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HEALTH INFORMATION SYSTEMS DEVELOPMENT AND STRENGTHENING

Guidance on needs assessment for national health information systems development

World Health Organization
Department of Organization of Health Services Delivery
Evidence and Information for Policy Cluster
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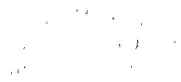

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Preface

One of the objectives of the World Health Organization is to support countries in their efforts to develop health systems that ensure the delivery of effective health services and care for the entire population, based on the primary health care approach. Among the areas emphasised by the Organization is the establishment of national health information systems that enable monitoring of health service. Health information systems have to be periodically assessed to ensure that they meet the needs of the health system.

The development of the guidance given in this document has evolved through years of responding to Member States' requests support in assessing their health information systems as part of the health systems development process. Lessons learnt from one country were applied, with adaptation, in subsequent countries. The guidance provided is therefore a synthesis of what the people working with national health information systems have found to be the best way of undertaking an HIS needs assessment. New lessons will be learnt as the guidance given in this document are applied by more countries and those lessons will be used to improve on the way future examination of the needs of the health information systems are assessed.

Preparation of these guidance started in 1994 in the then Strengthening Country Health Information Systems (SCI) unit at WHO Headquarters by Stephen Sapirie, Stanslaw Orzeszyna and Stephen Lwanga. The work benefited from the contribution of Khanh Nguyen in the Regional Office for Africa and a network of consultants who participated in HIS assessment activities. They included: Alphonse Akpamoli, Nirina Andriamanalina, Richard B. Biritwum, Dirk van Damme, El Hadji Diame, Simone Goosen, Mohamed M. Lecky, Bruno Piotti and Benoît Soro.

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Definitions*

Disease surveillance

Continuing scrutiny of all aspects of occurrence and spread of diseases to detect changes in trends or distribution for instigating control measures.

Feedback

The process by which information is passed back to the people providing the data. To be effective the information should have useful analytical comments.

Health information system (HIS)

Interrelated component parts for acquiring and analyzing data and providing information (management information; health statistics; health literature) for the management of a health programme or system and for monitoring health activities.

Health management information system

A subsystem of a health information system devoted to system management. Other subsystems are, for example: epidemiological surveillance and vital registration. Very the term health management information system is used to refer to health information system to emphasize the use of the information for management of the health system.

Health policy

A set of statements and decisions defining health priorities and main directions for attaining health goals.

Health system management

The management of the interrelated component parts, both sectoral and inter-sectoral, as well as the community itself, which produce a combined effect on the health of a population

Vital registration

Formal recording of events of human life such as: births, deaths, divorces, marriages etc.

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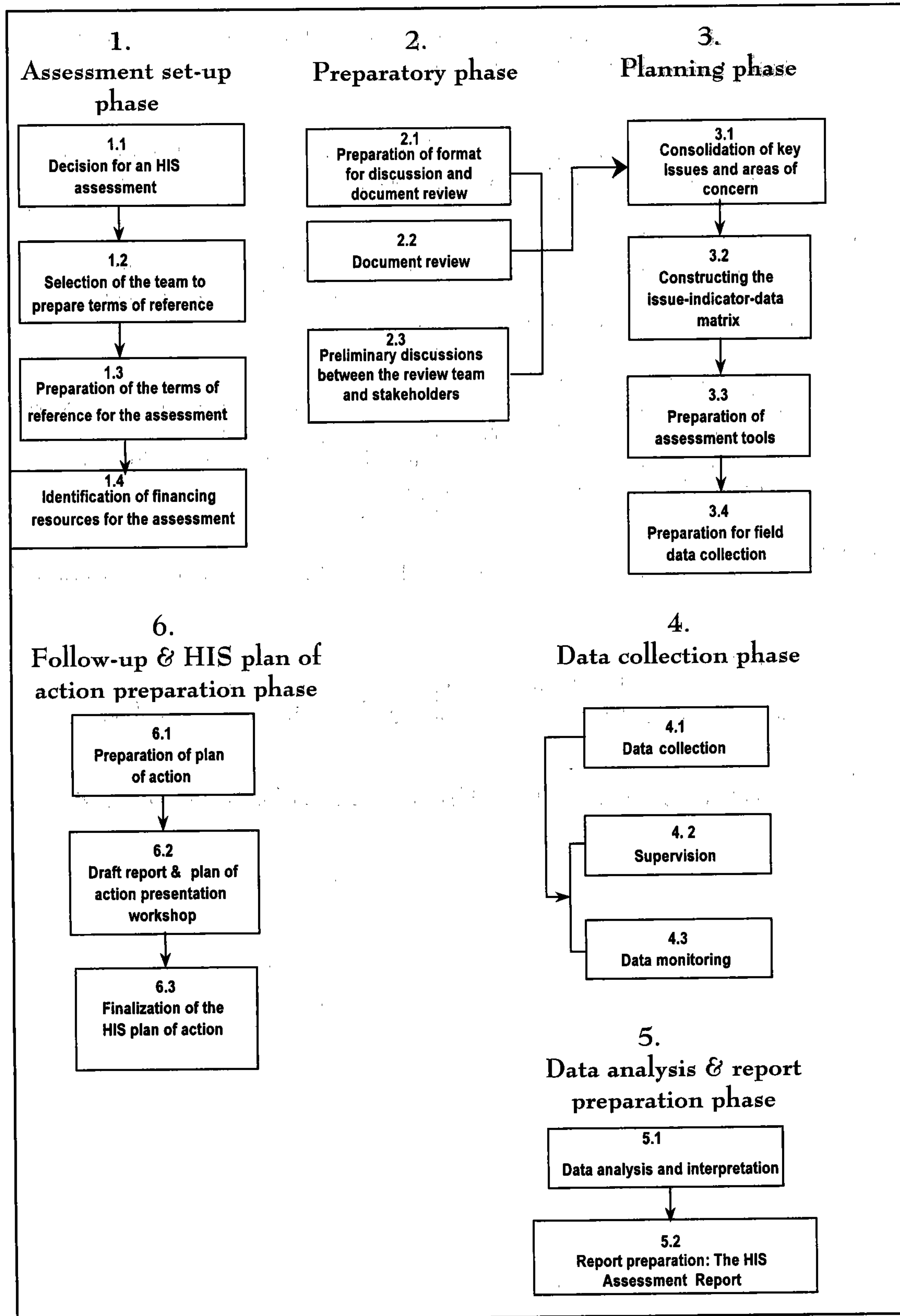
* Adapted from Lwanga SK, Cho-Yook T and Ayeni O. *Teaching health statistics. Lesson and seminar outlines (2nd edition)*. World Health Organization , Geneva, 1999.

HIS assessment phases and activities



Introduction

A health information system (HIS) provides information for the management of health programmes and services. In particular it is essential for monitoring the health situation, the performance of promotive, preventive and curative health services and activities, and the availability and utilization of health resources. An HIS is made up of mechanisms and procedures for acquiring and analysing data and for providing information needed by:

- all levels of health planners and managers for the planning, programming, budgeting, monitoring, assessment and coordination of health programmes and services;
- health care personnel, health research workers and educators in support of their respective activities;
- socioeconomic planners and the general public outside the health sector for intersectoral information linkage;
- national policy-makers for evidence-based policy formulation.

The information obtainable through an HIS may be usefully categorized into the following *interrelated* and *possibly overlapping* subsystems:

- epidemiological surveillance (e.g. disease case and outbreak notifications);
- service records and reporting (from community health workers and health care delivery facilities);
- programme monitoring and evaluation (for example, specific for TB, MCH/FP, EPI, etc.);
- administration and resource management information systems (e.g. budget, personnel, supplies, etc.);
- vital registration (e.g. births and deaths).

At the patient care level the information system should be capable of supporting patient management and follow-up and monitoring special risk groups.

At the facility and district levels the system should have the capacity to provide data for *measuring*:

- service coverage of the population
- achievement of programme and service objectives and targets
- quality of care provided by the facility
- service workload (volume of services provided)
- client satisfaction
- community participation in the management of the facility activities
- resource availability and use
- health situation and trends.

The primary *objective* of an HIS needs assessment is to address issues affecting the information system's development. The specific objectives are, therefore, to:

- determine the adequacy and relevancy of the HIS at all levels of the health care system in support of the key functions of the health system such as:
  - health care delivery
  - disease surveillance
  - planning, monitoring and evaluation of health services.
- evaluate the extent the health information system supports the management of services and activities of the health system
- identify the weaknesses of the information system and propose corrective measures and activities that should be undertaken, to resolve the problems.

The assessment can be broadened in scope and depth to obtain information on the existing gaps in the system which need to be resolved to strengthen its *performance* by:

- determining whether the information system (service recording and reporting) is capable of providing the data needed for the health care and public health functions
- assessing the timeliness, accuracy and completeness of the health information both in public and private sectors, and
- determining the information shortcomings of the health sector.

A well-executed HIS assessment should be able to provide information on the following desirable *attributes* of an information system:

- acceptability
- flexibility
- representativeness
- simplicity
- usefulness.

The HIS needs assessment approach presented here provides for a menu-type selection of the subsystems and/or domains for assessment. Seldom will an HIS assessment cover all subsystems. In addition the assessment could focus on one region or service level.

This approach provides a comprehensive view of HIS from different perspectives (e.g. use of information, resources in support of the information for the subsystem, managerial support, outputs, organizational aspects, etc.). All of these perspectives do not have to be studied in the course of an HIS assessment, but only those felt by decision-makers to deserve attention at the time.

The *key elements* of an HIS needs assessment are:

- the issues to be addressed for the selected HIS subsystems
- the indicators to be used for assessing HIS performance
- the types and sources of data needed for the measurement of the indicators
- the collection, analysis and interpretation of the data
- the report of findings including an action plan for implementation of recommendations.

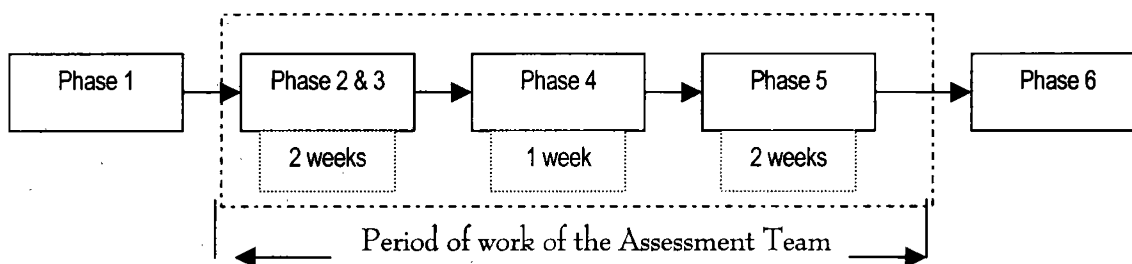
The following *basic steps* of an HIS assessment have been identified through experience:

a) Selecting the core assessment team
b) Formulating the terms of reference for the assessment
c) Reviewing documents
d) Holding discussions with programme managers and heads of departments in the ministry of health and other key people in the health sector
e) Identifying the issues and areas of concern to be addressed during the assessment
f) Constructing the issue-indicator-data matrix
g) Preparing assessment tools
h) Preparing for field data collection
i) Conducting the assessment (data collection)
j) Analysing the data
k) Elaborating the report
l) Preparing the plan for the implementation of the assessment recommendations

m) Communicating the assessment findings and the plan of action
n) Finalizing the report and plan of action.

Guidelines tend to be taken as *prescriptions* of *what has to be done* and *how to do it*. This document is not a prescription for HIS assessment. It offers ***guidance***, based on experiences gathered from many countries, on how to undertake an HIS assessment. HIS assessment process is driven by the commitment of policy-makers to the improvement of the health information system and human, financial and time resources. Since no two countries are identical all the steps of the six phases have to be adapted according to the country's commitment and resources.

Experience has shown that two weeks are sufficient for phases 2 and 3, one week for phase 4 and two weeks for phase 5. It is advisable to have breaks between phases 3 and 4 and phases 5 and 6 since it is normally difficult to have the members of the assessment team for too long from their regular jobs.



1. Assessment set-up

1.1 Decision for an HIS assessment

While there is no unique way of starting the HIS assessment process, the decision should be taken by the people in charge of the health system or component of the system supported by the HIS, or its subsystem. For example, epidemiological surveillance subsystem, management subsystem (see Annex 1.1). Such a decision must be motivated by a felt need for action and should be accompanied by a commitment to use the findings for appropriate corrective action and endorsed by high authorities of the ministry of health. The decision should be based on the concern to improve, for example, the quality of data timeliness or their use for decision-making at all levels of the health system.

1.2 Selection of the team to prepare the terms of reference

A small core group of about five people, with reasonable expertise in systems assessment and organizing field data collection, should be appointed to be responsible for the planning of the assessment. The group should include the head of the health information system and the head of the epidemiological surveillance department. The work of the core group would be enriched by including in its membership technically competent representatives of agencies (nongovernmental or international) playing key roles in the health sector development. One of the national members of the group, who is preferably not the head of the service being assessed, should be the leader of the group.

1.3 Preparation of the terms of reference for the assessment

The terms of reference specify the purposes of the assessment and the conditions under which it must be completed. The terms of reference define the objectives, the specific information subsystems and/or domains to be assessed, the scope of the assessment report, the time frame for the assessment exercise and the post assessment activities.

a) Who formulates the terms of reference?
The core group formulates the terms of reference through discussions with the senior management that are calling for the assessment.

b) What should the terms of reference contain?
The following is a list of specific questions that should be addressed in the discussions leading up to the terms of reference.

i) *Who* has asked for the assessment? (Indicate the office or officer who has requested the assessment and to whom the results should be delivered).

ii) *Why* is the assessment being requested? (Indicate how the findings will be used and the nature of the decisions or actions to be taken on the basis of the results).

iii) *When* must the assessment findings be available? (State a time frame for the assessment.)

iv) *Who* are to constitute the assessment team, and what special skills are they to provide and how well suited are they for full-time involvement in the assessment exercise?

v) *What* health services, public health functions, and information subsystems are to be the subject of the assessment? (Common health services subsystems are shown in the first column of the table in Annex 1.1).

vi) Are there any *levels of the health service or the health system* that should receive special attention during the assessment? (Examples could be central level of the Ministry of Health, central health service institutions, community level or the family).

vii) Are there any *"domains" of assessment* that should receive special attention? (Examples of possible HIS domains of assessment are shown in the first row of the table in Annex 1.1. It is recommended that the first three domains should be included).

Annex 1.2 shows examples of terms of reference which have been used for assessments of:

- a maternal and child health reporting system,
- a pilot HIS project, and
- a comprehensive HIS.

These examples are not models, but illustrations of terms of reference from different HIS assessment situations.

1.4 Identification of financing resources for the assessment

It is important to obtain a firm commitment on how all phases of the assessment will be financed. A comprehensive budget should be prepared for each assessment phase. Table 1 shows a list of items which might be included in the budget.

2. Preparatory phase

2.1 Preparation of format for document review and discussions

In order to have consistency among the different people reviewing documents and the discussions with different people it is advisable to have a check list of what to look for in the documents and the points to be covered during the discussions.

Table 1: Items which might be included in the budget for an HIS assessment

Phase	Item	Unit cost	Total cost	Source of funds
2 & 3	Daily subsistence allowance			
	Local travel			
	Meeting facilities			
	Secretarial services			
	Stationery			
	Miscellaneous expenses			
4	Daily subsistence allowance			
	Field travel			
	Field kits (see section 3.4)			
	Stationery			
	Reproduction			
	Miscellaneous expenses			
5	Daily subsistence allowance			
	Local travel			
	Meeting facilities			
	Secretarial services			
	Stationery			
	Data management and analysis facilities			
	Reproduction			
	Miscellaneous expenses			
6	Daily subsistence allowance			
	Workshop facilities			
	Local travel			
	Stationery			
	Reproduction			
	Miscellaneous expenses			

For each document reviewed a format should be made for recording:

- the title of the document
- a brief summary and
- HIS issues raised in the document.

Similarly for the discussions with stakeholders a format should be prepared for recording:

- the names of the persons with whom the discussions were held
- their organization, ministry or department
- their positions
- summary of the discussion
- HIS issues raised during the discussion.

2.2 Reviewing relevant documents

The documents to be reviewed should provide descriptive information on the health system and organization in the country, and on the HIS, particularly on the specific subsystems targeted for special attention during the assessment as required in the terms of reference. Relevant documents could be:

- national strategic development plan
- statutes detailing the role and functions of the health information system
- descriptions and diagrams of the structure of the health service and information system
- current health development objectives and targets
- essential indicators for monitoring and evaluation, as proposed in health plans or specially organized health indicator selection workshops
- results of recent surveys and assessments
- routine data flow charts
- recent routine and ad hoc reports from services, programmes and international and bilateral agencies
- lists of existing information support staff (statisticians, epidemiologists, statistical clerks) and extent of specialized and general computer literacy
- documentation of the availability of computers in various offices, institutions and service facilities
- existing projects or plans for developing components of the health information system including external support projects.

The purpose of the document review is to provide the background to the HIS assessment, and possibly issues, the context within which it is expected to support the health system, and to draw on any previous assessment results.

2.3 Preliminary discussions between the assessment team and stakeholders

One of the basic principles of HIS development is that health information systems development must be an integral part of the efforts to strengthen the health care system. It is therefore important to canvass the views of the people managing the health system at all levels to ensure that the assessment focuses on the key issues hindering HIS supporting the health system efficiently. The discussions and interviews at this stage should be probing for key systems issues, which the assessment exercise should take into account. Examples are shown in the first column of Table 2.

The people to be covered should include decision-makers and programme managers. They should also include people in the private sector and international and bilateral agencies capable of providing the 'big picture' on the state of the health information system.

3. Planning phase

3.1 Consolidation of key issues and areas of concern

The goal of an HIS assessment is to identify and resolve HIS problems in order to improve health service performance, including its planning and decision-making processes, at any level of the health system.

A key question which should be answered by an HIS assessment is whether the information system (for example: service recording and reporting procedures) is capable of providing the data needed for health care and public health action as specified in essential health indicators[1].

An HIS assessment is expected to identify the magnitude of presumed problems (issues) as well as additional problems discovered during the course of the assessment. Issues which can be quantified should be measured by indicators which can be used to judge their magnitude. Information system indicators (as opposed to health indicators) should be used to measure the magnitude of quantifiable issues. There are, however, issues which are qualitative (e.g. attitudinal issues) which cannot be measured directly by conventional indicators. Information on those issues should be collected through open-ended questions or by questions structured in some other appropriate manner. It is important that HIS issues (i.e. problems with the current generation and use of health information) should be causally related to health service issues (see Table 2).

Answers to the following questions are useful in identifying key issues that should be addressed during the assessment:

- What *national health objectives, targets and services* are relevant to the HIS subsystems selected for assessment and should be used as a basis for determining the adequacy of data generation and information use?
- What *indicators* have been chosen for monitoring and evaluating the services or public health functions selected for review during this assessment?
- What are the issues of current concern that are to be addressed during the assessment? (It may be helpful to enter such issues in the appropriate cell of Annex 1.1).

Annex 1.1 gives a conceptual framework for use in identifying the components and domains of the health information system to be addressed in the assessment, allowing for the specific HIS issues to be noted in the appropriate cells of the framework.

3.2 Constructing the issue-indicator-data matrix

This stage of an HIS assessment preparation is concerned with taking each issue and identifying at least one indicator for measuring its magnitude. These are not indicators of the performance of the health system but indicators associated with the assessment issues.

Whatever indicators are chosen they should be simple, easily interpretable, sensitive, specific, valid, objective and useful in determining the magnitude of the issues and associated factors.

Table 2 gives examples of *health service* issues with corresponding HIS issues and indicators:

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[1] The following documents may be useful:

(a) *Catalogue of health indicators. A selection of important health indicators recommended by WHO programmes.* WHO/HST/SCI/96.8. (A second edition is under preparation.)

(b) *Workshop for selecting and defining essential health indicators.* Sample workshop session guides and formats for facilitating the selection of essential health indicators. (Unpublished document; available on request from Department of Organization of Health Services Delivery, World Health Organization, 1211 Geneva 27, Switzerland).

Table 2: Examples of health service issues with corresponding HIS issues

Examples of common *health system issues*	Examples of corresponding *HIS issues*
• Problems in providing critical supplies continuously.	• Lack of accurate and timely stock inventory reports.
• Inadequate detection and control of communicable diseases.	• Failure to receive reports of communicable diseases from non-government services.
• Inadequate planning and scheduling of critical activities and services at facility and district level.	• Certain facility types or service levels not regularly submitting routine reports.
• Inadequate health protection and services for poor populations.	• Lack of up-to-date population data in relation to the distribution of health services, and failure to identify less advantaged population groups.
• Inadequate identification and follow-up of high risk groups.	• Routine case data not well kept by service staff leading to failure to note risk factors.
• Inadequate action by health staff at facility and district level to correct deficiencies in service coverage and quality.	• Poor training and supervision of health workers in use of routine data.
• High staff turnover.	• Lack of job descriptions and career development opportunities.

For each assessment indicator the necessary types of data and their sources are determined and form the basis of preparing the data collection tools. The issues, their indicators and needed data constitute the issue-indicator-data matrix. Annex 3.1 gives examples of issue-indicator-data matrices, that is issues with their associated indicators and data gathering method.

Part of the data to be collected are determined by the indicators. These data are most likely to be quantitative. There are also data to be collected that are not directly determined by the indicators but rather by the issues. These are most likely to be qualitative and useful for identifying underlying causes of the adequacy and relevancy of the information system. These data are, however, likely to come from a variety of sources, for example: official government documents, stock inventories, by observations, through staff interviews, etc. The first step is to find out what data or information is already available. These may be more easily found in formally published literature. Unpublished reports and documents commissioned by multilateral or bilateral aid agencies or nongovernmental organizations are, however, more likely to contain more raw data and useful information. (Refer to section .) When the needed data are not readily available then they have to be collected through a survey.

With reference to data, the following key questions must be answered in the course of preparing the issue-indicator-data matrix:

- What data are needed for each indicator (i.e. for exploring each issue)? For each assessment indicator specify the data (type and level of measurement accuracy) which would be needed.
- What additional information is needed for each issue on associated factors which might be useful to explore causes of, and solutions to, the issue?
- From where must the data and additional information be obtained? Identify the source of each of the specified data item (type of facility or office, type of staff, specific record).
- How will the data and additional information be collected? Appropriate instruments (questionnaires and data collection sheets) should be designed in such a way that they would elicit the required information.

In summary, the matrix should indicate:

- issues and the level of the health system at which each issue is relevant
- assessment indicators for each issue
- the data needed for each indicator
- additional information for associated factors.

Common data collection methods that could be used include:

- record review and extraction
- checking equipment and supplies
- observation of recording
- staff interview
- client interview
- telephone or mail survey.

3.3 Preparing the assessment tools

It is necessary to develop questionnaires and checklists to facilitate consistent data gathering by the various field teams. This questionnaire design stage is critical for ensuring that the data needed for HIS indicators are correctly and adequately obtained in a manner that can be easily summarized. These questionnaires *must be field tested* before the actual data collection begins. Annex 3.2 illustrates formats of questions and checklists.

Guidelines for the fieldwork should be prepared covering all the data collection tools to be used. The guidelines should:

- explain briefly why the data are being collected
- indicate the person to be interviewed at each level (including alternates)
- provide clear instruction on how the questions should be put and the responses recorded
- give the meanings of any special terms used in any of the data collection tool
- provide guidance on the field team size
- indicate the arrangements that should be made prior to each visit to a facility to collect the data.

An example is given in Annex 3.3.

It is highly recommended that blank tables, which are sometimes called "dummy tables", be prepared indicating how each type of data to be collected could be presented. This practice helps to ensure that the question formats are easily tabulated and summarized, and is a check on how the central issues and indicators are adequately analysed and presented.

3.4 Preparing for the field exercise

The following is a checklist of activities that should be carefully attended to:

- Selection of geographic areas, facilities and people to be targeted for data collection to ensure validity of the measurement of the indicators
- Preparation of the timetable of the assessment activities
- Contacting the officials and facilities to be covered by the data collection exercise informing them of the impending work and requesting their cooperation
- Preparation of a budget for the assessment (see section 1.4)
- Arrangement for the field logistics: transport, accommodation, etc.
- Preparation of field survey kits for each field team. The contents of each kit for a two person team might be:
  - ✓ Sufficient number of all the data collection tools (questionnaires, checklists, etc.)
  - ✓ 2 flat boards with clippers
  - ✓ pencils
  - ✓ 2 pencil sharpeners
  - ✓ ball pens
  - ✓ 2 erasers (rubbers)
  - ✓ 2 A4 envelopes
  - ✓ 1 ring folder
  - ✓ 4 soft folders
  - ✓ 1 stapler
  - ✓ 1 paper punch
  - ✓ 2 A4 ruled paper pads
  - ✓ 1 packet of paper clips
  - ✓ 1 bag
- Identification of the specific staff needed for the fieldwork (by name and office) in order to adequately perform the assessment tasks in the field
- Identification of the data analysis and report preparation team.

4. Data collection phase

4.1 Data collection

When all the arrangements are completed it is then time for field data collection. Teams of at least two people each are allocated geographic areas within which they are to collect the data according to the instructions of the data collection tools.

Each field team must have a leader responsible for the team's field arrangements (organizing data collection and support activities) and on the spot check of the data collection process. The overall assessment leader should keep in touch with the field teams, checking on their progress and resolving any problems that may occur.

Since extensive interaction with health workers and observation of activities take place during the collection exercise, a lot of information, which may not have been foreseen, becomes available. This information should be diligently recorded on paper and not merely committed to memory.

There are two key managerial activities during the data collection process that affect the quality of the data. These are supervision and data monitoring.

4.2 Supervision

The quality of the assessment and the validity of the results can be compromised by errors in the data through poor supervision, misunderstanding of the questions to be asked, lack of motivation of the data collection team, etc.

Data management is as important in the field as in the central assessment office. Strong and efficient supervision is needed within each field team if the data collection effort is not to be wasted. The following questions should be considered:

- Are guidelines for data handling being properly followed?
- Are data being checked for completeness and structural correctness as soon as they are received?
- Are there facilities for data safe keeping?

4.3 Data monitoring

Team leaders and the overall assessment leader should, in the course of data collection, closely monitor (see Annex 3.3):

- Adherence to the procedures and guidelines by all the people involved in collecting the data (refer to Annex 3.3)
- Sufficiency of the time allocated for data collection
- Sufficiency of supplies (refer to section 3.4) for the work to be undertaken without interruption and delays
- The welfare of the field teams.

5. Data analysis and report preparation phase

5.1 Data analysis and interpretation

The level and degree of sophistication to be used in the data analysis depends on:

- the demands of the assessment terms of reference
- availability of technical expertise
- other support resources
- the data to be analysed.

Basic data analysis should involve the computation of quantitative assessment indicators or description of the qualitative indicators. The analysis should not cover quantitative data but the include the qualitative observations and the additional information referred to in section 3.2 page 7. The additional information obtained during the extensive interaction with health workers should be taken into account during the data analysis stage.

The depth of the analysis depends on the assessment objectives and their assessment indicators. (Refer to section 3.3 statement about "dummy tables".) It is advisable to have well in advance a plan of how the data are to be analysed according to the indicators and tabular presentation in the various assessment domains. The plan for data analysis should also include threshold values for the indicators to be used in deciding whether an issue is significant or not. ('Significance' does not mean 'statistical significance' in this context.) Use of a computer for data handling and analysis is highly encouraged. Simple, easily available, software such as Epi Info could be useful. If an issue is judged to be significant according to predetermined criteria then information on associated factors should be used to determine the underlying causes. This is the main part of the data interpretation process.

5.2 Report preparation

The report of the assessment exercise should be seen as the medium of ***communicating*** the findings, and recommendations of the action to be taken, to all those involved in the health care system. The report *should therefore communicate rather than simply be a record of the activities undertaken during the assessment.*

The structure and contents of the report should be thoroughly thought through to ensure that it conforms to the terms of reference and fulfils the objectives of the assessment. It should be brief, attractively presented and written in such a way that it is readable by those for whom it is intended.

The essential part of the report should provide detailed description of the adequacy of the data generation, management and use in support of the critical service tasks and functions highlighted for attention during the assessment. It should address each of the issues in the issue-indicator-data matrix.

The report should include ***practical*** recommendations for action in changing and improving data generation, management and use, as a main result of this assessment (see examples given in Annex 5.1). The recommendations should:

- be feasible to implement
- aim at improvement in service performance, not just better data recording and reporting
- not propose changes in registers and records unless the changes are primarily for the purpose of enhancing service performance, or for reducing the amount of data to be recorded and reported
- be totally justified without requiring further study and extensive design
- not require extensive resources.

After describing the functionality and efficiency of the subsystems of the HIS, including clear definition of the identified problems, the report should propose steps to be taken to reduce those problems. Existing methodologies and material should be considered at this point for addressing common HIS problems.

6. Follow-up and HIS plan of action preparation phase

6.1 Preparing a plan of action

Preparation of the plan of action should be the responsibility of the person in charge of the health information system. This step includes the preparation of a broad country-specific plan of action for implementing the recommended actions. The plan should indicate for each recommendation:

- the activities to be undertaken
- when each activity should start and its duration
- the expected products
- the person responsible for each activity
- the resources which would be needed and their source.

The implementation of the plan of action requires the development of detailed activity-specific work plans by the people identified as being responsible for those activities. The work plans should include the process of monitoring the implementation of the activities and evaluating, after a reasonable time, the effect of the changes on HIS performance. An example of a format for a broad plan of action is given in Annex 6.1.

The plan of action should be endorsed at the highest level to ensure its rapid acceptance, appropriate allocation of resources and effective implementation. An HIS steering committee should be established to oversee the plan's implementation.

6.2 Workshop for presenting the draft report and plan of action

The process of preparing a plan of action should involve extensive consultation with the people who will be implementing it. A brain-storming process to elicit the needed corrective actions may be the best way of obtaining the required wide views of the people likely to be involved in its implementation. A 1-2 days workshop should be arranged during which the draft report is presented. During the workshop the participants are organized in small working groups to discuss the findings, recommendations and proposed activities.

Workshop participants should be programme managers and decision-makers at national and subnational levels. In order to ensure a high level of participation the duration of the workshop should be as short as possible. Presentations of the assessment findings, recommendations and the plan of action should be well prepared and attractively delivered. The workshop should aim at eliciting views of decision-makers and programme managers on how the information system can be improved to meet their needs. The participants should have a sense of ownership of the recommendations.

6.3 Finalizing the report and plan of action

The final step of the assessment exercise involves the core group (the people undertaking the activities of sections 5.2 and 6.1). Their tasks include preparation of the final report and plan of action that involves:

- Incorporation of the workshop comments and recommendations into the draft report and plan of action
- Preparation of an executive summary highlighting the process followed, the key findings, recommendations and the major follow-up actions to be taken
- Production of well presented copies for submission to the authority which commissioned the assessment.

The final report and plan of action must be formally presented to the commissioning authority highlighting:

- the process followed during the assessment
- the contributions during the workshop
- the major recommendations
- the key activities in the plan of action
- the decisions which have to be undertaken to start the implementation of the plan of action.

Annex 1.1
Health information subsystem – framework for exploring possible issues

Possible information subsystems	Possible HIS domains of assessment								
	Use of information - Decisions & actions	Processing, Output - Reporting & communication	Input - Data generation	Resources				Information systems management	Organizational Aspects (coordination & networking)
				Financial resources	Staff availability & skills	Material & facilities	Computer use		
Epidemiological surveillance									
Service records and reporting-									
Programme monitoring and evaluation									
Administration and resource management									
Vital registration									

Annex 1.2

Examples of HIS assessment terms of reference[2]

Example 1 - Health subsystem

Terms of reference for the assessment of a maternal and child health reporting system

1. The Chief of the Health Information Unit and the Director of the MCH programme jointly request the assessment.

2. The purpose is to detect weaknesses in information support for maternal care. Findings will be used as the basis for designing a Safe Motherhood project for improving the provision of maternal care through better use of information.

3. The findings are needed within three weeks.

4. A study team comprised of chief, maternal services, nurse-midwife, tutor, officer responsible for PHC monitoring and evaluation and epidemiologist from the AIDS control programme is assigned this task.

5. WHO is providing funding ($2,000) for transport cost from the country MCH budget line.

6. The focus of the assessment is to be the maternal health services data and reporting system, with emphasis upon the community, health centre and district hospital levels, including patient referral to higher levels.

7. Relevant health indicators currently used in programme management:
   - i) Number of maternal deaths
   - ii) Coverage with appropriate antenatal care (percentage of pregnant women receiving one antenatal consultation)
   - iii) Proportion of women 15-45 years old using some child spacing method
   - iv) Proportion of pregnant women with Hb levels at least 10g/dl blood.

8. Assessment to focus on community health centre and district hospital level and referral to higher levels.

9. The following descriptive material are to be assembled in advance:
   - i) A listing of the geographical location of the maternal health service outlets in the country (e.g. sources of ANC, FP, referral sites for complicated deliveries)
   - ii) Results of past DHS survey and Rapid Evaluation of Maternal Care
   - iii) Description of flow of antenatal, delivery and FP reports
   - iv) Examples of recent maternal and FP service reports from district, provincial and central level, indicating the percent of units reporting on time
   - v) Description of the maternal health database maintained in the MCH programme staff and computer support for its maintenance in the last year, by locality and level of service.

[2] These are real-life examples of terms of reference for HIS assessment that were used in three countries.

Example 2 - Pilot HIS Project

Terms of reference for the assessment of a pilot health management information system in the ministry of health planning unit

1. Background

The Health Information System Section of the Ministry of Health Planning Unit has designed and tested a new Health Management Information System (HMIS) in two districts of the country. The HMIS has been developed from the peripheral level up to the national level. The data collection instruments and manuals for use at the peripheral health unit level were created before the start of the testing phase. Materials for the district level were developed during the course of the test run of the system. The focus has so far been on testing the new system at the health unit and district levels. At the national level only the documentation of the database of information that will be available has been prepared so far. The HMIS contains only the information that should be collected routinely from all health units every month throughout the country.

2. Objective

The objective of the assessment is to provide the Health Information Section with a critical review of the new HMIS with concrete recommendations for its improvement.

The new HMIS was developed to be relevant to, functional for, and integrated with the health care activities. The resulting databases are considered to be the necessary and sufficient amount of information to be collected routinely at all health units. All data items in the HMIS (at each administrative level) are to be assessed in relation to these principles. Recommendations should also be consistent with these principles.

3. Scope of Work

a) The Assessment Team will be provided with all the HMIS material and internal review documents.

b) The Assessment Team will undertake a systematic review of the recording forms, suggested tabulations, registers, and reports, and make recommendations, with justifications, based upon relevance, functionality and usefulness for:
- the system documents as a whole
- the data items (what should be dropped, added or modified)
- the layout of the manuals
- the frequency of collection, compilation, and reporting
- the appropriateness of *routine* (everywhere, all the time) collection and reporting.

The manuals created for the HMIS will be assessed for their *content, format, layout, clarity* and *presentation.*

c) The Assessment Team should identify gaps in the collection, use and reporting of the information.

d) The Assessment Team will assess the flow of information between the health unit and the district, and between the district and the national level. (The procedures for dissemination and feedback of information at the national level have not been fully developed, and recommendations for providing this service will be welcome.)

e) The Assessment Team will assess the commitment of the Ministry of Health and vertical programmes to changing the current HIS and implementing the new HMIS nation-wide.

4. Outputs

The Assessment Team will produce a final Assessment Report that will contain their assessment and recommendations. The Report will cover the following areas:

a) General comments and concerns
i) sustainability of the system
ii) commitment to change.

b) **Health unit level HMIS**
   i) data items on all forms and reports
   ii) formats, layout and presentation of forms, tables and reports.

c) **District level HMIS**
   i) data items in the tables and reports
   ii) format, layout and presentation of tables and reports.

d) **National level HMIS**
   i) data items
   ii) dissemination and feedback of information.

e) **Information flow**
   i) from health unit to district level
   ii) from district level to national level.

5. Method of Work and Time Schedule

The assessment will be undertaken over a four-week period. The basic schedule of activities will be as follows:

Week 1: Review of "internal review" documents and reports, and HMIS material for the health unit and district levels. Meetings with the relevant Ministry of Health officials and donor representatives.

Week 2: Visit to the pilot districts. Meetings with the district health teams and visits to selected health units.

Week 3: Preparation of draft report. Presentation of the draft report to HIS Steering Committee.

Week 4: Preparation of the final report. Presentation of the report to the Minister of Health.

6. Composition of the Assessment Team

The Assessment Team will be composed of eleven members. The Team Leader will be determined before the start of the Assessment. Each of the five donor agencies will be requested to select a person to represent them on the Assessment Team. Six members (selected from the ministries of Health and Local Government) will represent the government. Two resource people from the Health Information System Section of the Health Planning Unit will assist the Assessment Team.

7. Funding

The government from its Essential Drugs Management Programme under Component 5 will fund the assessment: *Development of a Health Management Information System*. The participating donor agencies are, however, free to financially support the assessment apart from the expenses of their individual representatives.

8. Documentation to Be Made Available to the Assessment Team

The following documents will be sent to each member of the Assessment Team before the commencement of the assessment:

- Health unit HMIS manuals (volumes 1, 2 and 3)
- District HMIS manuals (volumes 1, 2 and 3).

The following documents will be available at the start of the assessment exercise:

- Background document and review of the HMIS by the HIS section
- HMIS review by the pilot districts
- Copy of the previous HIS forms
- Trainers' manual for HMIS
- Computer tabulations of HMIS at national and district levels
- Estimates of the budget for national implementation of the HMIS.

Previous drafts and versions of the HMIS material will be available on request.

Example 3 - Comprehensive HIS assessment

Terms of reference for a comprehensive HIS assessment

1. Introduction

A new HIS was placed into operation in 1990. A first assessment was carried out in June 1991. After four years of implementation, the national authorities desire an assessment.

The purpose of the exercise is to review the HIS and to take appropriate measures for its improvement. The purpose is not only to assess the procedures and the mechanisms of the health information system, but also to test its performance with a problem-solving approach with the proactive involvement of service staff.

The assessment is under the responsibility of the HIS team at the central level. This team will benefit from the support of an *ad hoc* technical committee, composed of both country and external resource persons.

2. Objectives

The overall objectives are (a) to assess the performance of the National Health Information System, and its fulfillment of the information needs of the health sector, and (b) to formulate proposals for its improvement.

Specifically, the team will

a) make an inventory of the problems encountered in the use of the HIS by the different health workers at all levels of the health system

b) assess the level of achievement of the objectives of the HIS as defined in 1991

c) assess the effectiveness of the procedures and mechanisms of data collection, management, analysis, use and feedback

d) assess the relevance and adequacy of the information gathered through the HIS and of the instruments used

e) assess the completeness of coverage of the HIS, both in public and private sectors

f) assess the effects of the solutions proposed in 1991 aiming at overcoming the obstacles identified then

g) propose corrective actions for the improvement of the HIS.

3. Use of the assessment results

The findings and the conclusions of the exercise will be presented and discussed during a workshop.

Annex 3.1

Example of an issues - indicators - data matrix

Indicator	Level	Data gathering method
Issue : Lack of completeness, timeliness and feedback of reportable data from all levels		
Indicator of completeness		
Proportion of DTP, TT, MCH forms received out of the expected number in the last six months	National Provincial District	Staff interview
Ratio of still births with positive foetal heart beat reported to those recorded in previous six months	Health facility	Review of registers and reports
Indicator of timeliness		
Proportion of DTP, TT, MCH forms received within the prescribed time in the last twelve months	National Provincial District	Review of registers recording receipt of reports
Indicator of feedback		
Proportion of reports submitted for which a feedback was received (by type) within the past six months	Provincial District Health facility	Staff interview and review of report records
Issue: Uncertainty about the ability to correctly monitor and manage critical facility resources		
The proportion of facilities which have properly maintained temperature chart for the refrigerator containing vaccines	Health facility	Records review
The proportion of facilities for which it is possible to calculate security stock of important drugs	Health facility	Records review
The proportion of facilities for which it is possible to report cases of measles which had previously been vaccinated	Health facility	Records review
Issue: Lack of timely dissemination of information for programme and service management		
Examples of inability to undertake management actions for lack of timely information	Provincial District Health facility	Staff interview: - Essential drug programme - EPI - MCH
Issue: HIS weakness in data for indicators of quality, cost and human resource management		
Number of districts with summary reports of monthly costs by line items	District	Staff interview Record review
Number of hospitals with summary records of monthly costs of the food and beverage department	Hospital	Staff interview Record review
Number of districts with summary reports of staffing levels	District	Staff interview Record review
Issue: Inadequate analysis of the data and use of the information		
Number of (annual) programme and health facility reports with analyses and comments (not tables only)	National Provincial District Health facility	Reports review
Number of health facilities with trend morbidity and/or mortality and/or service data	Health facility	Review tabulations and graphs of selected health conditions and services
Number of health facilities and districts extracting data from their registers or reports for planning activities (e.g. follow-up of special cases etc.) and using the report for situation analysis	District Health facility	Staff interview Work plans review
Issue: Data are requested by higher levels from the lower levels which may be irrelevant to the health managers at the lower levels		
Frequency of requests for non-HIS standard data from higher levels	Provincial District Health facility	Staff interview
Frequency of perceived relevancy of additionally requested data from higher levels	Provincial District Health facility	Staff interview

Annex 3.2
Examples of assessment questions

A. Indicator-based questions

Does the staff know or can they calculate the following population target groups?

	Yes	No	Size
Women of reproductive age (15-45)			
No. of pregnant women expected			
No. of births expected			
Infants 0 to 11 months			
Infants 0 to 23 months			
Infants 9 to 23 months			
Children 0 to 3 years			

What is the trend in the following three diseases over the past six months?

	Increase	Decrease	Variable (no trend)	True or false (T or F)	Don't know
Diarrhoea					
Measles					
Meningitis					

Verify the trend in cases by extracting data from the registers

	January	February	March	April	May	June
Diarrhoea						
Measles						
Meningitis						

Determine whether the cases reported in the last annual report agree with the monthly registers

Disease	Number of Cases		Percentage difference
	Total from monthly registers	Total in the annual report	
Malaria			
Diarrhoeal diseases			
Acute respiratory infection			
Meningitis			
Measles			
Anaemia			
Tuberculosis			

Awareness/availability of data on hospital personnel situation

Tables/registers are available with data on	Hospital director	Chief matron	Personnel office
Sanctioned posts by staff type			
Filled and vacant posts by staff type			
List of in-service training received last year			
List of impending retirements by year			

B. Issue-based questions

Issue: Inadequate analysis, interpretation and use of morbidity, disability mortality and surveillance data

Question	Information to collect
1. Do programme annual reports have analyzed data with commentary?	Record yes or no
2. If "yes", may we see the last two reports?	Record review reports for evidence of data analysis and commentary
3. Do you use the data you record for planning your activities	Record yes or no
4. If "yes", can we see the current plan of activities	Record review and record evidence of data use
5. Does the health facility/district/province analyze surveillance data by person, place and time?	Look for and record evidence of analysis of data either in reports or displays noting whether results are described by person, place and time

Issue: Lack of availability and use of non-health sectors data

Question	Information to collect
1. Do you regularly receive data or reports from non-health sectors?	Record the type of data or reports and the source of the non-health sector
2. Have there been situations in the past twelve months when you used data from non-health sectors in support of your activities?	Record examples given including the non-health sectors
3. How many times in the last six months have you shared information with other sectors?	Record yes or no
4. If "yes" how?	Record examples given
5. Give us an example of information-sharing during such meetings	Record examples given

Annex 3.3

Generic guidelines for use in the data collection phase

1. Introduction

This questionnaire is for use in the assessment of the health information system (HIS) in .... at the ... level. HIS issues of special concern have been identified by officials involved in the health care system at all levels, and the questionnaire is designed to collect data on the magnitude of these problems. The ultimate aim is to devise strategies for resolving the issues affecting the efficient performance of the HIS. These guidelines are to assist the people collecting the data in the use of the questionnaire.

2. Person to be interviewed (to be adapted according to national health system)

Level	Person in charge	First alternate	Second alternate
Health Post	Person In-Charge	Acting In-Charge	
Health Centre	Director	Acting Director	
Hospital	Director	Clinic Director	Hospital Administrator
District Level	Director	Chief Medical Officer	Head of Public Health
Provincial Level	Director	Provincial Chief Medical Officer	Acting Director
National Level	Directors, Head of Departments and Programme Managers	Acting	

The interview should be addressed at the person in charge, if the person in charge is not present then the interview should be with the first alternate. If the first alternate is also not available then the interview should be with the second alternate.

3. Data recording

For questions requiring a "**yes**" or "**no**" write or circle the response in the space provided. For open-ended questions record as accurately as possible the response given to the question in the space provided in the questionnaires or on a separate sheet of paper. For *observations* record your observations on a separate sheet of paper, if there is not enough space in the questionnaires, indicating clearly the question the comment refers to. A number of prompts are provided in the questionnaires for ease of reference. Always avoid making suggestions to the person being interviewed as to the answers you would like to be given.

> Data analysis in the questionnaire refers to ***converting the recorded data into indicators***. It does not necessarily imply sophisticated statistical analysis but it does not also cover mere presentation of data by charts, diagrams or graphs. For example a health worker who demonstrates that she/he computes percentages or rates using the data may be regarded as analysing the data.
>
> Feedback in the questionnaire refers to comments made on reports sent to the originators of the reports. Feedback does not refer to reminders for reports.

4. Interviewers

A data collection team should be made up of at least two people. One person should ask the questions while the other notes down the responses. The team should review the completed questionnaire for completeness.

5. Conducting the interview

The interviewers should be familiar with the questionnaire and try, as far as possible, to establish an even flow of communication with the person being interviewed.

At the start of the interview you must

a) Introduce yourself
b) Be sensitive to the customs of the people
c) Explain the context of the visit
d) Explain the purpose of the exercise
e) Make it clear that the visit is not in connection with any supervisory activities. Explain that the visiting team is trying to obtain information on how the health information system is functioning
f) Emphasize that the respondent will be contributing to the improvement of the health care services by answering the questions
g) At the health facility level ask the person being interviewed to have all the registers and records to be examined ready at the start of the interview to avoid interrupting the interview in search of the documents as they are requested
h) Ask the questions exactly as they are written down in the questionnaire
i) The sequence of the questions may be altered because of the need to collect information from a different location within the health facility
j) Do not react negatively to the responses of the person being interviewed
k) At the end of the interview you may give a feedback on "wrong" answers and words of encouragement for any good performance, without being condescending
l) Always thank the person being interviewed for their time and cooperation.

6. Arrangements for visits

a) Make an appointment well in advance:
   i) explaining the purpose of the visit
   ii) indicating the person to see during the visit
   iii) specifying when the visit will take place (date and time)
   iv) indicating roughly how long the visit will last.
b) Always respect the priority of the activities at the place being visited.
c) Ensure that you have a letter of introduction from recognized authorities explaining the nature of the work you intend to undertake and authorizing you to collect the data you will be requesting.
d) Organize transport and all the necessary logistics for the visit.

Annex 5.1

Possible responses to some HIS problems

Problem	Possible action
Problems associated with service level case diagnosis, recording and data use	a. Assess the current diagnostic and recording performance of selected types of clinical work at different service levels. b. Produce standardised treatment and recording guidelines. c. Review and revise clinical registers, records and report formats as necessary to capture data essential for sound case management. d. Prepare standard national case definitions for infectious and reportable diseases. e. Conduct in-service training in diagnostic skills for important health problems currently being improperly diagnosed. f. Publish examples of outstanding case detection and reporting at service and district level. g. Conduct district team problem-solving to perform analysis of assigned health problems and to design and implement local solutions to these problems, including monitoring and assessment. h. Prepare procedures for facility and district micro-planning which leads to operational targets and plans tailored to each local area. Such plans would include specific target populations and coverage targets.
Communications Problems	a. Strengthen the health sector communications ability with fax or E-mail to facilitate the feeding of disease data to designated offices for data entry and analysis at regional and national levels. b. Study the possibility of radio-fax communications from remote regions. c. Produce a monthly Health (epidemiology and service performance) Report and distribute it throughout the services. d. Begin a process of rapid assessments of priority services (e.g. maternal health, communicable diseases control) involving staff from several levels. e. Begin a process of district performance assessment using available data and enable staff to propose suggestions for improvement.
Data Analysis Problems (in the services and at programme management level)	a. Involve staff from several levels in district team problem-solving and rapid assessments. b. Provide training in basic data analysis techniques to programme management and surveillance staff. c. Develop data base and data analysis packages for use at regional or provincial health offices or disease surveillance and control units. d. At the central level, review and revise the organization of data bases and data analysis in order to reduce redundancies, facilitate the sharing of data across programmes and respond better to user requirements for planning and monitoring. e. Obtain standard statistical computer packages and distribute to regional centres in support of the statistical analysis training. f. Conduct health situation and service analysis in selected districts and regions in order to identify the most cost-effective service interventions and use these results to plan and describe priority health programmes for the medium-term future. g. Conduct special analysis of service data (such as costs and efficiency) in support of health care reform processes.
Problems in Reporting	a. Strengthen legislation and regulations requiring medical practitioners to report infectious diseases. b. Develop and maintain practical disease and programme databases for managing the data flowing from service levels, and to support the preparation of required reports. c. Develop a monthly Public Health Report which summarizes all infectious disease reports from around the country along with data on certain critical services and articles on especially effective case detection and outbreak control. d. Select and define a set of essential health indicators for monitoring and reporting at several levels. Selection can take place in several group processes: i. specific priority programmes ii. district or regional level services iii. central level indicators including health surveillance, programme performance and health care reform. e. Undertake special studies and analysis using routine data, and distribute the results to service managers, programme and institution directors, and people involved in the implementation of health reform processes. f. Design and produce an improved annual health report which serves several purposes: i. providing feed-back of the health trends and service performance to clinicians, service and programme managers ii. summarizing the health, service and reform situation to senior decision-makers and politicians iii. satisfies much of the requirements for reporting to international agencies.

Annex 6.1
Example of broad plan of action format

Tasks	Schedule		Product	Responsibility	Resource Requirements	
	Start	End			Type/amount	Source
Data problem: ***Lack of data analysis at the health facilities***						
Training programmes in data analysis at the district level and consolidation at the central level						
Data problem: ***Lack of information feed-back to data collectors (the health facilities)***						
Create a mechanism for providing data feed-back to health facilities			Document outlining the feed-back system to be used	MoH statistics unit		
Data problem:						
Data problem:						
Data problem:						
Data problem:						
Data problem:						