PN-ABZ-063

TRIP REPORT

BASICS

PN-ABZ-063

HEALTH INFORMATION SYSTEM ASSESSMENT STUDY

July 11 - August 4, 1995

Theo Lippeveld

Basics Technical Directive: 000 ER 00 027
USAID Contract Number: HRN-6006-C-00-3031-00

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ACKNOWLEDGMENTS

The consultant wishes to express his gratitude to the Ministry of Health and especially to Dr. Tekeste, the Vice-Minister, and Dr. Sennay Kifleyesus, the Head of the Planning and Evaluation Bureau, for their support during this consulting assignment.

The results of this consulting assignment could not have been achieved without the hard work of my colleagues on the HIS assessment team: Dr. Iyob Tekle, Head of Health Services Planning, Mr. Ghebrenegus Negash, Head of the Health Information Unit, and Ms. Haimanot Araya, I/C Felego Hiwot Health Center in Asmara.

Finally, my thanks go to Al Neill and his family for the warm welcome and support I received, to Samuel Iyasu, the BASICS office manager who solved all my logistics problems, and to Susan Ross and the USAID mission for their facilitation.

ACRONYMS

BASICS	Basic Support for Institutionalizing Child Survival
EPLF	Eritrean People Liberation Front
EMA	Eritrean Medical Association
FLCF	First Level Care Facilities
GIS	Geographic Information Systems
HIRO	Health Information and Research Office
HIS	Health Information System
HMIS	Health Management Information System
HMIS/HF	HMIS for Health Facilities
HMIS/ADM	Administrative HMIS
HPN	Health Population and Nutrition
MCH	Maternal and Child Health
MOH	Ministry of Health
PEB	Planning and Evaluation Bureau
PMO	Provincial Medical Officer
UNICEF	United Nations Children Fund
USAID	United States Agency for International Development
WHO	World Health Organization

I. EXECUTIVE SUMMARY

Purpose of the trip

For this four week consulting assignment in Eritrea (July 11-August 4, 1995), the Consultant, Theo Lippeveld, had the following objectives:

1. Assess the existing health information system (HIS) in a representative sample of health facilities to determine its strengths and weaknesses, and get input from the field workers on how to restructure the system so that it can better respond to the planning and management needs of the health services at all levels.

2. Based on the field assessment and on the previous planning efforts undertaken by the Ministry of Health and BASICS, propose a detailed workplan for the HMIS design and implementation.

3. Make recommendations for the design of an appropriate computerized data processing system capable of conducting required analysis and generating the necessary feedback information for planning and management of the health services, and propose a computer training program for relevant MOH staff.

4. Make recommendations on the required technical expertise (long-term and short-term), and draft the scope of work for the proposed long-term resident specialist.

Summary of activities

With a team from the Ministry of Health, the consultant conducted an HIS assessment study (see Appendix E). The findings were discussed with the Ministry of Health, BASICS, and USAID, and recommendations were made on how to improve information support to the Eritrean health services system.

Based on the study's findings, a five-year provisional workplan for the HMIS design and implementation was prepared (see Appendix F). The workplan needs to be further refined and the timeline adapted as soon as the BASICS HIS long-term advisor arrives in-country.

The consultant also gave advice on the design and implementation of a computerized data processing system.

Finally, the consultant made recommendations on the need for technical assistance to design and implement the planned HMIS.

Conclusions

The following recommendations are in this report:

1. The health information system needs to be restructured so that information supports the decision-making process at all levels of the health services system. It will be very important, prior to specific interventions to improve the information generating process and the HIS management structure, to first define the overall structure and functions of the health services system in the newly-created nation.

2. HMIS data processing should be computerized at national and zonal levels. It is suggested that a customized HMIS application software package be developed rather than using commercial database management software. Hardware should be compatible with the software requirements and the climatic environment in which it operates.

3. The following technical assistance staff is required to effectively support the restructuring process: an expatriate HIS Advisor on a long-term basis (three years) followed by short-term visits in the fourth and the fifth year; and an expatriate Computer Expert/Systems Analyst on a short-term basis (48 person weeks in the first three years).

II. PURPOSE OF VISIT

For this four week consulting assignment in Eritrea (July 11-August 4, 1995), the consultant had the following objectives:

1. Assess the existing health information system (HIS) in a representative sample of health facilities to determine its strengths and weaknesses, and get input from the field workers on how to restructure the system so that it can better respond to the planning and management needs of the health services at all levels.

2. Based on the field assessment and on the previous planning efforts undertaken by the Ministry of Health and BASICS, propose a detailed workplan for the HMIS design and implementation.

3. Make recommendations for the design of an appropriate computerized data processing system capable of conducting required analysis and generating the necessary feedback information for planning and management of the health services, and propose a computer training program for relevant MOH staff

4. Make recommendations on the required technical expertise (long-term and short-term), and draft the scope of work for the proposed long-term resident specialist.

III. BACKGROUND

The establishment of an adequate health information system has been part of a comprehensive effort of the Ministry of Health to reorganize the health services in Eritrea after independence. Before liberation, two routine data collection systems were operational: the Ethiopian government system in the occupied part of Eritrea, and a new system initiated by the Eritrean People Liberation Front (EPLF) in the liberated areas. Initial efforts to streamline reporting were undertaken in 1992, when a working party consisting of high-level public health officials prepared a new set of comprehensive reporting forms, which are presently used in all health facilities. In the interim, the Ministry of Health prepared for a more comprehensive restructuring effort, starting with an analysis of the actual information needs at all levels in the health services system. In July 1994, the Planning and Evaluation Bureau (PEB) published a document, "A Health Management Information System for Eritrea," which contained the outline for a comprehensive restructuring plan.

The Health Information System (HIS) Assessment Study was planned in the initial phase of the restructuring effort. The Ministry of Health requested this consultancy to assist it in undertaking the study and analyzing the results, so that recommendations could be made on the further course of action. It is part of BASICS' assistance to the Eritrea Health and Population Project. Previously, the consultant had provided his input in drafting the document "A HMIS for Eritrea" in June 1994.

IV. TRIP ACTIVITIES

This section gives an overview of the activities performed during this consultancy. A full list of contacts during the visit is provided in Appendix A.

The consultant arrived on July 11, 1995. He first met with Mr. Sennay Kifleyesus, Head of the Planning and Evaluation Bureau (PEB), and with Susan Ross, HPN Officer at USAID. The first days were spent reviewing various documents related to this consultancy. A list of the main documents consulted is provided in Appendix B.

With the help of the PEB Head, an HIS Assessment Team was assembled. The team leader was Dr. Iyob Tekle, Head of Health Services Planning; the team members were Mr. Ghebrenegus Negash, Head of the Health Information Unit, Ms. Haimanot Araya, I/C Felego Hiwot Health Center in Asmara, and the consultant. The consultant prepared a protocol for the HIS Assessment Study that included developing various questionnaires and checklists. The protocol was further refined with the input of the other members of the HIS Assessment Team. It underlined that the conceptual basis for the study was that a health information system was a "functional entity within the framework of the health services as a whole" (WHO, 1980). Therefore, the existing health information system would be assessed in terms of its potential to provide specific information support to make appropriate decisions for planning and

management at all levels of the health services system. Another important study objective was to get input from public health managers and health care providers on the content and the process of the restructuring process, so as to ensure that the future HIS could better respond to their information needs. The protocol calls for interviews with the main department heads at the central level and with visits to a sample of nine health facilities. For further details, the protocol and the questionnaires/checklists are provided respectively in Appendix C and D.

Data collection was performed between July 17 and 26, 1995. Field visits outside of Asmara were done in three trips: one to the Senhit Province (July 18-19), one to Denkali Province (July 21-23), and one to the Seraye Province (July 24-25). Bada in Denkali Province, one of the selected health stations, could not be visited because the I/C was on leave. It was replaced by the Gelalo health center. Seven main decision-makers in the Ministry of Health were interviewed. The consultant also met with the representatives of WHO and UNICEF, the main health donors in Eritrea, to get their input in the future HMIS restructuring.

On July 27 and 28, the HIS Assessment Team analyzed the data from the field visits, interviews, review of the data collection instruments, and the study of existing documents and datasets. The team summarized the findings and provisional recommendations in table form and discussed them with the PEB Head.

On August 1 and 2, 1995, in collaboration with the Ministry of Health, the Eritrean Medical Association (EMA) organized a two-day Information and Research Seminar for all doctors in the country. The consultant assisted Dr. Negassi, EMA President, in organizing the seminar. The Vice-minister and about 60 doctors attended the seminar. The consultant gave a presentation on August 1, 1995, on the design of health information systems; he also presented the provisional findings of the HIS assessment study. The next day workgroups discussed some important issues related to the preparation of the HIS restructuring: the district coverage plan and the role of the health centers as referral and supervisory centers. The participants gave some valuable inputs that helped in finalizing the recommendations of this consultancy.

The consultant further finalized the HIS Assessment Study Report (see Appendix E) and prepared a provisional HMIS five year workplan (see Appendix F).

On August 3, 1995, an official debriefing took place in the MOH under the direction of the Vice-minister and in the presence of the HPN Officer of USAID. All department heads attended. The consultant presented the recommendations and the provisional workplan of the future HIS restructuring. He stressed the importance of the health services system reorganization prior to a systematic overhaul of the existing system. In the lively discussion that followed the participants at the meeting agreed that the proposed action plan should start in September 1995. It was hoped that by that time the new administrative division of the country would be finalized and the BASICS Health Information System Advisor would be in-country.

The consultant debriefed with Dr. Assefaw Tekeste, in charge of the Health Sciences College at the University of Asmara, on the advised course of action in the HMIS restructuring and discussed with him and Sarah MacFarlane, consultant from the Liverpool School for Tropical Medicine, ways to improve the use of information for the planning and management of the health services.

The consultant also met with Carolyn Krueger, BASICS Project Officer for Eritrea, and Al Neill, BASICS Coordinator in Asmara, to determine the financial and technical assistance inputs required to implement the workplan.

V. RESULTS AND CONCLUSIONS

The objectives for this consultancy as described under the "Purpose of the Visit" have been fully achieved.

HIS Assessment Study

A HIS assessment study was undertaken with a team of the Ministry of Health. The findings and recommendations were discussed with the Ministry of Health, BASICS and USAID. The report is in Appendix E.

HMIS Design and Implementation Workplan

A five-year provisional workplan for the HMIS design and implementation was prepared and discussed with the Ministry of Health, BASICS and USAID. The workplan in Appendix F needs to be further refined and the timeline adapted as soon as the BASICS HIS long-term advisor arrives in country.

Recommendations on a computerized data processing system

The HIS assessment study contains summary recommendations on the design and implementation of a computerized data processing system. This section adds additional information for use by the BASICS technical assistance team.

In the Eritrean context it seems appropriate to computerize data processing in the future HMIS at least at the national and future six zonal levels. The data volume to be processed and the human and physical resources currently available do not justify a more peripheral level of computerization. With computer technology advancing extraordinarily rapidly, it is difficult to make final recommendations on software and hardware options.

Software Options

For new computer users, as will be the case with most Eritreans, the Windows™ software environment provides a consistent interface. Menus, function keys and dialogues behave in a similar manner in most applications. In addition, the dynamic linking and embedding and dynamic data exchange functions available in most Windows™ packages provide very powerful mechanisms for integrating a variety of different tools (spreadsheets, graphics packages, mapping software, etc.) with the database software that is used for developing HMIS applications.

We advise using a fully-customized software package for the future HMIS. It will require a reasonable level of technical expertise, but will result in a product which simplifies work for end users and can include a wide range of complex outputs. We recommend using a fourth generation database management software such as FoxPro™ as application software. This packages have proved to be a reasonable compromise between cost and utility. The software should be able to compile executable files which can be installed on any number of computers with no royalties or licensing fees. This also provides better data security, since end-users cannot change the program logic or data base structures.

Installing a small network at the central Ministry of Health would be worthwhile option to consider. It will allow managers and administrators to have direct access to all HMIS/HF and HMIS/ADM databases. One network operating system to consider is the Microsoft Windows for Workgroups™ system.

An increasingly important form of analysis in HMIS involves the analysis of the geographical distribution of trends in health services delivery. Geographic Information Systems (GIS) packages are helpful for mapping spatial distribution and coverage of health services, and as a tool to identify geographic areas where health services development activities can be targeted. Different commercial packages on the market all have a feature that makes it possible to link data that has been entered in a database application to points and/or regions on maps. Newly-developed Windows-based mapping software (such as MapInfo™) are quite easy to add to the menu of a database package.

Hardware Options

We advise that the following hardware be installed at national and zonal levels. The specifications given for the computers could be modified based on the requirements of the HMIS application software. Laptops are recommended for the zonal HMIS offices despite their higher cost (as compared to desktops), based on the difficult climatic conditions which make a desktop computer more vulnerable to failure. With a monitor and a desktop keyboard, the laptop could be used for data entry.

HIRO Office:

- one IBM compatible 486 or Pentium™ (66 MHZ or more) desktop computer - memory one GB
- one IBM compatible 486 or Pentium™ (66 MHz or more laptop computer - memory 400 MB
- two color monitors and desktop keyboards
- one laser printer
- one dot matrix printer
- one photocopier
- one uninterrupted power supply (UPS)

Zonal HMIS office:

- one IBM compatible 486 or Pentium™ (66 MHZ or more) laptop computers - memory 400 MB
- one color monitor and desktop keyboard
- one dot matrix printer
- one photocopier
- one uninterrupted power supply (UPS)

Computer Training

In September 1995, a Ministry of Health employee with basic computer skills will be sent to Boston for an intensive one-year computer training course in programming and database design. In addition to these skills, he would also get basic skills in hardware and software trouble-shooting, operating simple networks, and GIS and communications software. As soon as he returns from the States, he will be appointed as computer programmer in the HIRO office.

For the data entry staff, we recommend organizing computer training for both the HIRO staff and the zonal HMIS office staff, in two stages:

1. A general one-week initial training session to introduce the concepts of hardware, software, operating systems, and the use of commercial word processing, spreadsheet, and database management packages.

2. As soon as the HMIS application software is developed, an additional one or two weeks of formal training on the use of the HMIS specific software should be organized.

Both training sessions will be followed by intensive on-the-job training and the assistance of the short-term expatriate computer expert, and then the Eritrean computer programmer.

Required technical expertise

The consultant discussed the required technical expertise in detail with the Ministry of Health, BASICS, and USAID. Three types of technical assistance are required:

1. Technical Assistance for the HMIS Design

As outlined in the workplan, we recommend the continuous presence of a long-term HIS advisor for the first three years of the HMIS design and implementation. This advisor should have previous experience in the design of health information systems and in health services planning. He should have a solid training background in epidemiology and be familiar with database management and spreadsheet software. The HIS advisor will work closely together with and provide on-the-job training to the appointed HIRO head. After three years, the HIRO head will fully take the lead of the HMIS nationwide implementation assisted by the HIS Advisor on a short-term basis.

2. Technical Assistance for Computerized Database Design

The design of the customized HMIS application software will need intensive short-term technical assistance (48 person weeks in the first three years) by an expatriate computer expert/systems analyst with previous experience in the design of complex databases, ideally in the health sector. The workplan further details the sequence of tasks to be performed by the computer expert in the first three years of the HMIS design and implementation. Starting from the second year, the computer expert will work closely with the computer specialist who was trained in the States. The amount of technical assistance needed in the last two years will depend on the skills developed by the computer programmer.

3. Technical Assistance for Computer Training

Initial general computer training of HIRO staff and zonal HMIS office staff could be organized by the HIS Advisor in collaboration with a local short-term computer consultant. The required capability for this consulting is available. The local consultant could also assist the HIRO staff on an ad-hoc basis in analyzing available data (e.g., through spreadsheets) and in software trouble-shooting. The expatriate computer specialist can provide specific HMIS application software training.

VI. RECOMMENDATIONS

The following summarizes the recommendations in this report:

A. Recommendations on restructuring of the health information system for the Ministry of Health of Eritrea (see Appendix E)

Restructure the health information system so that information supports the decision-making process at all levels of the health services system:

1. Define functions/activities and corresponding indicators at each health services system level: national, provincial (or zonal), district, health unit, and patient/client;

2. Define "health districts" based on geographical and cultural realities and appoint district management teams;

3. Develop "district coverage plans" with active involvement of peripheral health care providers and communities, resulting in well-defined catchment areas for each first level care facility (health centers and health stations);

4. Design (through restructuring) the routine health management information system for health facilities (HMIS/HF) to ensure adequate information support to all levels of the health services system, especially to the basic health services;

5. Design and computerize the routine administrative health management information system (HMIS/ADM) to ensure infrastructural management, financial management, personnel and training management, drugs and supplies management; and

6. Complement the information generated through routine reporting with information from appropriate alternative data sources: surveys, information from other sectors, and informal sources.

B. Recommendations on the design of an appropriate computerized data processing system and training the computer staff

1. HMIS data processing should be computerized at national and zonal levels.

2. Develop a customized HMIS application software package rather than using commercial database management software

3. Hardware should be compatible with the software requirements and the climatic environment where it operates.

C. Recommendations on required technical expertise for the HMIS design and implementation

The following technical assistance staff is required:

1. An expatriate long-term HIS Advisor (for three years) followed by short-term visits in the fourth and the fifth year.
2. A short-term expatriate Computer Specialist/Systems Analyst (for 48 person weeks in the first three years).

3. A local computer specialist hired on a short-term basis.

VII. FOLLOW-UP ACTIONS REQUIRED

1. It is important to plan for an initial three years of project assistance for the HMIS design and implementation. As discussed with the BASICS team, a detailed budget for the HMIS design and implementation should be developed.

2. To start the first phase of the HMIS restructuring on time, the HIS long-term advisor should begin work in Asmara in September 1995.

3. To make efficient use of the technical assistance personnel, it is recommended that a health planner/epidemiologist be appointed as soon as possible to direct the HIRO and the HMIS restructuring process and a computer staffer from the Ministry of Health begin overseas computer training in September 1995.

APPENDICES

APPENDIX A

APPENDIX A: LIST OF CONTACTS

Ministry of Health

Dr. Tekeste Fekadu, Vice-Minister of Health, MOH
Mr. Sennay Kifleyesus, Head Planning and Evaluation Bureau, MOH
Dr. Iyob Tekle, Head Health Services Planning, MOH
Mr. Ghebrenegus Negash, Head Health Information Unit, MOH
Ms. Haimanot Araya, In Charge Felego Hiwot Health Center, Asmara
Dr. Afeworki Abraham, Head Health Care Services, MOH
Mr. Kidane Woldeyesus, Head Pharmacy Department, MOH
Dr. Debrezion Berhe, Head Communicable Diseases Control, MOH
Dr. Mismay Ghebrihiwet, Head Primary Health Care
Dr. Melles Seyoum, Head Central Laboratory, MOH
Dr. Michael Ghebrehiwet, Director Mekane Hiwot Hospital
Dr. Assefaw Tekeste, Head Faculty of Health Sciences, University of Asmara
Dr. Negassi, President Eritrean Medical Association
Ms. Hiwot, I/C Akria Health Center, Asmara
Dr. Andoum, Provincial Medical Officer Senhit province
Mr. Al Azar Haile, I/C a.i. Elabaret Health Center, Senhit
Sr. Bhranu Habtemriam, I/C Keren Town Health Station, Senhit
Dr. Goitum, Provincial Medical Officer Seraye province
Mr. Tecleab Woldeab, I/C Enda Giorgis Health Station, Seraye
Ms. Mesfin, I/C a.i. Areza Health Center, Seraye
Mr. Guhmed Ali, I/C a.i. Tio Health Center, Denkali
Mr. Gebriwot Zedengel, I/C Gelalo Health Center, Denkali

Donors/Technical Assistance

Mr. Glenn E. Anders, USAID Representative, Asmara
Ms. Susan Ross, HPN Officer, USAID/Asmara
Mr. Albert Neill, Representative BASICS project, Asmara
Dr. Elmi A. Duale, WHO Representative, Asmara
Dr. Isiye Ndombi, Planning Officer, UNICEF/Asmara
Ms. Nancy Harris, Director, SEATS project, Washington, USA
Ms. Joan Haffey, Consultant, SEATS project, Washington, USA
Ms. Nancy Godfrey, Planning Advisor, Save the Children UK, MOH
Dr. Sarah McFarlane, Consultant, Liverpool School for Tropical Medicine, UK

APPENDIX B

APPENDIX B: LIST OF DOCUMENTS CONSULTED

Proposed BASICS Assistance to Eritrea Health and Population Project, Patricia Taylor and Albert Neill, September-October 1994.

A Health Management Information System for Eritrea, Planning and Evaluation Bureau, MOH, July 1994.

Eritrean Strategic Health Sector Plan (Draft). Planning and Evaluation Bureau, MOH. July 1995.

Report on Mission to the Ministry of Health of Eritrea, Theo Lippeveld, Harvard Institute for International Development, June 1994.

Guidelines for the Assessment of National Health Information Systems (HIS). Unit of Strengthening Country Health Information, WHO/Geneva, 1995.

Strengthening Health Information Systems in Africa. WHO/Brazzaville, 1995.

Children and Women in Eritrea. UNICEF, 1994

Ministry of Health Cost Estimates Study, Richard Yoder, BASICS Trip Report, May 1995.

Eritrea Health Facility Assessment: Summary Update, John Murray, BASICS consultancy, June 1995.

The Expanded Programme on Immunization of Eritrea, draft Review Report, Ministry of Health Eritrea, June 1995.

The Expanded Programme on Immunization of Eritrea, draft Report on Immunization Coverage Surveys, Ministry of Health Eritrea, June 1995.

The Eritrean Medical Journal, July 1988.

East African Regional Workshop on Burden of Disease, Cost Effectiveness, and Implications for Health Policy: Summary Report Eritrea. Mineab Shebatu, Nairobi, Kenya, August 1994.

Baseline Survey Report for Denkalia Province Child Survival and Maternal Health Project, Kasete Araya Tekie and Daniel J. Smith, December 1994.

Eritrea. Options and Strategies for Growth. World Bank, November 1994.

Proposal to Construct a GIS-based Malaria Monitoring System for Eritrea, Andrew Spielman, Harvard School of Public Health, June 1995.

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APPENDIX C

MINISTRY OF HEALTH OF ERITREA

HEALTH INFORMATION SYSTEM ASSESSMENT STUDY PROTOCOL

INTRODUCTION

This assessment study on the existing health information system (HIS) in Eritrea is part of a long-term effort of the Ministry of Health to restructure the system and to improve the generation and use of information for planning and management of the health services. In 1994 a planning document has been prepared by the Planning and Evaluation Bureau of the Ministry of Health entitled "A Health Management Information System for Eritrea". It calls for a restructuring of the existing information system in four phases. This assessment study was to be performed in the first phase. Technical assistance for the study is provided through the BASICS Project with financial assistance from USAID.

A. CONCEPTUAL BOUNDARIES OF THE STUDY

A health information system cannot exist by itself. It is a "functional entity within the framework of the health services as a whole" (WHO, 1980). Therefore, the existing health information system will be assessed in terms of its potential to provide specific information support to make appropriate decisions for planning and management at all levels in the health services system (= Health Management Information System or HMIS). The health services system is composed of three management levels: the patient/client management level, the health unit management level, and the system management level. In Eritrea, the main health units are health stations and health centers at the first level, and hospitals at the referral level. In some areas, this network of professional health units has been extended through community health workers (see figure 1).

The decisions to be made derive from the functions and activities at each of the management levels. At the patient/client level and the health unit level, these functions and activities are directly related to the delivery of health care to the population. The health centers and the health stations provide first level care. Since the health stations mostly do not provide the full "minimum" package of first level care activities (e.g. no family planning services, or no laboratory), some patients have to be referred to health centers for these activities. The hospitals at the provincial level ensure secondary care (first referral level). The national hospital in Asmara provides tertiary referral care. The system level provides coordination, planning, and management support to the service delivery levels. Presently, these functions are provided mainly from the national level but also from the provincial level. In the context for the decentralization policy of the Government, it is expected that additional planning and management responsibilities will be delegated to the provincial level (or to the projected new regions). Also, up to a certain extent, health centers ensure supervision of health stations.

The quality of the information support depends further on the information process and on the management structure of the information system. The information process can be broken down in the following steps: (1) data collection; (2) data transmission; (3) data processing; (4) information generation; (5) information use. The management structure ensures optimum use of the resources needed to operate the information system: persons (e.g. data collectors, statisticians); equipment and supplies (e.g. telephones, computers, printed supplies); and financial resources.

The data to generate the necessary information can be collected from a variety of sources. From a methodological point of view, data sources can be classified as routine systems and non-routine systems. The two main routine health information systems are the health unit based system and the vital events registration system. Non-routine methods of health data collection include surveys, rapid assessment methods, and other special studies. In Eritrea at present, the main source of health information is the health unit based routine information system. The assessment study will therefore mainly focus on this system, both in government managed health units (80%) and in NGO managed units (20%).

Figure I ORGANIZATIONAL MODEL OF THE HEALTH SERVICES SYSTEM
Based on Three Management Levels

Health System Level	Health Facility Level	Patient Client Level
National	*Tertiary Level* Referral Hospital	Referred Patients
Zonal/ Provincial	*Tertiary Level* Referral Hospital	Referred Patients
Subprovincial/ District	*Secondary Level* District Hospital	Referred patients
	First Level Health Center	Communities Patients/Clients
	Health Stations	Communities Patients/Clients

B. OBJECTIVES OF THE ASSESSMENT STUDY

This assessment study is full part of a broader effort to restructure the health information system in Eritrea. Its objectives are therefore double:

1. To assess the capability of the existing information system (HIS) to provide information support to all management levels of the health services system, and to identify its strengths and weaknesses.

2. To assess the relevance of eventual health information system restructuring and to get input from public health managers and health care providers on the content and the process of the restructuring effort so as to ensure that the future HIS can better respond to the planning and management needs of the health services at all levels.

C. INDICATORS FOR THE EVALUATION

The assessment study has to provide the following information in order to achieve its double objectives:

Obj. 1: To assess the capability of the existing information(HIS) to provide information support to all management levels of the health services system, and to identify its strengths and weaknesses.

1.1 Indicators related to **acceptance:** Is the existing HIS perceived as useful by its users at all levels in the system (care providers, provincial managers, national public health managers and program managers, other government institutions, donors? How well is HIS integrated in the overall health services system?

Perceived strengths by different data collectors and users
Perceived weaknesses by different data collectors and users
Reporting regularity and quality of data

1.2. Indicators related to **effectiveness:** Is the HIS providing the necessary information support that makes appropriate management at all levels in the health services system possible? If so, is there evidence that information generated by the system is really used for planning and/or management of the health services?

HIS indicators: are HIS indicators available for functions/activities performed at all levels of the health services system?

Availability of a list of indicators for functions/activities * at the patient/client level * at the health unit level * at the provincial/national level
For evaluation and planning of the health services: health outcomes, demographic information, distribution of health facilities
For programme planning: MCH, EPI, malaria, AIDS, etc.
For allocation of resources: databases on personnel, infrastructure (building and equipment), on finances
For health services management: ability to measure coverage, utilization, quality of care
For management support: ability to measure allocation, distribution, and availability of resources

Data collection system: how is the data collection system functioning presently? What is the actual quality of the data before transmission for further processing?

Adequacy of the design quality of different data collection instruments (forms, registers, cards, etc.) for the different management levels
% of time spent by staff (care providers and managers) on data collection
Adequacy of laboratory equipment for data needing laboratory results
Quality of data as recorded on various data collection instruments
Quality of aggregation process before reporting

Data transmission: is the data transmission system organized in such a way that data can be effectively channelled towards the data processing units? What is the present status of the data transmission system?

Compatibility of the data transmission system with line management channels
Existence and relevance of reporting time tables
Existence of parallel reporting by programme information systems
% of health units reporting regularly
% of health units reporting timely

Data processing system: where and how are data processed?

Ability of the statistical staff to operated the data processing systems at the provincial and national centers
Timeliness of data entry
Quality of data entry

Data analysis and feedback: What mechanisms have been built into the system for data analysis and feedback? How if feedback provided to care providers and managers at all levels in the health services system?

Adequacy of the information feedback systems at all levels in the health services system (in terms of providing the information needed for decision making)
Timeliness of the feedback reports
Appropriateness of the format of feedback reports

Use of the information: Is there evidence that information generated is really being used by health planners and managers and by care providers at all levels in the system?

Concrete examples of use of the information by care providers for patient/client management
Concrete examples of use of the information for health station and health center management
Concrete examples of use of the information for hospital management
Concrete examples of use of the information at the provincial level
Concrete examples of use of the information at the national level

1.3. Indicators related to **efficiency**: How well used are the resources (personnel, equipment, supplies, money) to operate the system, meaning to generated the needed information?

HIS staffing: Have care providers and managers at peripheral levels received adequate training in data collection procedures and in use of the information? Are responsibilities assigned for HIS

management at the different levels (e.g. for aggregation and reporting at the health unit level, for verification of reporting regularity and quality at the provincial level)?

% of care providers adequately trained in data collection procedures
% of managers adequately trained in data collection procedures
% of care providers adequately trained in use of the information
% of managers adequately trained in use of the information
% of health units with clearly defined HIS responsibilities

Computer equipment:

Appropriateness of the hardware and software for the computerized data processing system
Functional status of hardware and software
Adequate availability of computer supplies

Printed supplies distribution system:

Procedures for ordering and distribution of printed supplies established
% of health facilities with stock-outs of printed supplies

Organizational set-up: who is coordinating the HIS at national and provincial levels? Do clearly defined job descriptions exist? Are standard instructions available on data collection and reporting procedures?

Adequacy of HIS coordination
Presence of standard instructions on data collection and reporting procedures at all levels

Recurrent costs of HIS:

% of recurrent budget allocated for HIS operation costs

Obj. 2: **To assess the relevance of eventual health information system restructuring and to get input from public health managers and health care providers on the content and the process of the restructuring effort so as to ensure that the future HIS can better respond to the planning and management needs of the health services at all levels.**

2.1. Indicators related to the **relevance of the planned HIS restructuring**: does restructuring of the existing routine information system respond to a need in the context of the overall health policy and planning environment, and, if so, is it a priority?

Assessment of importance of HIS restructuring by different public health officials
Planned allocation of sufficient resources (staff, money, equipment) for implementation of new HIS

2.2. Indicators related to **inputs of future users**: If restructuring of the existing HIS is a priority, how far should restructuring go? Should it be a major overhaul, or should it focus on specific components of the system? What are these components?

Summary of suggested improvements by users at various levels in the health services system

D. DATA COLLECTION METHODS

In order to collect the necessary data for these indicators, different data collection methods will be used:

1. Study of existing documents and datasets
2. Interviews with the principal public health managers
3. Assessment of provincial headquarters
4. Assessment of a sample of health care facilities
5. Assessment of computer center in Asmara

E. DATA COLLECTION INSTRUMENTS

1. Questionnaires for Provincial Medical Offices (PMO)

2. Questionnaires for health care providers
   * I/C Hospital/Health Center
   * I/C Health Station

3. Checklists
   * Hospital/Health Center
   * Health Station
   * Computer center

F. SAMPLING PROCEDURES

The samples should be as representative as possible of the geographic, ethnic, and demographic characteristics of the country.

Given the time and climatic constraints, it is proposed to limit the sample of facilities to nine: one hospital, four health centers, and four health stations. One of the health stations will be NGO managed.

First one health center will be randomly selected in each of the four areas of the country: Asmara, the western lowlands, the coastal lowlands, and the highlands. Then, for each health center, one health station will be randomly selected . One will be a NGO managed health station. Finally, one referral hospital of one of the selected health centers will be chosen (see appendix 1).

G. ANALYSIS OF RESULTS

The data obtained from the various sources will be manually analyzed by the HIS Assessment Team. For this purpose a table as given below will be used. The results will be incorporated in a study report. This report will be presented to the main decision makers in the Ministry of Health for revision. The final version of this report will then be used as the workdocument for the HIS restructuring effort.

INDICATORS	DATA SOURCES	FINDINGS	RECOMMENDATIONS

H. COMPOSITION OF THE STUDY TEAM

The HIS Assessment Team is composed of the following persons:

Mr. Iyob Tekle, Head Health Services Planning
Dr. Girmai Tesfassilasie, PMO Hamasien
Mr. Ghebrenegus Negash, Head Health Information unit, MOH
Ms. Haimanot Araya, I/C Felego Hiwot Health center
Dr. Theo Lippeveld, BASICS consultant

I. TIMELINE

Activity	Dates
Preparation Protocol	July 12-14
Preparation Questionnaires/Checklists	July 14-16
Field testing of Questionnaires/Checklists	July 17
Study of documents	July 12-31
Interviews public health managers	July 14-27
Assessment provincial headquarters	July 18
Assessment health facilities	July 17-27
Assessment computer center Asmara	July 20
Data Analysis	July 27-29
Preparation of study report	July 30-31
Presentation of report to Ministry of Health	August 1

J. BUDGET

1.	Office Supplies		Birr	500
2.	Field supplies and other			1,000
3.	Forms and photocopying			400
4.	Vehicles			
	1 - 10 days @ Br 850	8,500		
	1 - 3 days @ Br 850	2,550		11,050
5.	Fuel			600
6.	Per Diem 3 team members			
	Dankalia - 3 days @ Br 70 + 40%	782		
	Highlands - 5 days @ Br 70	1050		
	Keren - 1 day, Hotel Br 70 (1 night)	210		
	M&IE Br 50 (2 days)	300		2,342
	Total:		Birr	15,892

Appendix 1 **MINISTRY OF HEALTH OF ERITREA**

HIS ASSESSMENT STUDY
FIELD VISITS

1. Sample of health units and administrative structures

AREA/PROVINCES	HEALTH CENTER	HEALTH STATION	OTHER STRUCTURES
Western Lowlands (Barka,Sahel, Gash Petit, Senhit)	Elabaret	Keren town (NGO)	PMO Senhit in Keren
Coastal Lowlamds (Denkalia, Semhar)	Tio	Bada	
Highlands (Hamasien, Seraye, Akeleguzai)	Areza	E. Gorgiso	Hosp. Mendefera
Asmara	Acria	Edaga Akbi	Health Info Unit/MOH

2. Itinerary

July 17	HC Acria: pretesting of questionnaires
July 18	Visit HS Keren town and PMO Senhit in Keren Overnight in Keren
July 19	Visit HC Elabaret -- Return Asmara
July 20	Visit Health Information Unit Asmara Interviews MOH officials
July 21	Travel to Tio -- Overnight in Tio
July 22	Visit HC TIO -- Overnight in Tio
July 23	Visit HS Bada -- Return Asmara
July 24	Visit Hosp. Mendefera Overnight in Mendefera
July 25	Visit HC Areza Overnight in Mendefera
July 26	Visit HS E. Gorgiso Return Asmara
July 27	Visit HS Edaga Akbi

APPENDIX D

MINISTRY OF HEALTH OF ERITREA

HIS ASSESSMENT STUDY
INTERVIEW OF PUBLIC HEALTH DECISION MAKER/MOH ASMARA

NAME:_____ DATE:_____

FUNCTION:_____

_____

(use other side if more space is required)

The Ministry of Health intends to restructure the health information system, so as to make it more responsive to the information needs of decision makers at all levels in the health services system: health care providers, provincial administrators and supervisors, and national health planners and managers. We would like to have your inputs on the existing and planned health information system.

1. Could you list us the functions and activities of your department/unit?

2. What is your opinion on the existing health information system?

Strengths:

Weaknesses:

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MINISTRY OF HEALTH OF ERITREA

HIS ASSESSMENT STUDY
QUESTIONNAIRE FOR IN CHARGE/HEALTH CENTERS-HOSPITALS

Health Center:
Hospital: _____

Name of In Charge: _____

Date of visit: _____

(use other side of pages if more space is required)

The Ministry of Health intends to restructure the health information system, so as to make it more responsive to the information needs of decision makers at all levels in the health services system: health care providers, provincial administrators and supervisors, and national health planners and managers. We would like to ask some questions on the existing health information system and to have your inputs on the planned health information system.

INTRODUCTORY INFORMATION

STAFF:	Doctors	[ ]
	Nurses	[ ]
	Health Assistants	[ ]
	Health Technicians	[ ]
	Barefoot doctors	[ ]
	Midwifes	[ ]
	Other medical	[ ]
	Administrative staff	[ ]
	Support staff	[ ]
	Other non-medical	[ ]

Catchment area defined No [ ] Yes [ ]

Population in C/A [ ]

Number of new cases last month [ ]
two months ago [ ]
six months ago [ ]

1. FUNCTIONS/ACTIVITIES

1.1. Have you been given a list of functions and activities to be performed in this health unit?

Yes [ ] Please show it.

No [ ] What do you think are the functions and activities in this hospital [ ] health center [ ]

2. HIS INFORMATION NEEDS AND INDICATORS

2.1. Is the information from the data collected on patient/client cards and registers sufficient to provide treatment, preventive care, and follow-up for your patients/clients?

Yes, totally [ ] Yes, mostly [ ] Partially [ ]

No, mostly not [ ] No, not at all [ ]

If not, what other information do you need?

2.2. Is the information from the data collected on the present data collection instruments sufficient to manage services and resources in your health facility?

Yes, totally [ ] Yes, mostly [ ] Partially [ ]

No, mostly not [ ] No, not at all [ ]

If not, what other information do you need?

2.3. Is some of the information from the data collected of no use to you?

No, all information is useful [ ]

Yes [ ] Please specify what information is of no use:

3. DATA COLLECTION

3.1. Do you find it difficult or time consuming to fill in the existing data collection instruments?

No, not all [ ] Yes [ ] Which ones?

Data collection instrument	Time consuming	Degree of difficulty		
		very	avera ge	some what

3.2. Do you report on laboratory results for malaria and tuberculosis?

No [ ] Yes [ ]

3.3. If yes, do you have all necessary equipment and supplies?

Yes [ ] No [ ] Missing:

4. REPORTING

4.1. Who fills in the Monthly Report and what is his/her qualification (or their qualifications if more than one person)?

4.2. When do you fill in the Monthly Report?

4.3. How much time does it take you to fill in the Monthly Report?

4.4. Is it easy to transfer the data from your cards and registers into the Monthly Report?

Yes, very easy [ ] Yes, quite easy [ ]

No, quite difficult [ ] No, very difficult [ ]

If difficult, could you describe why?

4.5. Do you have in your health unit an instruction manual to fill in the monthly report?

No [ ] Yes [ ]

4.6. Do you use it?

Yes [ ] No [ ] Why not?

4.7. Have you been given a reporting time table?

No [ ] Yes [ ]

If yes, can you show it to me, or tell me?

4.8. When do you send the Monthly Report?

4.9. To whom and how do you send the Monthly Report?

4.10. Do you keep copies of the monthly report?

No [ ] Yes [ ]

If yes, please show me your file with monthly reports.

Available: Yes [ ] No [ ]
Number sent last year: ___/12
Number kept on file: ___/12
Month of last report:

4.11. Did you have cases of measles, polio, cholera, or meningitis in the last month?

No [ ] Yes [ ]

If yes, how did you report them?

4.12. Do you prepare and send other reports?

No [ ] Yes [ ] Please list them:

5. DATA TRANSMISSION AND PROCESSING

5.1. Do you receive reports from health stations?

No [ ] Skip to 6. Yes [ ]

If yes, give reporting rate and reporting delays

5.2. Has a reporting time table been defined?

No [ ] Yes [ ] Could you give it to us?

5.3. Do you keep copies of the reports?

Yes [ ] No [ ] Why not?

5.4. Is the data from the reports compiled before sending it to the PMO?

No [ ] Yes [ ]

If yes: Who does it?

How much time does it take?

5.5. Do you verify the quality of the reports received?

No [ ] Yes [ ]

If yes, could you describe us your findings?

5.6. Do health units report cases of epidemic diseases to you?

No [ ] Yes [ ]

If yes: How?

How timely?

Which diseases?

What type of actions do you take?

5.7. Do you receive reports from other health units than those managed by the Ministry of Health?

No [ ] Yes [ ] Which ones?

5.8. Do you receive reports from CHWs and/or TBAs?

No [ ] Yes [ ]

If yes, do you use the information? Do you compile the data and transmit it to higher levels?

6. FEEDBACK AND USE of INFORMATION

6.1. Do you use the information from the data that you record on patient/client records?

No [ ] Yes [ ] Please give examples.

6.2. Are there any patient/client records that you do not use? If yes, which ones and why?

6.3. Do you use the information from the data that you record in the registers?

No [ ] Yes [ ] Please give examples.

6.4. Are there any registers that you do not use? If yes, which ones and why?

6.5. Do you use the information contained in the Monthly Report?

To discuss with your team about progress and problems?	[Yes] [No]
To monitor coverage and quality of services delivered	[Yes] [No]
To manage resources such as drugs, vaccines, contraceptives	[Yes] [No]
For other reasons (please specify)	[Yes] [No]

6.6. If yes on any of the preceding items, please give a practical example (e.g. the last time you used the information)

6.7. Did you receive feedback reports from the province or Ministry of Health in the last six months?

No [ ] Yes [ ]

If yes, did you use the information?

No [ ] Yes [ ]

7. HIS STAFFING AND TRAINING

7.1 Do you have a staff person in charge of data collection/reporting in your facility?

No [ ] Yes [ ] Please specify who and if full time

7.2. Did you or your staff ever receive training in data collection/reporting procedures?

No [ ] Yes [ ] When, where, and on what topics?

7.3. Did you or your staff ever receive training in using information for your daily work?

No [ ] Yes [ ] When, where, and on what topics?

8. HIS PRINTED SUPPLIES/EQUIPMENT

please fill in checklist

8.1. Did you have any stock-outs of printed supplies? If yes, for which data collection instruments and for how long?

8.2. When did you receive printed supplies the last time? How were they delivered?

8.3. How are you supposed to order printed supplies?

8.4. Do you have a calculator?

No [ ] Yes [ ]

9. SUPERVISION

9.1. Who is providing supervision to you?

9.2. When did you receive your last two supervisory visits?

9.3. Did the supervisor verify how you were filling in the data collection instruments?

No [ ] Yes [ ] During how much time?

9.4. Did the supervisor discuss with you about the information of the Monthly Report?

No [ ] Yes [ ] Please give an example.

9.5. Do you supervise health stations?

No [ ] Skip to 10 Yes [ ] How frequently?

9.6. During your supervisory visits do you verify how the staff is filling in the data collection instruments?

No [ ] Yes [ ] If yes, during how much time?

9.7. Do you discuss with the staff about the information contained in the reports?

No [ ] Yes [ ] If yes, can you give some examples?

10. ACCEPTANCE

10.1. Would you be in favor of changing the existing health information system?

Yes [ ] see question 10.2.

No [ ] could you give us the reasons?

10.2. What suggestions can you give us to improve the existing health information system?

Information needs/Indicators:

Data collection instruments

Reporting

Data transmission and processing

Feedback and use of the information

HIS staffing and training

HIS printed supplies and equipment

Supervision

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MINISTRY OF HEALTH

HIS ASSESSMENT STUDY
OBSERVATIONAL CHECKLIST FOR HOSPITALS/HEALTH CENTERS

Hospital:
Health Center: _____

Date of visit: _____

1. HIS DATA COLLECTION TOOL

Data Collection tool	In stock Y/N	In use Y/N	Quality of recording
PATIENT/CLIENT RECORD CARDS fr = facility retained pcr = patient/client retained ip = in-patient			
1. Out-Patient Card (pcr)			
2. Out-Patient Record (fr)			
3. Child Health Card W/A (pcr)			
4. Child Health Card W/H (pcr)			
5. Woman Health Card (pcr)			
6. Woman Health Record (fr)			
7. TT Vaccination Card (pcr)			
8. Family Planning Card (pcr)			
9. Family Planning Record (fr)			
10. Tuberculosis Card (pcr)			
11. Tuberculosis Record (fr)			
12. Laboratory Request Form (fr)			
13. X-Ray Request Form (fr)			
14. Clinical Record Card (ip)			
15. Temperature Card (ip)			
16. Referral Form			

FACILITY RECORDS/REGISTERS			
1. Out-Patient Register			
2. Referral Register			
3. Antenatal Register			
4. Delivery Register			
5. Postnatal Register			
6. Family Planning Register			
7. TT Vaccination Register			
8. EPI Register			
9. Growth Monitoring Register			
10. Tuberculosis Register			
11. Leprosy Register			
12. AIDS Register			
13. Stock Record Card (PMS)			
14. Stock Record Card (Vaccines)			
15. Stock Record Card (FP)			
16. Inventory Card (equipment)			
17. Temperature Record Card			
18. Attendance cards			
19. Laboratory Register			
20. X-Ray Register			
21. In-Patient Register			
22. Rehydration Register			
23. Dressing Register			

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REPORT FORMS			
1. Monthly Report Form (H/HC-1)			
2. Monthly Report Form (HS-1)			
3. Compilation Form (HS-2)			
4. Weekly Notifiable Diseases Report			
5. Community Health Services Report			
6. Pharmacy Monthly Report			
7. Pharmacy Order Form			
8. Tally Sheets			

2. DIAGNOSTIC EQUIPMENT

Type	Y/N	Funct. Status
Baby weighing scale		
Adult weighing scale		
Hemoglobinometer		
Microscope with 100x immersion objective		
Stains for tuberculosis diagnosis		
Stains for malaria diagnosis		
Widal reagents		
Sphygmomanometer		

MINISTRY OF HEALTH OF ERITREA

HIS ASSESSMENT STUDY
QUESTIONNAIRE FOR PROVINCIAL MEDICAL OFFICER

Province: _____

Name of PMO: _____

Date of visit: _____

(use other side of pages if more space is required)

The Ministry of Health intends to restructure the health information system, so as to make it more responsive to the information needs of decision makers at all levels in the health services system: health care providers, provincial administrators and supervisors, and national health planners and managers. We would like to ask some questions on the existing health information system and to have your inputs on the planned health information system.

1. FUNCTIONS/ACTIVITIES

1.1. Have you been given a list of functions and activities to be performed at the provincial headquarters?

Yes [ ] Please show it.

No [ ] What do you think are the functions and activities of the provincial headquarters?

2. HIS INDICATORS

2.1. According to you, is the information from the data collected in the health units (hospitals, health centers, health stations) sufficient to provide treatment, preventive care, and follow-up for the patients/clients?

Yes, totally [ ] Yes, mostly [ ] Partially [ ]

No, mostly not [ ] No, not at all [ ]

If not, what is missing?

2.2. According to you, is the information from the data collected in the health unit sufficient to manage services and resources in that health unit?

Yes, totally [ ] Yes, mostly [ ] Partially [ ]

No, mostly not [ ] No, not at all [ ]

If not, what is missing?

2.3. Is the information reported to you by the health units sufficient to plan and manage the health services in your province?

Yes, totally [ ] Yes, mostly [ ] Partially [ ]

No, mostly not [ ] No, not at all [ ]

If not, what is missing?

2.4. Is some of the information reported to you by the health units of no use for you?

No, all information is useful [ ]

Yes [ ] Please specify what information is of no use

2.5. Do you get information from other sources?

No [ ] Yes [ ] Which ones?

3. DATA COLLECTION

3.1. Based on your experience during supervision and on the reports sent to you, what is your opinion in general on the quality of the data collected in the health units:

Excellent [ ] Good [ ] Average [ ] Poor [ ] Very poor [ ]

If below average could you specify for what type of data and for reasons:

3.2. Do you collect data yourself?

No [ ] Yes [ ] If yes, please specify what data

4. DATA TRANSMISSION AND PROCESSING

4.1. Could you list all reports you normally receive from the health units and specify the frequency, the reporting rate (in %), eventual delays in reporting, and to whom in the Ministry of Health you sent them?

TYPE OF REPORT	RECEIVED EVERY	REPORTING RATE	REPORTING DELAY	SENT TO

4.2. Has a reporting time table been defined?

No [ ] Yes [ ] Could you give it to us?

4.3 Do you keep copies of the reports?

Yes [ ] No [ ] Why not?

4.4. Is the data from the reports compiled before sending it to the Ministry of Health?

No [ ] Yes [ ]

If yes: Who does it?

How much time does it take?

4.5. Do you verify the quality of the reports received?

No [ ] Yes [ ]

If yes, could you describe us your findings?

4.6. Do health units report cases of epidemic diseases to you?

No [ ] Yes [ ]

If yes: How?

How timely?

Which diseases?

What type of actions do you take?

4.7. Do you receive reports from other health units than those managed by the Ministry of Health?

No [ ] Yes [ ] Which ones?

5. USE of INFORMATION

5.1. Do you directly use the information from the reports received from the health units? (before they are sent to the Ministry of Health)?

To monitor coverage and quality of services delivered	[Yes] [No]
To manage resources such as drugs, vaccines, contraceptives	[Yes] [No]
For other reasons (please specify)	[Yes] [No]

5.2. If yes on any of the preceding items, please give a practical example (e.g. the last time you used the information)

5.3. Did you receive feedback reports from the Ministry of Health in the last six months?

No [ ] Yes [ ]

If yes, did you use the information?

No [ ] Yes [ ] Please give examples

6. HIS STAFFING AND TRAINING

6.1. Do you have any staff at the provincial level to coordinate HIS activities or to process data?

No [ ] Yes [ ] Please specify

MINISTRY OF HEALTH

HIS ASSESSMENT STUDY
OBSERVATIONAL CHECKLIST FOR HEALTH INFORMATION UNIT/ASMARA

Date of visit: _____

1. Staffing

Position	Qualifications

2. Status of hardware

Computers/Printers/UPS	Functional Status	Maintenance

3. Status of Software

Type of programmes	Use

4. Status of supplies

Type	Quantity
Diskettes	
Printer ribbons	
Paper	

5. Data collection

What type

Who/When/How

5. Data entry

Who/When/How?

Back log?

6. Feedback reports

What types of reports and how were they produced?

When were last ones produced?

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MINISTRY OF HEALTH

HIS ASSESSMENT STUDY
OBSERVATIONAL CHECKLIST FOR HEALTH STATION

Health Station: _____

Date of visit: _____

1. HIS DATA COLLECTION TOOLS

Data Collection tool	In stock Y/N	In use Y/N	Quality of recording
PATIENT/CLIENT RECORD CARDS fr = facility retained pcr = patient/client retained ip = in-patient			
1. Out-Patient Card (pcr)			
2. Out-Patient Record (fr)			
3. Child Health Card W/A (pcr)			
4. Child Health Card W/H (pcr)			
5. Woman Health Card (pcr)			
6. Woman Health Record (fr)			
7. TT Vaccination Card (pcr)			
8. Family Planning Card (pcr)			
9. Family Planning Record (fr)			
10. Tuberculosis Card (pcr)			
11. Tuberculosis Record (fr)			
12. Referral [illegible]			
FACILITY [illegible] REGISTERS			
1. Out-Patient Register			
2. [illegible]			
3. [illegible]			
4. [illegible]			

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5. Postnatal Register			
6. Family Planning Register			
7. TT Vaccination Register			
8. EPI Register			
9. Growth Monitoring Register			
10. Tuberculosis Register			
11. Leprosy Register			
12. AIDS Register			
13. Stock Record Card (PMS)			
14. Stock Record Card (Vaccines)			
15. Stock Record Card (FP)			
16. Inventory Card (equipment)			
17. Temperature Record Card			
18. Attendance cards			
19. Dressing Register			
REPORT FORMS			
1. Monthly Report Form (HS-1)			
2. Weekly Notifiable Diseases Report			
3. Community Health Services Report			
4. Pharmacy Monthly Report			
5. Pharmacy Order Form			
6. Tally Sheets			

2. DIAGNOSTIC EQUIPMENT

Type	Y/N	Funct. Status
Baby weighing scale		
Adult weighing scale		
Sphygmomanometer		

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2.3. Is some of the information from the data collected of no use to you?

No, all information is useful [ ]

Yes [ ] Please specify what information is of no use:

3. DATA COLLECTION

3.1. Do you find it difficult or time consuming to fill in the existing data collection instruments?

No, not all [ ] Yes [ ] Which ones?

Data collection instrument	Time consuming	Degree of difficulty		
		very	avera ge	some what

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4. REPORTING

4.1. Who fills in the Monthly Report and what is his/her qualification?

4.2. When do you fill in the Monthly Report?

4.3. How much time does it take you to fill in the Monthly Report?

4.4. Is it easy to transfer the data from your cards and registers into the Monthly Report?

Yes, very easy [ ] Yes, quite easy [ ]

No, quite difficult [ ] No, very difficult [ ]

If difficult, could you describe why?

4.5. Do you have in your health unit an instruction manual to fill in the monthly report?

No [ ] Yes [ ]

4.6. Do you use it?

Yes [ ] No [ ] Why not?

BEST AVAILABLE COPY

4.7. Have you been given a reporting time table?

No [ ] Yes [ ]

If yes, can you show it to me, or tell me?

4.8. When do you send the Monthly Report?

4.9. To whom and how do you send the Monthly Report?

4.10. Do you keep copies of the monthly report?

No [ ] Yes [ ]

If yes, please show me your file with monthly reports.

Available: Yes [ ] No [ ]
Number sent last year: ___/12
Number kept on file: ___/12
Month of last report:

4.11. Did you have cases of measles, polio, cholera, or meningitis in the last month?

No [ ] Yes [ ]

If yes, how did you report them?

4.12. Do you prepare and send other reports?

No [ ] Yes [ ] Please list them:

5. DATA TRANSMISSION AND COMPILATION

5.1. Do you receive reports from CHWs and/or TBAs?

No [ ] Skip to 6. Yes [ ]

If yes, do you use the information? Do you compile the data and send them to higher levels?

6. FEEDBACK AND USE of INFORMATION

6.1. Do you use the information from the data that you record on patient/client records?

No [ ] Yes [ ] Please give examples.

6.2. Are there any patient/client records that you do not use? If yes, which ones and why?

6.3 Do you use the information from the data that you record in the registers?

No [ ] Yes [ ] Please give examples.

6.4. Are there any registers that you do not use? If yes, which ones and why?

6.5. Do you use the information contained in the Monthly Report?

To discuss with your team about progress and problems?	[Yes] [No]
To monitor coverage and quality of services delivered	[Yes] [No]
To manage resources such as drugs, vaccines, contraceptives	[Yes] [No]
For other reasons (please specify)	[Yes] [No]

6.6. If yes on any of the preceding items, please give a practical example (e.g. the last time you used the information)

6.7. Did you receive feedback reports from the province or Ministry of Health in the last six months?

No [ ] Yes [ ]

If yes, did you use the information?

No [ ] Yes [ ]

7. HIS STAFFING AND TRAINING

7.1. Do you have a staff person in charge of data collection/reporting in your facility?

No [ ] Yes [ ] Please specify who and if full time

7.2. Did you or your staff ever receive training in data collection/reporting procedures?

No [ ] Yes [ ] When, where, and on what topics?

7.3. Did you or your staff ever receive training in using information for your daily work?

No [ ] Yes [ ] When, where, and on what topics?

8. HIS PRINTED SUPPLIES/EQUIPMENT

please fill in checklist

8.1. Did you have any stock-outs of printed supplies? If yes, for which data collection instruments and for how long?

8.2. When did you receive printed supplies the last time? How were they delivered?

8.3. How are you supposed to order printed supplies?

8.4. Do you have a calculator?

No [ ] Yes [ ]

9. SUPERVISION

9.1. Who provides supervision to you?

9.2. When did you receive your last supervisory visit?

9.3. Did the supervisor verify how you were filling in the data collection instruments?

No [ ] Yes [ ] During how much time?

9.4. Did the supervisor discuss with you about the information of the Monthly Report?

No [ ] Yes [ ] Please give an example.

9.5. Do you supervise CHWs and/or TBAs?

No [ ] Yes [ ]

If yes, can you tell us how frequently and how you provide supervision?

10. ACCEPTANCE

10.1. Would you be in favor of changing the existing health information system?

Yes [ ] see question 9.2.

No [ ] could you give us the reasons?

10.2. What suggestions can you give us to improve the existing health information system?

Information needs and indicators:

Data collection instruments

Reporting

Data transmission and processing

Feedback and use of the information

HIS staffing and training

HIS printed supplies and equipment

Supervision

APPENDIX E

MINISTRY OF HEALTH OF ERITREA

HEALTH INFORMATION SYSTEM ASSESSMENT STUDY:
Findings and Recommendations

August 1995

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HEALTH INFORMATION SYSTEM ASSESSMENT STUDY:
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A. INTRODUCTION

This assessment study on the existing health information system (HIS) in Eritrea is part of a long-term effort of the Ministry of Health to restructure the system and to improve the generation and use of information for planning and management of the health services. In 1994 a planning document has been prepared by the Planning and Evaluation Bureau of the Ministry of Health entitled "A Health Management Information System for Eritrea". It calls for a restructuring of the existing information system in four phases. This assessment study was part of the activities in the first phase. Technical assistance for the study is provided through the BASICS Project with financial assistance from USAID.

B. OBJECTIVES OF THE ASSESSMENT STUDY

This assessment study was full part of a broader effort to restructure the health information system in Eritrea. Its objectives were therefore double:

1. To assess the capability of the existing information system (HIS) to provide information support to all management levels of the health services system, and to identify its strengths and weaknesses.

2. To assess the relevance of eventual health information system restructuring and to get input from public health managers and health care providers on the content and the process of the restructuring effort so as to ensure that the future HIS can better respond to the planning and management needs of the health services at all levels.

C. CONCEPTUAL BOUNDARIES OF THE STUDY

A health information system cannot exist by itself. It is a "functional entity within the framework of the health services as a whole" (WHO, 1980). Therefore, the existing health information system was assessed in terms of its potential to provide specific information support to make appropriate decisions for planning and management at all levels in the health services system (= Health Management Information System or HMIS). The health services system is composed of three management levels: the patient/client management level, the health unit management level, and the system management level. In Eritrea, the main health units are health stations and health centers at the first level, and hospitals at the referral level. In some areas, this network of professional health units has been extended through community health workers (see figure 1).

Figure I

ORGANIZATIONAL MODEL OF THE HEALTH SERVICES SYSTEM
Based on Three Management Levels

Health System Level	Health Facility Level	Patient Client Level
National	*Tertiary Level* Referral Hospital	Referred Patients
Zonal/ Provincial	*Tertiary Level* Referral Hospital	Referred Patients
Subprovincial/ District	*Secondary Level* District Hospital	Referred patients
	First Level Health Center	Communities Patients/Clients
	Health Stations	Communities Patients/Clients

The decisions to be made derive from the functions and activities at each of the management levels. At the patient/client level and the health unit level, these functions and activities are directly related to the delivery of health care to the population. The health centers and the health stations provide first level care. Since the health stations mostly do not provide the full "minimum" package of first level care activities (e.g. no family planning services, or no laboratory), some patients have to be referred to health centers for these activities. The hospitals at the provincial level ensure secondary care (first referral level). The national hospital in Asmara provides tertiary referral care. The system level provides coordination, planning, and management support to the service delivery levels. Presently, these functions are provided mainly from the national level but also from the provincial level. In the context for the decentralization policy of the Government, it is expected that additional planning and management responsibilities will be delegated to the provincial level (or to the projected new zones). Also, up to a certain extent, health centers ensure supervision of health stations.

The quality of the information support depends further on the information process and on the management structure of the information system. The information process can be broken down in the following steps: (1) data collection; (2) data transmission; (3) data processing; (4) information generation; (5) information use. The management structure ensures optimum use of the resources needed to operate the information system: persons (e.g. data collectors, statisticians); equipment and supplies (e.g. telephones, computers, printed supplies); and financial resources.

The data to generate the necessary information can be collected from a variety of sources. From a methodological point of view, data sources can be classified as routine systems and non-routine systems. The two main routine health information systems are the health unit based system and the vital events registration system. Non-routine methods of health data collection include surveys, rapid assessment methods, and other special studies. In Eritrea at present, the main source of health information is the health unit based routine information system both in government managed health units (80%) and in NGO managed units (20%).

The assessment study therefore mainly focused on this system. It examined first the **functions of the health services** in Eritrea at each management level, the extent to which these functions have been made explicit, and the actual operational status of the health services. It then assessed to what degree the present routine information system provided the information support to permit rational decision making at each of these levels. It did so by answering the following questions:

Related to **acceptance:**

> Is the existing HIS perceived as useful by its users at all levels in the health services system (care providers, public health managers, health planners, donors)?

Related to **effectiveness:**

> To what degree is the information generating process of the existing HIS effective in providing information support to all levels in the health services system? Is there evidence that the information generated is used for planning and/or management of the health services?

Related to **efficiency:**

> How well organized is the management of the resources (staffing, equipment, supplies, finances) to generate the information?

Finally it tried to answer the question how **relevant restructuring of the existing HIS** is in the overall policy and planning context. It questioned the main future users about the **modalities of the restructuring effort**.

D. METHODS AND DATA COLLECTION

Based on the objectives of the study and on the conceptual framework, a list of indicators was developed to assess the acceptance, effectiveness, and efficiency of the existing HIS, and to examine the relevance of the planned HIS restructuring effort. Data for these indicators would be collected through five methods: (1) study of existing documents and data sets; (2) interviews with the principal public health managers; (3) assessment of provincial headquarters; (3) assessment of a sample of health care facilities; and (5) assessment of the computer center in Asmara. Questionnaires for Provincial Medical Officers (PMO) and for the in charge of health facilities were developed, as well as checklists for health facilities and for the computer center.

Given the time and climatic constraints (rainy season), it was proposed to limit the sample of health facilities to nine: one hospital, four health centers, and four health stations. One of the health stations would be NGO managed. The sample was drawn as representative as possible of the geographic, ethnic, and demographic characteristics of the country, based on a list of health facilities divided in four geographic areas: the western lowlands, the coastal lowlands, the central highlands, and Asmara.

A more detailed description of indicators and data collection methods as well as the formats of the questionnaires and checklists are described in the protocol document that was prepared for this study. Data collection took place between July 17 and 27, 1995. Table 1 gives an overview of the health facilities and provincial headquarters visited. One selected health station in Denkali was not visited because the in charge was absent (Bada). Instead the health center of Gelalo in Denkali was visited.

In the Ministry of Health in Asmara, the computer center was visited and most department heads were interviewed.

Table 1 Health Structures Visited

AREA/PROVINCES	HEALTH CENTER	HEALTH STATION	OTHER STRUCTURES
Western Lowlands (Barka.Sahel, Gash Petit, Senhit)	Elabaret	Keren town (NGO)	PMO Senhit in Keren
Coastal Lowlands (Denkalia, Semhar)	Tio	Gelalo (HC)	
Highlands (Hamasien, Seraye, Akeleguzai)	Areza	Enda Gorgiso	PMO Seraye Hosp. in Mendefera
Asmara	Acria	Edaga Akbi	HIRO/MOH Department heads (MOH)

D. FINDINGS

The findings of the HIS assessment study are related following the order of the assessment framework proposed in the study protocol. For further details, appendix 1 summarizes findings and recommendations in table form.

1. Functions of the health services in Eritrea

It was found that the functions of the health services at the three management levels of the health services system are not clearly defined.

At the national level, various departments are redefining their functions: the Planning and Evaluation Bureau; the Pharmacy department; the Central Laboratory; the Human Resources Development Department. Some national programmes such as EPI and AIDS are defining their functions and formulating short- and long-term plans. Other programmes such as Mother Health, Tuberculosis, Nutrition have to start this exercise.

At the regional level, a serious vacuum exist. The functions of the provincial headquarters are unclear. Although a decentralization policy has been established, it is not yet implemented on the field. The pending administrative restructuring into six zones is contributing to the existing confusion. Provincial Medical Officers use their own judgment in defining their actual functions. Some of them try to formulate short term plans but are constrained by their financial planning limits. The supervisory and the referral system does not function. One of the issues is the ambivalent role of the health centers: should these health units in addition to their first level care functions also act as a referral center for the health stations and supervise them? At present, their functional status and staffing pattern certainly does not permit them to do so.

At the health unit level, definition of functions is more obvious. The health stations and the health centers both are supposed to provide a package of first level care, while the rural hospitals should provide first level referral care. The actual content of these packages is not well defined, but we have tried to compare the present activities the health stations and health centers with a standard first level care package used in other African countries. Curative care is offered to a certain extent in all facilities visited. Utilization rates were acceptable. In five of the seven centers more than 20 new cases per day were seen. Various preventive and promotive services were not provided for several reasons in the health stations and health centers we visited (see table 2). Even if they were provided, utilization rates were low compared to the estimated population at risk. We have no sufficient information to assess the quality of services provided, but in none of the visited centers a system for follow-up of risk episodes and chronic patients existed.

Most importantly, their is a very poorly developed interface between health centers and health stations and the community. Most health workers we interviewed have no precise idea of the catchment area they serve and of the population in each of the villages in the catchment area. Mostly no real contacts are maintained with community leaders. No outreach activities or home visits are organized except in the Asmara region.

Table 2: Standard package offered in first level care facilities

Service	N of facilities
1. Curative Care focused on Priority Health Problems	7/7
2. Preventive Care	
▌ Pregnant Ladies	
• Risk Detection	6/7
• TT Vaccination	5/7
▌ Safe Deliveries	4/7
▌ Family Planning Services	4/7
▌ Children under three	
• Growth Monitoring	4/7
• Vaccinations	5/7
3. Follow-up of chronic diseases	4/7
4. Promotive services	
• Health education	7/7
• Water and sanitation activities	2/7
5. Community Development Activities	2/7

Human resources and physical resources management at all levels of the health services are deficient. Health care providers receive no supportive supervision or structured in-service training. The drug distribution system except for hospitals is not based on real needs. Most health centers and health stations therefore face continuous stock-outs. Equipment is not well maintained, and if it breaks down, it takes several months before it is repaired or replaced.

It was already mentioned that health centers in addition to their role as first level care facilities, also have some referral and supervisory functions for health stations. We actually found this arrangement in only one health center out of the five visited. One PMO was of the opinion that both health centers and health stations should operate only at the first level of care, and that the district hospital should ensure referral and supervisory functions for both types of facilities.

2. Acceptance of the existing HIS

We questioned the principal national and some provincial public health managers about the strengths and weaknesses of the existing HIS. On the positive side, staff motivation and high reporting regularity are cited. Also, most agree that the comprehensive monthly report created in 1992 greatly improved the information offer at all levels.

Several weaknesses were cited:

* Absence of population denominators
* Plethoric and unfocused disease reporting system
* Low quality and incompleteness of data collected
* Ambivalence in the supervision and data transmission system (role of health center)
* Inefficient manual data processing
* Feedback mostly non-existent
* Low use of information at all levels
* Insufficient staff for HIS coordination
* Lack of training in data collection procedures and use of the information
* Chaotic distribution of printed supplies

The general opinion therefore was that the HIS in its present form was not able to respond to most information needs of the health services system. We will further substantiate these perceived strengths and weaknesses in the following paragraphs, based on our field visits and on study of existing documents and datasets.

3. Effectiveness of the existing HIS

How effective is the information generating process in providing the necessary information support to each management levels in the health services system? We assessed the different steps of the information generating process: (1) the information offer; (2) data collection; (3) data transmission; (4) data processing; (5) information generation; (6) information use.

(1) Information offer and indicators

The lack of definition of functions within the health services system obviously results in an information offer that is not adequate to plan and manage the health services.

Again, based on a provisional list of functions at national, at intermediate or district, and at health unit level, we have tried to estimate how the existing information offer is responding to real information needs. In some areas their is information overload that is unnecessarily burdening the health care providers: e.g. the endless lists of diseases to be reported every month from all health stations and health centers; or the sanitation and food hygiene information in the monthly report. On the other hand serious information gaps have been identified. The following list summarizes those, but for more detail we refer the reader to appendix 1, where information gaps are linked with actual functions at each level:

* Insufficient information on continuity of care for patients/clients
* No defined catchment areas and specific population denominators in health centers and health stations
* No information on community resources
* No information on quality of care (no established standard treatment guidelines)
* No information on appropriate use of hospital
* No information on quality of laboratory support
* No information on functioning of referral system
* Insufficient information on physical resources
* Insufficient baseline information on socio-economic indicators and mortality

(2) Data collection and data reporting

We mainly focused our assessment on data collection and reporting from the routine information system. We assessed data collection instruments (DCI) for patient/client and community management, DCI for health unit management, and DCI for system management. A list of most frequently used data collection instruments in the existing health information system is given in appendix 2.

Existing data collection instruments for *patient/client management* often contain too much data and are poorly designed. They do not help the care provider to take appropriate case management actions, and more particularly for follow-up of risk episodes and chronic diseases. For example, no pre-designed treatment card exist for follow-up of tuberculosis patients.

As for *health unit management* DCI, the staff of health stations and health centers have no maps or lists of villages permitting them to locate the population in the catchment area. Most formats of registers are not standardized. This is important because they are not pre-printed and should help the staff to compile data for the monthly report. Also, registers only used for this purpose could be

replaced by tally sheets and simplify the burden of data collection. One such tally sheet on MCH activities exists but it was not found in all facilities visited. No appropriate DCI are available to measure appropriate hospital use and to measure the quality of communication between first and referral level.

As for *system management DCI*, most data are provide through routine reporting. The comprehensive monthly report implemented in 1992 starts from an excellent conceptual basis, i.e. to direct all information on disease surveillance, on services provided (in-patient as well as out-patient), and on resources used through one single report. It therefore replaces a cumbersome system of separate programme-specific reports. Its format is not very user-friendly for the care providers and implies a tedious process of disease reporting by sex and age category. It does not permit the staff to calculate coverage for various activities. It also calls for an excessive amount of sanitation, food hygiene and laboratory data.

Presently an informal six-monthly and/or yearly report exists mostly summarizing data from the monthly report. No standardized and timely epidemic diseases outbreak reporting exists. There is no reporting on physical infrastructure and equipment. Drugs consumption is irregularly reported through a separate monthly report. We also found in Seraye province that care providers need to report in addition on a weekly basis on services provided. We were told that this happens at the request of the local government. Some care providers told us they do not comply because of the additional data collection burden.

The community health workers (CHWs) and traditional birth attendants (TBAs) linked to health centers and health stations are supposed to send a monthly community health services report to the center. In fact, we found only one health center (Akria in Asmara) where this actually happened through the use of a standard form. In another health center (Gelalo), CHWs were keeping notes on their activities and brought the notebook to the center when it was full.

Very little data collection is actually done at the provincial level. For example, supervisors do not use a checklist to a measure quality of care and to assist in problem-solving. We mostly did not find evidence of data collection from other sources, such as rapid assessment methods, or data collection from other sectors (education, agriculture). In Senhit, the PMO used population data from the local government as a basis to start developing district coverage plans.
The health facility staff does not feel overburdened by the data collection system. The only exception that was systematically mentioned was the disease reporting process that took excessive time, in some facilities up to two full days a month

Several reasons explain why the quality of the data collected and reported is not always very good. Often no standard definitions have been given to the staff: e.g. difference between new case and repeat visit; or case definitions for disease categories. Laboratory support is not always available at

the health center due to deficient equipment or supplies. Procedures for compiling data from registers and tally sheets into the monthly report are not always very clear. Mathematical errors and imprecisions in the reports further deteriorate the quality of information.

(3) Data transmission

Reporting time tables for the monthly report are well known by all health care providers and managers. Reporting regularity and timeliness of reporting is excellent. According to HIRO feedback reports, reporting regularity was more than 80% in all provinces except in Senhit and Denkali. Health stations report more irregularly than health centers and hospitals. We found that NGO facilities and mission clinics are well participating in the government reporting system.

Parallel reporting is virtually non-existent. Some separate reports exist such as seasonal malaria reports or sometimes family planning reports, but all reports are transmitted to the Provincial Medical Officer (PMO). Community health services reports are sent to health stations or health centers and then sent to the PMO in a compiled format.

The reporting flow between health stations and PMOs is ambivalent. Officially, health stations have to send the monthly report to the nearest health center who compiles the reports of all health stations in a summary form that is sent to the PMO. But at least in Senhit and in Denkali we found that reports form health stations are sent directly to the Provincial Medical Officer.

(4) Data processing

Presently all data processing of reports is done manually by compiling the data into summary forms at different levels. Health stations compile reports from CHWs and TBAs; health centers compile reports from health stations; provinces compile reports from health centers and health stations; and the national level compiles provincial summary reports. At the national level, at least one 486 IBM computer is available for data processing, but the HIRO staff use it only for editing and formatting the feedback tables. The actual computation is done manually or with a calculator.

This manual compilation at different levels is obviously time consuming and error prone. In spite of this, compilation is done within the time tables foreseen by the Ministry. The national level is actually having some problems at present because compilation is done by two persons instead of four previously.

(5) Feedback and use of the information

Virtually no analysis of data is done, neither at the system management level, nor at the health unit level and at the patient/client level. Very little feedback is given from higher level to lower levels. The HIRO issues a limited number of feedback reports to other departments within the central MOH offices, but not to provincial levels. These feedback formats only list absolute numbers. Lack of denominators make the information difficult to utilize.

Use of the information for decision making at various levels is very limited. At the patient/client level, lack of standard treatment guidelines and of a system for patient/client follow-up limit the use of data to ensure quality care. At the health unit level, no measurement of coverage and utilization of services takes place. Limited sue is made of data for resource management. The monthly report is not systematically used for problem identification and solving (with some exceptions such as in the hospital of Mendefera). In fact, in the absence of the nurse in charge, we often found the monthly report locked up in his/her desk. The staff told us that the information of the report was mostly not shared within the team.

The situation is not much better at provincial and national levels. A combination of factors limits the use of information for decision making: (1) unclear definition of functions and targets; (2) incomplete information offer; (3) low quality of the data; (4) and lack of training of the managers. The better use made of EPI data is probably linked to the provision of training.

4. Efficiency of the existing HIS

How are the resources for the present health information system managed? We assessed the following components: (1) HIS staffing and training; (2) data processing and computer equipment and supplies; (3) printed supplies distribution; (4) HIS coordination; (5) HIS recurrent costs.

(1) HIS staffing and training

At the national level, the health information and research office is headed by a statistician and two clerks who are part time students. Formerly, four clerks were posted, but two of them left and were not replaced. Obviously, this staffing is insufficient to handle all activities required for HIS coordination. Except for the statistical officer, the staff has been trained on the job. Limited training in computerized data processing has been provided to the staff, mostly on the use of a word processing package.

At the provincial level, we found one officer in charge of HIS data processing for both the data from all the health units in the province and from the provincial hospital. Mostly this person is a

paramedic with some inborn mathematical skills. He has received training in data processing from the Chief Statistical Officer from HIRO.
Mostly, in health centers and health stations the in charge of the health facility coordinates the drafting of the monthly report in which each staff member contributes according to his responsibilities. As explained before, the provincial statistical officer coordinates the drafting of the hospital reports. At the health unit level, care providers have not received formal training in data collection. Procedures on how to fill in the data collection instruments are passed on from one staff member to another on an informal basis.

(2) Data processing and computer equipment and supplies

Presently the central Ministry has twelve computers, four 486 IBM and eight 386 IBM machines. It has one laser and two dot-matrix printers. The HIRO has access to one 486 machine and one dot-matrix printer. As mentioned before they use it for formatting of tables. Spreadsheet and database management software is available on the computer but actually not used. The other computers are used by other departments also mostly for word processing. No maintenance contracts are provided.

HIRO does most duplication of documents and formats on a stencil machine. Access to a photocopier is limited. There seems to be an adequate supply of computer supplies, but paper supply is limited.

At the provincial and health unit level, calculators are mostly present to help the staff in data compilation.

(3) Printed supplies distribution

Printing and distribution of supplies is ensured through multiple sources; the government printing press prints treatment record cards and mother health cards; UNICEF provides child health cards; the EPI programme provides vaccination registers; HIRO distributes monthly report forms. Most registers are not pre-printed and provided by the Provincial Medical Officer. No overall coordination of printed supplies distribution exists. In most of the facilities we visited one or another data collection instrument was out of stock. The most regular supply was for plain registers and monthly report forms.

(4) HIS coordination

HIRO is insufficiently in control of the overall coordination of the health information system: data collection; data processing; feedback system; printed and computer supplies management. Lack of staffing and lack of definition of responsibilities are the mainly causing this situation.

Provincial HIS offices have been very recently established and are only involved in processing and transmitting reports. No real supervision of data collection procedures in the peripheral health units is done.

HIS coordination is further hampered by the lack of standard instructions on data collection procedures. An instruction manual on drafting of the monthly report has been prepared by the HIRO office, but needs revision and is mostly not available in the peripheral health stations and health units.

(5) HIS recurrent costs

We could not gather sufficient data to have a precise estimate of the present HIS recurrent costs, but it can be assumed that they are very low. For salary costs, only a few staff persons have to be included who are exclusively working on HIS activities. Most HIS data collection is done by care providers as part of their tasks, their time. We found two HIS related line items in the 1994 recurrent budget cited in the recently implemented MOH Cost Estimate Study: printing and notices - Birr 12,025; and stationary and office material - Birr 182,378. Obviously, this last line item also includes general office supplies.

Other costs that need to be added are computer supplies, utilities (telephone, electricity), depreciation of computer equipment, printed supplies provided through other sources than the Ministry.

5. Relevance and modalities of future HIS restructuring

Finally the assessment study also studied the relevance of restructuring of the existing HIS is in the overall policy and planning context. Based on interviews with the main decision makers in the Ministry of Health, we can state with confidence that improvement of the existing health information system is definitely a top priority in establishing a remodelled health services system.

Mostly it was felt that restructuring should build upon the strengths of the existing health information system. Everybody also agreed that a broad-based consensus-building process (even if time-consuming) was a better strategy than an expert-in-the-office approach, in order to ensure that the restructured HIS would really be institutionalized and used for decision making at all levels.

Various managers and care providers provided us with their inputs on how to improve the existing HIS. Their suggestions are summarized in the document on findings and recommendations of the HIS assessment study (appendix 1). They are also build in the recommendations of the HIS Assessment Team that follow this chapter.

E. RECOMMENDATIONS

Based on the conceptual framework proposed for the HIS assessment study, the main objective of the restructuring will be to set up a health information system that generates information support to the decision making process at all levels of the health services system, in other words, to transform it into a health **management** information system (HMIS). In order to do so, all steps in the (re)design process of the system need to closely match the structure of the health services system.

The health services system in Eritrea is in a phase of redefinition. After liberation, the new government herited two totally different health services systems: the former Ethiopian health services system built upon a classic bureaucratic framework; and the flexible EPLF system, able to respond to quickly changing operational and logistic environments. The main challenge is to match two health services systems built upon different premises into one system able to provide quality health care to the Eritrean population. Early on it was decided that decision making in this system needs to be decentralized to a level as close as possible to the communities. The ideal level as proposed by the World Health Organization (WHO) is the "health district".

> "A district health system based on primary health care is a more or less self-contained segment of the national health system. It comprises first and foremost a well-defined population, living within a clearly delineated administrative geographical area. It includes all institutions and individuals providing health care in the district, whether governmental, non-governmental, private, [or] traditional. A health district system therefore consists of a large variety of interrelated elements contributing to health in homes, schools, workplaces,

and communities. It includes self care, a network of first level care workers and facilities, up to and including the hospital at the first referral level. Its component elements need to be well coordinated by an officer assigned to this function." (WHO, 1986).

Another element that will need to be taken into account for the HIS restructuring is the pending administrative reorganization in the country, abolishing the existing awraja and wereda structures, and replacing those by zones, subzones, and villages. Therefore, prior to HIS restructuring, the new health services structure at all levels need to be defined.

A HMIS is made up of several "subsystems", mostly based on the data sources needed to generate the information. While the Ministry of Health obviously targets comprehensive restructuring, priorities need to be set on which subsystems need to be developed first. As already explained in the conceptual boundaries of the assessment study, presently most information in the health sector is provided through the routine information system. It is therefore recommended to focus the restructuring on the two main systems of routine data collection:

HMIS/HF: HMIS for routine data collection and reporting from the health facilities

HMIS/ADM: HMIS for administration of the health services resources (personnel, equipment/infrastructure, drugs/supplies, and finances)

Development of a vital events registration system, or use of survey and operations research methods as additional sources of information for decision making will be structured in a later stage. In the mean time, surveys and studies will be organized on an ad-hoc basis.

Based on these initial thoughts, we have divided our recommendations in five groups:

(1) Definition of the management levels in the health services system and of their respective functions
(2) Development of district coverage plans
(3) Design (through restructuring) of the routine health management information system for health facilities (HMIS/HF)
(4) Design of the routine administrative health management information system (HMIS/ADM)
(5) Information from alternative data sources

(1) Definition of the management levels in the health services system and of their respective functions

On of the first tasks preceding the actual restructuring of the health information system will be to define the different management levels of the health services system and their respective functions. Under the new administrative division of the country what will be the role of the central Ministry of Health national level versus the zonal level in decision making? Is the zonal level going to be the "health district" level? Maybe in Zone 1, which comprises a part of Denkali province, but not in Zone 5, which will have a population of more than 500,000. It is clear that another level will function as "health district level", a "subzonal" level. What will be the respective functions of the zonal and subzonal levels?

Once "health districts" have been defined, functions and activities of the elements within the health district need to be defined. What are the functions of the "district health management team? What activities should be provided by first level care facilities? Is the health center offering more services than the health station? Which ones? What is the role of the referral hospital at the district level? Maybe the health center can be a referral center for certain activities such as dental care or laboratory. Maybe the distance to the hospital is too big, so that certain health centers need to be equipped for emergency surgery. Should health centers supervise health stations, or should supervision be organized from the district level. Most importantly, what will be the role of the community in the management of health services? How can they be actively involved in decision making? What are the functions and activities of community health workers?

These very important questions need to be answered clearly and based on a national consensus. Based on these defined functions and activities at each level, the information needs and indicators can be identified to support decision making.

(2) Development of district coverage plans

Once "health districts" have been defined based on geographical and cultural realities, and taking into account resource constraints, planning for the effective delivery of health services need to be started. The "district coverage plan" (DCP) contributes to coordination of health activities in the health district. The DCP attributes catchment areas (CA) to all first level care facilities (FLCF) and determines the location of the referral level. First level care facilities include both health stations and health centers. The referral level is mainly the district hospital, but, as was pointed out before the health center can also take certain referral functions: dental care; laboratory services; or even emergency surgical procedures in areas where distance to the nearest hospital are too far.

The attribution of catchment areas to first level care facilities implies that the staff of these facilities is accountable to the communities in the catchment area to provide them with a package of promotive, preventive and curative services. Ideally catchment areas of first level care facilities have a population between 5,000 and 10,000. In areas with low density population this can be lower than 5,000. Possible criteria for CA delineation are present utilization patterns, administrative boarders,

ethnic realities, natural barriers (rivers, mountains), and road networks. Ideally, CAs should be defined with full involvement of the care providers. The FLCF staff should make contacts with the village authorities and estimate populations in each village. As a result list of villages and population denominators will be available to monitor coverage of services within the CA.

The establishment of a DCP is also an ideal opportunity for the FLCF staff to actively establish contact with the community leaders in their catchment area. Discussions can be held with the communities on the package of services offered, an inventory made of the main community resources (such as CHWs and TBAs), and future communication on the organization of health services established.

(3) Design (through restructuring) of the routine health management information system for health facilities (HMIS/HF)

Once the role of each level in the health services system has been clearly defined, restructuring of the routine health management information system for health facilities (HMIS/HF) becomes a much more obvious task. A step wise process can be followed whereby both the information generating process (steps 1 to 4) as well as the management infrastructure (step 5) will be remodelled according to the findings of the assessment study:

STEP 1: INDICATORS AND INFORMATION NEEDS

* Establish a list of indicators and information needs based on the functions and activities at each level of the health services system

* Compare this list with the existing information offer: eliminate excess information and fill required information gaps

* For each indicator determine the feasibility and necessity of data collection through the HMIS/HF (particularly for information required at the system management level) so as to limit the burden of data collection by the care providers

* For those indicators (e.g. mortality or socio-economic indicators) difficult to collect through HMIS/HF define alternative data sources such as surveys or special studies to collect this information

STEP 2: DATA COLLECTION and REPORTING

* Standardize definitions (particularly case definitions) and data collection procedures

* Review the format of all data collection instruments (patient/client cards, tally sheets, and registers) based on the information required and standardize formats

* Set up a system for continuity of care (e.g. tickler file system: see appendix 3)

* Review the monthly report form: simplify disease reporting from health centers and health stations; eliminate excess data on laboratory, sanitation and food hygiene; introduce targets and denominators

* Standardize immediate reporting on epidemic diseases: creation of a simple format

* Standardize yearly report to include data for resource management: update on population in catchment area; status of building and equipment; yearly drug consumption; financial data

* Create supervisory checklist to assist district level supervisors in monitoring quality of care and in problem identification and solving

* Train staff at all levels starting with the HMIS staff and the zonal and district managers and most importantly all care providers on standardized data collection procedures

STEP 3: DATA TRANSMISSION and PROCESSING

* Design computerized data processing system for national and intermediate levels with technical assistance from systems analyst: relational database linked with HMIS/ADM and programmed in customized user-friendly software (e.g. FoxPro linked with graphics and GIS software)

* Streamline reporting flow for monthly and yearly reports:

  --> Health stations (eventually via health centers), health centers and district hospitals send their reports to the district health officer who screens data quality and the content of the reports for immediate action
  --> District Health Officer transmits to the zonal computer center for data entry
  --> Zonal computer center transmits electronically (diskette) to national level

STEP 4: FEEDBACK AND USE OF THE INFORMATION

* Define users and their information needs: communities, health units, district health managers, zonal health managers, national planners and programme managers, local government, other sectors

* Design "action-oriented" data collection and reporting instruments to stimulate use of the information by the health care providers and managers themselves: see examples in Pakistan Instruction Manual (copy left in Planning and Evaluation Bureau).

* Design user-friendly computerized feedback reports, combining tabular, graphic, and mapping data presentation formats

  e.g. - Yearly summary feedback report to each health unit showing their performance as compared to the district average
  - Quarterly and yearly district feedback reports comparing health stations and health centers for various indicators such as coverage for preventive services, daily average number of patients, etc.
  - Zonal and national feedback reports comparing district performance based on coverage, utilization, and quality of care indicators.
  - Presenting time trends for morbidity data and for programme activities under expansion

* In-service training in data analysis and use of information and introduction of concepts on information and management in the pre-service curricula (in collaboration with health sciences college)

  --> In-service training at district level: based on actual data sets from the health units
  --> Integrate data collection and use of information in all clinical and administrative management in-service training courses

STEP 5: MANAGEMENT INFRASTRUCTURE

* Assign overall coordination responsibility for HMIS management to the Health Information and Research office (HIRO) and provide them with means to ensure this responsibility: access to transport, storage room, computer and office equipment, and supplies.

* Strengthen staffing pattern of HIRO: give priority to appointment of a health planner/epidemiologist (MD/MPH) as head of the office; maintain position of statistical officer; appoint computer programmer and minimum two data entry clerks

* Establish zonal HMIS offices to assist HIRO in HMIS coordination and provide them with means to ensure this responsibility: access to transport, storage room, computer and office equipment, and supplies

* Strengthen staffing pattern of zonal HMIS offices: appoint HMIS coordinator (paramedic with good mathematical skills) and two data entry clerks;

* Ensure training of HMIS staff, national, zonal, and district managers and care providers in data collection and use of the information

* Procure appropriate hardware/software and provide maintenance contracts for all equipment (see appendix 4)

* Train HIRO and intermediate HIS office staff in computerized data processing, first through a generic course and later through a specialized course on using the customized HMIS software

* Establish printed supplies distribution system coordinated by HIRO:
  --> Identify appropriate local printing company who will ensure printing of all HMIS related DCI
  --> Distribution of printed supplies from HIRO to zonal HMIS offices and further to district health offices, who will be providing printed supplies to the health units on demand basis

(4) Design of the routine administrative health management information system (HMIS/ADM)

HMIS/HF will be intimately linked with a series of databases for administrative management: the administrative health management information system (HMIS/ADM). These databases will assist the Ministry of Health at national, zonal, and district level to ensure management of the various management support systems:

(1) Infrastructural management
(2) Financial management
(3) Personnel management
(4) Training management
(5) Drugs and supplies management
(6) Laboratory management

The core database will be the Health Facilities Database (HFD) identifying each health unit in the country both private and public, administrative and clinical, functional or non-functional, with a unique code number. All other databases including HMIS/HF will be linked to this database (see schematic diagramme in Figure 2).

The development of these databases will take place in three steps:

STEP 1: COMPUTERIZED DESIGN OF DATABASE

After functions and activities at each level have been clearly defined and indicators identified, the content of each of the databases can be defined. For example, the personnel management database will be based on standard staffing patterns for each health unit; or the drugs management database will start from a standard list of drugs to be available in each type of health unit. Based on this information the computerized design of the databases can be undertaken with technical assistance by a systems analyst. The database should be "transactional" so that regular updating is possible.

STEP 2: COLLECTION AND ENTRY OF BASELINE DATA

For each of the databases, initial data collection need to be undertaken so that a baseline can be established: for example a list of health facilities with status of building and equipment; or the present staffing availability in each health facility.

STEP 3: ROUTINE UPDATING OF DATABASE

Once the baseline data have been entered, a system for regular updating needs to be operationalized. Data for updating will originate mainly form HMIS/HF, e.g. through the yearly report.

(5) Information from alternative data sources

Often information needed for health planning at national and zonal levels can not be collected through the routine health unit based system (HMIS/HF), because the data are not available (for example literacy rates), or their collection would unnecessarily burden the health care providers (for example mortality data). For those indicators alternative data sources need to be identified and data collected.

Examples of alternative data collection sources are:

* Vital events registration (need further study how to involve communities)
* Sample surveys
* Quantitative and qualitative rapid assessment methods
* Information from other sectors: education, agriculture, etc.
* Informal sources

Appendix 1: LIST OF DATA COLLECTION INSTRUMENTS USED IN EXISTING HEALTH INFORMATION SYSTEM.

Appendix 2: HIS ASSESSMENT STUDY: FINDINGS AND RECOMMENDATIONS

INDICATORS	DATA SOURCES	FINDINGS	RECOMMENDATIONS [Note: provincial level means "zonal" level as soon as the new administrative structure will be operational]
I. HIS ACCEPTANCE INDICATORS			
Perceived strengths	Study existing documents Interviews planners/managers	* Motivated staff at all levels in the health services system * Existence of routine comprehensive monthly reporting focusing on services provided * Excellent regularity (mostly more than 80 %) and timeliness of reporting * Good participation of non-government health sector	
Perceived weaknesses	Study existing documents Interviews planners/managers	* Absence of population denominators * Plethoric and unfocused disease reporting system * Low quality and incompleteness of data collected * Ambivalence in the supervision and data transmission system (role of health center) * Inefficient manual data processing * Feedback mostly non-existent * Low use of information at all levels * Insufficient staff for HIS coordination * Lack of training in data collection procedures and use of the information * Chaotic distribution of printed supplies	

2. HIS EFFECTIVENESS INDICATORS			
Response to information needs			
Availability of list of indicators	Interviews planners/managers Questionn. health facilities Questionnaire PMO	* Functions/activities, targets, and corresponding indicators at each level in the health services system have not been defined * Initial work done for Planning Bureau and National Public Health Laboratory	* Consensus-building within the MOH on definition of functions and activities at each level in the health services system and on corresponding indicators - National level - Provincial level - Hospital/HC/HS level
Evaluation and planning of health services (national level) * Identification of health needs * Planning of health facilities implantation * Planning of health services to be provided * Allocation of resources	Study existing datasets and documents Interviews planners/managers Questionn. health facilities Checklists health facilities	* Incomplete baseline situational analysis * No mortality and unfocused morbidity data * No information on linkage between first level and referral level care facilities * Limited data on infrastructure, equipment and drugs * Data from health facility assessment and cost estimates study available but not analyzed	* Analyze data of recent studies and complete situational analysis (e.g. DHS survey) * Focus disease reporting on priority health problems * Examine possibility of community reporting of deaths (child and maternal) * Establish referral system and information support * Establishment of a health institution database with information on infrastructure/physical resources/personnel
Programme planning (national level)	Study existing datasets and documents Interviews planners/managers	* Good information offer for EPI (also recent coverage survey), malaria, and Family Planning programmes * Serious information gaps for Maternal Health, Nutrition, Tuberculosis, Epidemic Diseases Control and AIDS programmes.	* Identify targets and information needs for each national programme based on its functions

Health services management (mostly provincial level) * Coverage and utilization of services * Disease surveillance * Quality of care delivered * Management of resources * Supervision	Study existing datasets and documents Interviews planners/managers Questionn. health facilities Checklists health facilities	* No defined catchment areas and population denominators for first level care activities * Unfocused disease reporting * Ambivalent (role of health centers) and unstructured referral and supervisory system * Lack of data on quality of care * Irregular information flow on consumption of drugs and vaccines and on personnel management * Incomplete information on laboratory support	* Prepare "district coverage plans" with active involvement of peripheral health care providers and communities * Define catchment areas for all first level care facilities with list of villages and population * Focus disease reporting on priority health problems * Reexamine respective role of health units based on geographical and cultural realities and revise referral, supervisory and reporting system accordingly * Define indicators to monitor quality of care * Standardize lists of laboratory exams to be performed in health centers and hospitals and establish system for quality control
Health unit management	Questionn health facilities	* No defined catchment areas and population denominators for first level care activities * Insufficient information on community resources and involvement * No information on appropriate use of hospital care * No written job descriptions	* Define catchment areas for all first level care facilities with list of villages and population * Define indicators on community resources and involvement * Define indicators on appropriate use of hospitals * Establish job descriptions at all levels of the health services system
Patient/client management	Questionn. health facilities	* No information on continuity of care for risk episodes and chronic diseases * No information on functioning of referral system	* Define indicators and follow-up measures to ensure continuity of care * Establish referral system and define indicators

Data collection and reporting system			
Design quality of *Patient/Client* data collection instruments (DCI)	Checklists health facilities Study of DCI	* Often too much data * Not action-oriented * Do not permit follow-up (e.g. no tuberculosis cards)	* Establish "tickler file" system for continuity of care (family folder system as a more long-term solution) * Design action-oriented DCI permitting follow-up of at risk episodes and chronic patients
Design quality of *Health Unit Management* data collection instruments (DCI)	Checklists health facilities Study of DCI	* No maps or lists of villages in the catchment area * Most formats of registers have not been standardized * Several registers could be replaced by tally sheets * DCI do not permit monitoring of referral system * Good MCH tally sheet	* Create maps and DCI to collect data on community resources * Standardize format of registers and tally sheets * Registers to be used to monitor coverage and follow-up of at risk episodes and chronic patients ("balance" registers) * Tally sheets to monitor utilization
Design quality of *System Management* data collection instruments (DCI)	Checklists health facilities Study of DCI	* Monthly report has good conceptual basis of integrated service delivery - Certain sections containing too much data (disease reporting, laboratory, sanitation) - Not designed for use by facility staff - Insufficient instructions for compilation * In certain provinces excessive weekly reporting at request of local administration * No standard format for six monthly and yearly reports summarizing activities * Information on infrastructure/physical resources/personnel is collected directly by HIRO staff (last time in January 1994) * No DCI for monitoring of quality of care * No DCI for epidemic disease control	* Redesign monthly report in function of real information needs and for direct use by facility staff * Standardize yearly report and revise format to include information on infrastructure/physical resources/personnel * Immediate report for epidemic diseases * Create "supervisory checklist" to monitor quality of care

% of time spent on data collection by care providers and managers	Questionn. health facilities	* Data collection time for patient/client forms and registers acceptable to the health workers * Excessive time for compilation of monthly report, particularly for disease reporting (up to several days...)	* Prepare standard instructions for aggregation of monthly report * Simplification of disease reporting
Adequacy of laboratory equipment	Questionn. health facilities Checklist health facilities	* Several health centers have no adequate equipment, supplies, and/or staff for essential laboratory tests	* Add to monthly and yearly report data to be collected for monitoring of laboratory equipment and supplies
Quality of data recording on DCI and data aggregation	Questionnaire PMO Checklist health facilities	* Unreliable data due to lack of standard definitions: new case/repeat visit, case definitions * No difference made between zero reporting and absence of activity * Frequent mathematical errors * Incomplete reporting	* Standardize case definitions and data collection procedures * Provide training to health staff * Provide supervision on a regular basis
Data transmission			
Existence and relevance of reporting time tables	Questionn health facilities	* Reporting time tables well known by all health care providers and managers	* Ensure clear reporting time tables under the new system
Compatibility with existing line management channels	Questionn. health facilities	* Ambivalent information flow: in certain provinces HS report to health centers; in other to PMO * Six-monthly and yearly reports bypass HIRO office	* Return to two-tier "district system": first level and referral level * Revise and redefine supervisory and reporting system accordingly * All reports should be directed via PMO to HIRO
Existence of parallel reporting to programmes	Interviews planners/managers Questionn. health facilities	* No real parallel reporting except for HIV lab results * Some separate reports exist but go first to PMO: seasonal malaria reports; in certain areas family planning; pharmacy consumption report	

Regularity and timeliness of reporting	Study of existing datasets Questionn. health facilities	* Excellent regularity and timeliness of reporting * According to HIRO feedback, reporting regularity was more than 80 % in 1994 except in Senhit and Dankali * Health stations report more irregularly * Excellent reporting rates for NGO facilities	Reinforce reporting requirements for health stations (e.g. use of logbook)
Data processing			
Data processing capacity at provincial and national level	Questionnaire PMO Checklist HIRO/Asmara	* Manual data processing system with too many compilation levels: error-prone	* Stop compilation at health center level * Computerize data processing at provincial and national levels, using customized data processing software
Timeliness and quality of data entry	Questionnaire PMO Checklist HIRO/Asmara	* Excellent except recent problems at national level because of staffing problems	* Ensure adequate staffing for data processing at provincial and national levels
Data analysis and feedback			
Adequacy of analysis and feedback for decision making	Study existing datasets and documents Interviews planners/managers Questionn. health facilities	* Virtually no analysis neither at system management level nor at health unit and patient/client management levels * Virtually no feedback to lower levels * Some feedback at central level from HIRO to other MOH departments	* Promote immediate use of information at health unit and provincial levels through action-oriented data collection and report forms * Computerize feedback system at provincial and national levels
Appropriateness of feedback formats	Study of existing datasets Interviews planners/managers Questionn. health facilities	* HIRO feedback formats only list absolute numbers: lack of denominators make the information difficult to utilize	* Introduce appropriate denominators in feedback formats * Use of graphic features such as graphs and maps (GIS) in computerized feedback formats

Use of the information		*General finding*: limited training of managers and care providers on link between information and management	
Use for patient/client management	Questionn. health facilities Questionnaire PMO	* Use for direct service delivery limited by lack of diagnostic/treatment guidelines * Major problem to ensure continuity of care because of insufficient information support	* Establish standard diagnostic/treatment guidelines * Create action-oriented DCI * Establish follow-up measures for risk episodes and chronic patients and introduce tickler-file system
Use for health unit management (first level, referral level)	Questionn. health facilities Questionnaire PMO	* No measurement of coverage nor utilization of services * No use for personnel management (e.g. calculation of workload) * Limited use of information for resource management * No systematic use of the monthly report for problem identification and solving (with some exceptions such as the hospital of Mendefera) * Monthly reports often locked in the desk of the I/C	* Define catchment areas for all first level care facilities with list of villages and population * Create action-oriented registers and monthly report formats * Promote team work and problem solving approach
Use at provincial level	Questionnaire PMO	* Limited use of information in monthly report for health services management and supervision * Use of information in general limited by lack of information support, by unclear definition of responsibilities, and by lack of training	* Define functions at provincial level * Complete information support particularly for quality assurance and supervision * Eventually use other data sources such as surveys or selected rapid assessment methods (RAM) * Create action-oriented report and feedback formats

Use at national level	Interview planners/managers	* Use of information in general limited by lack of information support and lack of training * Better utilization of EPI data is probably linked to provision of training	* Define functions and targets at national level (e.g. for each programme) * Complete information support through other data sources such as surveys (e.g. upcoming DHS survey) or selected rapid assessment methods (RAM) * Create action-oriented report and feedback formats

HIS EFFICIENCY INDICATORS			
HIS staffing			
Number and qualifications of HIS staff at various levels	Questionn. health facilities Questionnaire PMO Checklist HIRO/Asmara	* Insufficient staff at national level in HIRO unit * One statistical person is combining data processing responsibilities of province as well as of the hospital * Responsibilities for data collection in HC/HS mostly well defined	* Reinforce HIRO staff: - Headed by epidemiologist/health planner - Sufficient number of statisticians and data entry clerks - Computer programmer * Appoint full-time provincial HIS coordinator and clerk * Appoint at least half-time statistical person in hospitals
Training of staff (care providers and managers) in data collection procedures	Questionn. health facilities Questionnaire PMO Checklist HIRO/Asmara	* Non-existent at all levels	* Need to plan for training in data collection procedures under new system * Best is to use cascade-type training starting with HIRO/Provincial staff

Training of staff (care providers and managers) in use of the information	Questionn. health facilities Questionnaire PMO Checklist HIRO/Asmara	* Non-existent at all levels with the exception of some programme-oriented training such as EPI	* Ensure training in use of information through integrated administrative and clinical management courses for managers and care providers
Data processing and computer equipment			
Availability of calculators	Questionn. health facilities	* Mostly available	
Adequacy of hardware/software	Checklist HIRO/Asmara	* No use of database and spreadsheet software * Only wordprocessing software used for data presentation * HIRO uses one 486/33 IBM computer * Most duplication is done with stencil machine * Difficult access to photocopying	* Design customized data base management software based on the final design of the restructured HIS * Install adequate hardware (computers and printers) to run the software at national and provincial levels * Train required staff to use the software * Plan for photocopier at national and provincial levels
Availability of computer supplies and maintenance	Checklist HIRO/Asmara	* Adequate supply of diskettes/ribbons * Limited paper supply * No maintenance contracts for hardware (?)	* Ensure adequate computer supplies and paper for data processing and feedback * Provide maintenance contracts for hardware
Printed supplies distribution			
Procedures for ordering and distribution	Questionn. health facilities Questionnaire PMO Checklist HIRO/Asmara	* Printing from multiple sources: UNICEF, Government printing press, EPI programme, HIRO for monthly reports. * Registers mostly plain and bought by the PMO from hospital budget. * No system for ordering and distribution.	* Printed supplies purchase and distribution needs to be exclusively coordinated by the HIRO Office * Ensure adequate storage space at national and provincial levels
% of health facilities with stock-outs for printed supplies	Questionn. health facilities Checklist health facilities	* Multiple stock-outs mostly for patient/client records * Good supply of monthly reports	* Establish procedures for ordering and distribution

HIS coordination			
Adequacy of coordination	Questionn. health facilities Questionnaire PMO Checklist HIRO/Asmara	* HIRO insufficiently in control of overall coordination: data collection, feedback system, printed supplies	* HIRO should become the clearing house for all information support and responsible for all aspects of information system management
Existence and presence of standard instructions on data collection and reporting procedures	Questionn. health facilities Questionnaire PMO Checklist HIRO/Asmara	* Instruction manual for monthly report exists but is not available in most facilities * Insufficient standard definitions and procedures * No diagnostic/treatment guidelines	* Standardize all required definitions and instructions for generation of quality information * Provide instruction manuals for data collection and data processing and make them available to all users
HIS recurrent costs			
Amount and origin of recurrent budget allocated for HIS operating costs	Study of existing data sets Interview Head Administration and Finance/MOH Questionnaire PMO	* Low amount of HIS recurrent expenditures (salaries, printed supplies and computer supplies)	* Ensure availability of capital and recurrent costs for the new system BEFORE operationalization

INDICATORS FOR RELEVANCE OF HIS RESTRUCTURING			

Assessment of importance of Hrestructuring	Interviews planners/managers Questionnaire PMO	* Consensus on the priority need for a well functioning HIS * High receptivity for change to improve the system from all managers at national and provincial levels and from the donor community	SUMMARY OF IMPROVEMENTS SUGGESTED BY HEALTH PLANNERS/MANAGERS AND CARE PROVIDERS * New system should take into account new administrative organization of the country * Establishment of district coverage plans with catchment areas and population denominators for first level care facilities * Establishment of Health Institutions Database with data on infrastructure and physical resources * Limit data collection to strict necessary * Simplify disease reporting system * Establish standard case definitions, data collection procedures, and diagnostic/treatment guidelines * Create supervisory checklist * Computerization at provincial level * Establish effective feedback system from center to periphery * Promote use of information at all levels * Reinforce overall HIS coordination at national and provincial level: - Training in computer and analytical skills - Full-time HIS Coordinator at provincial level - Statistician in each hospital
Planned allocation of sufficient resources for new HIS	Interviews planners/managers	Financial planning for HIS restructuring: Capital costs: donor-funded Recurrent costs: initially donor-funded (3-5 years) -- ultimately through cost recovery system (need for recurrent cost study)	

Appendix 3: TICKLER FILE SYSTEM FOR CONTINUITY OF CARE

For efficient patient/client follow-up, the "tickler file system" is particularly well-suited. This appropriate technology consists of two rectangular wooden file boxes that can contain the size of the record forms. One box, the "days box" is divided in 31 slots. The other box, the "months box", is divided in twelve slots. The system can be used for chronic episodes of illness such as hypertension or tuberculosis patients, and for preventive risk episodes such as pregnancies and children under five.

At the end of each visit, the appointment date is explained to the patient/client and is recorded on the card that stays in the health facility. The record card is filed in the "day slot" or "month slot" (if the appointment is in a different month) of the given appointment. At the end of each day, remaining record forms in the slot of the day are missed appointments for which some follow-up measures can be instituted. At the end of the month, all records in the next "month slot" are transferred in the "day slots".

The consultant had the opportunity to observe such system successfully functioning for a first time in the Kasongo Project in Zaire, and helped to introduce it later in several other projects and countries.

Appendix 4: HARDWARE/SOFTWARE FOR HMIS MANAGEMENT

1. HIRO office:

Hardware:

1 IBM compatible 486 or Pentium (66 MHz or more) desktop computer - memory 1 GB
1 IBM compatible 486 or Pentium (66 Mhz or more laptop computer - memory 400 MB
2 Color monitors and desktop keyboards
1 Laser Printer
1 Dot Matrix Printer
1 Photocopier
1 UPS

Software:

Windows and DOS environment
Wordprocessing package
Spreadsheet package
Database management package (e.g. FoxPro/Foxbase)
EPIInfo and EPIMap
GIS package
Statistical package
Communications package
Customized HMIS software

2. Zonal HMIS offices:

Hardware:

1 IBM compatible 486 or Pentium (66 MHz or more) laptop computers - memory 400 MB
1 Color monitor and desktop keyboard
1 Dot Matrix Printer
1 Photocopier
1 UPS

Software:

Windows and DOS environment
Wordprocessing package
Spreadsheet package
EPIInfo and EPIMap
Customized HMIS software

APPENDIX F

PROPOSED WORK PLAN FOR HMIS DESIGN AND IMPLEMENTATION

The following proposed work plan outlines the major activities, defines responsibilities, and gives a time line for the design and implementation of a restructured health unit based routine health information system. To underline the concept that an adequate information system provides information for decision making, the restructured system is called "Health Management Information System" (HMIS).

This five year work plan is based on the document produced by the Planning and Evaluation Bureau (PEB) of the Ministry of Health, "A Health Management Information System for Eritrea" (July 1994), and on the results and recommendations of the assessment study undertaken by the Ministry of Health with the assistance of the BASICS consultant (July 1995). It should be further detailed and refined by the Planning and Evaluation Bureau and by the BASICS long term technical assistance team who will be in charge of the design and implementation process.

It should be stressed that, waiting for the new system to be implemented nationwide, the existing system should continue to function. Some improvements based on the recommendations of the assessment study could be applied immediately. In-service training on use of the information could also be initiated, so as to prepare the health managers and care providers for more informed decision making and better health delivery to the population.

1. Objectives of the HMIS

As already clearly stated in the document "HMIS for Eritrea", the new HMIS should become a major tool for planning and management of the health services at all levels: the patient/client and community level; the health unit level; the "health district" level, and the national level. It will be closely linked to the proposed decentralized health services system. Under this model, important decision making power will be delegated to the "health district" level. The health district provides promotive, preventive, curative and rehabilitative services to a population of 150,000 to 250,000 through a network of first level care facilities (FLCF) and a first referral level hospital.

2. Strategy for HMIS Development

The ultimate success of the new HMIS will depend largely on the strategy used during the development process for two main reasons:

(1) HMIS development needs to take into account the realities of the communities and of the work situation of the health care providers in a geographically and culturally diverse Eritrea. This is unlikely to happen if the system is developed by some experts at the central level. It will need broad involvement of the future users of the system.

(2) The general management structure of the health services is being remodelled, and the main management support systems such as financial management, drug management, laboratory support need to be restructured accordingly. HMIS development, being intimately linked to the general health services development, need therefore to be tested out very carefully within this new decentralized "health district system".

The following two strategies are therefore proposed for HMIS development:

(1) To use a broad based consensus-building approach in defining the macrostructure of the health information system, involving as many as possible representatives of the future users of the system: peripheral care providers; regional supervisors; national programme managers; MOH department heads; representatives of NGOs and of the main donors; and representatives of the main community organizations.

(2) To pilot test the newly designed information system for at least a year in a "health district" outside the capital, but at a reasonable operational distance.

3. Scope of the new HMIS

A comprehensive HMIS is made up of several "subsystems", mostly based on the data sources needed to generate the information. While the Ministry of Health obviously targets comprehensive restructuring, priorities need to be set on which subsystems need to be developed first.

It is therefore proposed to develop first two main subsystems:

HMIS/HF:	HMIS for routine data collection and reporting from the health facilities
HMIS/ADM:	HMIS for administration of the health services (personnel, equipment/infrastructure, finances)

Development of a vital events registration system, or use of survey and operations research methods as additional sources of information for decision making will be structured in a later stage. In the mean time, surveys and studies will be organized on an ad-hoc basis.

4. Responsibilities and funding for HMIS Development

Overall responsibility for development of the new HMIS will be ensured by the **HMIS development team** (HMIS/DT). This team will be directed by the head of the Health Information and Research Office (HIRO). Proposed members will a statistical officer, a training coordinator, and the technical advisors from the BASICS project.

All main policy and planning decisions related to HMIS design and implementation will be taken based on consensus-building by the **HMIS workgroup** (HMIS/WG). The HMIS workgroup will be composed of peripheral care providers, regional supervisors, national programme managers; MOH department heads, representatives of NGOs and of the main donors, and representatives of the main community organizations up to a maximum of 30 persons. Chairman of the workgroup will be the head of the Planning and Evaluation Bureau (PEB). The HMIS development team will be secretary to the HMIS workgroup in charge of preparing work documents and implementing decisions taken.

Most of the HMIS development effort will be funded by USAID under the BASICS Project. This the case for all capital investments, including design workshops, equipment, hardware/software for HIRO and zonal HIS offices, technical assistance and overseas training of nationals, and for the recurrent costs in the initial years of HMIS functioning. Ultimately, the Government will ensure funding for recurrent costs through its own funds or through cost recovery mechanisms.

5. Main phases and activities of the HMIS development process

For the HMIS development process, it is proposed to follow approximately the same process in four phases as outlined in the document "HMIS for Eritrea":

PHASE I:	HMIS PLANNING AND DESIGN (2 YEARS)
PHASE II:	PILOT IMPLEMENTATION OF HMIS (1 YEAR)
PHASE III:	NATION WIDE IMPLEMENTATION OF HMIS (1 YEAR)
PHASE IV:	CONSOLIDATION AND EVALUATION OF HMIS

Some of the activities outlined under each phase have been slightly modified or rescheduled. A time line for activities is following this document.

The future HMIS will be coordinated by the HIRO under the Planning and Evaluation Bureau. It will be assisted in coordination by six zonal HIS offices assuming early implementation of the new administrative division of the country.

PHASE I: HMIS PLANNING AND DESIGN (2 YEARS)

I.1. Establishment of management capability for HMIS development

* Reinforcement of staffing and infrastructure of HIRO (priority: appoint health planner/epidemiologist as head)
* Assistance by expatriate technical assistance: health information system advisor and computer specialist/systems analyst
* Immediate use of local computer consultant for further generic training of the HIRO staff

* Overseas training of health planner/epidemiologist and computer specialist
* Creation of the HMIS Development Team (HMIS/DT)
* Creation of the HMIS Workgroup (HMIS/WG)
* Reinforcement of staffing and infrastructure of zonal HIS offices
* Appoint statistical coordinator in each hospital

I.2. Development of district coverage plans

* Organization of conceptual workshops for district managers and I/C of FLCF at the district level
* Data collection for delineation of catchment areas by FLCF staff
* Organization of workshops to finalize district coverage plans
* Design of geographic information system based on DCPs

I.3. Identification of information needs

* Definition of functions/activities at all levels of the health services
* National workshop on HMIS indicators and data sources

I.4. Design of HMIS/HF

* National workshop on definition of HMIS/HF macrostructure
* Design and field-testing of data collection instruments
* National workshop to finalize HMIS/HF design
* Design and field-testing of computerized data processing system
* Design of computerized feedback formats

I.5. Design of HMIS/ADM

* Establishment of a Health Facilities Database (HFD) and initial data collection
* Design of computerized system for financial management
* Design of computerized system for personnel management and training
* Design of computerized system for drugs and supplies management

I.6. Establishment of computer centers in HIRO and zonal HIS offices

* Purchase of hardware/software according to requirements of the newly designed HMIS
* Generic training of computer staff

I.7. Undertake recurrent cost study

PHASE II: PILOT IMPLEMENTATION OF HMIS (1 YEAR)

The newly designed HMIS will be pilot tested in a "health district" at a reasonable distance from Asmara. Selected data collected in the health facilities will be reported to a pilot zonal computer center, that will transmit the data to the HIRO computer center.

II.1. Identification of location of pilot district and zonal computer center

II.2. Training of HF staff in data collection procedures

II.3. Limited printing of data collection instruments for pilot district

II.4. HMIS data entry training of HIRO and pilot center computer staff

II.5. Start of pilot HMIS implementation

II.6. Extensive HMIS monitoring

II.7. Analysis of HMIS pilot experience

PHASE III: NATION WIDE IMPLEMENTATION OF HMIS (1 YEAR)

Based on the experience from the pilot district, HMIS will be revised accordingly and implemented nationwide. Implementation will be phased in district by district.

III.1. Finalization of HMIS/HF and HMIS/ADM data collection and reporting procedures

III.2. Training of HF staff in data collection procedures

* Training of master trainers and managers
* Training of care providers district-wise

III.3. Printing and distribution of a one year stock of data collection instruments for the whole country

III.4. HMIS data entry training of computer staff of zonal HIS offices

III.5. Drafting/production of instruction manuals for HF and computer staff

III.6. Start of HMIS implementation district wise

III.7. Provide computerized feedback formats from computer centers to national and peripheral managers

III.8. Extensive HMIS supervision and monitoring

PHASE IV: CONSOLIDATION AND EVALUATION OF HMIS

IV.1. Training in the use of information

* Initial zonal or district level workshops based on available feedback formats and datasets
* Integrate training in the use of HMIS information in all in-service and pre-service curricula on clinical and administrative management

IV.2. Monitoring and evaluation

* Ongoing HMIS supervision and monitoring
* External evaluation one year after implementation

IV.3. Develop plan to meet the recurrent expenditures of the new HMIS

IV.4. Operations research on the use of information for decision making

6. HMIS DEVELOPMENT TIME LINE (starting 9/95)

Activity	Responsibility	Year 1	Year 2	Year 3	Year 4	Year 5
		1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
PHASE I: HMIS PLANNING AND DESIGN						
I.1. Establishment of management capability						
Reinforcement of HIRO staffing and infrastructure	Head PEB	x				
Technical assistance: Expatriate Health Information System Advisor (EHIA) Expatriate Computer expert Systems Analyst (SHIA) Local computer consultant ad hoc in the 1st year	Head PEB BASICS	 xxxxxxx x x x x x x	 xxxxxxx x x x x	 xxxxxxx x x x	 x x x x	 x x
Overseas training HIRO staff Computer specialist Epidemiologist Health Planner	Head PEB BASICS	 xxxxxxx		 xxxxxxx		
Creation of HMIS Development Team (HMIS DT)	Head PEB	x				
Creation of HMIS Workgroup (HMIS WG)	HMIS/DT	x				
Reinforcement of zonal HIS offices staffing and infrastructure	HMIS/DT	x x x	x			
Appoint statistical coordinator in hospitals	HMIS/DT		x x x x			
I.2. Development of district coverage plans (DCP)						
Organization of conceptual workshops National District-wise	 HMIS/DT District mngt	 x x				
Data collection for CA delimitation	District mngt	x x				
Workshops to finalize DCP	HMIS/DT District mngt		x x			
Design of GIS			x			

Activity	Responsibility	Year 1	Year 2	Year 3	Year 4	Year 5
1.3. Identification of information needs						
Definition of functions/activities	PEB Departm. heads	x x x				
National workshop on HMIS indicators	HMIS/DT HMIS/WG	x				
1.4. Design of HMIS/DF						
National workshop on HMIS/HF macrostructure	HMIS/DT HMIS/WG	x				
Design and field-testing of DCI	HMIS/DT	x	x			
National workshop to finalize HMIS HCI design	HMIS/DT HMIS/WG		x			
Design field-testing of computerized data processing system	HMIS/DT		x			
Design of computerized feedback reports	HMIS/DT		x	x		
1.5. Design of HMIS ADM						
Design and establishment of Health Facilities Database	HMIS/DT	x x				
Design of financial management database	HMIS/DT	x				
Design of personnel management training database	HMIS/DT		x			
Design of drugs/supplies management database	HMIS/DT		x			
1.6. Establishment computer centers HIRO/Zonal HIS offices						
Purchase hardware/software	HMIS/DT		x x			
Generic training of computer staff	HMIS/DT Comp. trainer	x	x			
1.7. Recurrent cost study	HMIS/DT STTA		x			

Activity	Responsibility	Year 1	Year 2	Year 3	Year 4	Year 5
PHASE II: PILOT HMIS IMPLEMENTATION						
II.1 Identification of pilot district zonal computer center	HMIS/DT		x			
II.2 Training of HF staff in data collection instruments	HMIS/DT		x			
II.3. Limited Printing of data collection instruments	HMIS/DT		x			
II.4. HMIS data entry training of HHRO/pilot computer center	HMIS/DT			x		
II.5. Pilot HMIS implementation	HMIS/DT			xxxxxxx		
II.6 Extensive HMIS monitoring	HMIS/DT			xxxxxxx		
II.7 Analysis of HMIS pilot experience	HMIS/DT			x		
PHASE III: NATIONWIDE HMIS IMPLEMENTATION						
III.1 Finalization of HMIS HF and HMIS ADM data collection procedures	HMIS/DT			x		
III.2 Training of HF staff in data collection procedures						
Training of master trainers and managers	HMIS/DT			x		
Training of care providers district-wise	HMIS/DT Master trainers			x	x	
III.3. Printing and distribution of printed supplies	HMIS/DT			x		
III.4 HMIS data entry training for computer staff	HMIS/DT Comp. trainer			x		
III.5. Drafting and production of instruction manuals	HMIS/DT				x	
III.6. HMIS implementation district-wise	HMIS/DT District mngt				xxxxxxx	xxxxxxx
III.7. Provision of computerized feedback	HMIS/DT				xxx	xxxxxxx
III.8. Extensive supervision and monitoring	HMIS/DT District mngt				xxxxxxx	xxxxxxx

Activity	Responsibility	Year 1	Year 2	Year 3	Year 4	Year 5
PHASE IV: HMIS CONSOLIDATION AND EVALUATION						
IV.1. Training in the use of information						
Workshops based on available feedback formats and datasets	HMIS/DT				x	x
Integrate training in use of information in pre-service and in-service training	HMIS/DT					xxxxxxx
IV.2. Monitoring and evaluation						
Ongoing HMIS supervision and monitoring						xxxxxxx
External evaluation						x
IV.3 Develop plan to meet HMIS recurrent expenditures						x
IV.4 Operations research activities						xxxxxxx