 = 53%	24/478 x 100 = 5%

c) Proportion of abnormal deliveries = 5/24 x 100 = 20.8% (21%)
Proportion of referred deliveries = 1/25 x 100 = 4%

3. Proportion of women who received at least TT2 = 1880/5730 x 100 = 32.8% (33%)

4. 300 deliveries minus 10 stillbirths = 290 live births

a) Stillbirth rate = 10/300 x 100 = 3.3%
b) Proportion of live births with low birth weight = 36/290 x 100 = 12.4%

5. Target group per year = 5730 = 478 per month
   Plan = 5730 x 45% = 2579 per year and 215 per month

Month	Target group per month	Cum. Freq. Target group	Plan per month	Cum. Freq. Of Plan	1st Visits Freq.	Cum. Freq. 1st Visits
Jan	478	478	215	215	365	365
Feb	478	956	215	430	288	653
Mar	478	1434	215	645	304	957
Apr	478	1912	215	860	320	1277
May	478	2390	215	1075	322	1599
Jun	478	2868	215	1290	261	1860

	Coverage	% of Plan Achieved
Jan	76%	170%
Feb	68%	152%
Mar	67%	148%
Apr	67%	148%
May	67%	148%
Jun	65%	144%

SESSION 6 & 7 – Exercise results

1. Population less than 1 year = 5157

Proportion of children less than 1 year who received DPT3 = 2000/5157 x 100 = 39%

Proportion of children less than 1 year fully vaccinated = 1500/5157 x 100 = 29%

2. Target group = 5157 Planned target = 2321

Month	Target group per month	Cum Freq. Target group	Plan Freq.	Cum. Freq. Of Plan	Freq. <1yr Fully Vaccinated	Cum.Freq. Of fully vaccinated
Jan	430	430	193	193	120	120
Feb	430	860	193	386	174	294
Mar	430	1290	193	579	152	446
Apr	430	1720	193	772	204	650
May	430	2150	193	965	198	848
Jun	430	2580	193	1158	132	980

	Coverage	% of Plan Achieved
Jan	28%	62%
Feb	34%	76%
Mar	35%	77%
Apr	38%	84%
May	39%	88%
Jun	38%	85%

3. Proportion of children less than 80% weight for age:
   Jan.: 57/164 x 100 = 35%
   Feb.: 32/156 x 100 = 21%
   Mar.: 93/273 x 100 = 34%

PILOT HEALTH INFORMATION SYSTEM TRAINING WORKSHOP

FINAL WORKSHOP EVALUATION

This is the final workshop evaluation – an opportunity to look back over the whole of the week and assess whether your knowledge and skills in relation to the H.I.S. have improved, and to give your views on the strengths and weaknesses of the workshop.

Your careful assessment of the workshop will help to plan follow-up and supervision during the implementation phase of the pilot information system.

1. Individually, review each of the learning objectives for the workshop in the table. For each objective place a tick in the box that best describes how far you feel you have progressed in your understanding/increased your knowledge of the HIS and improved your skills in order to carry out the activities related to the HIS.

2. In the space below write what you think were the major strengths and weaknesses of the workshop.

3. What other areas/topics do you think should have been included in the workshop?

4. What areas/topics do you consider to be the most important to include in follow-up and supervision?

FINAL EVALUATION

LEARNING OBJECTIVES	DEGREE OF IMPROVEMENT				
	None at all	A little	Good	Improved a lot	Comment
1. To learn how to improve the flow of information.					
2. To learn how to calculate indicators.					
3. To learn how to achieve an attitudinal change about the HIS.					
4. To understand the problems that may occur if wrong information is gathered/used/dissemin-ated.					
5. To understand how feedback and supervision of the HIS is performed.					
6. To be able to find ways of solving problems of shortage of resources for the HIS.					
7. To learn how to make comparisons between indicators.					
8. To understand how to simplify the HIS.					
9. To understand the relationship between information and decision-making and taking action.					

After completing the table above, a similar table will be displayed on flipcharts around the wall. Participants are asked to place a tick in the same columns on the flipchart that they completed in the individual table. This will give an overall impression of the group's assessment of progress during the week and will be used for plenary discussion.

APPENDIX B
List of Workshop Participants

First Group HMIS Workshop Participants (September 1st-5th)

SIDAMA ZONE

Bogale Neshaw	Family Health Expert	Sidama Zone Health Dept.
Tesehai Kebede	Statistics Clerk	Sidama Zone Health Dept.
Abedayehu Yitna	MCH Coordinator	Bensa Woreda Health Office
Daniel Bora	Statistics Clerk	Bensa Woreda Health Office
Zerihun Asres	OPD Nurse	Bensa Health Center
Tezera Sintayehu	MCH Coordinator	Bensa Health Center
Dereje Yeneneh	Statistics Clerk	Bensa Health Center
Dr. Yewondwosen Tilahun	Obs-Gyn Specialist	Yirgalem Hospital
Matewos Baje	MCH Coordinator	Yirgalem Hospital
Solomon Bogale	OPD Head Nurse	Yirgalem Hospital
Fiseha Zelalem	Statistics Clerk	Yirgalem Hospital
Akililu Yohannes	Planning and Programming.	Dale Woreda Health Office
Mesfin Negash	Statistics Clerk	Yirgalem Health Center
Dr. Endeshaw Mohamed	Health Center Head	Yirgalem Health Center
Sr. Almaz Mamo	MCH Coordinator	Yirgalem Health Center

KAT ZONE

Girma Tsegaye	Head Nurse	Alaba Health Center
Sr. Mulu Fekadu	MCH Coordinator	Alaba Health Center
Haymanot Agegne	Statistics Clerk	Alaba Health Center
Aster Sesso	MCH Coordinator	Alaba Woreda Health Office
Sr. Bekelech Letebo	Family Health Coordinator	KAT Zone Health Office
Engidayehu Hailu	Env. Health Coordinator (statistics)	Alaba Woreda Health Office
Dr. Fitsum Bekele	Health Center Head	Mudula Health Center, Omo Sheleko
Tekeba H/Wold	MCH Coordinator	Mudula Health Center
Tagesech Belachew	Statistics Clerk	Mudula Health Center
Alemtsehay Berhanu	MCH Coordinator	Omo Sheleko Woreda Health Office
Melkame Duguno	Statistics Clerk	Omo Sheleko Woreda Health Office
Tesfiaye Shegute	Asst. data collector Awassa	BASICS/ESHE

APPENDIX C
Summary of Workshop Evaluation

SUMMARY OF PARTICIPANTS' FINAL EVALUATION OF PILOT INFORMATION SYSTEM WORKSHOP SEPTEMBER 1ST – 5TH 1997.

LEARNING OBJECTIVES	DEGREE OF IMPROVEMENT				
	None at all	A little	Good	Improved a lot	Total*
1. To learn how to improve the flow of information.	0 (0%)	0 (0%)	18 (72%)	7 (28%)	25 (100%)
2. To learn how to calculate indicators.	0 (0%)	0 (0%)	10 (38.5%)	16 (61.5%)	26 (100%)
3. To learn how to achieve an attitudinal change about the HIS.	0 (0%)	0 (0%)	19 (68%)	9 (32%)	28 (100%)
4. To understand the problems that may occur if wrong information is gathered/used/dissemin-ated.	0 (0%)	0 (0%)	17 (61%)	11(39%)	28 (100%)
5. To understand how feedback and supervision of the HIS is performed.	0 (0%)	0 (0%)	23 (88%)	3 (12%)	26 (100%)
6. To be able to find ways of solving problems of shortage of resources for the HIS.	2 (7.4%)	6 (22.2%)	15 (55.5%)	4 (15%)	27 (100%)
7. To learn how to make comparisons between indicators.	0 (0%)	0 (0%)	21 (78%)	6 (22%)	27 (100%)
8. To understand how to simplify the HIS.	0 (0%)	9 (36%)	15 (60%)	1 (4%)	25(100%)
9. To understand the relationship between information and decision-making and taking action.	0 (0%)	1 (4%)	18 (69%)	7 (27%)	26 (100%)

* Some categories were not completed by all 28 participants.

The learning objectives were identified and established by participants at the start of the workshop. In the final evaluation, participants were asked to assess the degree to which they felt their skills and knowledge had improved during the five-day training.

It can be seen from the table that the majority of participants considered they had made either "Good" progress, or had improved "a lot" in relation to the objectives – most classified their progress as "good", which was an assessment comparable to the opinion of the workshop facilitators.

Only a few of the participants responded to the request to comment on strengths and weaknesses of the workshop, other topics that could have been included or the areas to be given priority for follow-up and supervision.

Of the few comments made, these focused on the following:

- more time to be allocated for the exercises and feedback from the exercises and less time spent on explanations by the facilitators;

- less time should be spent on how to calculate the indicators in the second half of the workshop and more group work and discussion on interpretation and utilisation of the information – it was felt that there was repetition of explanations about indicators that included similar calculations to those in the earlier part of the workshop;

- more group work centred on the participants' woreda data.

- One person felt there should have been more discussion on how decisions had been made regarding the design of the new report format.

APPENDIX D
Morbidity-Mortality Pilot Site Form

SNNPR

Pilot sentinel information system for the surveillance of major communicable diseases and key health management indicators

Name of Health Institution: _____

Health Institution Form

Region: _____ **Zone:** _____ **Woreda:** _____

Week/Month beginning on: _____ **Ending on:** _____

Date of reporting: _____ **Name of reporter:** _____

I. MORBIDITY - MORTALITY

Diseases	0 - 4 years		5 - 14 years		15 years and older		Total	
	New cases	Deaths	New cases	Deaths	New Cases	Deaths	New Cases	Deaths
Cholera								
Bacillary Dysentery								
Other Diarrhoea								
Malaria								
Pneumonia								
Measles								
Poliomyelitis								
Neonatal Tetanus								
Meningitis								
Relapsing Fever								
Yellow Fever								
Tuberculosis								
(*)								
(*)								
All other diseases (**)								
Total (***)								

Total Reattendance visits	

(*) Use blank spaces for any other diseases with significant number of cases reported

(**) Number of cases of all other diseases combined not listed earlier

(***) Summing up of all cases reported during the month, both listed as well as all other disease

APPENDIX E
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