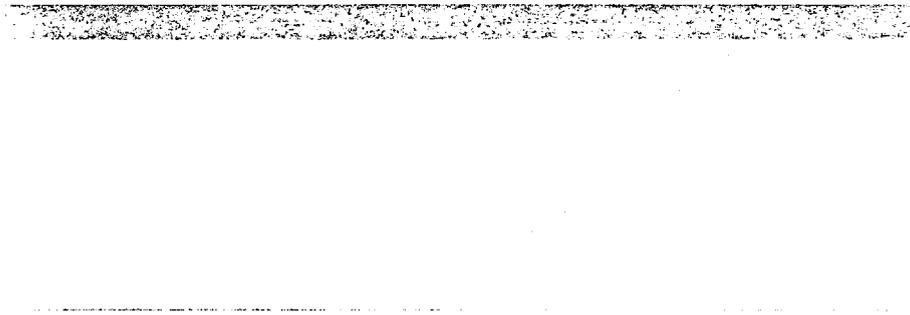


# TRIP REPORT



 **BASICS**

PD-ABN-384

**Health Management and Information System  
(HMIS)  
in the Southern Ethiopia People's Region  
Review and Recommendations for a Redesign**

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## ACRONYMS

AIDSCAP	AIDS Control and Prevention Project	Acute Respiratory Infections
BASICS	Basic Support for Institutionalizing Child Survival	
CDC	Control of Diarrheal Diseases	
CHA	Community Health Agents	
DHS	Demographic and Health Survey	
DPT	Diphtheria, Pertussis, and Tetanus Vaccine	
EPI	Expanded Program of Immunization	
ESHE	Essential Services for Health in Ethiopia	
GIS	Geographical Information System	
HFQR	Health Facility Quality Review	
HFS	Health Facility Surveys	
HMIS	Health Management and Information System	
ICD-8	International Classification of Diseases, 8th Revision	
ICD-9	International Classification of Diseases, 9th Revision	
ICM	Integrated Case Management	
MCH	Maternal and Child Health	
MOH	Ministry of Health	
NGO	Non-Governmental Organizations	
ORS	Oral Rehydration Salt	
PCS	Population Communication Services	
PHN	Population Health and Nutrition	
PSI	Population Services International	
RHB	Regional Health Bureau	
SEPR	Southern Ethiopia People's Region	
SOW	Scope of Work	
STTA	Short Term Technical Assistance	
TBA	Traditional Birth Attendants	
UNICEF	United Nations Children's Fund	
USAID	United States Agency for International Development	
WHO	World Health Organization	

## **I. EXECUTIVE SUMMARY**

The purpose of the consultant's visit to Ethiopia was to review the existing health and management information system (HMIS) in the Southern Ethiopia People's Region (SEPR) and to propose strategies to redesign the system. The visit took place from April 21 to May 5, 1995, and included meetings in Addis Ababa and Awassa (SEPR). This visit also addressed other activities of the current Basic Support for Institutionalizing Child Survival (BASICS) Project and planning steps for the future Essential Services for Health in Ethiopia (ESHE) Project.

### **A. General Project Matters**

The consultant and BASICS resident adviser, Dr. Paul Freund, joined staff from the United States Agency for International Development (USAID) mission to draft activities and milestones for the first year of the new ESHE project. Critical events include the hiring of project personnel and the order of project vehicles. It is expected that the agreement will be signed within the coming weeks.

Dr. Freund and the consultant drafted a design and strategy for a community demand study to be carried out between June and August 1995. Results of this study will be used to develop a program of community-based service delivery. The assessment will provide information about the need for health services, people's care seeking behavior, perceived quality of formal and informal providers of health care, and the acceptance and feasibility of community health agents (CHA) and traditional birth attendants (TBA). BASICS will identify a consultant to assist in implementing this study.

The health facility inventory in four zones of the SEPR is almost completed. BASICS/Headquarters will assist in the analysis of the survey data by developing a computer program in EPI-Info to enter data and to produce frequency distributions and cross tabulations of variables.

BASICS' consultant Sjoerd Postma has almost completed the analysis of the national health facility assessment and will provide results for key variables to the government in May 1995. However, it is not clear when the results of this survey will be used in the health systems design activity that is in progress.

### **B. Functional Assessment of Existing HMIS**

Interviews and reviews were carried out at the central MOH, the health bureaus of SEPR and Sidama Zone, and five health facilities. These facilities consisted of health stations, health centers and one hospital, three operated by the government and two by non-governmental organizations (NGOs). The zonal office and all facilities are very close to the regional headquarters in Awassa, and their functional status cannot be considered representative for SEPR. Decentralization has

not yet been adopted as a concept. The central MOH sees its role to mandate “minimum standards” that have to be defined, and regional staff expects directives from the center.

Staff is committed to maintaining service registers and to compiling monthly reports. In facilities near Awassa and in the health bureau of Sidama Zone staff showed an understanding about the use of information, although the depth of knowledge varied substantially.

The current data collection system falls short in completeness, quality and relevance of data collected. Important community related information is missing, and morbidity data are collected in excessive detail, but are less relevant for public health purposes. The current HMIS is not adapted to the reporting capacity of an “average” facility and health office, and resources are insufficient. Reporting, though incomplete, appears to be done regularly by facilities and zonal health offices. The regional, and more so the central Ministry of Health (MOH) levels experience considerable delays compared to the expected timelines. Health centers and hospitals spend a considerable amount of staff time on reporting.

Data quality is compromised because standard definitions of diagnoses are not adapted to health workers’ diagnostic skills and available equipment. Insufficient staff training and supervision may be other reasons for inaccurate record keeping, for example, as it was observed for the assessment of malnutrition and for children with diarrhea. Arithmetic errors are frequent at all levels of reporting. In an extreme case, some facilities seem to report activities that are not carried out.

Key indicators are used to some extent by health facilities and health bureaus to plan activities and to monitor progress. Several indicators are absent, for example nutritional status, client centered data, or quality measurements. The information is used in an appropriate way, but this needs to be examined further by assessing a larger and regionally more representative sample of facilities. Population-based indicators are used, but facilities seem to receive insufficient support from health offices to estimate accurately target populations and catchment areas. Personnel interviewed felt that insufficient feedback was received.

Personnel for data processing seems to be available, but not sufficiently trained, except at the regional level. The central MOH is experiencing a staff shortage. The supply of registers and report forms to facilities seems to be insufficient and staff spends time and money unnecessarily to reproduce these. The entire data processing relies on manual procedures, although personal computers are available in regional offices.

### **C. Recommendations**

The health systems reform activity that is currently taking place in Addis Ababa provides an opportunity for an appropriate re-design of the HMIS in SEPR. If realized by policy makers, the new system could take advantage of more community ownership, decentralization, service integration, more equitable resource allocation, and improved management. Community-based service delivery through CHAs and TBAs seems to be revived as ongoing training activities show.

These would benefit from a HMIS that is streamlined and responds more to community needs for planning, implementation and monitoring of health actions.

Several HMIS design options are proposed to derive a system that is more adapted to facility capacities and that is more effective. A HMIS should have a clearly defined purpose and objectives to meet the need of communities, facility managers, zonal and regional planners, and policy makers. Several principles are suggested that could improve data quality, the usefulness of information, and lower costs. A routine data collection system should not collect every bit of information, but be limited to data that have immediate use. Many other methods are available to collect additional data periodically for special purposes. The collection of data should be driven by a few key indicators and their use in planning, implementing and monitoring sound public health actions on community, facility and health office levels.

A specific design of an HMIS is not suggested at this point, but left to a more rigorous assessment of the current system. A few potential measures are outlined that would address some of the problems observed during this study. The HMIS design should be evaluated early on its ability to incorporate gender specific mortality and morbidity at health post and health station level, and whether a system of community based reporting of births and deaths is feasible for local uses.

#### **D. Proposed Workplan, Timeline and Level of Effort**

The steps proposed consist of six major activities and several tasks to be carried out in three phases. Top priority should be given to a detailed assessment of the information system in SEPR and at the central MOH that leads to a selection of indicators, the design of appropriate data collection instruments and report forms, and a data processing process that improves data quality. The detailed assessment will provide an opportunity to work very closely with counterpart staff from SEPR and the central MOH. In the meantime, the effectiveness of the existing system should be enhanced by improving data quality through supervision, training and electronic data processing (supply of computers and development of data entry and analysis software, i.e., using EPI-Info).

A task force with a few special workgroups should steer the re-design process, test the adaptation of the HMIS in the SEPR, and coordinate with the central MOH. This task force should focus on the specification and refinement of indicators for preventive care and community activities. Initially, less emphasis is necessary on mortality and morbidity data. Technical assistance to facilitate the HMIS assessment and the work of the task force can be provided by BASICS. The need for another work group for the central MOH should be assessed to adapt the currently used classification of diseases, probably the International Classification of Diseases, 8th Revision (ICD-8), to the latest version ICD-10. The group would benefit from input by World Health Organization (WHO) and by UNICEF about indicators and data sources.

The assessment and the following re-design steps will require a substantial amount of time, probably over two years, as the following illustrative schedule shows:

Phase I:	Detailed HIS assessment	1 month
	Development of interim computerized system	3 months
	Review and design process by task force	6 month
Phase II:	Test redesigned HMIS in Sidama Zone	12 months
Phase III:	Implement redesigned HMIS in SEPR	12-24 months

## **II. SUMMARY OF TRIP AND SCOPE OF WORK FOR MIS CONSULTANT**

The purpose of the consultant's visit to Ethiopia was to review the existing health and management information system (HMIS) in the Southern Ethiopia People's Region (SEPR) and to propose strategies to redesign the system. The visit took place from April 21 to May 5, 1995, and included meetings in Addis Ababa and Awassa (SEPR). This visit also addressed other activities of the current Basic Support for Institutionalizing Child Survival (BASICS) Project and planning steps for the future Essential Services for Health in Ethiopia (ESHE) project, and was part of the workplan established for the current BASICS delivery order that covers one year beginning in September 1994.

Activities under this delivery order include baseline data collection from health facilities, a community demand study, and technical assistance to the regional and also national Ministry of Health (MOH) in designing a new health care delivery system. Part of the health system re-design effort focusses on the HMIS as one important source of information to monitor program progress and service quality. These activities are essential components in preparing for the long-term Essential Services for Health in Ethiopia (ESHE) Project with the following implementing partners proposed: BASICS, Population Communication Services (PCS), Population Services International (PSI), Pathfinder, and AIDS Control and Prevention Project (AIDSCAP).

The consultant, joined by BASICS' Country Adviser Dr. Paul Freund, had meetings with Dr. Victor Barbiero, USAID Population Health and Nutrition (PHN) Officer. Discussions concerned the scope of work of the consultant, the progress of the health systems design activity, and the status of the ESHE project agreement. The health systems design and the future of the HMIS were discussed with Dr. Gabremaskal Habtemariam and Mr. Mehar Woldeab from the Statistics Section of the MOH in Addis Ababa. The Ministry has already developed a proposal for a re-designed national HMIS that might serve as a minimum standard for each region. The proposed format would require health facilities and community health posts to report more data than under the current system.

Concerning the health systems design activity, this consultant met with BASICS' consultant Sjoerd Postma about the status of the national facility survey; key indicators have been defined by the consultant and national staff, and data analysis will be completed by the end of April. These first results draw only on a minor portion of the data collected. Some further analysis during the implementation of the new health system will yield additional useful information. Regarding the actual use of the survey results, the Ethiopian partners expressed no interest in USAID/BASICS input into the systems design process itself at this time. Originally it was agreed that USAID/BASICS would provide short-term technical assistance (STTA) and organize a health systems workshop. Estimating the impact of the new systems design on a future HMIS will not be possible because neither strategies nor structures of the new system are presently made public.

With Dr. Carmela Abate, USAID Health Adviser, a tentative workplan was drafted for the first year of the ESHE project, through September 1996 (Appendix B). This covers time-critical activities remaining under the current delivery order and also activities expected under the new BASICS delivery order, i.e., arrival of long-term resident advisers, availability of housing and vehicles. Procurement options were discussed with Mr. Tom Palmer, a local administrative consultant hired by BASICS, who will follow-up with a more precise proposal.

The consultant spent most of his time in Awassa and the SEPR visiting health facilities and meeting with officials in the health offices of the region. BASICS' Office Manager Ato Lema assisted in the scheduling of regional meetings and field trips. Dr. Freund and the consultant developed a design and implementation strategy for the community demand study to be carried out between May and August 1995 (Appendix C). This is related to the first item in the consultant's SOW. The detailed scope of work for this STTA covers the following activities:

- Work with BASICS' Medium-term Resident Adviser regarding ongoing data collection exercise (e.g., review questionnaires, help design data entry templates and advise on data analysis).
- Work with the Regional Health Bureau (RHB) in SEPR and BASICS' Resident Adviser in the selection of key indicators to be used for monitoring program impact and tracking of management issues at the regional, zonal, and woreda levels.
- Work with RHB (SEPR) and provide advice on the capacity of the regional, zonal and woreda levels to manage a re-designed information system.
- Review the current reporting system, including the forms in use, the reporting procedures and use of data collected.
- Provide advice on computer entry and analysis of routine data from monthly and quarterly reports to the SEPR health bureau

- Review current health systems design activity at the central MOH level as it relates to implications for HMIS at the regional, zonal and woreda levels (i.e., interface of central and regional HMIS).

As requested by USAID, the present HMIS review took a general look at various system elements, but it did not attempt to provide specific solutions, i.e., the selection of indicators, the design of report forms, or the mechanics of data analysis.

### **III. FUNCTIONAL AND ORGANIZATIONAL ASSESSMENT OF THE HIS IN SEPR (SWOT ANALYSIS)**

Health information in Ethiopia is mainly provided through routine reports from all public and private (NGO) facilities (health stations, health centers, hospitals). In addition, researchers and graduate students from several universities carry out studies that enhance the knowledge about health status and the impact of health interventions in selected communities. Community-based delivery of health care through informal providers like CHAs and TBAs is virtually non-existent in the SEPR, with very few exceptions (about six in Sidama Zone) that survived in communities not disgruntled by politics. Vital events such as births and deaths are only registered by community-based providers (CHA). Meaningful health post statistics cannot be generated, because hardly any routine reports are submitted.

The functional and operational assessment builds on information from interviews with central MOH staff from the Statistics and Health Services Research Team, regional health bureau, Sidama Zone Health Bureau, and five health facilities. This sample of facilities was biased because they were all near Awassa. They can be easily reached, and they have substantial human resources as well as regular contact with zonal and regional headquarters (Table 1).

#### **A. Data Collection**

A description of the registers and reports used at various health facilities and health offices is summarized in Table 2. Table 2 shows the approximate number of data items collected per topic. The large number of items for health centers and hospitals illustrates not only the difficulty of analyzing and selecting useful information, but also complicates any effort to computerize such a system. Microcomputers easily handle 256 data elements or less<sup>1</sup>. A larger number adds unnecessary complexity and cost when developing and operating computer programs. The

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<sup>1</sup> The most commonly used spreadsheets (i.e. Lotus 123 or Microsoft Excel), xBase compatible databases (i.e. dBase, FoxPro), and statistics programs (i.e. Epi-Info) can handle a maximum of 256 fields in a single table. If more fields are desired either a relational database that links several tables or a series of stand-alone databases has to be developed. Relational databases are more difficult to program and maintain than single flat file databases. It is tedious to update several stand-alone but related databases on a routine basis

estimated time required to complete a monthly report varies between a few hours in health posts, one day for health stations, three or more days for health centers, and one week for hospitals.

Health care providers at peripheral levels show a great willingness to maintain records and compile monthly reports. However, this needs to be verified by looking at more facilities than the small sample visited due to time constraints. \*The three publicly operated facilities, two health stations and one health center, found the workload acceptable for the maintenance of registers and compilation of reports, because it is part of what is expected from them. One health station staff member might spend one day a month compiling the report if daily tallies of activities have been maintained. Most daily tallies are done during service delivery, or might require 30 minutes time at the end of the work day. However, the NGO-operated health center and hospital voiced concern about the effort that reporting requires and about the usefulness of so many data.

**Table 1**  
**Characteristics of Facilities Visited**

<b>Facility Visited</b>	<b>Distance from Awassa</b>	<b>Total Staff or Registrars and Clerks</b>	<b>Observations</b>
Tulla Health Station	5 km	no designated (5 total)	Chief of Station well versed with meaning and use of key indicators. Outreach. Map.
Leku Health Station	15 km	no designated (5 total)	Numbers to calculate key indicators are inconsistent, DD case management/ recording non-standard.
Busholo Health Center (70 beds, including TB and AIDS)	5 km	1 administrator for records and reporting	NGO operated, very busy, 80% occupancy rate, 2,500 outpatients / month, 4 outreach sites.
Yirgalem Health Center	24 km	1 full time statistician	Does community outreach, key staff unavailable.
Yirgalem Hospital (123 beds)	24 km	1 registrar, 2 clerks full time for record keeping and reporting	NGO operated, very busy (130% census), referral for Awassa and several zones. No outreach except for TB. Follow-up needed for statistics.

**Table 2**  
**Registers and Reports Used by Health Facilities**  
**and Amount of Data Collected (order of magnitude)**

Type of Register or Report	Health Post		Health Station		Health Center		Hospital §	
	Reg.†	Rep.‡	Reg.†	Rep.‡	Reg.†	Rep.‡	Reg.†	Rep.‡
Outpatient, morbidity	1	45	1	47	1	2,173	1	2,173
Inpatient, morbidity & fatality					1	2,483	1	2,483
Family Health				9	1	27		
EPI			1		1	30		
Acute Diarrhea in Under 5			1	3		37		37
Antenatal and Postnatal Care		6	1		1	56	1	56
Maternity			1	3	1	28	1	28
Family Planning			1	3	1	60		60
Epidemic Diseases		7		21		230		230
Outreach			1	20	1	36		
Health Education		7	1	30	1	111		
Water and Sanitation		21	1	37	1	37		
Vital Events (births & deaths)		20						
Laboratory					1	30	1	30
Other Services *					1	20	7	50
AIDS Control					1	64	1	64
Tuberculosis Control					1	64	1	64
Staffing Situation (annually)								
Financial Status		0		0		0		0
<b>TOTAL</b>	<b>1</b>	<b>106</b>	<b>9</b>	<b>173</b>	<b>14</b>	<b>5,486</b>	<b>14</b>	<b>5,275</b>

\* Other Services include: Surgery, Blood Bank, X-Ray, Ultrasound, Endoscopy, Ophthalmology, Physiotherapy. Each service compiles its own monthly report.

§ Hospitals provide a varying number of preventive and outreach services, therefore their number of registers and reports varies

† Registers or individual patient records maintained by the facility

‡ Reported: each number stands for the approximate number of possible data elements that can be required to fill out the report. Several sections are usually combined on one report form.

## B. Flow of Information, Data Processing And Reporting

Monthly reports are submitted by the facility to the next health office, which is the woreda for health posts and health stations and the zone for health centers and hospitals. Some health centers report to a woreda, too. The woreda forwards its synthesis to the zone and the zone to the regional health bureau. Separate summary reports are available for each type of facility and they follow the same structure as the corresponding facility report.

The reporting process follows approximately the timeline shown in Table 3.

Overall, zonal health offices compile their monthly, quarterly and annual summary reports without a major delay, usually one to three months after the end of the reporting period <sup>2</sup>. At the end of April 1995, the regional office had received reports from all zones for January 1995; March reports are in for eight of the 14 zones and special woredas. The regional health office is less timely, but still produces a report within six month following the reporting period (the central MOH is requesting the regional report for the last quarter of 1994). The central MOH seems to publish health service statistics irregularly; for example, outpatient statistics for 1989/90 were reported in 1993.

**Table 3**  
**Timeline for Monthly and Quarterly Reports**

Level	Time to Compile And Transmit	Approximate Due Date	Next Station
Health facility, Kebele Reporting Period: 16th-15th	1 - 5 days	20th	Woreda (monthly)
Woreda	3 - 5 days	25th	Zone (monthly)
Zone	5 days + 10 days for transmission	10th of following month	Region (monthly)
Region	90 days	1st day of following quarter	Central MOH (quarterly)
Central MOH		Annually	

<sup>2</sup> Dates and time estimates in this report are all based on the Georgian Calendar with 12 months. This leads to a minor imprecision, because monitoring and reporting follows the Ethiopian calendar with 13 months. The Ethiopian financial and planning year begins in July and ends in June.

### C. Data Quality

Of greatest concern is the validity of reported data and an unknown number of missing reports every month. In a worst case scenario, which is quite real as responses from the facility survey suggest, some units do not provide certain service data, for example the Expanded Program of Immunization (EPI), but report these activities as if they happened.

The classification of cases according to disease categories for health stations seems to be difficult for some health workers leading to a misclassification of diarrheal diseases and dysentery, or acute respiratory infections (ARI) and other respiratory tract problems. The required diagnosis of specific infectious diseases like cholera and typhus might be beyond the capability of facilities without a laboratory. According to entries in the register in one health station, the assessment of children with acute diarrhea, especially the degree of dehydration and malnutrition, and the treatment were inconsistent with accepted clinical practices. The quality of entries varied from almost complete to very deficient.

Health centers, and to a lesser extent hospitals might face similar diagnostic problems. These facilities are required to report morbidity and case fatality for inpatients and outpatients according to 155 specific diagnoses from the International Classification of Diseases, 8th Revision (ICD-9).

Arithmetic errors in tallying and totalling monthly activities seem to be a major source of error, because most facilities did not have an inexpensive calculator. This type of error might be perpetuated through all levels of reporting up to the regional statistics office. One random check revealed an excess of more than 10 percent in patients reported for one month by one facility simply due to incorrect addition. Without serious quality checks even a computerized aggregation of data would not increase the validity of the results.

Zones seem to provide inconsistent support, even facilities near headquarters, and/or facility staff might have a poor understanding of simple health indicators because population denominators in one facility varied widely for the same indicator. Three different estimates were displayed on wall charts for the number of infants in 1994, ranging from 1,000 to 4,500 when about 2,000 would have been expected according to the total population.

The three quality problems — inconsistent classification of diseases, arithmetic errors and wrong target population estimates — plus incomplete or false reporting can be linked to the lack of supervision and continuing education of health workers. Because these deficiencies were observed in facilities that are very accessible, a much worse situation can be expected for remote locations.

Although reports seem incomplete and not entirely accurate, available data suggest that services provided by facilities, especially health stations, are underutilized by the population. The antigen specific vaccination coverage was between 20 percent and 50 percent for 1994, and only a small fraction of women, perhaps 10 percent, deliver in peripheral health units. Whether this reflects a

lack of demand or poorly perceived quality of services is unknown, but should be evaluated through a comparison of facilities operated by the government and by NGOs.

#### **D. Indicators**

In all facilities visited, current numbers for some key indicators were displayed in easy to read wall charts that largely followed a standard format. The zone seems to have a standard layout for charts and tables that facilities mostly follow. Staff members had some understanding of the meaning and relevance of these indicators, though depth and correctness varied substantially. Health stations and health centers close to Awassa seem to get support from zonal health offices concerning the calculation of population-based indicators and estimates of target populations, i.e., catchment population, number of infants, or expected number of pregnancies. However, facilities have difficulties in determining which communities they cover, some have a substantial "out of coverage area" attendance that overestimates coverage.

Standard indicators with target population denominator estimates used by facilities include:

- EPI coverage
- Antenatal care visits
- Deliveries at the facility
- New family planning acceptors
- Health education attendance
- Volume of outpatient attendants for top 10 diseases

Some indicators were not seen in any of the facilities visited:

- Nutritional status
- Client satisfaction
- Quality of services
- Vital events
- Essential drug stock-outs
- A calendar of community health related events, i.e., meetings

#### **E. Use of Information**

*A government health station reported to use monthly data to track outreach activities. For example, staff compares the actual immunization coverage and prenatal care contacts with targets set for each community in the catchment area. Because far fewer deliveries occur at the station than expected, the station plans to use more TBAs to mobilize women to use these services. The target for health education, measured by the number of sessions given, was exceeded, because of a special effort by outreach staff. More details about how data are actually used will be provided by the facility survey.*

Staff from a health center questioned the value of information about health education activities that is currently collected because it does not provide any measurement of effectiveness or coverage. The health center uses the reports of inpatient case fatality and length of stay for internal quality reviews, but only for a select few diagnoses.

At the zonal level, service statistics are used to formulate annual zonal health plans and to track their implementation. Supervisors use this information to plan visits to woredas and facilities. Several examples were given by staff from the Sidama Zone health bureau about how service data show service problems. Owing to a shortage of motorcycles, vaccination coverage for DPT3 dropped from 61 percent in 1994 to 53 percent in 1995. After UNICEF discontinued the drug supply in 1992, including oral rehydration salts (ORS), to the Maternal and Child Health (MCH) Program, attendance of antenatal care and other maternal services dropped.

According to central MOH officials, until about four years ago health service statistics reports were used to formulate a 10-year health plan for each administrative level. Targets were set in these plans and actual achievements were to be tracked. Service reports were also used during annual review meetings and rewards were given for good performance. Documentation of these procedures was not available at the time of interview.

#### **F. Feedback**

The main purpose of information collection seems archival. The absence of feedback from higher levels was consistently cited during this visit and in interviews from the facility survey. However, data storage with little public health use comes at a high price as staff are unavailable for service provision and because of the high cost of supplies.

#### **G. Personnel**

Because of the recent reorganization, the central MOH seems to lack workers to analyze regional reports and to provide timely feedback. This also makes it very difficult for them to provide technical support to regional health bureaus. It is expected that the central level will be reorganized after the new government is in place.

At the regional office for health information, a statistician leads the aggregation of monthly zonal reports. He is helped by one or two clerical staff members.

At the health zone, one or two persons compile reports from monthly facility and woreda submissions. Most have not had any substantive training in quantitative analysis or data processing.

## **H. Equipment And Supplies**

The large number of registers, patient cards and monthly reports requires a substantial amount of paper and health worker time. The MOH supplies necessary forms and stationery irregularly, leaving it up to the facilities to use their scarce resources to buy paper and redraw forms manually. This places, unnecessarily, a great burden on staff. The time spent on paper work is time not spent on curative and preventive services.

While the regional bureau is equipped with several computers, the health information office does all compilations with hand-held calculators. Existing computers are used by the EPI, MCH and Family Planning Programs. No trained computer support personnel is available to maintain software and hardware.

## **I. Role of NGOS, Bilateral Donors and International Organizations**

Several organizations assisted Ethiopia in HMIS development in the past, including the Save the Children Fund, the Swedish International Development Association, WHO, and UNICEF. However, this assistance occurred in other regions than SEPR, and none is currently helping the government on a larger scale in HMIS design.

Any HMIS re-design effort would benefit from close collaboration between the central MOH and organizations with an interest and expertise in HMIS design.

## **III. RECOMMENDATIONS FOR A RE-DESIGNED HMIS**

### **A. General Observations**

#### *1. Opportunities*

Based on an earlier draft of a health systems design strategy<sup>3</sup>, there is a great opportunity for positive change in the community ownership of health service delivery, decentralization, allocation of resources according to needs, and improved management. The re-design of the HMIS should be driven by a successful health sector reform that aims at improving access, quality and utilization of health services. The intention to integrate service delivery in a move away from vertical programs could facilitate the development of a streamlined HMIS.

Many health professionals contacted during this visit were highly motivated and striving for excellence. These qualities are very important when re-designing an HMIS that

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<sup>3</sup> Report of the National Health Policy Task Force. Office of the Council of Ministers. Transitional Government of Ethiopia. Addis Ababa. February 1993.

focuses on the completeness, accuracy and usefulness of information rather than on comprehensiveness alone. Any new system will benefit from the fact that most staff are very familiar with a complex monitoring and reporting system, although the quality is not consistent.

Community-based delivery of health care through informal providers like CHAs and TBAs is virtually non-existent in the SEPR, though a few exceptions (about six in Sidama Zone) survived in communities not disturbed by politics. Meaningful health post statistics cannot be generated because hardly any routine reports are obtained. The idea of community health workers is being revived in Sidama Zone where recently about 100 agents completed basic training (arranged by the zones), with the intention to train CHAs for all kebeles in Sidama Zone over the next five years. Other zones are to follow. These newly instated workers could benefit from re-designed reports that meet community needs to manage and supervise health care delivery.

## **2. *Critical Assumptions***

Health systems reform is both a technical and political process. No guarantee exists that the design process of the new system incorporates lessons of the past and that it addresses the most fundamental problems: insufficient access to services, underfinancing of non-personnel operating costs of facilities, and ineffective distribution of personnel. Failure to rectify these problems will affect the functioning of the HMIS, whether in its current form or re-designed, especially if the unequal distribution of labor is maintained.

The lack of supervision might induce the design of a burdensome, exhaustive HMIS to compensate for the absence of direct interaction between facilities and health offices. Due to the problems cited earlier this approach provides a false sense of being informed because data quality is not assured.

To the extent that the MOH takes a directive versus an advising approach, minimum standards for an HMIS might be developed that are inappropriate for many peripheral health units. An exhaustive HMIS will overburden these facilities because they do not have the capacity to provide a large volume of information regularly. If academic institutions are involved in the design of the HMIS, there could be a tendency to ask for inappropriate details to suit research purposes, for example, mortality and morbidity information for more than 10 to 15 examples.

## **B. *HMIS Design Options***

The following outlines some general options that should be considered in re-designing the HMIS in the SEPR. An HMIS should have clearly defined purposes and objectives to meet the need of communities, facility managers, zonal and regional planners, and policy makers. Several principles are suggested that could lead to the design of a more effective and appropriate HMIS.

A routine data collection system should not collect every bit of information but be limited to data that have immediate use. Many other methods are available to collect additional data periodically for special purposes.

**1. Purpose and Objectives of the HMIS**

The purpose of the HMIS is to provide comprehensive information about key characteristics of the health care delivery system and the population served, including health status, changes in epidemiological patterns, service volume and quality, service management, and interaction with the community, i.e., through outreach and CHAs/TBAs. The information collected on each level has to be relevant and used for management and decision making at the community, facility, woreda, zonal, regional, and national levels.

**Objectives:**

- a. Each level uses indicators that are relevant and valid according to specific criteria as reflected in an annual action plan and in annual management targets;
- b. Primary care facilities provide their communities with key information for planning, implementing and monitoring local public health actions.
- c. Reports are received in a timely manner according to an established schedule from at least 80percent of all facilities (health posts to hospitals);
- d. Quality control of data is implemented on all levels and reveals an error that does not exceed  $\pm 5$  percent (error is defined as (1), an arithmetic summary where the actual total is more than  $\pm 5$  percent of the true arithmetic total based on record checks at each level, and/or (2) error due to misclassification of a few index diseases with more than 5 percent margin of error, 1 out of 20 cases misdiagnosed);
- e. Appropriate quarterly feedback is provided by each health office within three months after a reporting period has been closed;
- f. Supervision and on the job training, including the maintenance of registers and the accurate compilation of reports, takes place at least quarterly; facilities with two or more professional staff organize internal quality reviews; and
- g. Regional and zonal health office staff carry out a rapid assessment for specific purposes at least once a year to complement routine statistics.

## **2. Principles**

### **a. Population-based Planning and Monitoring:**

Build on the current practice of giving health facilities population data for their catchment area to calculate the size of target groups. Facility staff require more assistance to derive accurate estimates and adjust these annually. These numbers should be complemented by a map that shows all kebeles covered by the facility and the location of health posts and outreach sites.

### **b. Appropriate Targets and Reference Values:**

Key indicators should have defined annual and quarterly targets that can be easily tracked on wall charts following the example of the EPI program. Facility staff should not only monitor these indicators monthly, but should undertake special activities to reach the targets, such as local companies, the mobilization of women, and bringing children in for immunization. Therefore, a facility should only select a few key indicators for this purpose; suggested is a maximum of three for health posts, five for health stations and 10 for health centers depending on the staff contingent available. The tradition of working in health teams should be revived because these targets cannot be reached by an individual health worker. To succeed, involvement of the community is indispensable.

For other indicators, such as utilization of services, annual targets could be less meaningful or important from a public health perspective, for example the annual utilization of curative services and the ten most frequently diagnosed diseases. Zonal and regional health offices should develop reference values that might indicate an underutilization of services compared with an average of well-utilized facilities given similar service conditions. These could also be useful in deciding whether a facility has adequate personnel or whether it might be over staffed given a low workload.

### **c. Collect, Transmit and Present Only What Is Needed for Planning, Decision Making and Management on Every Level:**

Before completing lists of data to be collected at every level of the health care delivery system, key indicators should be identified. A definition, including the numerator and denominator, and the source of information should be given for these indicators. The use of each indicator needs to be established as well before deciding whether to collect data or not. This might mean that a facility keeps track of more information than is actually included in monthly reports and health offices might want to aggregate facility data more selectively.

Reports for feedback purposes should only contain a few tables and graphs, focus more on the interpretation of findings of epidemiologic or management relevance, and include geographic comparisons as well as trends. This could mean a radical

break with the tradition of producing high volume quarterly reports with more than 100 tables and little narrative. Most of the information would be archived on a computer for further analysis if needed, but except for a concise service statistics bulletin, much less paper and time would be required to compile data.

d. Design the HMIS for Facilities with Limited Means:

Most HMISs are conceived with a hypothetical health unit in mind according to some national standard. This assumes a sufficient number of personnel and other resources. Many facilities in urban settings will probably meet or exceed such standards and compliance with exhaustive reporting requirements could be realized. However, the actual capacity of most remote facilities will fall short of such standards and the HMIS should be conceived to meet their needs and capabilities. More elaborate reports can be required from well-equipped units in a sentinel site surveillance system that complements a basic routine system. Exemplary facilities that serve as training sites should maintain the simpler but appropriate system for remote units and not an HMIS tailored to their capacity.

e. Data Quality: Completeness and Validity:

To be useful for any purpose, data quality and complete reporting should have precedence over quantity. Data quality can be assured by several measures besides supervision.

1. *Standard definition of disease groups:*

Illness categories, especially for health posts and health stations, need to be well-defined and specify the diseases they include. The large number of ICD-8 codes that health centers and hospitals use should be limited to conditions that can be diagnosed with the diagnostic skills and means available. For instance, most malignancies cannot be classified without a pathologist, or viruses as a causal agent cannot be detected without very sophisticated laboratory equipment unless the disease presents unique symptoms.

2. *Sensitivity:*

A measure is sensitive when it can identify a (public) health problem. Low sensitivity suggests that no problem exists when indeed it does, resulting in a failure to take action. Indicators included in an information system should be sensitive, meaning that they represent the true epidemiologic problem in a defined population, i.e., a population has a high incidence and it is correctly reflected in cause-specific facility utilization data. Instead of a disease problem, another public health situation could be the target, i.e., an insufficient level of knowledge in a target population. The number of people attending health education sessions indicator seems to have a very

low sensitivity to identifying groups in need of education as reported by one health center.

Obviously, sensitivity varies according to the indicator and is generally low for data collected through an HMIS. Health workers often assess a situation differently or derive different diagnoses for the same patient. Many indicators for epidemiologic surveillance that are based on passive case reporting have a low sensitivity, because a low case number might be due to poor access to health facilities by a rural target population. For example, most newborns who contract neonatal tetanus die before medical care is sought are never captured by a facility based reporting system.

As a result, a large percent of the HMIS data could miss certain diagnoses, leading, for example, to no or ineffective treatment, or painting a too optimistic picture about the impact of health education. If health workers fail to recognize the symptoms of life threatening pneumonia because they do not properly examine children, but classify symptoms as less harmful upper respiratory tract infections instead and treat inappropriately, low sensitivity results in patients dying unnecessarily. Therefore sensitivity is often more important for a measure than specificity. Sensitivity of some measures can be increased by standard definitions, training and careful selection of indicators.

3. *Specificity:*

Specificity indicates the ability to confirm the absence of an illness or to exclude the existence of a harmful health practice. Low specificity might indicate the presence of a problem when in fact no problem exists, resulting in unnecessary action and to possibly a waste of resources. These consequences of unnecessary action might be less harmful than omitting necessary action. Therefore sensitivity of an indicator is often considered more important than specificity. Observing the actual practice of those who received health education is a more specific (and sensitive) measure than assessing knowledge only. Specificity can be increased by standard definitions, training and careful selection of indicators.

4. *Reliability:*

Health workers should maintain the same quality in their preventive and curative work. Their ability to assess the effectiveness of preventive measures and to diagnose diseases consistently is maintained by regular supervision and continuing education. In one health station, the registration of children with diarrhea shows that reliability cannot be assumed because symptoms, diagnosis, and treatment did not follow a consistent pattern.

5. *Costs of collection:*

Not all information is worth the costs of obtaining it. A health assistant's time might be better spent (for reducing the severity or frequency of illness) by educating a group of women for half a day than visiting three dispersed households to remind them to dig a latrine only because reports require such information. The effectiveness of the latter is especially limited if water is contaminated by freely moving domestic animals. While the requirement to report on certain activities can ensure that important processes are carried out, an overly detailed HMIS makes it difficult for health workers to set priorities based on the effectiveness of interventions.

### 3. Use Different Methods of Data Collection

**Table 4**  
**Summary of Data Collection Methods**

Data Collection Method	Strengths	Weaknesses	Costs
<b>Routine Facility Reporting</b>	<ul style="list-style-type: none"> <li>data for local decision making and problem solving</li> </ul>	<ul style="list-style-type: none"> <li>only captures users of systems</li> <li>data overload</li> <li>poor quality</li> </ul>	<ul style="list-style-type: none"> <li>cost of operation usually high due to inappropriate design</li> </ul>
<b>Supervision Check Lists</b>	<ul style="list-style-type: none"> <li>immediate feedback for quality improvement</li> <li>can be simple</li> </ul>	<ul style="list-style-type: none"> <li>can be used in a punitive sense</li> <li>not representative of the quality of services in all facilities</li> </ul>	<ul style="list-style-type: none"> <li>low</li> </ul>
<b>Sentinel Site Surveillance</b>	<ul style="list-style-type: none"> <li>yields valid and reliable information</li> </ul>	<ul style="list-style-type: none"> <li>may not be representative of the delivery system as a whole</li> </ul>	<ul style="list-style-type: none"> <li>mid to high</li> </ul>
<b>Sample Surveys of Registers and Records</b>	<ul style="list-style-type: none"> <li>quick</li> <li>simple</li> </ul>	<ul style="list-style-type: none"> <li>poor record keeping yields invalid data</li> <li>historical instead of actual performance</li> </ul>	<ul style="list-style-type: none"> <li>low to mid</li> </ul>
<b>Exit Interviews of Patients or Customers</b>	<ul style="list-style-type: none"> <li>client oriented</li> <li>data yield a perception of quality</li> </ul>	<ul style="list-style-type: none"> <li>time consuming</li> <li>only captures users</li> </ul>	<ul style="list-style-type: none"> <li>mid, if part of facility survey</li> <li>low, if done by the facility for internal quality improvement</li> </ul>
<b>Community Focus Groups</b>	<ul style="list-style-type: none"> <li>good interaction with population</li> <li>captures people outside the system</li> </ul>	<ul style="list-style-type: none"> <li>can be subjective</li> <li>interviewers require extensive training</li> </ul>	<ul style="list-style-type: none"> <li>low to mid</li> </ul>
<b>Health Facility Survey and Program Review</b>	<ul style="list-style-type: none"> <li>standardized</li> <li>valid and reliable information</li> <li>representative of the system</li> </ul>	<ul style="list-style-type: none"> <li>time consuming</li> <li>requires a high level of technical skills</li> </ul>	<ul style="list-style-type: none"> <li>high, but depends on design and sample size</li> </ul>
<b>Sample Household Surveys</b>	<ul style="list-style-type: none"> <li>capture people outside the system</li> <li>yield level of impact information</li> </ul>	<ul style="list-style-type: none"> <li>time consuming</li> <li>requires a high level of technical skills and training</li> </ul>	<ul style="list-style-type: none"> <li>very high</li> </ul>
<b>Community Reporting of Vital Statistics and Key Preventive and Primary Care Indicators</b>	<ul style="list-style-type: none"> <li>participatory for the population and local facility</li> <li>allows for and enhances local problem solving</li> </ul>	<ul style="list-style-type: none"> <li>difficult to sustain without outside input</li> <li>data quality varies</li> </ul>	<ul style="list-style-type: none"> <li>low, but depends on appropriate design</li> </ul>

Methods of data collection are summarized in Table 4 and explained in greater detail in the remainder of this section.

a. **Routine Facility Reporting:**

The routine reporting system regularly collects basic information for key indicators from all facilities. Routine surveillance should only include data that are essential

for public health purposes and that can be collected accurately and completely by all health facilities given available resources. Routine data will trigger specific questions that can be answered through the following methods.

b. Supervision Check Lists:

During these visits the supervisor assesses whether health workers comply with standard procedures for preventive and curative care. A good example might be the management of children with acute watery diarrhea and dehydration. This might provide better information than a detailed facility report that would not indicate whether the actual practice was correct.

c. Sentinel Site Surveillance:

If detailed information about mortality and morbidity is required regularly, it could be obtained from a much smaller number of facilities that have more resources. This is usually done for specific conditions such as malaria or onchocerciasis. The aim is that epidemiologic data gathered by these sentinel sites are representative for a defined population. Sentinel sites often have better resources and diagnostic capabilities, which allow them to report in greater detail, but it also means that they do not perfectly represent all population groups in geographically diverse areas.

d. Sample Surveys of Registers and Records:

Instead of requiring facilities to report routinely on many diagnoses, health offices could take a sample of patient records periodically and tally additional diagnoses, treatment practices, detailed age and gender breakdown, and/or patient origin. This would be valuable information not contained in any routine report. If many records are available, a systematic sample can be drawn of every xth record.

e. Exit Interviews of Patients or Customers:

To assess patient or customer satisfaction with certain services, a small sample could be interviewed after they received these services. It is also an appropriate method to see whether messages were appropriately communicated during counseling.

f. Community Focus Groups:

Focus groups allow health workers to obtain the opinion of many people with relatively little effort. However, the technique has to be learned to yield useful results, and results are more qualitative than quantitative.

g. Health Facility Survey and Program Review:

These are mostly elaborate surveys that assess the physical condition of health facilities, including the availability of essential drugs, and the quality of health

services provided. It is the instrument of choice, recommended by WHO, to assess standard case management of ARI, diarrheal diseases, malaria and malnutrition.

Health facility surveys (HFS) are expensive and labor intensive. They are most useful if health workers have received training in standard case management following WHO curricula. HFSs should be repeated every three to five years.

The health facility quality review (HFQR) is an integral part of the WHO integrated case management training. It is under development by WHO and BASICS and will be tested in the second half of 1995. The HFQR is a follow-up to the ICM training course that evaluates health worker performance periodically and reinforces skills.

The rapid case management assessment is a precursor to the HFS, and it is less demanding of resources and does not assume training in WHO integrated case management. It assesses health worker performance for selected clinical practices according to accepted standards of good diagnosis and treatment. In addition, the assessment evaluates the physical, personnel and supply situations of the facility that could represent prerequisites for a successful introduction of integrated (standard) case management. BASICS has developed this instrument in consultation with WHO, and testing will be done in June 1995.

The WHO Focussed Program Review consists of a thorough two-stage evaluation of the status and the effectiveness of individual programs, for example, EPI, ARI, control of diarrheal diseases (CDD), essential drugs, MCH and family planning, and tuberculosis control. These reviews focus on a few key indicators collected from the central and peripheral program levels, including districts and facilities. A desk review can be used as a shorter version.

h. Sample Household Surveys:

The most expensive and time-consuming survey methods involve investigations at the household level, i.e., to assess the behavior of caretakers and their attitude toward formal and informal health care providers (demand study). These can only be conducted infrequently and require large teams of surveyors. The national demographic and health survey (DHS) (Macro International) and situation analysis (PCS) are examples of such an elaborate survey method.

Instead of selecting individual households through simple random sampling, a combination of systematic sampling and clusters of households provides less expensive means and also yields statistically valid results. A frequently applied example is the EPI cluster sample survey to determine vaccination coverage.

The UNICEF multi-indicator survey is carried out every few years in an increasing number of countries and contains essential morbidity and mortality information.

i. Community Reporting of Vital Statistics:

In several countries, a reporting system for births and deaths based on existing community structures has been tried, including in Zambia under PRITECH by BASICS' Resident Adviser Dr. Paul Freund. Community-based reporting succeeded on a small scale, but it proved difficult to maintain or expand without continuous support. The ESHE project has an opportunity to explore community structures in the SEPR that could support the reporting of vital statistics and test the approach in several target communities. The advantage of community-based reporting is that infant and child mortality rates as well as changes in birth rates can be monitored on a local level.

Other methods such as the preceding birth technique approximate the survival (mortality) rate for children less than two years of age. This technique records vital events during women's use of maternity or postnatal services and requires only three additional pieces of information beside data already reported. However, preceding births are more suitable for providing information about mortality trends rather than precise rate estimates. If the assessment is facility based, adjustments need to be made for the bias introduced by the exclusion of women who do not contact health services. This technique might be unsuitable in a situation where maternal and child health services are used only by a small fraction of the target population. Many health stations and health centers in Ethiopia report figures as low as 10 to 20 percent.

4. *Effort of Data Collection Proportional to Usefulness*

To decide which of the above methods to employ and how elaborate a routine reporting system should be, costs of data collection have to be compared with the use of the information. If critical decisions cannot and are not made without the information, it should probably be collected. However, costs of supplies and work force will limit what is feasible. If health offices have only a limited budget for stationery, then the reports should only be as long as can fit on the paper purchased and supplied to all health facilities regularly.

If donors and NGOs support the system, their continuous funding has to be assured, or eventually the system will become dysfunctional. Generally, HMIS design and routine operations should not rely on the availability of donor funding but on full government financing. Operations research and population survey activities have always had more donor support.

## 5. *Key Indicators and Data Sources*

The following matrix of systems characteristics and specific diseases shows indicators that are commonly used to measure the outcome and impact of health services, especially child survival programs. Several indicators have been adopted from WHO/CDR and UNICEF. Some indicators can be obtained through routine reporting while others require the application of other methods of data collection already described in this report. The second part of the matrix does not yet contain indicators, but it lists additional service categories that require new measurements, or that are covered by some of the cross cutting indicators. A definition, including the numerator and denominator, and the source of information will be provided for each indicator.

**Matrix of Program Indicators**

<b>Intervention</b>	<b>Health Status</b>	<b>Availability</b>	<b>Access</b>	<b>Utilization</b>	<b>Coverage</b>	<b>Quality</b>	<b>Behavior</b>	<b>Program Mgm't</b>	<b>Policy/ Strategy</b>
<b>ARI</b>	Proportional Mortality: Pneumonia	Availability of antibiotic		Antibiotics given			Appropriate action (cough + fever)		
<b>CDD</b>	Proportional Mortality: Diarrhea	Availability of ORS	ORS access rate	ORT use rate			Continued feeding + fluid		
<b>Cholera</b>	Proportional Mortality; Incidence	Surveillance & treatment available							
<b>EPI</b>	Proportional Mortality: Measles, Polio, NNT, Cases report.	Availability of Vaccines	BCG; DPT1; Prenatal care		Completed series by 12 months; Measles by 12 months	Drop-out rate: DPT1 - Measles; DPT1 - DPT3 Missed opp.	Initiated visit for Measles at 9 months		
<b>Malaria</b>	Proportional Mortality	Availability of antimalarials		Antimalarial given			Appropriate action (fever)		
<b>Nutrition, Breast Feeding</b>	% children w/ weight gain; Stunting; Underweight			% children nutritional status assessed	Actual/Exp. Women with: Prenatal care Attended deliveries		BF after birth; <4 exclusive; Food supplement 6-9 months		
<b>Integrated Case Mgm't</b>		Trained providers		Actual/Exp. OPD visits	% pop. with access to trained HW	Compliance w/ algorithm		Integrated service del.	
<b>Private Sector</b>		Type of CS service avail.		CS services provided		Compliance w/ SCM			Policy and interface
<b>Cross Cutting</b>	IMR Under 5 MR Fertility	% Population within 5km radius, Geography, Travel time		Utilization rates of PPHC specific services		Compliance w/ standard case mgm't, Appropriate counseling by provider, Appropriate referral	% caretakers seeking modern care when appropriate	Supervision Cost recover. M&E activities HMIS Training	Policy devel. + enacted for: System design, Financing, Decentraliz.
<b>Family Planning</b>									

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<b>Intervention</b>	<b>Health Status</b>	<b>Availability</b>	<b>Access</b>	<b>Utilization</b>	<b>Coverage</b>	<b>Quality</b>	<b>Behavior</b>	<b>Program Mgm't</b>	<b>Policy/ Strategy</b>
<b>AIDS/STDs</b>									
<b>TB Control</b>									
<b>Prenatal, Delivery, Postnatal Care</b>									
<b>General Outpatient Services</b>									
<b>General Inpatient Services</b>									
<b>Essential Surgical Care</b>									

Different indicators are needed to measure impact, outcome, process, and outputs, each requiring a different intensity of data collection. Output indicators show whether certain products have been delivered as planned, for example, the number of training courses for community health agents held. Process indicators assess whether these products are provided by adhering to agreed upon standards, for example, using certain training methods, or the improvement in knowledge measured before and after training. Outcome indicators measure the effects of skill improvement, increasing management capacity and support activities, for example, the improvement of health workers' practice of standard case management. The most desirable indicators measure the impact of health services on mortality, morbidity and fertility in a population; they are also the most difficult and costly to obtain.

Epidemiologic data obtained from an HMIS that uses no active case finding, as observed in SEPR, are incomplete and not representative for the population covered by a health facility. It is estimated that only 20 to 30 percent of the population in the region has access to formal health services. Therefore, morbidity and mortality statistics based on self-reporting are only to a very limited extent indicative of the true disease burden. Therefore, the HMIS should not be overburdened by reporting morbidity and mortality in excessive detail. The following suggests some approaches to set priorities for indicators and to select a number feasible for reporting and sufficient for decision making.

#### 6. *Health Status: Mortality, Morbidity*

The long list of disease categories to be reported by health centers and hospitals renders reporting and analysis very time consuming. The data volume makes data entry and storage impossible without the help of computers, assuming the availability of reasonable resources. Decisions are rarely based on diagnoses that are infrequent or that have a wide margin of error. The following criteria help to select diagnostic categories that are most important for managing health service delivery. The first four criteria should be most important for selecting diagnoses for facilities at all levels; the last two serve very special interests and should only be applied to selected facilities, i.e., reference hospitals and some sentinel sites.

## Criteria to Set Priorities for Indicator Selection

- **Data required to make specific decisions**  
I.e., improving access to services, improving service quality (inpatient case fatality), re-designing training courses, improving supplies, or making supervision more effective.
- **Diagnoses have public health importance**  
I.e., vaccine preventable diseases, STDs, AIDS, TB, cholera
- **All facilities have the capacity to report these data**  
Even facilities with few skilled workers need to be able to complete reports with a reasonable effort and accuracy. Facilities might keep more detailed records of diagnoses, patient age, gender and comorbidities<sup>4</sup>, but they should not be required to report everything. If more detailed information is needed, it should be obtained from a sample of facilities and registers through a special study with assistance from university faculties and students. Examples where too much detail is reported include the following diseases: syphilis, accidents, tumors.
- **Technical capacity to diagnose a disease correctly**  
Reporting according to ICD-10 for many illnesses is only meaningful if the facility has the medically trained staff and diagnostic equipment to make an accurate diagnosis, i.e., rare malignancies, most viral infections.
- **Data that serve special interests**  
Universities and researchers at the MOH might require special reports to answer specific questions: the occurrence, stages and fatality of certain tumor types. The necessary data should not come from routine reports of primary care facilities, but from studies. Reference hospitals might design special reporting systems if such questions are of interest to their medical staff.
- **Providing data to international organizations and donors**  
A limited number of data that meet the first criterion is sufficient to satisfy most requests. Special demands should not drive the design of a regional HMIS. Organizations with special needs should finance surveys to obtain the desired information.

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<sup>4</sup> Comorbidities refer to instances where patients are diagnosed with having more than one condition at a given time (i.e., a patient is diagnosed with both persistent diarrhea and pneumonia.)

#### **D. Design**

Entering a discussion of HMIS design at this stage is premature. A more thorough analysis of the existing system has to take place. However, based on the situation of limited human and financial resources, some suggestions might be helpful.

The current reporting system of loose leaf forms could be made more effective by giving facilities blocks of forms with the required number of duplicates. Forms supplied in one block could cover at least one or several years of reporting. One copy should always remain with the facility. To keep mortality and morbidity reports to a minimum, diagnoses should be listed instead of providing empty rows. Diseases should be selected according to above criteria and perhaps limited to the 10 most frequent diagnoses, with an addition of a few other categories that have public health relevance. A total of 15 groups seems appropriate for health posts and health stations (currently forty), 20 to 30 for health centers and rural hospitals. If sentinel sites are established, these facilities could report on more diseases.

Cutting back on the number of diseases to be reported on by health posts and health stations will permit them report these diagnoses by gender and age (only health centers and hospitals report these characteristics now). To keep reporting feasible, three age groups are suggested: under 5 years, 5 to 14 years, and 15 years and older. It could be discussed as to whether adults and children 5 to 14 should be combined to simplify matters further. The group under 5 years of age is important because it contributes a large proportion to overall mortality and morbidity and child survival services should be monitored separately.

The current practice of reporting program data (for example, EPI and MCH) on the same form should be maintained because these programs are mature and the reporting format is not expected to change frequently. Other programs make frequent changes, for example, AIDS and tuberculosis control, according to new treatment and control guidelines. The programs are better off maintaining their current parallel reporting system.

Feedback is a crucial element of an HMIS and the health bureaus of the SEPR and some zones attempt to publish quarterly and annual summaries timely. How this information is used needs to be assessed. These reports present tallies of service data in tabular form without much interpretation of findings and without pointing to specific problem areas. Much shorter quarterly service statistics bulletins could address specific problems more effectively and suggest a possible course of action for the areas and facilities concerned.

#### **E. A Computer Enhanced Manual System**

Computerization of regional health offices to process reports and analyze data will be an option very early in the HMIS re-design process. This can increase the accuracy and timeliness of reporting to the extent that quality checks are made on all levels. However, this technology is vulnerable to resource shortages that could render the equipment inoperable due to the lack of

maintenance and supplies. Therefore, the re-designed HMIS should rely on manual reporting and data processing at all levels, including health bureaus of the regions and zones. As long as computers are available, these bureaus should use them to process data and to generate reports for feedback. In case of equipment failure, staff has to be able to carry out tasks manually and necessary tally sheets need to be available. The manual system might not generate the same detail of analysis that is available when computers are used, but it should include reports on key indicators.

## V. PROPOSED WORKPLAN, TIMELINE AND LEVEL OF EFFORT

The steps proposed consist of six major activities and several tasks to be carried out in three phases. Top priority should be given to a detailed assessment of the information system in SEPR and at the central MOH that will lead to a selection of indicators, the design of appropriate data collection instruments and report forms, and a data processing process that improves data quality. The detailed assessment will provide an opportunity to work very closely with counterpart staff from SEPR and the central MOH. Meanwhile, the effectiveness of the existing system should be enhanced by improving data quality through supervision, training and electronic data processing. The assessment and the following re-design steps will require a substantial amount of time, probably more than two years as the following illustrative schedule shows:

Phase I:	Detailed HIS assessment	1 month
	Development of interim computerized system	3 months
	Review and design process by task force	6 months
Phase II:	Test re-designed HMIS in Sidama Zone	12 months
Phase III:	Implement re-designed HMIS in SEPR	12-24 months

### A. Phase I

#### 1. *Assessment of the Existing HMIS*

Based on this preliminary situation analysis, a more detailed assessment of the HMIS is proposed that would describe important components of the existing system in more quantitative terms. This would allow the identification of the size of specific problem areas and permit the setting of priorities for the re-design process. Following recently drafted WHO guidelines<sup>5</sup> seven steps are proposed to carry out the HMIS assessment. The total level of effort required for STTA is estimated at four person-weeks. An illustrative timeline for this and all following activities is attached.

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<sup>5</sup> Guidelines for the Assessment of National Health Information Systems (HIS). World Health Organization, Geneva. Draft of 5/12/95.

- a. Formulating the terms of reference for the assessment
- b. Assembling and translating relevant existing documents (already done in part by the project)
- c. Identifying the issues and areas of concern (this HMIS review)
- d. Preparing the assessment exercise (form a team of about three persons from SEPR and the central MOH assisted with STTA through BASICS) and starting to establish the task force (see section V.B)
- e. Conducting the assessment (by the team)
- f. Elaborating the report
- g. Preparation of the re-design plan for the follow-up of recommendations

## 2. *Short Term TA to Implement Electronic Data Processing*

Because personal computers are already available at the regional office and more will be received, the project could provide short-term technical assistance to implement electronic data processing for selected tasks. These should include data entry and analysis with EPI-Info of surveys carried out in the region and portions of the existing HMIS that deal with preventive and primary health care services. The volume of morbidity and mortality data is too large to be computerized, but a subset of the 10-15 most important diseases could be feasible. A total of three person- months of STTA should be sufficient to develop and install the system. During this time Ethiopian partners will be trained in the support and use of the system.

Ideally, the systems development effort should involve a counterpart from the start to make these skills available for similar tasks later. Possible software includes EPI-Info, dBase, or Microsoft Access that should be combined with a Geographic Information System (GIS) front-end to map key indicators. BASICS has in-house capacity in all these databases and GIS development tools.

## 3. *Task Force and Workgroups for HMIS Re-design (MOH, NGOs)*

A task force with a few special work groups should steer the re-design process, test the adaptation of the HMIS in the SEPR, and coordinate with the central MOH. This task force should focus on the specification and refinement of indicators for preventive care and community activities. Technical assistance to facilitate the HMIS assessment and the work of the task force should be provided by BASICS.

The need for another work group from the central MOH should be assessed to adapt the currently used classification of diseases (probably ICD-8) to the latest version ICD-10. This high level work group should have the responsibility to specify standard definitions for each level of care and to adapt reporting requirements for morbidity and mortality to the capabilities of different types of facilities. The group would benefit from input by WHO and UNICEF about indicators and data sources.

The following is an illustrative outline of the agenda and tasks that the task force should address. Although the number of issues seems large, many can be addressed in a single session. To make good progress, each task force meeting should have drafts prepared for each session to keep discussions focussed and to reach concrete decisions. Special work groups with fewer members should prepare issue papers for topics that require more extensive work. The ESHE project should provide short-term technical assistance to help the groups with technical input to prepare documents.

a. Development of Mission Statement, Purpose, Output and Members:

The mission of the task force is to guide the re-design process of the HMIS for the SEPR. The re-designed HMIS will be based on information needed for making decisions to implement a sound public health policy. At the same time, the HMIS design will take into account the capacity of those who provide data and the resources available at all levels. The task force ensures that this is a coordinated process with adequate representation of the providers and users of information. These include community leaders, facilities (especially from the primary and community level), health offices at the woreda, zone and region, the central MOH, NGOs, and international organizations. It is the responsibility of the task force to accommodate these diverse needs and to reach concrete decisions in a timely manner.

It is the purpose of the task force to analyze the existing HIS and to identify the main problems that render information inaccessible and unreliable and therefore limit its use. The task force will address these issues by modifying existing data collection, reporting instruments, information flow, data processing, and feedback. Other tasks include the following:

- b. Review current system: what works, what does not work (based on in-depth HMIS assessment)
- c. Define the purpose and the objectives for the HMIS
- d. Identify indicators, definitions, interpretation
- e. Set priorities and specify the use of information for each level
- f. Compare existing forms and data collected with data needed for indicators
- g. Draft new forms, facility records and registers
- h. Determine the data analysis process and flow of information (including the use of microcomputers)
- i. Use key indicators to set priority action in annual workplans
- j. Determine the costs and human resource needs of the re-designed HMIS, consider alternatives
- k. Develop computer programs for data processing/analysis
- l. Develop an HMIS implementation plan to start tests in Sidama Zone
- m. Plan expansion within the ESHE focus zones and in SEPR

- n. Develop a timeline and budget

## **B. Phase II**

### **1. *Design the HMIS and Test in Sidama Zone***

The design recommended by the task force should be tested in one zone including all facilities and all woreda health offices. Sidama Zone has several advantages as a test zone. It can be closely monitored due to its proximity to Awassa and it represents the entire scope of rural and urban health facilities from community posts to hospitals. However, Sidama probably has better resources than other zones, and the HMIS should be designed by taking the situation in zones with lesser means into account.

### **2. *Fine-tune, Estimate Material and Personnel Resources, Quality Control***

Testing in Sidama Zone should be used to fine-tune the re-designed HMIS, to estimate material and personnel resources required to operate the system, and to put support structures into place that permit quality control at all levels. The latter should probably be done in conjunction with revived supervision functions. During the test phase, the HMIS task force should develop an HMIS implementation plan for the entire region.

## **C. Phase III**

Implement stepwise in regions: finally, implementation throughout the region should take place in steps, one additional zone at a time. A stepwise approach allows each zone to build the necessary capacity to support a re-designed HMIS. The downside to this is that the regional headquarters level will have to be prepared to deal with both new and old sets of forms and data during both Phase II and Phase III.

**APPENDICES**

**APPENDIX A**

**Persons Contacted**

## Appendix A

### Persons Contacted

#### Ministry of Health

Dr. Gabremaskal Habtemariam	Teamleader of the Statistics and Health Services Research Team, MOH, Addis
Dr. Lamiso	Regional Health Bureau Head, SEPR
Dr. Petros Olango	Planning and Programming Head, SEPR Health Bureau
Dr. Sahle Sita	Family Health Service Team Leader, SEPR
Ato Feleke Dana	Acting Planning and Programming Service Head, Statistician, SEPR
Mr. Ashenafi Argata	Disease Prevention and Control Division Head, Sidama Zone
Mr. Begashaw Dabena	Training and Upgrading Expert, Sidama
Mr. Feleke Fanta	Chief, Tulla Health Station
Matron	Yirgalem Hospital
TB Control Program Coordinator	Yirgalem Hospital
Mr. Fiseha Zelalen	Registrar, Yirgalem Hospital
Statistician	Yirgalem Health Center
Nurse	Leku Health Station
Sr. Hellen Fennell	Matron, Busholo Health Center
Dr. Isabel Arbide	Pediatrician, Busholo Health Center

#### USAID

Dr. Margaret Bonner	Mission Director
Dr. Victor Barbiero	Director of the HPN Office
Dr. Carmela Abate Green	Health Adviser

#### BASICS

Dr. Paul Freund	Country Adviser
Ato Lemma Chika	Office Manager
Mr. Tom Palmer	Operations Consultant
Mr. Sjoerd Postma	Health Systems Assessment Consultant
Ato Mehari Woldeab	Data Analysis Consultant

#### JHPIEGO

Mr. Mark Lurie	Johns Hopkins University Graduate Program
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**APPENDIX B**

**Draft Timeline For Initial ESHE Activities**



**ESSENTIAL SERVICES FOR HEALTH IN ETHIOPIA (ESHE)  
BASICS ACTIVITIES 1995/96**

Task Name	Duration	1st Quarter	2nd Quarter			3rd Quarter			4th Quarter			1st Quarter			2nd Quarter			3rd Quarter		
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Order furniture and office equipment	30d																			
Purchase of BASICS vehicles	90d																			
Houses leased	45d																			
Staff vehicles in country	15d																			

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Project: Date 5/4/95	Task	Milestone	◆	Rolled Up Task
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**APPENDIX C**

**Community Demand Study Design Strategy**

**Community Demand Study**  
**Outline of Strategy, Methods and Implementation Plan**  
**Paul Freund and Eckhard Kleinau**

**1 Purpose, Expected Results, Research Questions**

**1.1 Purpose**

The purpose of the community demand study is to understand the needs, strengths, and expectations related to health service delivery within the context of the community. The study will identify approaches that worked, and the key factors that made them successful. The need for further research and potential topics will emerge from the results.

**1.2 Expected Results**

The results of the community demand study will be used to formulate a framework for the design and implementation of community based health services for the ESHE project. This framework will be pilot tested through interventions in target communities with a potential for a region-wide expansion in the future. In designing and implementing this study, the project will help the Ministry of Health to define its "basic package of health services."

**1.3 Research Questions**

The community demand study will answer the following research questions:

1.3.1 How do the formal and the informal health delivery systems interact?

1.3.2 What makes community based service delivery sustainable?

Different options will be explored, such as income generation and social marketing approaches for CHAs and TBAs.

1.3.3 Are people willing to pay for services, for which type of services, and how much?

### 1.3.4 How do CHAs and TBAs relate with formal health services?

Several questions need to be answered if CHAs and TBAs emerge as a feasible and acceptable solution to improve access to basic health services:

- What makes CHAs and TBAs acceptable to the communities as providers of quality preventive and curative services?
- Into which community structures fit CHAs and TBAs?
- What are the appropriate roles and responsibilities of CHAs and TBAs?
- What are the minimal support requirements?
- How much does community-based service delivery cost the community?

## 2 Strategy

- 2.1 Elicit a community's "felt" need for development that might include health, but could give a higher priority to other sectors, i.e., water, agriculture, education.
- 2.2 Determine who are the most effective agents to promote and support community-based service delivery and their role.

Ministries of Health and their local representations are traditionally weak in effecting sustained community participation. In the context of this study the project will explore the potential impact that other institutions could have, for example the regional council and the regional development committee and their local representatives. The study will evaluate how the regional health bureau can be strengthened to fulfil its role of providing technical support.

- 2.3 The availability and utilization of formal and informal providers of health care will be assessed.
- 2.4 The community- demand study will assess a community's perception and attitude towards basic health services including prevention and curative care: "felt" disease priorities, accessibility of and satisfaction with current services, and expectations from formal health care providers. The need for services that are part of the "basic package" (to be defined) will be addressed specifically.
- 2.5 The study will describe the power structure and decision making processes in the community. This will include interviews with leaders, women groups, development and other committees, local associations, and religious groups.
- 2.6 Care seeking behavior will be assessed in a small sample of households to complement results obtained from focus groups and other interviews.
- 2.7 To allow appropriate stratification, the following interviewee characteristics will be noted: gender, age group, ethnicity, and geographic location.

### **3 Methods**

#### **3.1 Site Selection and Sampling**

3.1.1 Two communities will be selected in each focus zone. The total sample size is eight, because Kaficho Zone will not be included initially. Communities will be selected at random from two sampling frames, one for communities in the catchment area of functioning health stations and another of functioning health centers.

3.1.2 A systematic sample of 10 households, with a random starting point, will be selected in each community.

To answer the research questions and to assess all aspects of community-based service delivery, several interview approaches will be used for this study.

#### **3.2 Focus Group Interviews**

Separate focus group interviews will be held with women and men as well as with a mixed group to elicit responses that are gender sensitive. A fourth group of adolescents could be interviewed about topics such as family planning and STDs if field tests suggest its need.

#### **3.3 Health Facility Interviews**

Personnel from the closest formal health care provider will be questioned about how they perceive their interaction with the community.

#### **3.4 Small Sample Household Survey**

Caretakers will be asked for their care seeking behavior for selected diseases related to child survival and other frequent illnesses affecting the child and adult (i.e., eye, ear, mouth, skin problems). Disease occurrence will be assessed for a four week recall period.

#### **3.5 Interviews of Alternative Health Care Providers in the Community**

Alternative health care providers include CHAs and TBAs, traditional healers, drug sellers, etc.

4 Implementation Plan

Task	Responsibility	May				June				July				August			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Write SOW and hire local consultant to: - conduct literature review - interview NGOs with community experience - visit successfully implemented Health Posts with project team	Paul	█															
2. Draft strategy and outline methods for study	Paul Mekanen Tedelle Rasmus. Battachar.		█	█	█												
3. Provide STTA consultant(s) to: - finalize study design - select sites - field test instrument	BASICS/w			█	█	█	█										
4. Produce forms and discussion guides for all methods	Paul/team STTA						█	█									
5. Interview teams selected: interviewer, recorder	Paul RPB							█									
6. Train interview team	Paul Petros Mekanen Tedelle							█	█								
7. Schedule and inform communities (3 local hires-done)	3 local hires							█									
8. Carry out interviews: 2 teams of 3 each, 3 days per community	HW Zone Woreda								█	█	█						
9. Supervision and quality checks	Paul Tedelle									█	█						
10. Transcribe interviews, summarize in tables and charts	Paul/team											█	█				
11. Write report	Paul L. Consult												█	█	█		
12. Hold dissemination workshop and develop next steps (2 days)	Paul/team																█

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