Human Resources for Health Information systems: a fact-finding study

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1. Executive Summary

This paper details the results of a 12-day fact-finding study into human resources for health information systems (HR for HIS) in both Ethiopia and Zambia. Both countries have carried out Health Metrics Network (HMN) HIS assessments and are currently implementing their strategic plans of action. The study aims to elucidate to what extent personnel are capable of incorporating and implementing policies and interventions aimed at reinforcing their country HIS. It hopes to provide a preliminary overview of the situation concerning HR for HIS in these countries on the backdrop of the worldwide human resource for health crisis.

Information was collected through interviews in the field with personnel at national, regional and local administrative and service levels, based on a standardised questionnaire. Three regions in both Ethiopia and Zambia were visited. Further discussions with other stakeholders such as government bodies and international organisations, consultation of reports and other documents, and personal observations also formed the basis of the findings and recommendations.

In Zambia, extensive HIS reforms and the presence of dedicated HIS staff in many facilities somewhat alleviate the strain on medical staff. This, combined with a good tradition of clinical record keeping and a longstanding understanding of the importance of health information, contributes to a functional HIS in the three regions visited. Although infrastructure and equipment are often insufficient and HIS staff, particularly at lower levels, are overworked and at times de-motivated, leading to high turnover, co-operation between donors and stakeholders through Sector-Wide Approach programmes has led to better co-ordination and should enable further developments to be optimised.

Zambia faces challenges in the field of HR for HIS in three main areas: firstly, HIS job attractiveness, staff motivation, and retention; secondly, use of information at lower levels; finally, use of existing equipment and tools and procedure of HIS tasks. These challenges open up opportunities for improving working conditions, providing more feedback and making the best use of staff’s existing skills; providing a clear framework and increasing the means for staff at lower levels to act on information collected; and optimising use of equipment and maximising streamlining of HIS tasks.

In Ethiopia, a different historical context and a vast territory have led to a heterogeneous HIS situation. Whilst the HIS pilot region has proven successes, in other regions visited severe shortages of HIS and medical staff work to the detriment of information collected. Additionally, high staff turnover combined with poor infrastructure further increases strain on existing personnel. However, the development of countrywide standardised medical records forms testifies to the benefits and possibility of a more co-ordinated approach.

Several opportunities for improvement of the HR for HIS situation in Ethiopia have been identified. These include: increasing HIS awareness through training, strategic placement of HIS
focal points and an overall increase of HIS personnel. Providing incentives such as feedback, equipment and infrastructure, and staff accommodation present a possibility for reducing high turnover levels. Finally, targeting computerisation in key areas could be considered in order to streamline HIS tasks and contribute to the overall improvement of the HIS.

Lessons learned from this study point to several key areas that Health Metrics Network could concentrate on in future work. These include, first and foremost, promoting co-ordination and co-operation between all stakeholders for an integrated approach to the challenges faced. Furthermore, there are opportunities for increased and co-ordinated technical support, help defining norms for HIS staffing levels, HIS training, strategic use of computerisation and optimisation of existing equipment including streamlining of paper-based systems, and working to ensure the inclusion of all levels and regions in the HIS developments, all of which may help alleviate the strain of HIS reporting on all staff and improve countries’ health information systems.
### 2. List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ART</td>
<td>Antiretroviral Therapy</td>
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<td>ARV</td>
<td>Antiretroviral</td>
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<tr>
<td>BPR</td>
<td>Business Process Re-engineering</td>
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<td>CDC</td>
<td>Centres for Disease Control and Prevention</td>
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<tr>
<td>CSA</td>
<td>Central Statistics Agency</td>
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<tr>
<td>CSO</td>
<td>Central Statistical Office</td>
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<tr>
<td>DACA</td>
<td>District AIDS Co-ordinating Advisor</td>
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<tr>
<td>DFID</td>
<td>Department For International Development</td>
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<tr>
<td>DHS</td>
<td>District Health System</td>
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<tr>
<td>DHIS</td>
<td>District Health Information System</td>
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<td>DHO</td>
<td>District Health Office</td>
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<tr>
<td>DLDP</td>
<td>District Level Decentralisation Programme</td>
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<td>FMOH</td>
<td>Federal Ministry of Health</td>
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<tr>
<td>HEW</td>
<td>Health Extension Worker</td>
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<tr>
<td>HC</td>
<td>Health Centre</td>
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<tr>
<td>HIS</td>
<td>Health Information System</td>
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<td>HMIS</td>
<td>Health Management Information System</td>
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<td>HMN</td>
<td>Health Metrics Network</td>
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<td>HP</td>
<td>Health Post</td>
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<td>HR</td>
<td>Human Resources</td>
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<tr>
<td>HSDP</td>
<td>Health Sector Development Program</td>
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<tr>
<td>ICD</td>
<td>International Classification of Diseases</td>
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<tr>
<td>ICT</td>
<td>Information and Communication Technology</td>
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<tr>
<td>IPD</td>
<td>In Patient Department</td>
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<tr>
<td>JICA</td>
<td>Japan International Co-operation Agency</td>
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<td>JSI</td>
<td>John Snow, Inc.</td>
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<tr>
<td>MDG</td>
<td>Millennium Development Goals</td>
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<td>MOH</td>
<td>Ministry of Health</td>
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<tr>
<td>M&amp;E</td>
<td>Monitoring and Evaluation</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>MPI</td>
<td>Master Patient Index</td>
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<tr>
<td>MRN</td>
<td>Medical Record Number</td>
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<tr>
<td>NAC</td>
<td>National AIDS Council</td>
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<tr>
<td>NARF</td>
<td>NAC paper-based reporting system for HIV/AIDS</td>
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<tr>
<td>NMCC</td>
<td>National Malaria Control Council</td>
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<tr>
<td>OPD</td>
<td>Out Patient Department</td>
</tr>
<tr>
<td>PACA</td>
<td>Provincial AIDS Co-ordinating Advisor</td>
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<tr>
<td>PHCU</td>
<td>Primary Health Care Units</td>
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<tr>
<td>PHO</td>
<td>Provincial Health Office</td>
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<tr>
<td>RHB</td>
<td>Regional Health Bureau</td>
</tr>
<tr>
<td>SNNPR</td>
<td>Southern Nations, Nationalities and People’s Region</td>
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<tr>
<td>SWAps</td>
<td>Sector Wide Approach</td>
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<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
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<tr>
<td>UTH</td>
<td>University Teaching Hospital</td>
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<td>WHO</td>
<td>World Health Organisation</td>
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5. Introduction

“Nothing less than the viability of our planet and the future of humanity are at stake.”
Ban Ki-moon, Secretary-General, United Nations, 2009

Against the backdrop of worldwide efforts to reach the majority of the Millennium Development Goals (MDGs) by 2015, combined with resolutions to enhance the effectiveness and sustainability of developmental aid, the healthcare delivery systems of the world’s poorest countries have been put under increasing scrutiny. Health information systems (HIS) are a key element in the healthcare system as a whole, structuring the collection of data and generation of information necessary for healthcare workers, policy makers and aid partners to make informed policy decisions and operations, strategically target aid efforts, reduce wastage, increase accountability and measure progress towards attaining the MDGs. But such systems do not function on their own accord: human resources are a crucial factor. Ensuring the availability of trained healthcare staff at all levels of the health data collection, transfer and analysis process is paramount if the system is to function correctly. Yet World Health Organisation estimates point to a shortage of 4.3 million healthcare workers worldwide. The poorest countries in Africa are the worst hit; the sub-Saharan region alone lacks over one million healthcare workers.

The Health Metrics Network (HMN) is an independently funded, World Health Organisation-hosted global partnership founded in 2005 with the aim of strengthening health information systems to facilitate better health information at regional, country and global levels. With a framework and standards to guide developments in this field, advancements have been made in many participating countries. Yet the current worldwide crisis in human resources for health (HRH) has consequences on health information and efforts to improve it. This study sets out to clarify the consequences of the human resources for health crisis on health information systems in developing countries and, on the basis of a situational analysis, make recommendations to the countries studied as well as to WHO/Health Metrics Network headquarters.

5.1. Human resources for health: healthcare in crisis

In recent years the human resources for health crisis has moved progressively to the top of the agendas of aid agencies and states alike. A shortage of healthcare workers is not a new

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3 The Health Metrics Network is hosted by the World Health Organisation. For more information, please see section 3.3, or visit the site http://www.who.int/healthmetrics
phenomenon. Studies have shown that Africa, the continent that bears the burden of 25% of the world’s morbidity rate, possesses a mere 3% of the world’s health workforce.\(^4\) The failure to overcome this challenge poses a direct threat to the realisation of MDGs 4, 5 and 6: reducing infant and maternal mortality rates and deaths from AIDS, tuberculosis and malaria. It is estimated that the current number of healthcare workers would have to be tripled for these goals to be met.\(^5\)

### 5.1.1. Increasing needs, falling capacities for response

This already chronic shortage has taken on new dimensions that have further exacerbated the situation. As economic, social and demographic changes have swept through developing countries their epidemiological profiles too have changed. The threat from infectious and tropical illnesses has remained constant, if not increased. At the same time, chronic illnesses, such as cancer, diabetes and cardiovascular disease, thus far characteristic of developed countries, have begun to appear. This creates a double burden for the countries’ health systems and their limited personnel.\(^6\)

Whilst the demand for healthcare workers continues to increase, studies have pointed to numerous factors swelling the deficit of those available. Freezes by developing countries on recruitment into the public sphere since the 1980s have combined with a net decrease in workers in the most regions that need them most due to migration trends from rural to urban areas, from less developed to more developed regions and countries, and to more profitable work outside of the medical field.\(^7\) Increasing opportunities for emigration, along with a demand for trained medical personnel in the developed world, have promoted an exodus of workers. Under-investment in both pre- and post-service training combines with inadequacies in public health planning to exacerbate the imbalances between the offer and demand of health workers.\(^8\) Too little focus on improving working conditions for healthcare staff, a lack of not only equipment and material resources, but of professional recognition for a challenging job, has further worsened the situation.\(^9\) Additionally, not only does the HIV epidemic expose medical personnel to risks to their own health, but new incentives from the international community to provide universal anti-viral treatment to people living with HIV/AIDS add significantly to their workload.\(^10\)

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\(^6\) Kerouedan D, op. cit.
\(^7\) Commission Internationale du Conseil National du SIDA, op. cit.
\(^8\) Ibid.
\(^9\) Ibid.
5.1.2. The international response: a collective will reflected in studies, initiatives and strategies

The international community has created numerous initiatives to monitor, evaluate and respond to the challenges in the field of human resources for health. The European Union adopted a Programme for Action in 2006 (PfA)\(^{11}\) and in 2007 the Douala Conference on Human Resources for Health in Africa saw the adoption of a twelve-point action plan. In 2009, at the European Regional Committee, states reiterated their commitment to a 2004 resolution to develop a code of practice for the international recruitment of health personnel.\(^{12}\) Perhaps most significantly, in March 2008, governments gathered at the first Global Forum on Human Resources for Health to pronounce the Kampala Declaration and Agenda for Global Action centred on increasing financing and fair and proper distribution of healthcare personnel.\(^{13}\)

Studies have informed strategies to increase the available pool of human resources and increase the efficacy of those present. A recent paper shows that training is paramount as in Africa a significant number of the few healthcare workers available are insufficiently trained.\(^{14}\) Others have shown promising results of incentives aimed at encouraging healthcare workers into underserved areas.\(^{15}\) Strategies have concentrated predominantly on short and long-term funds provided by international donors and structural reforms at the national level. The need to create mechanisms to combat pull factors contributing to HRH migration and facilitate recruitment is also recognised as crucial.\(^{16}\) The European Union’s PfA has focused on increasing the abilities of countries to train, manage and retain health workers.\(^{17}\) Increasing the delegation of certain tasks to para-medical staff - known as “task-shifting” - has been a policy of several countries among them Ethiopia, as well as of development partners.\(^{18}\) Yet whilst such strategies have proven to alleviate the strain on healthcare staff\(^{19}\) they have not reduced overall need for the qualified medical professionals that are in such short supply.\(^{20}\)

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\(^{12}\)World Health Organisation, Regional Committee for Europe, 59\(^{th}\) session, Sept 2009.


http://www.who.int/workforcealliance/forum/1_agenda4GAction_final.pdf


\(^{16}\)See, for example, the aforementioned resolution by the World Health Assembly and the European Commission Programme (cited below).


\(^{19}\)See for example, Global Alliance for Vaccines and Immunization, Progress Report, “Ethiopia: partners working together”, 2007.

5.1.3. A shortage far beyond the healthcare delivery level

There has been growing recognition that the HR crisis does not concern a homogenous group of medical workers. There is not only a shortage of doctors, nurses, midwives and so on, but also an inadequate number or insufficiently large trained pool of administrative personnel, middle managers, planners, analysts and policy-makers in the health sector. Such employees are vital at whatever level of the system they may be: ensuring the effective management of limited available resources,\(^{21}\) or generating and treating health information that informs choices at regional, national and global levels. At a time when donors are increasingly demanding transparency and the use of effective and quality health monitoring and evaluation mechanisms the importance of a well-functioning and accurate country health information system has become increasingly clear. Meanwhile, the number of human resources available to provide this is dwindling.

5.2. Health Information Systems: informing decision-making country-wide

5.2.1. A health information system: definition and components

A health information system can be defined as “a set of components and procedures organised with the objective of generating information which will improve health care management decisions at all levels of the health system”.\(^{22}\) The aim of such an information system is to allow transparent, evidence-based decision-making founded on pertinent and quality information.\(^{23}\) It is about answering the information needs of all actors involved in healthcare at all levels, from doctors in the field to Ministry of Health policy-makers and international donors. It provides the information necessary for health staff to do their jobs effectively and for the impact of their work to be monitored. Figure 1 shows the six elements that may be considered to be part of a health information system.

Figure 1. The elements of a health information system

<table>
<thead>
<tr>
<th>Resources</th>
<th>Legislative, personnel, financial, logistical, ICT.</th>
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<tbody>
<tr>
<td>Indicators</td>
<td>And related targets.</td>
</tr>
<tr>
<td>Data sources</td>
<td>Population based / institution based.</td>
</tr>
<tr>
<td>Data management</td>
<td>Collection, analysis, storage, compilation at timely intervals.</td>
</tr>
<tr>
<td>Information products</td>
<td>To turn data into relevant information.</td>
</tr>
<tr>
<td>Dissemination and use</td>
<td>So that information is used to inform decision-making.</td>
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5.2.2. Measuring the performance of a health information system

A health information system may be evaluated both “in terms of the quality of data produced and the evidence of continued use of data for improving the performance of the health system and, ultimately, the population’s health status”. 24

The structure of a health information system and the resources available for it are key factors in determining the system’s efficiency. A framework developed by Health Metrics Network and detailed below determines necessary inputs, outputs, outcomes, components, standards and norms for a HIS to function properly. This takes into account not only policy, technical and structural determinants, but also “the roles and responsibilities of the different actors and the available resources for HIS, and the behavioural determinants such as the knowledge and skills, attitudes, values, and motivation of those involved in the production, collection, collation, analysis, and dissemination of information”. 25 It is precisely this human component of the information system that will be the focus of our study.

5.3. A fact-finding study on human resources for health information systems conducted for the Health Metrics Network

Health Metrics Network’s strategic objective is to “increase the availability and use of timely and accurate health information in country and globally by catalyzing the joint funding and development of core country HIS.” 26 Its framework to monitor progress is composed of three phases:

1) Leadership, coordination and assessment. Health workers, managers and the relevant ministries are questioned in detail in order to allow a clear assessment of the strengths and weaknesses of the system in place. At the time of writing, 65 countries have finished this preliminary assessment.

2) Priority-setting and planning. Working with the norms and standards detailed in the framework, countries create action plans that list the necessary steps to be taken to strengthen the HIS.

3) Implementation of country HIS-strengthening activities.

Six countries have been selected by HMN to receive extra funding with a view to improving their health information systems and are “Wave One” countries. 27 Four of these have now begun to implement their strategic plans of action. This study will draw from research carried out in two of these countries: Ethiopia and Zambia.

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27 The six HMN wave one countries are: Belize, Cambodia, Ethiopia, Sierra Leone, Syria and Zambia.
Whilst numerous studies have focused on various aspects and manifestations of the human resources for health crisis, hitherto none have focused precisely on the consequences of this on a country’s HIS management and decision-making processes and outcomes.
6. Objectives

The general objective of the study is to investigate the situation surrounding human resources involved in the health information systems of Ethiopia and Zambia. The overarching goal is, as that of Health Metrics Network (HMN), to improve availability and use of timely and accurate health information in both countries by strengthening their HIS.  

The study thus intends to provide HMN with qualitative and quantitative information on who is doing what and where? It is about elucidating to what extent stakeholders at various levels of the healthcare system are capable of incorporating and implementing policies and interventions aimed at reinforcing their HIS after the HMN assessment. It should also help:

- Disclose potential areas in need for further technical support;
- Explain why certain HIS components progress at a higher pace than others;
- Give reasons to involve other partners in HMN activities;
- Supply evidence to better define HIS strengthening mechanisms.

And furthermore intends to be of use to the participating countries by:

- Disclosing gaps in staff training;
- Underlining any deficit in staff numbers and qualifications/skills to do this job;
- Exposing budget shortages and imbalances in budget allocation;
- Showing the differences between regions and facility types;
- Disclose reasons for high staff turnover rates, if any.

With a view to attaining these overall goals, the specific objectives guiding the study were set out in the Terms of Reference (TOR) and fit largely into four main themes:

1. **Staffing numbers**: number of existing staff responsible for HIS at different facility levels, from the administrative level (Ministry of Health, Provincial and District Health Administration Bodies), to the service level (hospitals, medical centres, private clinics, should time/logistics allow). Furthermore, the constraints on and attitude of staff.

2. **Tasks** that staff involved in HIS activities are responsible for. This includes: finding out who fills out patient forms; how many different types of forms there are; how much time does it take; is the system electronic or paper-based; where does the data go once collected; and what is done with it?

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29 Presentation made by Viktoria Dijakovic, 24th September 2009 at first meeting between consultancy team and Health Metrics Network.
30 Ibid.
31 For the complete terms of reference please refer to Annexe 1
3. *Specific training* undergone by staff involved in HIS tasks and thus evaluating the level of knowledge and their capacities to carry out their tasks: did this training meet their requirements for their task, how much did it cost and who provided it?

4. *A visual description* of the places visited to indicate staff working conditions.

Figure 1 presents the objectives as detailed in the Terms of Reference:

![Figure 1. Objectives of the study](image)

A situational analysis and the subsequent conclusions drawn from this will provide a clearer picture of the HR4HIS challenges low and middle income countries face and will enable recommendations for HIS-strengthening activities to be better informed.
7. Methodology

The methodological approach of the fact-finding study was based largely on the following aspects shown in the figure below:

![Methodology overview](image)

7.1. Discussing the TOR and defining the objectives of the study

The initial TOR provided the overall context and objectives of the study. A meeting with HMN was subsequently organised in Paris in late September 2009 to clarify some points, such as HMN’s expectations with regards to the findings, the form and submission date of the final report, the expected degree of analysis, and of what the procedure would be in the countries visited, including the possibility of a debriefing. The consultancy team consequently proposed a preliminary agenda (elaboration of the questionnaire, suggested contacts, etc.)
7.2. Literature review

A literature review revealed a lack of any research on the topic of HR for HIS. A review of related literature, such as HMN and related organisation documents, HIS assessments, ministry reports, research articles on HR or HIS provided an overview of the general situation and helped position the current study, providing the background information and inspiration necessary for the elaboration of the study tools, namely the list of interviewees and the questionnaire itself. Please refer to the Bibliography for details of documents reviewed before departure and during the field visit.

7.3. Identifying places to be visited and categories of target interviewees

Both the Zambia and Ethiopia consultant teams prepared a list prior to departure of who would need to be interviewed and at what level. The objective was to see as many different types of structure as possible in the limited time available. More detailed lists were created once on-site upon contact with the respective focal points and depending on availability of personnel. The preliminary list can be found in Annexes 2 and 3, whilst the final list of people interviewed is shown in the itinerary (Annexes 6 and 7).

For the Zambian mission, the list took into account the intended stay in the capital, Lusaka, plus visits to two provinces, Copperbelt (HIS pilot region) and Southern (non-pilot region). Three places were identified for visits in Ethiopia: the capital Addis Ababa, Dire Dawa (second largest city), and Awassa (which has a good history of HIS). During the two-week mission, 19 institutions were visited in Ethiopia and 22 institutions in Zambia.
Figure 3. Hierarchy of institutions visited in Ethiopia

Figure 4. Hierarchy of institutions visited in Zambia
A total of 61 people were interviewed in Zambia and 59 in Ethiopia over two weeks. The numbers are represented on the pie charts below according to job category:

**Figure 5. Staff interviewed in Ethiopia, by job category**

**Figure 6. Staff interviewed in Zambia, by job category**
7.4. Questionnaire

To extract the necessary information to meet the study objectives, emphasis was put on the four key aforementioned objectives:

- Staff numbers
- Staff tasks (including data use and decision making steps)
- Training
- Budget

The questionnaire was thus divided broadly into two main parts: “employment” and “additional questions”. Within the “employment” section a distinction was made between two categories of interviewees based on the target audience defined in the preliminary list – those working at “administrative level”, and those at “service level”. For personnel at each of these levels, questions in this section were further divided into two sub-sections:

- **Process-based questions**: referring to processes at each step of HIS, in order to define who are the people involved, how many, and how they do their job.
- **Training-based questions**: details (training scope, training provider/financer) of any pre-service/in-service training undergone, if any.

Several additional questions allowed opinions to be expressed on the system and training opportunities (advantages, drawbacks, improvements, recommendations, suggestions, perspectives etc.). This aimed to clarify the interest of staff in the HIS process and their understanding of its purpose. A copy of the questionnaire can be found in Annexe 4.

7.5. Interviews and site visits

Role-plays of the interviews undertaken before departure indicated that approximately 20 minutes would be required per interview. Both teams had 12 full days in their respective countries, of which 10 were working days. In addition to interviews, time was allocated to meet with WHO/MOH focal points, define the schedule, arrange interviews, organise logistics, collate findings, and prepare and present a debriefing session for national stakeholders. Before arrival it was not entirely clear how logistic and other issues might be obstacles to the study. Thus, a tentative estimate of approximately 50 interviews per country was envisaged.

7.5.1. Organising interviews and visits

In both countries appointments were periodically made on our behalf by MOH personnel. In Ethiopia, visits were always accompanied by Federal Ministry of Health (FMOH) staff. In Zambia, visits to service level facilities outside of Lusaka were generally facilitated by a staff member.

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32 Cf. Questionnaire, Annexe 4
from the local Provincial Health Office (PHO) or District Health Office (DHO). In Lusaka, it was often possible to simply call ahead. Please see Annexes 6 and 7 for the final trip mission schedules.

Logistics were organised with the help of John Snow Inc. (JSI) in the United States prior to departure and further arrangements were made in country in liaison with the local counterparts (JSI/Share in Zambia, plus further assistance by the MOH, JSI and the FMOH in Ethiopia).

7.5.2. Conducting interviews

To ensure impartiality of the responses, attempts were made to conduct individual interviews as much as possible. In addition to the interviews, both teams were able to visit related departments such as: card rooms, out-patient departments (OPD), triage rooms, IT department etc. This enabled visual observations to be made of the working conditions and the data collection, storage and processing tools. Both teams were able to document such observations with photographs (see Annexes 8 to 26).

In Zambia, interviews were conducted for the most part on an individual basis, without the presence of MOH or other administrative or facility staff. On a few occasions, group interviews of staff from the same department were carried out. This did not seem undermine the information gathered, as for the most part interviewees seemed at ease. The goals and objectives of the study were exposed to each interviewee before commencing. In almost all cases, interviews took place at the workplace.

In Ethiopia, interviews were conducted both on an individual basis and on a collective basis, always with the presence of FMOH staff. In the beginning of each interview, FMOH staff first explained the intention of the visit and made a brief introduction in Amharic. The objectives and goals of the study were then presented and the interview procedure explained. On occasion, the FMOH staff acted as translators when interviewees did not speak English. The interviews were sometimes held at the place of work, sometimes at the office of the health service manager.

7.6. Limitations and constraints

Timeframe and manpower were the two biggest limitations, and thus an exhaustive study was not envisaged. Due to limited contact with focal points prior to departure it was not possible to establish a more detailed list of interviewees in advance. This meant that contact could not be made to check interviewees’ availability, which ultimately slowed the process of arranging interviews and also left both teams open to situations where an intended interviewee was unavailable, or had limited time to dedicate to the interview.

7.6.1. Constraints specific to Ethiopia
Although the HR4HIS research was supported by Ministry staff, arranging interviews and opening doors that would have otherwise been closed, it must be noted that their presence might have distorted the responses. The attendance of FMOH staff during interviews may have influenced to a certain extent the answers of interviewees especially in cases where their personal opinion was expressed, disrupting the responses of the interviewee. Furthermore, the extent to which this may have affected their translations of interviewees’ answers is unclear.

Individual interviews were usually not possible. Often panels of staff members of various status were interviewed together. Whilst this did not seem to affect the answers of some staff members, others seemed to feel restricted in their responses. The opinions of some staff members could at times influence those of others.

Occasionally, certain information was not obtainable. For example, in some health facilities no interviewees were available due to training sessions or lack of time - Central Statistics Agency (CSA) staff were on a two-week training course during the stay. A number of international partners were not available owing to lack of interest, or because their office was closed. One international partner refused to be interviewed due to the similarity of our mission with their duty. Because of this, full understanding of the interaction between the FMOH and some partners on training and funding issues might be impeded. Since the CSA could not be visited, we could not gain a precise idea of the role of the Census at the national level for HMIS.

### 7.6.2. Constraints specific to Zambia

Constraints with regards to personnel’s reluctance or reticence during interviews were not experienced. A fair amount of time was spent waiting due to last-minute interviews and some target interviewees were not available. This also complicated the arrangement of interviews with other partners and international organisations.

A significant proportion of time was spent arranging travel arrangements, as some travel had to be rescheduled to fit the availability of interviewees and to fit with other engagements that we were unaware of before arrival. Travel was further hindered by a diesel shortage in-country during the stay. On two occasions this led to a significant amount of time spent searching for diesel and subsequently less time for interviews.

The two-week investigative mission in Zambia undertaken between the 1st and the 14th of November 2009 enabled us to make the following observations, which will form the basis of our subsequent analysis and recommendations. Due to the obvious time and logistical constraints these observations do not presume to provide an exhaustive or definitive illustration, yet may be considered a preliminary indication of the current situation in the country and may be of use as the basis for further investigations.

8.1. Background to HIS work

In 2007, a situational analysis of Zambia’s HIS was conducted based on the HMN assessment framework. The country is now in the first phase of its HIS strategic plan (2009-2010), in line with the fourth National Health Strategic Plan (ending 2010). The second phase will be implemented in 2011-2015. The strategic plan addresses several issues, including the fact that a lot of health information was being routinely collected, but not disseminated or used to inform programme monitoring and evaluation, or policy setting.33 Priority HIS functions to be addressed concerned with the human resources aspect of the system centred on HIS staff’s weak ability to analyse, disseminate and put to use the information collected in a relevant and timely fashion, especially at lower levels. Furthermore, healthcare workers also involved in HIS tasks were undertrained in information tasks.

8.2. Zambia’s health system: a brief overview

Zambia, with a population of approximately 12.9 million (2009 estimate)34, is divided into nine administrative provinces and 72 administrative districts. These administrative boundaries reflect those of the administrative layout of the health system. The system remains centralised, despite some devolvement of power to regions. The budget, staff recruitment and training are all resolved at the Ministry level.

8.2.1. Administrative Level

At the administrative level, Zambia disposes of nine Provincial Health Offices (PHO) and 72 District Health Offices (DHO). At the national level the Ministry of Health co-ordinates the provincial and district health offices. Health information is also collected by two statutory boards (National Aids Council and the National Malaria Control Centre) and, to a lesser extent, the Central Statistics Office.

8.2.2. Service Level

At service level there are three hospital levels: the national level (level three), the provincial level (level two) and the district level (level one) in addition to health centres (urban and rural) and health posts. In 2002, there were a total of five level three hospitals, including the University Teaching Hospital (UTH) in Lusaka; 18 level two hospitals; 74 level one hospitals; 1220 health centres (973 rural and 237 urban); and 20 health posts.\(^\text{35}\)

8.3. The structure of the information system

Figure 8. Health data flow between the Zambian institutions observed during the mission

Figure 10 shows in more detail the standard health information flow at hospital level.

Diagram 8 shows the health data flow between institutions in Zambia and the intended process of aggregation, analysis and action at each HIS level before data transfer. This process involves tallying and data verification, with the main objective being to ensure data accuracy. When a patient enters a health facility, he or she goes to the data entry clerk at the reception desk, who opens a new or retrieves an old patient file. The patient’s basic details are noted in the patient register. The patient then sees a triage nurse, who might send him to a clinical officer or a doctor if necessary. The nurse fills in a number of sheets (temperature, blood pressure, diagnosis, etc). The clinical officer or the doctor – where present – may also add information to the file. After his visit, the patient returns to the data entry clerk, who completes the register and then stores and files the patient’s file in the medical records office. If the patient needs to be admitted, an admission form is opened and the patient file, along with the various sheets that have been completed in during his stay, will be returned to the medical records office upon discharge. In larger health facilities, there may be both data entry clerk and medical records officer positions. In smaller facilities, all the abovementioned tasks may be completed by the same staff member. In addition to the information in the patient file, tally sheets are filled in on a monthly basis by either data entry clerks, medical records officers or nurses in the wards based on the information in the register. These tally sheets are sent to statistic officers/IT staff – if present – who are in charge of verification and centralisation of all the tally sheets from the different health facility departments, as well as of the preliminary analysis. The tally sheets are submitted to the District Health Information Officer on a monthly basis. In health centres it may be that a nurse completes all the steps of the abovementioned process.

8.3.1. Data Transfer
Past HIS assessments found that health information was collected routinely. During the course of the field visit a standardised and fairly timely transfer of data from facilities to their respective district or provincial health offices and from these administration bodies upwards to the Ministry was indeed observed, despite some delays at lower levels for reasons such as staff illness, busy periods, or health centre inaccessibility due to the rainy season. Information was collected on extensive standardised indicator forms by various staff members (dedicated or non-dedicated) depending on the size of the institution. Where health information officers were present (in most institutions apart from health centres and health posts), data was verified before being transferred to the DHO (for hospital level one and health centres or health posts), or the PHO (for hospital level two). Then data was once again verified at each level before being transferred up the chain to the MOH. According to the district health information officers interviewed the preliminary data they received was between 75% and 87% accurate. Sources in the Ministry ICT department responsible for most information verification and analysis tasks estimated that the data received was approximately 93% accurate.

8.3.2. Aggregation, Action, Analysis

At every step of the abovementioned system a process of data aggregation, analysis and action on the basis of this decision is foreseen. Observations showed that whilst data aggregation was indeed carried out (patient information aggregated from the patient registries onto standardised indicator forms), the analysis of this information took various forms, as detailed below, at different facility levels. Moreover, action taken on the basis of this information to counteract negative health situations in the community could be limited; the Ministry was aware of this and expressed the desire to remedy this situation. At the health centre level, analysis and action could include manually reviewing the aggregates and alerting the DHO in case of an increase in one of the notifiable diseases. Two of the rural health centres and health posts visited stated that they created “action plans” and discussed the analysis of their health information with local village committees, in order to warn local residents in case of heightened rates of certain diseases. However, this was not always the case and, in general, their action was predominantly limited to asking the DHO for equipment to counter the disease increase. This equipment was generally provided. In hospitals, which are more likely to have dedicated HMIS staff, analysis went further than epidemic surveillance. Moreover, where computers were available, graphs tracking disease rates were created and statistics discussed with medical staff to formulate action plans.

8.3.3. Sector-Wide Co-ordination

Clear co-operation and co-ordination attempts between the MOH and international donors were observed. Zambia has had a Sector-Wide Approach programme (SWAps) in place for several years. Ministry sources indicated that the new HMIS, once fully implemented, should become a hub for all partners to draw health information from. Although not currently in place, this system would see the regular publishing of reports on the internet to allow donors to easily get the information they require, without putting an extra burden on local administration offices or facilities. Nevertheless, during the study period, in none of the hospitals or medical
centres visited did staff mention that they were providing health information separately to donors, in addition to the MOH administration. Although this may not be the case all over Zambia, – sources at the National AIDS Council mentioned some duplicate donor reporting still occurring - this situation was confirmed at least by WHO. Our interviewee, in charge of surveillance, worked in complete co-operation with the MOH. The WHO country office received information on notifiable diseases directly from the MOH and the follow-up analyses by UTH laboratories were fed back simultaneously to the MOH and WHO. The National AIDS Council (NAC) and the National Malaria Control Centre (NMCC) receive their information from the PHOs. The Central Statistics Office (CSO) collects its own data and holds a separate database to that of the Ministry. So far it has only carried out one study directly related to health, the Demographic Health Survey (DHS) which was completed in 2007. The office shares its data with the MOH if asked, but otherwise works independently.

8.4. Staff involved in HIS

At the Ministry of Health, the department for Monitoring and Evaluation is involved in HIS issues. Furthermore, ICT staff have significant HMIS roles. At the National AIDS Council (NAC), it is predominantly the Monitoring and Evaluation department that is involved with HIS. Within the Provincial Health Offices (PHO), dedicated Health Information Officers (HIO) and, at times, planners, deal with the HMIS. The Provincial AIDS Coordinating Advisors (PACA) report HIV/AIDS information to NAC. In District Health Offices (DHOs) with Health Information Officers, these deal with the HMIS. Likewise, District AIDS Coordinating Advisors (DACA), where present, report HIV/AIDS information to NAC. In hospitals, depending on the level of the facility, ICT staff and/or HMIS Officers deal with the HMIS, as well as clerks and medical staff (nurses). In health centres and health posts medical staff deal with all HMIS information.

Given the fairly widespread presence of HMIS staff, it thus seemed fruitful to concentrate on their knowledge, motivation and working conditions. This is all the more so given that many of these staff are new to their jobs. Only one medical doctor was interviewed, in Kafue Central Hospital, for three reasons: there are no doctors at health centre level, the shortage of doctors at all other levels means that it was not practical to disrupt their work, and it was discovered during the course of interviews that doctors in Zambia do not tend to be involved in recording information fed into the health information system.

8.5. Observations of HMIS staff by institution

At all PHOs and DHOs a dedicated HMIS Officer was observed. According to Ministry sources, some DHOs are still awaiting HIS officers to be appointed, but the majority are in place. Due to difficulties in arranging contact with NAC earlier in the visit, we did not personally observe those involved in NAC information collection at administration level (only at service-level).

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Table 1 details the institutions visited and the staff available for HMIS tasks. These numbers include both staff that we personally observed and that we were told were currently employed. Where interviewees mentioned the number of staff there should be (according to the new structure), but are missing, this is indicated.

**Table 1: HMIS staff at administrative level in Zambia**

<table>
<thead>
<tr>
<th>Structure</th>
<th>Dedicated HMIS officer present? How many?</th>
<th>Other staff involved in HMIS tasks? Who?</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOH</td>
<td>6</td>
<td>5 ICT staff, + 2 international ICT staff implanted in the Ministry and funded by CDC, + 1 HMIS consultant funded by WHO.</td>
</tr>
<tr>
<td>NAC</td>
<td>1 M&amp;E specialist, 1 M&amp;E officer, 1 data entry clerk.</td>
<td>Information unavailable.</td>
</tr>
<tr>
<td>CSO</td>
<td>Number not available.</td>
<td>ICT staff, number not available. The last health survey to be carried out involved 45 nurses from facilities for data collection.</td>
</tr>
<tr>
<td>PHO: Lusaka</td>
<td>1 HMIS officer.</td>
<td>No.</td>
</tr>
<tr>
<td>PHO: Ndola (Copperbelt)</td>
<td>1 HMIS officer.</td>
<td>No.</td>
</tr>
<tr>
<td>PHO: Livingstone (Southern)</td>
<td>1 HMIS officer.</td>
<td>Planner.</td>
</tr>
<tr>
<td>DHO: Chongwe (Lusaka)</td>
<td>1 HMIS officer.</td>
<td>No.</td>
</tr>
<tr>
<td>DHO: Luanshya (Copperbelt)</td>
<td>1 HMIS officer.</td>
<td>No.</td>
</tr>
<tr>
<td>DHO: Mpongwe (Copperbelt)</td>
<td>1 HMIS officer.</td>
<td>1 data entry clerk.</td>
</tr>
<tr>
<td>DHO: Kazungula (Southern)</td>
<td>2 HMIS officers.</td>
<td>No.</td>
</tr>
</tbody>
</table>

**Table 2: HMIS staff at service level in Zambia**

<table>
<thead>
<tr>
<th>Structure</th>
<th>Dedicated HMIS officer present? How many?</th>
<th>Number of staff foreseen in MOH guidelines</th>
<th>Other staff involved in HMIS tasks? Who?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 3: University Teaching Hospital (UTH) (Lusaka)</td>
<td>5 statistics officers.</td>
<td>Total of 130 people involved at all levels data entry, records clerks, stats etc (not including medical staff). We observed 2 medical records clerks, 5 medical records officers, 3 senior medical</td>
<td></td>
</tr>
</tbody>
</table>

33 Human Resources for Health Information Systems: a fact-finding study, January 2010
### Level 3: Ndola Central Hospital (Copperbelt)
- 2 information officers, 2 statistics officers, 1 data processing officer.
- 5 statistics officers, 3 data processing officers
- Around 30 people in total working with the HIS at some level. Plus medical staff.

### Level 2: Livingstone General Hospital (Southern)
- In the medical department: 1 health information officer.
- 2 registry clerks, plus cashier who does their job at night. Plus medical staff.

### Level 2: Ronald Ross Hospital (Mulfulira District, Copperbelt Province)
- 1 HMIS officer.
- 2 additional assistants
- 5 registry clerks including one “statistics officer” for morning, afternoon and evening shifts (no more than 2 at the same time), one for night shift. Plus medical staff.

### Level 1: Kamuchanga District Hospital (Copperbelt)
- 1 medical records clerk.
- 1 registry clerk per department (OPD/IPD), 2 data entry clerks for the ART section, plus medical staff.

### Level 1: Kafue District Hospital (Lusaka)
- 1 information officer.
- Registry clerks.

### Mambova Rural Health Centre (Southern)
- No.
- 1 nurse and 1 environmental health technician.

### Kazungula Rural Health Centre (Southern)
- No.
- 2 nurses and 1 environmental health technician.

### Kabeleka Health Post (Lusaka)
- No.
- 1 nurse and 1 local community volunteer.

### Chiyota Health Post (Lusaka)
- No.
- 1 nurse. Occasionally helped by the maid with paperwork.

### 8.6. Common observations of places visited

The following observations were characteristic of the structures visited during the two-week period. Although they cannot be assumed to be a wholly representational picture of the current situation, they do give a general overview. Additional information regarding areas not visited, which was obtained during discussions with MOH staff at various levels, is also provided to complete the picture as much as possible. Where this occurs it is clearly noted in the text.
8.6.1. Staffing numbers

Overall, staff shortages are most acute on the side of medical personnel. This was clear at all facilities visited. The presence of HIS officers or similar at facilities from level one upwards alleviates the negative consequences of this on information reporting. The new structure has not yet been fully implemented, but foresees dedicated HMIS positions at all administrative levels. At service level institutions three, two and one, HMIS staff are envisioned although not in health centres or health posts, which tend to have a total number of staff ranging from one to five. According to the Ministry, some facilities at both service and administrative level are still waiting for their HMIS positions to be filled.

Proposed, authorised and actual

Information concerning the total human resources for health in Zambia was unavailable. The closest approximation for this is found in the Ministry's payroll but it was not possible to access this information. Furthermore, lack of an up-to-date HR database made it difficult for Ministry staff to provide total staffing numbers by institution and a breakdown of staff by job category. It should also be noted that:

- The restructuring process of the health system in Zambia has perhaps aggravated the already high turnover rates. This, combined with a transfer delay between paper-based records kept by HR departments at service level institutions and the Ministry, may increase the likelihood of inaccuracies in current HR records.
- At the time of research, not all positions had been allocated and authorised at service level institutions. Thus, there were some reports of medical personnel in rural areas working without a salary in hope of securing themselves a position in the new structure. These staff were thus in active service either unbeknownst to the Ministry or at least unrecorded by the records departments.

The most commonly cited reason for understaffing in HMIS activities and services was that the MOH had not approved funding for the position foreseen in the structure. Despite the qualification requirements for HMIS Officers being raised under the new structure, staff at most PHOs and DHOs maintained that should the funding be available, qualified personnel could be found. This differs from the situation with medical personnel where attrition rates of approximately 9.8% for doctors and 5.3% for nurses combine with extremely low graduation rates (in 2004, Zambia produced only 49 doctors and 540 nurses). Nevertheless, turnover of all staff is a problem recognised by the Ministry: studies have shown the problem of attrition due to staff gaining employment in international organisations after having received training from the MOH. A rural retention scheme is currently in the process of elaboration by the Human Resources Department of the Ministry. However, whatever the reason may be for understaffing, the result is the same: an increased strain of HIS tasks on those remaining,

particularly medical staff.

Figure 11. Zambian Districts by Current to Optimal vacancy rate for overall HCWs
Figure 11 shows Zambian districts by current to optimal vacancy rate and Figure 12 by current to funded vacancy rate for overall health care workers. (Maps courtesy of Jason Pickering, Consultant, World Health Organisation). This data is unavailable for HIS workers in particular, but can be used as an indication of the areas where HIS staff are particularly needed to reduce the strain on chronically understaffed medical staff.

8.6.2. Workload

In most service-level facilities HIS staff suggested that their departments are understaffed. Staff knew the number of staff foreseen in the MOH structure requirements for their department and could clearly see that in the majority of cases the actual number of staff was lower than required. Most staff mentioned overtime as a means to keep with the pace of their work. However, at no point did any staff member at any facility level mention skipping HIS tasks when overworked. Nurses responsible for filling in indicator sheets stated cutting out other paperwork, such as Nursing Care Plans, to make time for HIS reporting. At the administrative level understaffing was also an obstacle, but to a lesser extent. HIS officers, especially at DHO level, noted that the large amount of data entry they are responsible for (such as inputting paper-based indicator forms into the system) could result in long working hours. However, almost all district health information officers stated that if health facilities transferred their data
on time, they were able to complete their tasks in a timely manner despite being short-staffed. Nevertheless, some said they would welcome help of a data-entry officer. It should be noted that this situation may not be the same for HIV/AIDS reporting to NAC, where HIS officers at national level noted that particularly in the past there had been some reluctance towards reporting to NAC instead of donors.

8.6.3. Staff tasks & equipment

Forms used

Patient information is collected on paper and stored in the registry office (when existent). Patient forms were standardised to collect data such as name, address and preliminary diagnosis (see Annexe 20 for more details of data collected). However, only UTH in Lusaka had a printed standardised patient details form, all other facilities noted standardised fields of patient information on a blank piece of paper. Additional pieces of paper are attached each time the patient moves around the facility and between doctors. These patient files were often scrappy; protective folders were not observed.

Information from the patient forms is recopied into a register (departmental and OPD where existent). Please see Annexe 21 for a sample register. Relevant data is then copied onto indicator forms (tally sheets). All facilities visited had MOH-issue standardised health indicator forms (see Annexe 22). Some smaller health facilities complained about having to make copies of these themselves.

Storage and retrieval of information

Patient files are stored in patient number order by date and are unique in each institution. Each patient is given a card with a record number. Should a patient arrive without a card, his file can be retrieved by searching the entry (and thus his record number) in the register under the date of his last visit. Patient files are stored in the registry offices on shelves or in boxes. The quantities are frequently immense, particularly in larger hospitals. There is apparent disorder in many of the locations. At one health facility patient files were scattered in various boxes piled around the room. The paper is often tattered and some staff complained about the bulkiness of files to store. Registry clerks were in agreement that it is usually possible to find the necessary files. However, some medical staff complained of registry staff losing or improperly filing documents and opening new files for returning patients. Indicator tally sheets are stored in hospitals, in HMIS offices and in health centres in filing cabinets. When passed on to the DHO or PHO these are stored in ring binders. Please see
Annexe 26 for more photographs of patient files in storage.

Computerisation

The system as a whole is part paper-based, part computerised. In both cases the same information is collected and analysed. When information is computerised it is often in addition to paper documentation, therefore not a replacement but a backup. In the majority of cases computers used for HIS tasks were provided by the European Commission Development Fund in the context of its support to the country SWAps, or by the US Centre for Disease Control (CDC).

Service level: At service level the majority of the documentation is paper-based, although all hospitals we visited had computers at the highest data processing levels. The information goes through several paper-based stages of collection, aggregation and verification before being computerised. Furthermore, even after the information is aggregated, verified and entered into the HMIS at hospital level, most level one hospitals with HMIS computers and staff still submit their information to the DHO in paper format.

On several occasions HIS officers, or those involved in preliminary data collection and analysis, manually verify the data for errors before inputting it into the system and performing data validation electronically. Also, in some hospitals data officers involved in the preliminary collection of data, verify the data manually. At UTH (level three hospital), several computers are used by the ICT department, statisticians and data processing officers. At the level two hospitals observed, at least one computer is available for data processing by the time it reaches the HMIS officer or the ICT department.

Thanks to an extensive programme supported by CDC many facilities (including rural health centres) have been provided with computers dedicated solely to the SmartCare system that is used to manage patient anti-retroviral treatment (ART). Whilst basic HIV/AIDS indicators are collected on MOH tally sheets, more detailed information is fed into the National AIDS Council (NAC) information system. Figure 13 below shows the service level facilities with a computer for the SmartCare system.
Administration level: All administrative facilities (from DHO all the way up to the MOH) have computers specifically for HMIS tasks. Donors were normally responsible for repairing broken computer equipment. Alternatively, money from the office budget would be found for repairs. Even when HIS officers have access to a computer, they also manually note the information down on paper as a backup.

8.6.4. Training

The transfer from the old to the new system and the replacement of certain information officers has swollen the numbers of those requiring training. Gradual replacement of staff members has led to uneven training levels.

Regarding pre-service training, the assumption that “national training facilities often omit medical information topics from their programs”\textsuperscript{38} appears accurate to some extent. Nursing care plans and general patient monitoring forms were covered by the nursing curriculum. However, training on indicator forms and their importance did not seem to be included. A number of medical staff viewed tasks involving information as something learnt on the job.

\textsuperscript{38} Cf. Terms of Reference, Annexe 1
Training coverage

Training courses generally last a few days to a maximum of two weeks. The majority of staff members at all levels who have recently taken part in a training session stated that it was directly linked to the transition to the new HMIS system. However, training sessions have not yet been offered everywhere. In Copperbelt PHO, the pilot for the new HMIS implementation, all information officers at DHO level have received training on the new system. Overall, of the 30 people interviewed that are directly involved in HIS, 15 have undergone some form of training relevant to their HIS tasks (excluding the MOH level). It should be added that out of the 15 remaining interviewees who have not undergone any form of training, this included seven nurses who had been taught how to fill out nursing care plans and general patient monitoring forms during nursing school, but had not yet been trained to use HIS indicator forms. General data collection for nurses is covered in the nursing syllabus. Many nurses in hospitals are involved in filling in the indicator forms on a monthly basis and those working in rural areas carry out all HMIS tasks. Some staff involved in HMIS collection and preliminary analysis (especially at rural health centre and health post levels) have yet to receive training on indicator forms. This discrepancy could lead to hesitation and thus increased time spent on information tasks. These staff had often been oriented by the person previously in their position and are expecting training to be provided by the DHO at some point (training for all service levels is foreseen in the strategic plan). Staff who have undergone training often share this knowledge with colleagues who have not been trained. On a couple of occasions it was noted that non-medical, non-trained staff (i.e. cleaners) in rural health facilities have been oriented by health facility staff to support data collection and analysis tasks.

Training preferences

Apart from one interviewee in Copperbelt PHO, who stated a general preference for training organised by the MOH because of the incentives coming with it, none of the interviewees expressed any preference for training provided by one or another partner, or the Ministry. At the administration level, staff generally expressed a preference for shorter, in-house training sessions, requiring less time away from work and showing immediate results. All interviewees are keen to receive more training, more often and feel that it is important for their jobs. Nevertheless, many staff are sufficiently trained to complete their tasks without difficulty. Some disclosed a desire to study subjects not necessarily related to their everyday work. It is clear that training provides gratification and increases job satisfaction.

Organisers / Technical Support

HIS training sessions have been organised both by the Ministry of Health and donors (please see below for details on these donors). The DHO often organises training workshops for facilities and the PHO organises them for DHO staff and facilities. Health facilities may also recommend the DHO or PHO to launch a course when they feel training is necessary. These requests may or may not be granted, depending on the MOH’s budget and whether such
workshops fall within current strategic priorities. In-house training sessions are organised by the Department for Human Resources, where one exists.

Donors mentioned by training participants, or who were observed to have provided training on one or another aspect of the HIS were:

- Centre for Disease Control (CDC)
- European Commission (EC)
- Japan International Cooperation Agency (JICA)
- Swedish International Development Cooperation Agency (SIDA)
- UK Department for International Development (DFID)
- US Agency for International Development (USAID)

The training courses cover general HMIS tasks: filling in various forms, using tally sheets and performing a preliminary analysis of data collected. They set out guidelines necessary for the participant's daily tasks. Additionally, the CDC training focuses on using the computers and software provided. Training provided by other partners is beneficial to HMN's goal of strengthening country HIS as it increases HMIS competencies of medical staff working in the system. Information on all training sessions held in the past two years on HIS activities was not yet available from the MOH at the time of publication of this report.

**Funding / Costs**

Due to the centralised nature of the system, the MOH is the ultimate initiator of any significant training session. Facilities may, however, allocate a small part of their budget to organise in-house training. The SWApS mechanism should allow partners to organise training in accordance with the MOH and in line with perceived needs.

The average cost of organising a training session could not be established. However, as mentioned above, this information does exist at the MOH. It was clear that in-service training incurred costs only of stationary, location (if necessary) and drinks/snacks.

**8.6.5. Perceptions of HIS tasks**

**Feedback**

The definition of “feedback” should be specified. Feedback was understood by interviewees to have various meanings ranging from requests to double check the source of erroneous data to organising meetings or sending material supplies on the basis of particular information collected. Interviewees' opinions on feedback often diverged. The administration stated that feedback is always provided and that this is encouraged at every level. The majority of service-level facilities noted that they received feedback on the information submitted.

Service level facilities were not always content with the quantity or content of the feedback received. Many staff at all levels complained that the only feedback received was negative as
they only heard back from higher level officials when there were discrepancies in the data. Almost all HIS staff interviewed mentioned they would gladly receive positive feedback for good data collection or improved health outcomes reflected in the information. All staff agreed that this would be a clear source of motivation and job satisfaction. Whilst administrative level officials maintain they provide feedback through data validation, only one DHIO official suggested that he had been making attempts to provide positive feedback to a number of facilities that had done particularly well.

**Understanding of the importance of the information**

All staff understand to some extent the use of the information provided. Nurses are conscious of the importance of reporting on indicator tally sheets and are aware that funds, supplies and assistance from the DHO is provided on the basis of this information. They were also sensitive to the fact that there are no shortcuts in completing indicator forms, and that these forms are an important part of their job. Staff at two health facilities mentioned frequently discussing results of preliminary analysis of the indicator forms with local community committees. Overall, most interviewees agreed that providing correct information is important to avoid their superiors noticing discrepancies and getting back to them.

**Motivation**

The information communication technology (ICT) departments at both facility and MOH levels all feel their skills are underused. Many ICT staff feel capable of performing more complex queries and in-depth analyses, yet they are not requested to do so from their superiors. At the MOH in particular, staff feel that they are capable of providing much more than currently expected. According to these members of staff, it was the ICT department that provided the impetus for better use of the information, but their propositions often fell on deaf ears. This department also experienced some de-motivation after being eclipsed in the discussions surrounding the decision and implementation of the new HMIS. ICT departments at all levels are also responsible for hardware and software support. This is deemed a time consuming responsibility and efforts could be better spent on more complex tasks. These issues are dealt with in more detail in the “Discussion” section of the report.

Although it is generally accepted that there are fewer incentives for working at the MOH than in the private sector, several interviewees at the administration level had in fact come from the private sector. Furthermore, all interviewees stated that they intended to remain with the MOH. Reasons for this included job security, the feeling of satisfaction for working for their country and the fact that their jobs were challenging, interesting and dynamic, with opportunities for further training. A significant proportion of those interviewed were currently studying alongside their job to gain additional qualifications.
8.6.6. Infrastructure and communication

There are basic infrastructure problems at both service and administrative levels. Two of the four rural health facilities did not have electricity. Sources from the MOH confirm that this is true for a considerable number of them. Overall infrastructure in Zambia is poor. Roads are often potholed or not laid with tarmac. This means rural areas are especially cut off. Two of the three district hospitals visited were not easily accessible by car. Our trip was undertaken at the very start of the rainy season, which meant that roads to rural health centres were muddy, but still drivable in a 4x4. Ministry sources and local personnel confirmed that during the rainy season some health posts are cut off entirely.

Phone lines are available in all hospitals, but inexistent in all rural health centres visited. Staff at rural health centres use mobile phones to communicate with the DHO. There were two complaints that money for these calls came from their own pockets, as there was no provision by the DHO for money spent on work-related phone calls. In Mpongwe District (Copperbelt Province) it was noted that there are two rural health centres that have neither electricity, nor mobile phone access.

8.6.7. Transitional period from the old to new HMIS

It should be noted that the situation observed during this study is likely to change in the near future as the Zambian health system is currently in the process of restructuring. This forms the backdrop of the study and the changes it has brought about were mentioned by almost every person interviewed.

The new HMIS that has prompted the restructuring has not yet been implemented in all regions, although this process is well under way. The restructuring has provided new guidelines for staffing numbers. Staff in all facilities are aware of the envisaged staffing numbers. They are unsure, however, as to when these additional positions will be filled. Some were of the opinion that changes will not occur soon. Also, there is much talk about job insecurity at all levels due to the restructuring process. On several occasions, staff who had been in their position for some time, but that were found to lack the qualifications matching their job specifications as set out in the new guidelines, have been removed from their positions.

All administrative level institutions visited are already using the new HMIS. Most service level facilities are also partially or fully using it. There is a consensus that the new HMIS has numerous problems in comparison to the old system. The most reoccurring comment was that the new system does not allow reports to be generated automatically, thus increasing the time spent producing them. There is a consensus that the new system has some benefits: all necessary indicators are now covered and there is now more differentiation between illnesses.
9. Discussion – Zambia

The preceding section describes in detail the situation on the ground in Zambia as observed during the field visit. In subjecting this information to a critical analysis, through the prism of the study’s terms of reference and other related research, it is hoped to clarify the positive aspects and the areas for development concerning the human resources involved in the functioning of Zambia’s health information system.

9.1. Structure of the Health Information System

9.1.1. System functioning and strain on staff

Overall administration of the health information system in place in Zambia is standardised, centralised and functional. The nine provinces, 72 districts and three administrative levels coincide with administrative boundaries that are clear, as are the channels for information transfer. Both new or old versions of HMIS are in place in either paper or computerised format across the country. Staff in administrative offices at all levels understand the system’s mechanism and are capable of receiving and transferring information up the chain. Administrative levels are capable of tracing information for verification. Due to standardised indicator forms available in all regions visited, however small or distant from the capital, staff nation-wide are able feed standardised health information into the HMIS, with some small exceptions, which will be discussed later and are not related to the structure of the system in place. Staff in the rural areas visited did not work or perceive that they worked in isolation from the main health system. A long-lasting tradition of clinical records has translated well into an acceptance of the clear informational responsibilities to be carried out. Nevertheless, due to the limited nature of our study it was not possible to conduct interviews in the most distant regions of Zambia, where this situation may differ considerably.

Donor reporting and the SWAps success

Institutions such as the National AIDS Council (NAC) have their own data collection systems and gravitate around the central HMIS. Yet, due to the extensive work undertaken on the structure of the health information system itself, negative consequences on HIS staff workload have been reduced. A visit to the USAID offices revealed that the Health Systems and Services Programme that has been running for five years was in the process of being closed and all tasks handed over to the MOH, which points to a high degree of government ownership. Furthermore, the SWAps mechanism is regarded within the MOH as a successful work to co-ordinate work between donors and to reduce the impact of external information flows and requests. This is clearly a success for Zambia and in the spirit of the Paris Declaration of 2005\(^{39}\) aimed at

“increasing efforts in harmonisation, alignment and managing aid” between the country and developmental actors as well as between donors. Since separately reporting to donors is infrequent the strain on human resources responsible for this was reduced.

HIV/AIDS Reporting

A potential area for extra strain on HIS personnel is linked to reporting to the National AIDS Council (NAC). Whilst the computerised patient data management SmartCare system increases the ease of patient record-keeping, this is only the case in the facilities that have this system in place and trained staff to use it (see map on page 44). Facilities must report basic HIV/AIDS indicators on the standard MOH indicator sheets to the DHO/PHO and also report on the extensive NARF (National Aids Council Reporting) forms to the District or Provincial AIDS Co-ordinating Advisor at the appropriate administration level, or directly to NAC. Although the standardised Ministry indicator forms only collect minimal HIV/AIDS information, some duplication remains with the NAC paper-based reporting system for HIV/AIDS (NARF). When staff experience time constraints NARF forms seem to suffer foremost over MOH reporting. In health posts with, for instance, only one member of trained staff the NARF reporting burden remains considerable. For more details regarding SWAps and the introduction of computers for SmartCare management of HIV/AIDS patients, please refer to section 9.3.3 (Computerisation).

9.1.2. Limits of the Aggregation, Analysis, Action Process

The fact that data received finally by the MOH was estimated to be 93% accurate reflects the fact that the tally system (indicator sheets) was generally understood by all staff. There was a real feeling that there would be a follow-up should erroneous data be passed on and that there was indeed verification at each level before reaching the MOH. Aside from the difficulties for the majority of rural health posts to transfer data (because of infrastructural and equipment-based problems/deficiencies), this process works fairly well. Yet, it is possible that the analysis and action parts of this cycle suffer from certain weaknesses, as detailed below.

Data collection... for whom?

Whilst at facility level the overwhelming majority of respondents knew why the data was collected, and were even familiar with MOH terminology, stating that information was used for “formulating action plans” and “decision-making”, the most common answer (especially at lower levels) was that the information is used for planning at MOH level. This may reflect an under-use of information at lower levels. The MOH was conscious of these issues and is keen to promote data use whereby facilities would compare their monthly indicators to their baseline indicators to reveal health dynamics and consequently take preventative action. MOH staff mentioned that they did not wish facilities to collect information to “please” the Ministry, instead they want them to make use of the data they collect at local levels as well. This would certainly increase their motivation for collecting and ensuring the validity of the information.
However, active engagement in the community on the basis of a preliminary analysis of information collected was not always observed, which may mean that a clearer directive from the Ministry is required in order to co-ordinate more discussion and use of information with community leaders to further promote health education, and alert local residents of changes in the health situation. This could lead to improved health outcomes.

**Acting on the action plans – what room for manoeuvre?**

Yet despite the apparent formulation of action plans at local levels and certain cases of community involvement, information use seems to be rather limited. Personnel are not only limited in their ability to analyse this information – lacking precise training on this - but often also **lack the tools that would enable them to do so** quickly. Budget control is frequently at the heart of this issue: local facilities may see that action needs to be taken on the basis of the information, but with no funds or manpower to ensure this they are left dependent on the DHO, who is in turn dependent on the Ministry, with limited resources. This may slow down the process for any action to take place. Local levels seem to be open to training possibilities and one of the main attractions for rural health workers is, in addition to low living costs, the chance to see improvements in the health of the local community through their work. This is thus **fertile ground for increasing information use**. However, whilst further analysis and time dedicated to discussions, as the MOH is aiming for, is an excellent intention, it would also be an **extra strain on over-worked health workers** who often have no administrative support. A nurse who has little time to treat a large number of patients would be unlikely to have enough time to create further reports on the basis of her information. A solution to this would thus have to take into account the local particularities and provide an adequate supportive framework.

9.2. HMIS staff in the context of an HR crisis

The new establishment structure (that has not yet been fully implemented) foresees a number of HMIS staff that, according to our observations, would be adequate for proper functioning of the system. The issue remains to retain these staff, reduce turnover, and maximise their potential. **Doing so would relieve medical workers of the maximum amount of HMIS tasks possible.** Yet understaffing persists. Several explanations for this may be proposed:

- As restructuring has not yet been completed there is a gap between proposed and actual staffing levels. This has also contributed to higher turnover rates, as previous HIS staff whose qualifications no longer match the job requirements were replaced and may have also contributed to a feeling of job insecurity.
- HIS training is a double-edged sword. Whilst wholly necessary to ensure the capacities of staff to do their job, it simultaneously makes them more marketable to outside employers.
- Job progression may also be an issue for HIS staff. The HMIS officer position involves a significant amount of data entry when these staff members are in fact capable of more planning and analysis. Making the position more strategic could improve retention
rates. The data entry issue would also be remedied if the information was computerised by the time it reached the DHOs.

- On the one hand, recruitment difficulties are perceived due to poor incentives to work in the public sector (lower salaries). The MOH in particular may not be the most “obvious” choice of a career path for ICT graduates, for example. Nevertheless, perceived benefits such as the possibility for training, career progression and the provision of housing (in some rural areas) are a particular pull-factor and could be capitalised more by the MOH. In addition to improving material benefits, improving the attractiveness of the MOH “brand” could go some way to improving the situation. Furthermore, there is a need to increase awareness about job possibilities and how to go about applying for MOH positions. Many facilities, DHOs and PHOs received CVs from potential applicants that they have no mandate to process. These applicants were often deemed by local institutions to be qualified, yet unaware that the application procedure was centralised in the Ministry.

- The scarce amount of ICT personnel experienced in many developing countries was not perceived to be problematic by interviewees. There is a rising number of universities and colleges providing ICT courses and thus presumably rising numbers of graduates. It must be assumed, however, that due to the socio-economic situation of the majority of the population, access to ICT for the majority of the population remains limited, thus reducing the number of potential candidates. Nevertheless, as mentioned earlier, those trained in ICT can often find better work elsewhere.

Staff shortages are particularly grave for the health information system in smaller facilities where medical personnel are involved in all HIS tasks. For health centres, ensuring the presence of other non-medical staff members to complete these tasks would alleviate the strain on medical personnel. However, with medical centres lacking medical personnel, a dedicated HMIS staff would not be the priority. A general increase in numbers of medical staff (such as clinical officers, or staff qualified to dispense medicines) would address both the medical staff shortage and the effects of this on health information management, as information tasks could be shared. Improving the skills of existing non-qualified staff members could also be an opportunity.

Overall, the situation observed was not seen to be as extreme as may have been expected: there were no cases encountered where medical personnel failed to complete their HIS duties. More errors are the consequence of time constraints, but the feedback system seems to work well to overcome this. Few members of medical staff complained about time spent doing end-of-month reports (tallying indicators from the ward register). Although staff shortages did not seem to affect data collection and preliminary analysis phases, optimising all tasks would free up more time for medical staff to treat patients.
9.3. Optimising procedure: HMIS staff tasks and equipment

9.3.1. Speeding up data collection

Non-standardised patient files added by nurses and doctors were seen to be time-consuming. Although there were few complaints about this, nurses in triage filling out the patient details on these forms were rewriting the same information for every patient they saw (name, address etc). Time could be reduced by stopping this practice by introducing standardised patient files, thus reducing patient turnaround time.

9.3.2. Storage and filing

Filing and patient file retrieval is evidently time-consuming. Although medical records clerks did not agree with this, doctors complained of a lack of patient follow-up and background information as a consequence of clerks opening new patient files for returning patients. This may reflect complacency, insufficient training, a heavy work burden on the part of clerks, or equipment issues. Patient files are at risk of being damaged or lost due to lack of a sturdy cover that would also make them easier to retrieve. The storage and filing of indicator tally sheets did not seem to be problematic at any point.

9.3.3. Computerisation and data transfer: duplication of tasks

Tallying is not difficult, but somewhat labour intensive. The presence of computer equipment in an increasing number of facilities could streamline the HIS process and cut down on the amount of data recopying. It would make the data aggregation, verification and analysis process considerably quicker thus reducing the effects of staffing shortages. Furthermore, the use of current computer equipment could be put to better use. At times HMIS officers who had computers were performing numerous aggregation and validation tasks by hand before inputting the data into the system. This doubles the tasks and indicates an under-use of available computers by hospital staff. If data was systematically fed into a computer then end-of-month reports could be produced much quicker.

The situation surrounding the use of computers for ART monitoring (SmartCare) can also be considered in more detail. As these computers are only used for ART monitoring a two-speed system may be occurring where HIV/AIDS treatment management is dealt with efficiently, whilst other diseases are not benefiting from this. Health centres with a computer and SmartCare use it strictly for ART monitoring and not for any other HIS tasks. This means that the computer – the only one for a number of smaller facilities - is frequently standing idle. This raises the question as to the extent of the synergy of interventions and external funding purposes.

Computerisation needs regular ICT support. Maintenance of the ART SmartCare computers is
currently provided by donors. A long-term sustainable ICT solution need to be found if computerisation is to become widespread.

9.4. HMIS staff motivation

Two main issues stand out:

- The lack of positive feedback is not conducive to maintaining job satisfaction;
- Many HMIS officers (or similar) would like to have the impression that their job is positively viewed by their colleagues and society in general.

9.5. Training: a double-edged sword

Whilst investing in training has the double benefit of increasing the abilities of staff members to do their jobs and creating a clear pull-factor in terms of job attractiveness and motivation – thus also inciting staff to do their job better - it is simultaneously a push-factor in that better trained candidates quickly turn to better remunerated positions (including in private companies and international organisations) and cannot be guaranteed to remain at the MOH. Indeed, staff expressing an interest in training in subjects that are not necessarily related to their daily tasks could cause staff attrition if measures are not taken to prevent this.

9.5.1. In-service

The transitory nature of the current system makes it difficult to draw conclusions on the training issue. Firstly, the time-lapse in some cases between training for the new system and actual system implementation may reduce the effectiveness of such training courses. Secondly, although most staff are capable of performing their day-to-day tasks, which may lessen the urgency to provide training on the new system, training is nevertheless necessary for improved staff efficiency. Thirdly, whilst attempts have been made to address the problem of unqualified staff through training (as foreseen in the country’s strategic plan), the problem of retaining trained staff nevertheless remains.

Further issues also remain at the health centre level. Low staffing levels and high workloads have led to informal practices such as unqualified workers being initiated by medical staff to perform information tasks. The negative consequences on data quality could be mitigated should these informal initiations be placed in an official framework aimed at training non-skilled health centre workers (such as cleaners, etc). It should however be noted that providing rural health centre workers with training would cause temporary absences and consequently temporary closure of the health centre.

9.5.2. Pre-service

HMIS staff rarely have a medical background and often found this regrettable. Some see learning medical skills a question of personal motivation to improve one’s professional achievements. This testifies to the clear desire for career progression expressed by most HIS dedicated staff, which needs to be channelled in order to make the best use of these staff
members and to retain them. The abilities of HMIS staff to perform analyses, verify health information and draw conclusions from the data could likely be limited by their lack of medical knowledge. This could be an area for development in the future.

9.6. Increasing motivation and diligence through positive feedback

“Positive feedback” is desired, yet its definition is not elaborated at administrative level. Doing so could help create a mechanism that would enable health facilities to receive more information on policies devised by the MOH. Comparison of health centre results with others in the district was mentioned at times, but not necessarily used to its highest potential (this was not often readily pointed out). Encouraging this practice could also give facilities ideas for local actions to implement.

The fact that positive feedback is still limited could point to the fact that the MOH is still not achieving optimal levels of involvement of local actors in its activities. The MOH is interested in getting local levels to take more initiative in their actions. However, a lack of positive feedback combined with high centralisation of resources does not produce a situation that is conducive to the achievement of these goals. The current situation makes it difficult to request local facilities to produce more without training and resources.

9.7. The effects of a poor infrastructure on HMIS staff reporting abilities

The lack of telephone lines in rural health centres is a problem on many fronts. Not only is information flow interrupted during the rainy season (4 months), but staff motivation is also negatively affected. Furthermore, the fact that rural healthcare workers are responsible for phone calls to the DHO or emergency services could increase de-motivation, reduce their feeling of value and ultimately contribute to attrition. Isolation during the rainy season could reduce motivation for health information collection. Some DHOs have vehicles that service some of their health centres, but a majority are left to organise their own transport to and from the District Health Office. Those who are not serviced by DHO vehicles may feel more isolated and less supported by the Ministry and thus feel de-motivated.

9.8. A long transitional period: what consequences?

As stated in our earlier description the transfer from the old to the new system has caused issues that have not gone unnoticed by staff. All HMIS officers dealing with the new computer system found the old system easier to use. This has been subject of much discussion. Three points follow from this:

- Staff are prepared to do their best and deal with the new system (as they understand the benefits of more and differentiated indicators), but the MOH has to help them adapt to it. This means a need for more training, until all staff are comfortable and doing their jobs to maximum efficiency.
- Most staff members think that the system needs improvement and the MOH should take note. If the current system is not as practical as expected than changes need to be
made in consultation with all those who utilize it. For example, a meeting of DHO officers in Copperbelt Province (pilot HMIS region) in Zambia was dedicated to the new computer system and its shortcomings. Systematic system improvements should be undertaken on the basis of such discussions.

- The MOH has a competent and motivated ICT team who feel under-valued, which elevates the risk of them leaving to other organisations. They were excluded from the development of the new HMIS – this was surely a miscalculation. The problems experienced with the new HMIS could have been avoided should ICT staff input been included. Improvements to the new system could present an opportunity to get these staff members back on board.

9.9. Conclusion

Overall, the health information system in the regions visited in Zambia is standardised, centralised and functional. Extensive reforms of HIS – the revision of standardised indicator sheets, in particular - and the presence of dedicated HIS staff in many facilities somewhat alleviate the strain on medical staff. Efforts have been generally well co-ordinated between donors and stakeholders. This combines with a good tradition of clinical record-keeping and a general understanding of the importance of health information. Infrastructure and equipment issues, especially in rural areas, may cause problems for data transfer and analysis. HIS staff, particularly in rural areas, are overworked and at times de-motivated. This can lead to high turnover and delays or errors in information reporting.

The main challenges are as follows:

- Increasing HIS job attractiveness, staff motivation, and thus retention.
- Promoting better use of information at lower levels.
- Optimising the use of existing equipment and streamlining HIS tasks as much as possible.
10. Recommendations – Zambia

Following the analysis and with the assumption that actions in the strategic plan for HMIS are realised, several recommendations aimed at further improving the situation surrounding human resources for health information systems can be proposed:

10.1. Motivation and job attractiveness

- Delegating data-entry tasks of HMIS officers (or similar) at service and DHO levels to less qualified personnel to allow more time to be spent on analysis and to enhance the strategic appraisal of their post, in view of reducing attrition.
- Encouraging more interaction between HMIS officers and medical staff. Promoting the position of HIS officers with a view of increasing understanding of what HMIS does and can provide. Putting the spotlight on their work through more analysis and presentations would also be beneficial all round and could help improve the image of their role.
- Increasing the motivation of HMIS staff at service-level by providing positive feedback. This could include more information on actions taken and positive health outcomes achieved thanks to the information they have provided.
- At MOH level, promoting the ICT department. Encouraging staff members not to see the ICT department merely as a trouble-shooting department, but as a department capable of providing them with the information they need. Encouraging discussions between the ICT department and other HMIS-related departments to increase mutual understanding of requirements and capacity to fulfil these.
- Continuing development of the new HMIS in close co-operation with the MOH ICT department.
- Promoting employment opportunities for the MOH and how to apply. Other non-material benefits could be pushed forward such as working for one’s country and making a difference. This would tie in with retention efforts such as the provision of better and positive feedback.
- Providing MOH-issued mobile phones for rural health centres with no other means of communication. This would motivate staff and alleviate the cut-off during the rainy season. Similarly, where this is not the case, ensuring that DHO visits to rural health posts are undertaken more regularly and that supply trips coincide with due dates for data submission. Finding alternative ways of transferring information between the DHO and rural health centres would also reduce the strain on healthcare workers who spend time and money travelling to the DHO on a monthly basis to submit their information.
- Ensuring a better working environment (computers where possible and necessary, better filing equipment, stationary and furniture).
- Presenting a clear route for job progression for HMIS staff within the Ministry structure upon completion of the necessary training.
10.2. Increasing data use by facilities

- Increasing co-operation between the ICT department and other departments within the Ministry to optimise the use of data analysed from the HMIS and to encourage the exploration of opportunities for further analysis based on the needs of the departments and the abilities of the ICT department.
- Ensuring the implementation of the system envisaged that would publish HMIS information on the internet for donors, and promoting this within the donor community.
- Increasing the means for service-level institutions to act on their health information. This could include creating a framework of possible “actions” that can be taken, within the limits of their budgetary and personnel constraints, to remedy negative health situations shown in their preliminary analyses of health information collected. Encouraging meetings between local community committees and health centre staff to discuss issues revealed by the health information (where this is not in place). Providing more budgetary flexibility where possible to increase means to take action.
- Exploring the possibility of providing local community figures with training on certain aspects of Public Health. This would apply in particular to those who are already involved in volunteer work within the community and could lead to reduced strain on health post workers. Officialising up-skilling of untrained health post staff who are already involved in basic medical and information tasks.

10.3. Equipment and computerisation issues

- Creating and providing standardised patient files where none are available.
- Reducing the amount of recopying and manual checking before data entry into PCs. Ensuring that staff have skills necessary for data entry and verification. Better training and streamlining of HMIS officers tasks would reduce this problem.
- Maximising use of existing computer equipment. An agreement between HIV/AIDS donors and the MOH for the use of SmartCare computers which are underused could be envisaged.
- Implementing a frequently updated HR database that would allow HIS staff dynamics to be more closely monitored. This would make it possible to clearly identify the areas that are most at risk from increased strain on medical personnel, and consequently allow room to alleviate this strain through the use of HIS staff.

10.4. Recommendations to Health Metrics Network and partners

- Help the MOH identify priority areas for progress.
- Help countries define both qualitative and quantitative norms for HIS staffing levels.
- Investigate partnership opportunities with infrastructure stakeholders (to address poor electricity and telephone issues, especially in regards to rural health centres).
• Continue co-operation to ensure maximum co-ordination and optimisation of programme implementation.
• Promote better use of computer equipment.
• Accentuate training in liaison with partners.
11. Ethiopia: Findings, 1st – 14th Nov 2009

A two-week field study was conducted in Ethiopia in November 2009. This inquiry aims to describe the actual situation in the field based on face-to-face interviews and visual observations. Furthermore, the findings serve as the basis for analysis and recommendations. It is hoped that these findings inspire future studies in this domain.

11.1. Background

Ethiopia is now in the third phase of the Health Sector Development Program (HSDP-III) which provides guidelines and a framework to improve its health sector along with the five-year national plan (July 2005 - June 2010). The implementation of the Health Management Information System (HMIS) and its Monitoring and Evaluation (M&E) is the most relevant component to the subject of this study. The objective of HMIS and M&E is to enhance the quality of the health sector at all levels through action-oriented management, and standardisation of data recording and reporting procedures, which would ensure evidence-based planning and decision-making. The Federal Ministry of Health (FMOH) of Ethiopia has taken steps to ameliorate the HMIS with the Business Process Reengineering (BPR) assessment since 2006. FMOH also co-operated with two partners - Tulane University and John Snow Inc. (JSI) - on the training issue in order to spread knowledge and use of the HMIS. Thus, interviews in the field were aimed at clarifying the situation surrounding the newly implemented HMIS (supported by HMN) and expectations of improvements that could be achieved.

11.2. Ethiopia’s health system: a brief overview

Ethiopia was the second most populated country in Africa in 2005 with a population of 73 million. The population of Ethiopia is estimated to be 82.1 million in 2009. The country is divided into nine regional administrative states and two city administrations: Addis Ababa and Dire Dawa. Under these states and city administrations are 611 woredas (districts), including a number of special woredas. The system is decentralised. The woreda is the basic decision-making unit with an administrative council. This decentralisation is also reflected in the health care system, as well as the health information system.

![Figure 14. Regional States in Ethiopia](http://newimg.bbc.co.uk/media/images/41151000/gif/_41151285_ethiopia_regions_416.gif)
11.2.1. Decentralisation within the context of HMIS

The HMIS M&E strategic plan is being implemented over a two-year period, between 2008 and 2010. The implementation is divided into two phases. The first 18-month phase would see the implementation of HMIS M&E at all facilities in seven regions, accounting for 90% of the population.

According to the HMIS M&E strategic plan, regions and woredas should have the authority and the ability to allocate resources, both financial and human, to strengthen human resources whenever needed. In the HMIS M&E strategic plan, it is mentioned that “[w]ith the decentralization of responsibility for public sector services to regions and woredas, elected Assemblies at these administrative levels have the authority to allocate the financial resources and mobilize community support for health services” 40.

11.2.2. Administrative level

The Federal Ministry of Health (FMOH) co-ordinates 11 Regional Health Bureaus (RHB) and provides policies and technical support at the national level. The structure of the FMOH is shown in Figure 2. The Policy, Planning and Monitoring & Evaluation Directorate is the most relevant organ working on strengthening the implementation of the health information system. At the regional level, the RHB is the main administrative policy-maker, technical supporter, and co-ordinator, while at woreda level, woreda health offices support the Primary Health Care Units (PHCU).

11.2.3. Service level

There are four levels of health facilities. First, at woreda (district) or kebele (ward) level, there are Primary Health Care Units (PHCU), including Health Centres (HC) and Health Posts (HP).


These are followed by District Hospitals, Zonal\textsuperscript{43} Hospitals, and Specialised Hospitals.\textsuperscript{44}

11.3. The policy dimension of HMIS

The HMIS guidelines clearly state that “The Health Management Information System (HMIS), which draws its data from routine service and administrative records, provides an ideal source for indicators that are reviewed frequently to monitor and refine program implementation.”\textsuperscript{45} One of the main elements of the HMIS is the standardisation of data recording and reporting procedure. The standardisation targets four major areas:

1. **Client / patient encounter formats** record interactions between clients or patients, care providers and other technical or administrative health staff. The information recorded may include medical history, clinical observations, diagnosis, treatment, laboratory, pharmacy, and financial data. The formats proposed here are based on current Federal Ministry of Health (FMOH) guidelines and regional practices.

2. **Intra-facility data flow** describes the way the patient/client encounter forms follow an individual through the facility and how the medical information recorded by one practitioner can be consolidated so that it becomes available to other practitioners.

3. **HMIS reporting forms** contain data required for the indicators used in M&E. HMIS stands for the health hierarchical system at institutional levels collecting data and generating aggregated data, such as indicators. M&E uses the “hierarchy of objectives, targets ... and indicators”\textsuperscript{46} provided by the HMIS. Its objectives are “to improve the management and optimum use of programmes resources and to make timely decisions to resolve constraints and/or problems of implementation”\textsuperscript{47}.

4. **HMIS data flow** moves data from facilities and administrative offices through the reporting chain from facility to regional and national offices (the chart below shows the overall reporting and feedback flows encountered in the three regions). While HMIS/M&E reform includes a plan for electronic transmission of data from woredas upwards, according to instructions from the Ministry and international best practices, the first stage in the reform is to develop a clean manual reporting system.\textsuperscript{48}

\textsuperscript{43} A zone in Ethiopia represents an intermediate administrative level between a region and a district
\textsuperscript{44} A PHCU is planned to serve 25,000 people, while a district and zonal hospital are each expected to serve 250,000 and 1,000,000 people respectively. Ibid.
\textsuperscript{46} Federal Ministry of Health, “Health Management Information System (HMIS)/ Monitoring and Evaluation (M&E), Strategic Plan for Ethiopian Health Sector”, op cit.
\textsuperscript{47} Ibid.
\textsuperscript{48} Federal Ministry of Health, “Health Management Information System (HMIS)/ Monitoring and Evaluation (M&E), Strategic Plan for Ethiopian Health Sector”, op cit.
11.4. Common observations on institutions visited

11.4.1. Staffing

The reality in Ethiopia seems to be that health facilities and health offices at all levels are suffering from scarce human resources for health information tasks. A recent study\(^49\) conducted in four regions\(^50\) by the Federal Ministry of Health in collaboration with HMN shed light on various aspects of HMIS implementation in Ethiopia, among which the scarce human resources issue was identified as a major concern.

In interviews at all levels, almost 40% of interviewees pointed out that there is an obvious shortage of personnel, especially qualified HMIS personnel. In Ethiopia, the Health Extension Programme, initiated in 2004, aims to train and deploy Health Extension Workers (HEW) at local Health Posts to meet community needs in rural areas. However, as the HMIS has not yet


\(^{50}\) Benishangul-Gumuz, Gambella, Harari and Dire Dawa city administration.
reached the Health Posts, discussion on the consequences of deployment of HEW will not be included here. The table below shows the percentage of people reporting shortages of manpower across structures visited:

<table>
<thead>
<tr>
<th>Structure type</th>
<th>% reporting HR shortage</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMOH</td>
<td>50,0%</td>
</tr>
<tr>
<td>Federal hospital</td>
<td>50,0%</td>
</tr>
<tr>
<td>RHB</td>
<td>66,7%</td>
</tr>
<tr>
<td>Regional hospital</td>
<td>100,0%</td>
</tr>
<tr>
<td>Health centre</td>
<td>100,0%</td>
</tr>
</tbody>
</table>

To understand where the shortage is more prominent, the table below presents the percentage of people reporting scarce human resources according to staff category:

<table>
<thead>
<tr>
<th>Staff category</th>
<th>% reporting HR shortage</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT</td>
<td>75,0%</td>
</tr>
<tr>
<td>HMIS officer</td>
<td>50,0%</td>
</tr>
<tr>
<td>Nurse</td>
<td>30,0%</td>
</tr>
<tr>
<td>Physician</td>
<td>28,6%</td>
</tr>
<tr>
<td>Card clerk</td>
<td>57,1%</td>
</tr>
<tr>
<td>Planning officer</td>
<td>33,3%</td>
</tr>
<tr>
<td>Statistician</td>
<td>0,0%</td>
</tr>
<tr>
<td>Health officer</td>
<td>25,0%</td>
</tr>
</tbody>
</table>

As less than 100 people were interviewed, the percentages intend only to provide an overall picture of the shortage of human resources in institutions visited. The staffing pattern also varied from region to region; a breakdown by region is presented in section 11.5.

11.4.2. Staff tasks & equipment

Forms used and data management

In most of the visited medical facilities, the standardised patient encounter forms developed by FMOH have recently been implemented. A patient’s individual folder contains personal details, medical records from all services, preventive, Out-Patient (OPD) and In-Patient Departments (IPD), as well as an individual summary sheet. The same individual folder is used for each medical visit. When a patient registers for the first time, a card room clerk
registers not only the patient's personal details in the folder, but also the Master Patient Index (MPI) and Service Identification Card. Both cards contain the Medical Record Number (MRN), which facilitates card room management. Master Patient Indexes are kept in the Card Room for easy access to individual files, while Service Identification Cards are kept with patients in order to accelerate the process for future medical visits. In most places, registration is still done manually, but in some facilities, the SmartCare electronic system is available in card rooms hastening data processing for all patients.

Intra-facility data flow

When a patient enters a health facility, the head officers in the triage room will indicate which medical service he or she should visit. Once this is done, the patient goes to the card room for registration. A messenger then passes the patient’s folder to the assigned health care provider. After a patient’s medical visit, the health care provider should record the diagnosis and the treatment, while in the OPD and IPD tally sheets are used to compile the recorded data. Patients’ files return to the card room, where all patients’ folders are stored and filed. The tally sheets are then sent to the statisticians or IT staff in the health facilities to undertake a preliminary analysis. It is the responsibility of the statisticians or IT staff to send the results of this preliminary analysis to a higher body. A standardised reporting format is required in the reporting chain; however, it is not fully implemented in some regions. The chart below shows the registration process.

**Figure 7 shows intra-facility data flow at service level.**
In an emergency, patients may not be recorded according to the procedure mentioned above. Serious cases admitted through the Accident and Emergency department are first examined and then registered once treated. Also, whenever a woman comes to give birth she may not be recorded immediately. Another non-registration case for the HMIS is that of antenatal care and of children under 5, which depend on the Family Planning departments.

**Computerisation**

In card rooms and in the OPD, levels of computerisation are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Card room</th>
<th>OPD/IPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper</td>
<td>55.6%</td>
<td>66.7%</td>
</tr>
<tr>
<td>Both paper and computer</td>
<td>44.4%</td>
<td>33.3%</td>
</tr>
</tbody>
</table>

The use of computers was observed:
- In Addis Ababa, at federal level, i.e. in federal hospitals.
- In Dire Dawa, in almost all the facilities visited, as Dire Dawa is the pilot region for HMIS implementation.
- In Sidama zone (SNNPR) where card clerks were using a computer to recopy patient data from paper. Sidama zone is highly supported by USAID

In almost all the health facilities visited, statisticians and planning officers had computers, but not all had access to a network. This is particularly the case in health centres.

**A heterogeneous situation**

Interviewees complained that health facilities are not equally equipped with computers and related technologies. More than 25% of the people interviewed reported that there was an obvious lack of computerisation. Among these:
- No facility visited in Dire Dawa reported a lack of computerisation.
- Only nurses at OPD level in one of the federal hospitals reported a lack of computerisation.
- Almost all Health Centres and regional hospitals, apart from Dire Dawa, reported a lack of computerisation.
- Only nurses in the OPD or IPD and card room workers reported a lack of computerisation.
- HMIS officers at the Addis Ababa RHB regretted the lack of electronic materials to correctly process the reports sent by lower levels.

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51 At a referral hospital in Sidama Zone, there were a lot of USAID stickers mentioning that USAID had helped the facility upgrading on technical materials.
Apart from the lack of computerisation, some relevant points regarding scarce computer resources were made during the interviews:

- One health centre in Awassa did not report any scarce computer resources.
- In one referral hospital in Sidama zone (SNNPR) there were no complaints about computers, even though these were few in number. One statistician was more concerned about the lack of software to generate reports automatically.
- In Awassa, one health centre had only a single computer dedicated to statistics and reports, but staff nevertheless succeeded in providing timely and accurate reports to RHB and donors.
- IT officers at the FMOH and in Dire Dawa stated facing problems because of improperly updated technological equipment.

11.4.3. Training

Training coverage

At both administrative and service levels HMIS training occurred only once, during implementation of the HMIS. The training lasted less than 10 days and the length depended on the institution and occupation of the trainee. Most interviewees could not clearly tell whether the training they received was in-service or pre-service training. The training covered HMIS data management issues (data registration, data collection, data storage, and data analysis), HMIS indicators and diseases classification, and the SmartCare system (if in place). Trainees were not separated according to their duties during the training. There was no HMIS training below sub-city levels in Addis Ababa.

Most interviewees saw the need for more training adapted to professional needs. For example, doctors required more training and support on IT skills to facilitate their tasks. In Awassa, even though some interviewees said they were doing well without any training, most of them requested more action-oriented training, e.g. patient information with WHO International Classification of Diseases and how to collect it. Most interviewees also pointed out that newcomers did not receive training on the HMIS so they were not familiar with the HMIS system. Newcomers sometimes depend on orientation by other colleagues who have received HMIS training in the past. They expect HMIS focal points to be put in place to coach and monitor HMIS activities.

Organisers/ Technical support

The FMOH has organised HMIS training with technical support from two partners: Tulane University and John Snow Inc (JSI). The FMOH designated regions for different partners to develop their own training strategies. For example, JSI used a zone-by-zone strategy while Tulane University employed a facility-by-facility strategy. There are also some financial partners working with the FMOH on this training issue, such as USAID and CDC.
### 11.4.4. Budget

The following chart shows the budget allocated to all HMIS activities at different levels of the health system:

<table>
<thead>
<tr>
<th>Health system level</th>
<th>Department/Facility type</th>
<th>Specific budget</th>
<th>Comments/Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMOH</td>
<td>HR department</td>
<td>Specific budget allocated to HMIS training</td>
<td>100,000 to 200,000 birrs a year allocated by FMOH to HMIS training</td>
</tr>
<tr>
<td>FMOH</td>
<td>ICT department</td>
<td>Specific budget</td>
<td>Managed by PPF/resource mobilisation unit</td>
</tr>
<tr>
<td>Federal level</td>
<td>Hospital #1</td>
<td>No specific budget</td>
<td>Use of existing employees</td>
</tr>
<tr>
<td>Federal level</td>
<td>Hospital #2</td>
<td>Specific budget</td>
<td>Supported by the FMOH</td>
</tr>
<tr>
<td>Regional level</td>
<td>Addis Ababa RHB</td>
<td>No specific budget</td>
<td>They financially depend on the FMOH (though usually depending on City Administrative)</td>
</tr>
<tr>
<td>Regional level</td>
<td>Dire Dawa RHB</td>
<td>Specific budget</td>
<td>Specific budget for HMIS, as well as funds from FMOH/Tulane University/Global fund/HMN</td>
</tr>
<tr>
<td>Regional level</td>
<td>Awassa RHB</td>
<td>Specific budget</td>
<td>Specific positions (HMIS officers, ICT officers, statisticians)</td>
</tr>
<tr>
<td>Regional level</td>
<td>Hospital (DD)</td>
<td>Specific budget</td>
<td>Funded by RHB and FMOH</td>
</tr>
<tr>
<td>Regional level</td>
<td>Hospital #1/(AA)</td>
<td>No specific budget</td>
<td>Funded by government</td>
</tr>
<tr>
<td>Regional level</td>
<td>Hospital #2 (AA)</td>
<td>No specific budget</td>
<td>N/A</td>
</tr>
<tr>
<td>Sub-city/Zone</td>
<td>Sub-city Health office (AA)</td>
<td>No specific budget</td>
<td>Failures: - HR allocation/financing: responsibility of RHB - Training: responsibility of FMOH</td>
</tr>
<tr>
<td>Sub-city/Zone</td>
<td>Hospital (Awassa)</td>
<td>No specific budget</td>
<td>Use of other sources, as they are not allowed to allocate budget for HMIS. (&quot;collecting&quot; money from patients, then allocating it to HMIS)</td>
</tr>
<tr>
<td>District</td>
<td>HC #1/ #2 (DD)</td>
<td>No specific budget</td>
<td>N/A</td>
</tr>
<tr>
<td>District</td>
<td>HC #1/ #2 (AA)</td>
<td>No specific budget</td>
<td>N/A</td>
</tr>
<tr>
<td>District</td>
<td>HC (Awassa)</td>
<td>No specific budget</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Table 3: Budget allocated to HMIS activities, Ethiopia
Hence, the following findings:

<table>
<thead>
<tr>
<th>Finding #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>From the FMOH/HR department point of view, the budget allocated to training HR for HIS is not sufficient (barely 10,000 dollars a year).</td>
</tr>
<tr>
<td>2</td>
<td>For the majority of the facilities, the lower the level, the less they are likely to have a specific budget.</td>
</tr>
<tr>
<td>3</td>
<td>At the federal level, structures usually handle a specific budget allocated to the HMIS.</td>
</tr>
<tr>
<td>4</td>
<td>The Dire Dawa RHB has a budget allocated to the HMIS activities, but not specifically to the HR for HMIS. It gets funding for HMIS from other donors, such as GFATM. At service level, there is no specific budget allocated to HMIS.</td>
</tr>
<tr>
<td>5</td>
<td>Whether they have a specific budget or not, some structures try to find alternative funds (e.g. Awassa RHB with their technical committee or the referral hospital visited in Awassa where they could not allocate budget for HMIS).</td>
</tr>
<tr>
<td>6</td>
<td>Addis Ababa RHB seems “trapped” between FMOH and Addis Ababa city administration, which may explain the fact that they are not running a specific budget allocated to the HR for HMIS.</td>
</tr>
<tr>
<td>7</td>
<td>At sub-city level in Addis Ababa, the FMOH and the RHB obviously did not respect their commitments to HMIS resource allocation towards Health Centres (both financial and human resources).</td>
</tr>
</tbody>
</table>

11.4.5. Indicators

Most health facilities visited and most RHBs are aware of the fact that HMIS indicators and system of disease classification are unsatisfactory, particularly concerning age aggregation for OPD patients more than 15 years old, the lack of indicators concerning Vitamin A, latrine construction (for hygiene), the lack of indicators related to child immunisation such as DPT or measles and malaria prevention devices such as Indoor Residual Spraying (IRS) or Insecticide Treated Nets (ITN). Medical professionals and HMIS officers of the RHBs usually complained about the lack of indicators, as they were required to process the data-registration with the HMIS indicators and diseases classification.

11.5. Actual implementation of HMIS by regions

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52 Awassa RHB set up a technical working group for future HMIS implementation: JSI, Unicef, JHU, MSH, Malaria consultant, USAID are part of it. They are requesting all their partners to work on training issues, either financially or technically.

53 Hospitals are not allowed to allocate a specific budget for HMIS. Therefore, some lobby external donors or collect money through patient payment
As noted above, the HMIS aims to tackle the standardisation of data recording and data reporting procedures. Most health facilities appreciate the standardisation of data as it facilitates data registration, collection, storage, and further enhances the access and the quality of medical services. Data aggregation expedites the identification of problems, planning, the allocation of resources, and reporting to higher bodies. However, the actual implementation varies at different facility levels as well as in the regions, and raises some issues.

11.5.1. Dire Dawa

A Pioneering HMIS

Dire Dawa, the HMIS pioneer, implemented the system a year before the capital and has now quite a mature HMIS in place. There is a clear consensus on the necessity of HMIS and its implementation in all health facilities. Health facilities co-operate closely with the Regional Health Bureau (RHB). For example, there is a quarterly meeting with the RHB attended by all health facilities. RHB receives both paper-based and computer-based data from one regional hospital and 13 health centres. The regional hospital sends both paper-based and computer-based data to the RHB depending on their needs, and this usually occurs on a monthly basis. Health centres first receive data from smaller health centres and Health Posts, and then send it to the RHB. However, all health facilities expect a sounder supervision mechanism and more frequent feedback in written form from the RHB.

At the administrative level, the HMIS team in the Dire Dawa RHB is paid by the Global Fund to fight AIDS, Tuberculosis, and Malaria (GFATM), but the RHB intends progressively to internalise the team. At service level, health service managers all pointed to a need for HMIS IT staff to maintain the entire electronic system.

A well-functioning manual and electronic system

In most of the health facilities, data was filed and stored neatly in the card rooms. Every department has two systems working simultaneously: manual and electronic. The results of data analysis were displayed on the walls indicating the staffing structure of the facility, the age distribution of patients, the most frequently encountered diseases etc. in order to define health service priorities of the facility and improve its planning. A manually maintained HMIS has well developed in Dire Dawa. Certain health facilities frequently use the SmartCare electronic system. However, the problem of electricity cuts, which cause network interruptions, was mentioned by some interviewees.

11.5.2. Addis Ababa

A transition period for the HMIS

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54 Health Posts are not included in the implementation of HMIS yet.
Addis Ababa started implementing the HMIS very recently. Most interviewees did not deny the value of the HMIS for standardisation, integration and simplification. The FMOH works closely with the RHB and federal hospitals through a reporting-feedback channel. The RHB receives data from regional hospitals monthly and from the sub-city level quarterly. The sub-city level is responsible for collecting data from health centres and sending it to the RHB. It should be noted that the system used by Public Health Emergency Body is different to the HMIS. It uses a routine surveillance of 20 diseases identified through data collected directly from different health facilities and the RHB at national level.

In the RHB, an HMIS team collects, processes and analyses data received from different health facility levels. However, the HMIS officers complained about the poor quality of data received from health facilities. For example, the diverse data forms from different health facilities made it difficult to process the data. In some hospitals, an HMIS team had been newly built. Under the sub-city level, there are no staff dedicated to the HMIS.

An inconsistent working environment

There is no clear consensus on the HMIS. The inconsistency between the health service managers and medical professionals is clearly visible, especially in regional hospitals and health centres. For health service managers, the new system contributes to performance evaluation and planning. They see instant results from the HMIS. Contrary to health service managers, some medical professionals see the HMIS as additional routine work. As Business Process Reengineering (BPR)\(^55\) and the HMIS are supposed to be implemented in facilities almost simultaneously, and because of the unfamiliarity with the new HMIS, some medical professionals interviewed complained that HMIS actually doubled their workload. Some statisticians mentioned that they preferred the DHIS\(^56\) to the HMIS.

Sub-city officers and health service managers in health centres pointed out that the biggest problem for health centres in implementing the HMIS is both poor infrastructure and resources, such as narrow and overloaded card rooms. The sub-city officers recognised the necessity of implementing the HMIS, however, they pointed out that the lack of human resources dedicated to HMIS, especially IT staff, as well as the lack of training on the system, made it extremely difficult to put it into practice. So far, under the sub-city level, there has been scarcely any implementation of the HMIS.

11.5.3. Awassa

An alternative Health Information System

\(^55\) Business process reengineering (BPR): computer science and management-based approach whose purpose is to improve the way activity is conducted by scrutinizing business processes from scratch. The FMOH proceeded to its BPR for its Health System.

\(^56\) District Health Information Software (DHIS): DHIS is a software used at district level by health facilities to gather data and generate automatically reports (e.g. most prevalent diseases).
Unlike Dire Dawa and Addis Ababa, the Awassa region is not running the new HMIS. There seems to be a real concern about HMIS and its potential benefits. Interviews with stakeholders in the region revealed a true interest in the HMIS and it was clear that staff were doing quite well, although they lacked updated infrastructure (computers, card rooms, etc). Awassa Health Centre is a case in point. Despite only one computer, staff are committed to providing charts monitoring the evolution of malaria cases throughout the year, for example. Data and charts are also displayed on the Health Centre's walls as a reminder of their work and related performance. This testifies to a high level of staff commitment.

The HMIS information chain seems well in place. Some 68 Health Centres and 17 hospitals report to the Regional Health Bureau, which then reports to the FMOH. Upon discussion with the FMOH, the RHB provides feedback to the Zonal Health department and special woredas. The latter then pass this feedback on to the woredas, which finally give it to Health Centres and Health Posts. Health Centres also collect data from Health Posts.

The different health structures in the field also interact with the government. For instance, Yirgalem Referral Hospital is managed by a government board: every three months, they meet to analyse data from departments, and during such meetings they discuss decisions to be made.

Statisticians in hospitals and HMIS officers at the RHB complained that they were receiving inconsistent reports from hospital departments and hospitals respectively. For instance, a statistician may receive a tally sheet recording details of a man with a placenta-related disease. Both deplored the unawareness of staff (especially nurses in charge of filling in tally sheets) about the importance of the data reported and their neglect to do so.

External partnerships

Another important aspect is that the Awassa region, and above all the Sidama zone, is highly supported by external partners, among them international donors such as USAID, John Hopkins University, JSI or the Malaria Consortium. Therefore, national stakeholders are requested to provide numerous reports. But, in return, they expect these partners to support them with training workshops. Thus, Awassa RHB has set up a technical working group for the future HMIS, composed of their main partners i.e. JSI, UNICEF, John Hopkins University, MSH (Management Sciences for Health), Malaria Consortium and USAID, to ensure their commitment to providing either financial or technical support to train users at different levels of the HMIS.

57 Awassa Health Center.
12. Discussion - Ethiopia

Among the issues encountered in the field, and which have been stated in the findings, the most pressing ones to be addressed in order to progress in HIS strengthening in Ethiopia are:

- HMIS awareness (12.1)
- Computerisation (12.2)
- Shortage of manpower and skilled manpower (12.3)

Each of these points will be examined to expose the reasons why these problems are encountered by health structures and personnel. The analysis will also attempt to determine whether the perceived HMIS needs of staff do indeed reflect the priorities identified by the consultant team. Finally, an in-depth study will investigate the issue that may be one of the main causes of the problems reported by people in the field: the consequences of the autonomy granted to regions and woredas on their ability to effectively manage their budget and human resources. An analysis of the decentralisation processes will provide the answer to this question - "the first wave of decentralization"\textsuperscript{58,} from national level to regions and zones, and the District Level Decentralisation Program (DLDP).

12.1. HMIS awareness

12.1.1. Limited awareness

There is an overall awareness of the need for HIS in the field. As observed during the interviews, people who are aware of the objectives of HIS are mostly card room staff, HMIS and planning officers, and FMOH staff that are involved in HMIS core processes (PPD, ICT, and HR). HMIS workers and card room staff are essentially committed to HIS tasks. As their main duty is to deal with HMIS issues, they often understand the purpose of HIS and its benefits. Besides, few would risk being uncooperative since their job depends on HMIS processes. There is also a big difference between card room workers and HMIS officers: whilst the former are predominantly involved in data entry, the latter form the essential links within HIS that keep the system functioning.

For managers and hospital directors, HIS represents a key to running their facilities more efficiently and providing a better level of service. International aid providers also frequently request strategic data. For example, some facilities visited were reporting to international donors on HIV/ART. Therefore, aid provided to health facilities is often on the condition that these facilities regularly report to their donors, to allow follow-up on the evolution of their efforts.

12.1.2. Indicators

The majority of people are satisfied with HMIS processes, but there are concerns about indicators. At regional and woreda levels, collected data is aggregated to create indicators. Woredas are required by the Regional Health Bureaus to send these indicators and the Regional Health Bureaus in turn report to the FMOH.

The FMOH reviews indicators as part of an ongoing process. This is done with the help of partners, including WHO. WHO epidemiologists explained the reviewing process: WHO carries out a formal review of the indicators with the FMOH, as well as an informal review while training people how to use the indicators (six-day training), particularly at woreda levels. According to the woredas, the problem lies not in using the indicators but more in their number. Woredas prefer a limited number of indicators, while the FMOH asks for more. Therefore, on the one hand, the FMOH expects woredas to fill in all requested indicators and, on the other hand, the woredas prefer a limited number of indicators as they consider too many indicators to be time-consuming.

12.1.3. A change of the working culture

As it is a new approach, no proper working culture of HMIS has yet been developed. None of the HMIS staff, usually medical staff, has sufficient knowledge of HIS. Some heads of health facilities complained about insufficient HMIS training leading to poor understanding of it among medical staff. The fact that people lack training may explain their unawareness about the benefits of HIS, but this is something that only time can fix.

12.1.4. Medical staff: lack of awareness or reluctance?

The results of the interviews led to the conclusion that a specific pool of medical staff were not making sufficient efforts to use HMIS standards even though it’s a requirement in their work plans. Some members of medical staff, both doctors and nurses at regional and district levels, are evidently reluctant.

Some nurses in the OPDs did not seem to show great interest in filling tally sheets that were to be sent to the statistics department within the facility. For instance, at a referral hospital in Sidama (SNNPR), a statistician complained that nurses had reported female diseases for male patients. This has been corroborated by HMIS officers at Awassa RHB who reported spending extra time double-checking data coming from health facilities due to sometimes incoherent data.

Indeed, there are some reasons why nurses and doctors are unwillingly working with HMIS

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59 Mainly about ICD codes.
60 Around 15% of the nurses interviewed allegedly neglected the collection of data for HMIS purposes, according to either statisticians, planning officers, HMIS officers at RHB or heads of facility.
Due to the increasing burden of data collection, nurses and doctors think HIS may not be useful to them. Nurses carry a heavy burden as they oftentimes have to write patient diagnoses and complete tally sheets on top of their medical tasks in lieu of doctors, whom are short of time.

In some cases, nurses may have to enter data twice as two health information systems are running simultaneously. For example, donors (e.g. USAID) request that certain data (e.g. HIV/ART) be reported, while nurses also have to report data about HIV patients to statisticians.

Medical staff may not understand the benefit of shifting to a newer system (standard) when the current one is running perfectly. Thus, they may not agree to use the new HMIS standard system as required by the FMOH.

Insufficient training on the HMIS.

Talks with Ethiopia’s international partners often disclosed financial issues. One international partner stated that some medical staff may also not accept undertaking both medical tasks and HMIS tasks without a salary increase. This point is crucial, and all the more so given that medical staff are often drawn away from the public sector by attractive job packages offered by NGOs and private sector.

What are the lessons learned from the previous elements? First and foremost, even though most interviewees were aware of the purpose of HIS and were doing their jobs conscientiously, there remains a part of the medical population reluctant to adopt the HMIS.

The following question is therefore raised: what is the real concern with HMIS awareness? Indeed, higher level staff members (statisticians in either health facilities or at the RHB) sometimes complain that lower level staff members responsible for data collection make mistakes (reportedly often deliberately) in their reporting. On the one hand, upper level stakeholders may not be aware that they are dealing with medical staff whose mission is above all to take care of patients and not to collect data. On the other hand, lower level staff (medical staff at health facilities) should understand the purpose of the HMIS and its prospective benefits to them. For instance, they should understand that collecting data is not a waste of time. Collecting data allows statisticians to reveal most prevalent diseases. Consequently, reporting to the RHB, FMOH or to international partners, health facilities may be granted special funds or specific drugs to tackle these diseases.

12.2. Computerisation

61 In one regional hospital in Addis Ababa, physicians did not agree to be interviewed as they were in conflict with the facility management for the use of a new HMIS system (national standard system). They were actually satisfied with the current system, and did not see the purpose of a new one.
Data collection, processing and analysis are often much easier through the use of computers and networks, if handled and managed properly.

Not all facilities, however, are equipped with sufficient materials and IT officers, where present, have scarce resources. Also, the problem is not only about the presence of computers, which remain scarce in many facilities - it is also about being able to maintain and update the system when required.

There are various arguments to explain the current situation of computerisation:

- **“Top-down” approach**: the FMOH may prefer to first ensure that the upper levels are adequately equipped with electronic devices, to avoid problems when interacting with them.
- **HMIS new approach**: the FMOH is currently finalising, with the help of HMN and other partners, a detailed plan concerning the means of each level (the purpose of the study).
- **Paper-based pilot**: the FMOH is piloting the new HMIS in a number of regions. Initially, health facilities use paper-based procedures and upgrade to electronic-based procedures only on the condition that they've succeeded in the initial procedure, i.e. collecting data, reporting accurate and complete data timely to upper levels.
- **Financial reasons**: may be the main obstacle to widespread computerisation in Ethiopia. There is definitely not enough money to provide all facilities with computers and related equipment. Besides, funds allocated to the nationwide HMIS are oriented first towards paper-based procedures. Then, when they are ready to switch, health facilities may be allocated more money to obtain computers.

**To what extent is there a need for computerisation and automation?**

Firstly, computers need electricity, a scarce resource during the rainy season, for instance. What should come next? A network-integrated system would be the obvious preference. However, such a situation would reach far beyond equipping single facilities – it would concern infrastructure needs across the whole country. There are thus numerous obvious financial, technical and geographical hurdles to overcome in order to achieve this objective.

Furthermore, there are numerous financial issues: it may not be very costly to obtain computers, but to ensure their maintenance and repair. There will also be an increasing need for qualified staff to fix computers and networks, which raises the issue of rising payroll costs.

Finally, there may not be a need for computers at every health facility level as many are doing well with the paper-based system. For instance, in one of the health facilities visited in Sidama Zone, card room workers were working efficiently by using just one computer. There were seven card clerks filling in paper-based forms, and one person dedicated to inputting the data.

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62 IT staff in Dire Dawa reported regular electricity cuts, that hampered the facility computer system.
63 Some physicians in Dire Dawa were complaining about network interruption.
onto the computer. Therefore, it is necessary for the paper-based process to be supported as much as possible.

12.3. Shortage of personnel

12.3.1. Analysis of the reported shortage

The HR shortage was pointed out as a problem during most of the interviews. However, by further comparing interviewees’ answers, certain elements were revealed which may provide an alternative view on this problem:

1) In the card rooms, all staff seemed to have enough time to do their job during their shift.
2) No one reported reducing time spent on HMIS tasks at peak periods. Only in two cases, nurses were substituting doctors when completing patient information.
3) 60% of people expressing an HR shortage were satisfied with their time spent on HMIS tasks.

Whilst the evidence of an HR shortage for HIS in Ethiopia cannot be denied, a thorough analysis to identify the real needs in terms of manpower is required. Indeed, whilst most card clerks reported a shortage of manpower (which proved to be true in some cases, for instance at Entoto #1 Health Centre), nurses usually (mostly in the OPD) were more concerned with the increasing burden of data collection. Therefore, the fact that nurses are increasingly contributing\textsuperscript{64} to the HMIS has to be taken into account. The question is thus whether they are to continue providing more and more data. If so, this will further swell the numbers of additional nurses required. If not, there is need for extra HMIS staff to help nurses collect data.

12.3.2. Further elements of explanation

HMIS is a recent approach

As part of the third phase of Ethiopia’s Health Sector Development Programme (HSDP) initiated in 2005, HMIS is a recent approach. For four years, Ethiopia’s FMOH has been working with all stakeholders to shape the architecture of its HMIS M&E structure. Time is needed to finalise the strategy and allocate adequate resources, both human and financial. It will come as no surprise that human resources may not be fully allocated, thus partly providing an explanation for some complaints about scarce human resources for the HMIS.

However simplistic this explanation may be, it is not so far from reality. Discussions with stakeholders revealed that there were many people involved in the design of the HMIS in Ethiopia. Thus, Ethiopia’s government is not alone in the decision-making process, although it is the main architect. Furthermore, tests are being carried out. There are pilot regions (an

\textsuperscript{64} Nurses at OPD level are requested to collect data on the Tally Sheet. That sheet is then passed on to the “statistics department”.

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74 | Human Resources for Health Information Systems: a fact-finding study, January 2010
example is Dire Dawa city administration where the new HMIS is currently being implemented) where resource allocation is assessed. The results in Dire Dawa may change future implementation methods. As a matter of fact, although this issue may not be the main reason for the actual shortage of manpower, it is possible that once the system is fully up and running the shortage of manpower will be less significant.

Lack of interest

Surprisingly, some people were showing no interest in HMIS issues. Whilst it is understandable that medical staff (such as nurses, midwives or doctors) may not be interested in spending time collecting data (although it is often useful for their job), some health facility managers reported having difficulties recruiting HMIS officers. For instance, at a sub-city Health Office in Addis Ababa, the head of the Health Office reported that people wished to hold medical positions rather than HMIS related positions.

FMOH

Shortage of skilled manpower in the ICT department

As stated in the findings, the ICT department at the FMOH reported a shortage of manpower. For instance, they are responsible for helping regions to implement the new HMIS even though there are only 5 persons in their team at the federal level. Though they are relying on regions to cascade technical support and training down to lower levels, they need extra staff to help them. Therefore, a heavy workload and inadequate workforce in the ICT department make it difficult for them to achieve HMIS goals. The shortage in manpower is obvious. And HMIS goals are ambitious given the number of technical staff dedicated to them.

Policy of training and deployment of Health Information Technicians (HIT)

The FMOH is apparently aware of the shortage in human resources for HMIS. More specifically, there is an increasing awareness about the need for training and the allocation of action-oriented personnel for each level of the Health Information System.

That is why the FMOH is committed to training Health Information Technicians each year from 2009 onwards. Their capacities will be both technical and medical, for the collection, the processing and the analysis of medical data. The first group is due to graduate in 2010. Graduates will be then assigned to regions and lower levels of the health system as HMIS focal persons.

High staff turnover

One of the major problems that health structures have to cope with is staff turnover. This

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65 See with FMOH for specific figures at each level.
Concerns mainly qualified people with a strong university background such as IT personnel, nurses and doctors. Increasingly, skilled staff members are tempted to shift from state health structures to the private or international public-funded sphere, e.g. NGOs or international agencies, where wages are higher. Yet, according to some international observers, the FMOH may not be particularly concerned as long as skilled staff continue working in the same field, reducing salary costs for the FMOH. Of course, this is not a commonly shared point of view. Indeed, attraction to the private sector does pose a problem as it leads to the FMOH often losing trained staff. Also, the FMOH usually has to spend more time and money training people, which could be better dedicated to further development or hiring new skilled staff, for instance.

The financial aspect

There are two elements to be considered with respect to financial issues: the financial capacity - the amount of money allocated to run the budget - and the ability to allocate funds autonomously. The second will be considered in section 12.4 which focuses on the decentralisation process.

It is both intuitive and logical to state that a shortage of personnel has its roots partly in the lack of budget. Most facility managers stated that they were prevented from hiring new HMIS staff because of funding issues. In most cases, no budget was specifically allocated to HMIS tasks (at facility level), which means that there was no proper budget line to cope with increasing HMIS routines. Some managers are resorting to informal practices to overcome such issues. One hospital director financed the HMIS payroll using payments from patients. Of course, this kind of solution is in no way sustainable. The financial issue thus remains a key point in the current shortage of human resources for the HMIS.

12.4. Resource allocation for HIS and decentralisation in Ethiopia

12.4.1. Resource allocation

To further examine the budget issue, health facility staff were asked whether they knew if there was any budget dedicated to the HMIS, in particular to human resources. Very often, staff members were not able to answer. No relevant answer at the service level was obtained. As far as the administrative level was concerned, a large majority of people declared that they had no specific budget allocated to HR for HIS.66

Most people interviewed reported shortage of budget and, consequently, shortage of HR. The following reasons explain this:

- FMOH funds are not unlimited (budget of only 100,000 birrs for HMIS training). Thus, the FMOH is more likely to run a budget in the name of health facilities, rather than allocating them a specific budget for HMIS.

66 None of people interviewed at the administrative level could give an estimation of their budget (whether they had no idea, or they merely did not want to).
• Some areas are key areas for international donors, which may explain why they are running a specific budget for specific HMIS tasks. For instance, USAID is heavily supporting the Sidama Zone (SNNPR) for HIV/ART.

Yet, the situation is more complicated than it looks for resource allocation, as the following section will show.

12.4.2. Decentralisation in Ethiopia

A process dating back to 1991

In an effort to empower regions and zones, Ethiopia undertook a first phase of decentralisation between 1991 and 2001. During that period, regional governments were created and given, among other things, the right to run their budget autonomously. As stated by Tegegne Gebre-Egziabher, “[f]iscal decentralization was intended to assist Regional Governments by boosting their capacity for developing their localities through self-initiative”. Therefore, regional communities would no longer have to expect national subsidies; they would have the capacity to grow by themselves.

However, Ethiopia’s administrative map is complex and goes beyond regions and zones; woredas are an important entity. Indeed, the ethnic richness of Ethiopia is enshrined in the woredas. Therefore, self-governance was established at woreda level. In 2001, the second wave of decentralisation began with the District Level Decentralization Program (DLDP). Following the example of the first decentralisation, woredas were able now to “exercise planning and budgeting”, “through transfers from regions”.

Regions

The situation in regions is, unfortunately, worse. Regions do not seem to be able to run their own budget as for Human Resources for HIS:

• As observed in section 12.3.2, RHBs had difficulties budgeting HMIS in terms of human resources. Addis Ababa RHB is between its city administration and the FMOH. Awassa RHB and Dire Dawa RHB run their budgets, but rely partly on external funds (e.g. for training or staffing purpose).
• Regional hospitals are still funded by the FMOH
• As seen in section 12.3.2, there is a shortage in Human Resources at the Regional level.
• Besides, the RHB in Addis Ababa was reported to have failed to allocate Human resources to the HMIS.

All these elements indicate that the regions are not fully capable of funding the human

67 Gebre-Egziabher T., op cit.
68 Four regions, Oromia, Amhara, Tigray and SNNPR were initially part of that second wave.
69 Gebre-Egziabher T., op cit.
70 Ibid.
resources for the HIS; either they still rely on the FMOH to subsidise them, or they have to look for other sources of funding. Tegegne Gebre-Egziabher wrote, in his article “Decentralization in Ethiopia”, that “[f]iscal imbalances between regions and heavy dependence of the Regional Governments on the Federal Government’s transfer and subsidies have persisted since the first wave of decentralisation. The situation has obviously not changed much since.

**Woredas**

There is no evidence that Woredas have the capacity, as intended by the DLDP, to allocate resources, especially for human resources for HIS. However, as their capacity to plan and budget relies on fiscal transfers from the regions, it is quite certain that they are also facing such difficulties.

**Ethiopia is now facing a paradoxical situation.** Its HMIS M&E strategy states that regions (therefore zones) and woredas have the authority and the capacity to “allocate the financial resources” required for HMIS implementation. However, regions and woredas are in a deadlock, as they still depend upon the FMOH for resource allocation or need to find alternative funds. The fact that regions and woredas cannot effectively handle their budget and human resources allocation autonomously may jeopardise the future of the HMIS.

### 12.5. Conclusion

There is clear evidence that the implementation of the HMIS in Ethiopia is currently hindered by a number of critical issues.

First, the lack of awareness, as a result of poor HMIS knowledge, is an important issue. Some medical staff are still reluctant to use the HMIS. Yet, their behaviour is often the consequence of an increasing data burden or insufficient training. Moreover, medical staff are not adequately remunerated in the public sector and can earn more money when working for NGOs or private sector.

In terms of computerisation, there is no doubt that facilities are faced with scarce resources. This is mainly due to a shortage of funds. However, computerisation requires not only a computer supply, but also technical or HR support, for power supply, system maintenance and system updates.

**The shortage of “HMIS” personnel is one of the biggest issues.** The following points summarise the major elements of the problem:

- Medical staff, in particular nurses, tend to play an important role in HMIS. The increasing data burden adds to an already heavy workload.

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71 Gebre-Egziabher T., op cit.
• The ICT department at the FMOH, as well as IT officers if present, are understaffed.
• There is a high staff turnover, particularly a “brain drain” phenomenon, as qualified medical staff find better salaries working for internationally-funded structures.

Last but not least, facilities are facing a shortage of budget. On the one hand, the allocation of funds may be excessively oriented towards one sector, leading to budget imbalance. An example of this is when specific programmes such as HIV/ART are financially supported, whilst chronic diseases may not be supported at all. On the other hand, regions and lower facility levels are currently suffering from an inability to autonomously run their budget, despite the decentralisation process intended to give them increased financial independence.
13. Recommendations - Ethiopia

Several problems concerning the HMIS implementation in Ethiopia, such as HMIS awareness, computerisation, and shortage of human resources, were discussed in the preceding analysis. The following recommendations are aimed at tackling these problems and improving the situation surrounding the human resources for the health information system.

13.1. Reorient HMIS awareness

Due to a lack of awareness of the need for HMIS amongst medical professionals, there are large gaps and inconsistencies between their attitudes and those of health service managers. This has led to difficulties in implementing a nationwide HMIS. Below are some suggestions that aim to reorient awareness of the HMIS.

- **Increase the number of medical professionals and HMIS staff**
  The main duty of medical professionals is to treat patients, limiting their time available for registering patients’ information or to collect and aggregate the data for statisticians. Thus, increasing the number of medical professionals and HMIS staff may diminish their workload for HMIS tasks. Tally sheets filling and emergency cases registration are tasks which require the presence of more medical staff.

- **Increase the quantity and quality of training**
  Training is considered the main priority and additional pre-service and in-service training is necessary. The content of training should be adapted to the needs of different audiences. As there are different partners who work with the FMOH on the training issue, training methods and strategies should be shared or co-ordinated by a common platform. A clearer leadership both at national and regional levels to co-ordinate partners is necessary. This would be in line with the principles of the 2005 Paris Declaration on Aid Effectiveness and Harmonisation.

- **Deploy HMIS focal points in every facility**
  Training itself is not sufficient. The aim of training is to provide competent staff with the necessary skills for HMIS activities. It is thus important that, at the beginning of the training stage, there is a HMIS focal point in each facility to coach and monitor HMIS activities, and to ensure that facilities have the capacity to continue HMIS training and activities.
  - In Awassa, a skilled HMIS focal person should be assigned at each level (woreda, zone...), but also to double, at least, in hospitals, HMIS positions for data collection and pre-processing (chiefly statisticians).
  - In Addis Ababa, HMIS focal points at sub-city level and regional hospitals are especially needed.

13.2. Increase incentives for involvement in HMIS activities

During the interviews, some important elements were revealed for motivating staff to carry out
• **Not only reports, but also feedback**

Feedback can value routine HMIS tasks. In most cases, reports were sent back without any feedback or only with oral comments related to data collection problems. The use of collected data was not understood by the data collector. Written feedback or the results of pre-processed data may help data collectors to understand the utility and value of the data they have collected. Written feedback would also encourage HMIS personnel to improve the quality of results.

• **Improved infrastructure and equipment**

Without sufficient technical support, people see no interest in implementing HMIS. Based on the actual needs of different facility levels, modernisation of infrastructure and increased computerisation may provide a better working environment for HMIS implementation and thus encourage people to participate in HMIS tasks.

- Investing in computerisation in facilities where manual HMIS is already well-functioning, for example in Dire Dawa, or Federal hospitals in Addis Ababa.
- In Addis Ababa, health centre level enlargement and infrastructure improvement, especially in card rooms, needs particular attention.

• **Strengthen the HMIS mechanism**

High turnover is a common staffing phenomenon. As the implementation of the HMIS is not generally thoroughly scaled up, people see the promising policies, but not the sound HMIS mechanisms which ensure the continuity of the HMIS. The HMIS mechanisms need to be strengthened, especially for the supervision component and the independent budget issue at each level. Only a sound HMIS mechanism can keep people involved in HMIS tasks.

- Health facilities in Dire Dawa expect an HMIS supervision unit in the RHB to monitor their HMIS activities.
- An independent budget allocated to the HMIS is needed for every health facility to run its own HMIS activities.

• **Housing**

Housing can be another option to deal with the high turnover of personnel. One of the main reasons for high turnover is that salaries may be insufficient to support a family, and long commutes are also often an issue. Given that the government cannot provide salaries as attractive as those in the private sector housing welfare may retain staff working in the public sector.

13.3. **Recommendations to Health Metrics Network and partners**

- Help the government better understand and define quantitative and qualitative needs of HR for HIS.
• Develop bottom-up strategies with the FMOH to reach lower level health facilities, such as Health Posts, Health Centres, Regional Hospitals, especially in relation to the HMIS budget (including HR).

• Accentuate HMIS training and training strategies.

• Better co-ordination and harmonisation between partners working in different regions on technical support issues (tools, processes and computerisation).

• Promote computerisation in priority in areas where paper-based HMIS already functions well.
14. General conclusion: Zambia and Ethiopia in a Comparative Perspective

Ethiopia and Zambia are both HMN Wave One countries in the third phase of their HIS strengthening activities and both are faced with a continent-wide crisis in human resources for health. However, differences in their approach to the task in hand, as well as their country structure, geography and culture means that their experiences may not lend themselves greatly to comparisons. Yet both countries have encountered common problems in human resources for health information systems.

14.1. Common problems

**HMIS staff shortages** are not only detrimental to the functioning of HIS, but can also increase an already heavy work burden on medical personnel. HMIS staff shortages share some common features with medical staff shortages: both are accentuated by high attrition rates due to, amongst other things, emigration, working conditions and incentives to work in the private sector or for international organisations. Yet the HIS shortage differs from that of medical staff in that qualified HIS staff are generally easier to find and their training requires less time. A lack of financing and budget to hire HIS staff is often at the heart of the HIS staffing shortage.

**Infrastructure** issues hamper the efforts of existing HIS staff to do their jobs efficiently. This can include a lack or intermittent electricity, absence of telephone lines, poor roads, limited computer equipment and inadequate paper-based equipment.

**Under-optimisation of the existing HIS** can also accentuate HIS staff shortages. Under-optimisation can include continued practices of repeated recopying of data by hand or onto a computer, under-exploitation of existing computers and non-coordination of stakeholders, including international organisations, leading to an increased strain from donor-reporting.

14.2. Common trends

Common trends can be observed in the experiences of both Zambia and Ethiopia, whilst the differences between them may provide inspiration, knowledge and expertise for other countries to draw from.

**Training** for HIS staff that focuses on their daily tasks is not only highly appreciated by all involved, but also provides an impetus more efficient and effective HIS activities through increased motivation and capacity building.

**Feedback** is highly valued both by those providing it and those receiving it. In both countries, better use of feedback, incorporation of positive feedback and innovative ways to enhance the feeling of “involvement” may provide one element of the response to improving the quality and use of health information collected.
**Computerisation** comes with upsides and downsides. A solid paper-based system should be a prerequisite for any developments towards extensive computerisation. Tying in training to use of high-tech equipment should maximise the benefits of existing computers.

**Incentives** are central in attracting and retaining HIS workers. This does not necessarily require salary increases by a public sector that can ill afford it. Incentives can be given through amenities, support and recognition of HIS staff, vital for keeping them motivated, engaged, and willing to stay.

### 14.3. Comparative views on Zambia and Ethiopia

Zambia and Ethiopia have different historical backgrounds that should be taken into account when reviewing their HIS-strengthening performances. Whilst Ethiopia is a vast, decentralised country with an extremely large population, Zambia is more compact, centralised, has an incomparably smaller population and a history of excellent courting of international donors.

Zambia has made leaps and bounds in the improvement of the overall structure of its health information system. A good tradition of clinical record keeping facilitated the reinforcement of the foundations of the HIS and leaves the focus now predominantly on improving data analysis and use, and ensuring that all planned HIS positions are indeed filled. Although high centralisation has clear drawbacks (i.e. restrained local freedom in budget and control of staffing) a standard administrative structure, along with a high degree of donor co-ordination through SWAps, has allowed implementation of HMIS strengthening tasks in a harmonised and co-ordinated manner. This in turn has prevented conflicts amongst donors and between donors and state structures and has reduced strain on HIS personnel. It has also helped foster a high level of acceptance of changes in the system.

Ethiopia’s decentralised administrative units, especially regions, now have the ability to manage the majority of data flows from the lower levels of the information chain. Yet most regions still do not have real budget autonomy. This has led to an uncoordinated and non-standardised system, with clear inequalities between regions and situations where HIS training and HIS staff are scarcely present. It also means added strain and increased workload on personnel and thus negative attitudes from certain groups of staff. Improved co-ordination of stakeholders both at regional and national levels is necessary to enhance the quality of information. It should be highlighted that international donors have had their attention drawn to Ethiopia only over the past ten years. The benefits of nationwide efforts to provide standardised health facility forms, such as patient files, are a notable success and proof that co-ordination, even in a challenging environment, is indeed possible.

### 14.4. Focusing HMN’s Work in Zambia and Ethiopia

Health Metrics Network is in a position to work with partners to improve HR4HIS issues in several ways. Thus, in addition to country-specific recommendations, HMN may consider
working on further developing partnerships with other donors in order to ensure an integrated approach to all aspects of the key issues mentioned above. These could even go as far as working with those outside of the health sector to address basic infrastructure problems such as electricity. To eliminate avoidable pressures on HIS staff, work should concentrate on the optimisation of existing HIS tools, HIS staff’s use of computer equipment and taking the HIS optimisation process through to completion. Finally, bringing issues such as increased and positive feedback, pertinent training, increased incentives, and staff shortages to the attention of countries and backing these up with financial or technical support will also be important for future HIS strengthening activities.

Co-operation is the key to success in HIS strengthening and an integrated approach can never be far from the heart of HMN policies. In a difficult environment for human resources, country control and ownership of evidence of the impact of development programmes is vital. Yet, despite such difficulties, both Ethiopia and Zambia have made important steps towards improving their health information systems. Their experiences may be put to use to guide other countries embarking on this process.

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Better Information.
Better Decisions.
Better Health.

Sciences Po Young Consultants Project

Background on Health Metrics Network
Health Metrics Network (HMN) is a global partnership hosted by the World Health Organization (WHO) that facilitates better health information at country, regional and global levels. Partners include low and middle income countries, multilateral and bilateral agencies, foundations, other global health partnerships and technical experts. Most importantly, HMN seeks to bring together health and statistical constituencies in order to build capacity and expertise and enhance the availability, quality, dissemination and use of data for decision-making.

Project name:
Human Resources for Health Information Systems (HR4HIS): a Fact Finding Study

Background on the project:
HIS in low income countries has an important role to support Ministries of Health and other government agencies in monitoring health service activities, morbidity and mortality, vital events, and achieved outcome of health services. As a tool, HIS has the capacity to help leaders in evidence-based decision making and aims at improving service delivery as well as resource allocation. To manage comprehensive HIS, the public health authorities need qualified personnel for data handling, processing, analysing and reporting.

The problems:
1. Data collection at public health facilities are usually managed by nurses, auxiliary nurse attendants, midwives or auxiliary personnel. Often most of the staff lacks basic training in data management, statistics, analysis and presentation skills (visualization of data).
2. Personnel responsible for in depth data analysis and data screening are often lacking the basic skills needed to produce satisfactory results and existing national training facilities often omit medical information topics from their programs.
3. Ministries of Health are chronically understaffed in their statistics and epidemiology departments. Healthcare workers responsible for data management oftentimes spend too much time recording patient data and other tasks which consequently reduce their time for patient care.
4. It is difficult to recruit qualified human resources to manage HIS in low income countries. Given the scarce amount of IT personnel and the poor incentives to work in the public sector HIS are often understaffed. The consequences of this are grave: lives are at risk when medical records are not available for health service providers while treating patients.

HR4HIS project
Health Metrics Network's (HMN) objective is to strengthen and improve Health Information Systems
(HIS) in middle and low income countries. To achieve this, countries are required to use a set of tools provided by HMN including to follow HMN Framework and Standards for Country Health Information Systems guidelines. The Framework requires countries to follow a three-step process. The first phase requires the country’s stakeholder group to meet and complete an HMN assessment. Once the assessment is complete and approved by the Secretariat, the country enters the second phase: strategic planning. During this phase the stakeholder group is required to use the information gathered from the assessment and to create a strategic plan. The third and last phase is where the country begins implementing HIS strengthening activities.

HMN has six Wave One countries. Four out of six of these countries are now entering the third phase of the Framework process. This moment is crucial for the success of HIS strengthening activities. There are many actors involved in HIS implementation and it is therefore imperative that HMN has baseline data on HR for more effective and efficient results.

Clear and concise data collection is important from the moment the physician sees its patient. Nevertheless, health facilities oftentimes have unqualified staff or experience high turnover rates. This makes it difficult to maintain systematic and viable data processing within countries. If the initial data collected is not satisfactory, it inevitably creates use of improper data at national, regional and international levels. Therefore, it is crucial that human resources (HR) at each step of the chain are properly trained and knowledgeable to manage their responsibilities accordingly. It is crucial for HMN to better understand HR for HIS in low and middle income countries in order to properly advocate and mobilize funding and resources to the health sectors and health workers most in need for training and HR personnel. To properly manage HIS it is imperative that there is inside knowledge and experience of systems and management structures.

**Project Procedure**

To respond to these questions a case study in two of the six Wave One countries will be carried out. Two candidates will be sent to each the two countries for a duration of two weeks. Each candidate will be responsible for finding data concerning:

- Number of existing staff responsible for HIS at different facility levels (Ministry, Hospital, Health Centres, District and Provincial Health Administration and possibly private clinics.
- Tasks HIS workers are responsible for (Who fills out the patient forms? How many different types of forms are there? How much time does each of the healthcare workers spend on filling out forms? Is an electronic system in place or is it strictly paper-based? Where does the data go once collected? Etc.)
- Have people responsible for data collection/analysis undergone specific HIS training (basic diploma degree and/specific HIS training on the job? Does the training respond to the requirements for HIS workers' individual tasks?
- How much did training cost (if any), refresher courses, workshops, etc.
- Who financed the training? The Ministry of Health? The hospital? Donors?

The students will collect data through interviews of key HIS stakeholders using a standard questionnaire prepared prior to departure. The candidates will also be expected to give visual descriptions of the

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74 An HMN Wave One country is a country that has received an HMN Wave One country grant in addition to the small grant and additional technical support from the HMN Secretariat. The six Wave One countries are the following: Belize, Cambodia, Ethiopia, Sierra Leone, Syria and Zambia.
Relevance of the Final report to the Country and to HMN

This final report can greatly benefit the country as well as HMN. To the country the final report could:

1. Disclose gaps in staff training
2. Underline deficit in number of staff
3. Expose budget shortages and imbalances in budget allocation
4. Show the differences between regions and facility types
5. Evidence time staff spends filling forms and seeing patients
6. Possibly disclose reasons for high staff turnover rates, if any

To HMN the final report could:

1. Disclose potential areas in need for further technical support
2. Explain why certain HIS components progress at a higher rate than others
3. Give reasons to involve other partners
4. Give evidence to better define HIS strengthening mechanisms

Requirements

The candidates will be responsible for submitting a final report on the countries visited including a section summarizing the overall results of the two case-studies. The completed questionnaires will be included in the Annexes. The students will also have the option to prepare a brief highlight on their results for the HMN Weekly Highlights as well as a more elaborate article for the HMN biannual Newsletter. And finally, if the students are willing, there is the option to prepare a poster on the findings for the Global Health Information Forum, which takes place in Bangkok 28-30 January 2010.

Profile of the Candidate

English proficiency is required. The candidate has some field experience in middle or low income countries as well as knowledge of public health issues, and the ability to collect and analyse data. The candidate should be flexible and tolerant of sometimes challenging environments.
### Lusaka

<table>
<thead>
<tr>
<th>Structure</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Health</td>
<td>Directorate of Planning and Development</td>
</tr>
<tr>
<td></td>
<td>HMIS</td>
</tr>
<tr>
<td></td>
<td>Sentinel Surveillance (if different to HMIS)</td>
</tr>
<tr>
<td></td>
<td>Epidemic Alert (if different to HMIS)</td>
</tr>
<tr>
<td></td>
<td>National Malaria Control Centre</td>
</tr>
<tr>
<td></td>
<td>National AIDS Council</td>
</tr>
<tr>
<td></td>
<td>Statistical</td>
</tr>
<tr>
<td></td>
<td>ICT</td>
</tr>
<tr>
<td></td>
<td>HR</td>
</tr>
<tr>
<td></td>
<td>Finance</td>
</tr>
<tr>
<td>Central Statistical Office</td>
<td>Any</td>
</tr>
<tr>
<td>Province Health Office</td>
<td>HMIS</td>
</tr>
<tr>
<td></td>
<td>Finance</td>
</tr>
<tr>
<td></td>
<td>Sentinel Surveillance (if different to HMIS)</td>
</tr>
<tr>
<td></td>
<td>Epidemic Alert (if different to HMIS)</td>
</tr>
<tr>
<td>District Health Office</td>
<td>HMIS</td>
</tr>
<tr>
<td>Level 3 Hospital</td>
<td>Various people, depending on what exists, what is available, what appears to be most relevant (HR, Finance, HMIS, ICT, medical staff, data entry clerks)</td>
</tr>
<tr>
<td>Level 2 Hospital</td>
<td>As above.</td>
</tr>
<tr>
<td>Level 1 health structures</td>
<td>As above.</td>
</tr>
<tr>
<td>(health centres, health posts)</td>
<td></td>
</tr>
<tr>
<td>Other partners</td>
<td>DFID, USAID, WHO (where possible)</td>
</tr>
</tbody>
</table>
### Copperbelt Province

<table>
<thead>
<tr>
<th></th>
<th>Province Health Office</th>
<th>District Health Office</th>
<th>Level 3 Hospital</th>
<th>Level 2 Hospital</th>
<th>Level 1 health structures (health centres, health posts)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HMIS</td>
<td>HMIS</td>
<td>Various people, depending on what exists, what is available,</td>
<td>As above</td>
<td>As above</td>
</tr>
<tr>
<td></td>
<td>Finance</td>
<td></td>
<td>what appears to be most relevant (HR, Finance, HMIS, ICT, medical staff, data entry clerks)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HR</td>
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</tr>
<tr>
<td></td>
<td>Sentinel Surveillance/Epidemic alert (if different from HMIS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Southern Province:

<table>
<thead>
<tr>
<th></th>
<th>Province Health Office</th>
<th>District Health Office</th>
<th>Level 3 Hospital</th>
<th>Level 2 Hospital</th>
<th>Level 1 health structures (health centres, health posts)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HMIS</td>
<td>HMIS</td>
<td>Various people, depending on what exists, what is available,</td>
<td>As above</td>
<td>As above</td>
</tr>
<tr>
<td></td>
<td>Finance</td>
<td></td>
<td>what appears to be most relevant (HR, Finance, HMIS, ICT, medical staff, data entry clerks)</td>
<td></td>
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<tr>
<td></td>
<td>HR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sentinel Surveillance/Epidemic alert (if different to HMIS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Addis Ababa

<table>
<thead>
<tr>
<th>Structure</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Health</td>
<td>Planning and Programme Development (PPD)</td>
</tr>
<tr>
<td></td>
<td>Sentinel surveillance/epidemic alert</td>
</tr>
<tr>
<td></td>
<td>Statistics</td>
</tr>
<tr>
<td></td>
<td>Information and Communication Technology (ICT)</td>
</tr>
<tr>
<td></td>
<td>Human resources (HR)</td>
</tr>
<tr>
<td></td>
<td>Finance</td>
</tr>
<tr>
<td>Central Statistical Office</td>
<td>Any</td>
</tr>
<tr>
<td>Regional Health Bureau (RHB)</td>
<td>HMIS</td>
</tr>
<tr>
<td></td>
<td>Finance</td>
</tr>
<tr>
<td></td>
<td>Sentinel Surveillance (if different to HMIS)</td>
</tr>
<tr>
<td></td>
<td>Epidemic Alert (if different to HMIS)</td>
</tr>
<tr>
<td>Specialized hospital</td>
<td>Various people, depending on what exists, what is available, what appears to be most relevant (HR, Finance, HMIS, ICT, medical staff, data entry clerks)</td>
</tr>
<tr>
<td>Zonal hospital</td>
<td>As above</td>
</tr>
<tr>
<td>District hospital</td>
<td>As above</td>
</tr>
<tr>
<td>Primary Health Care Unit (health centres, health posts)</td>
<td>As above</td>
</tr>
<tr>
<td>Other partners</td>
<td>DFID, USAID, WHO (where possible), JSI, Tulane University</td>
</tr>
</tbody>
</table>

### Dire Dawa

<table>
<thead>
<tr>
<th>Structure</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional Health Bureau (RHB)</td>
<td>HMIS</td>
</tr>
<tr>
<td></td>
<td>Finance</td>
</tr>
<tr>
<td>Structure</td>
<td>Department</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>Regional Health Bureau (RHB)</td>
<td>HMIS</td>
</tr>
<tr>
<td></td>
<td>Finance</td>
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<tr>
<td></td>
<td>Sentinel Surveillance (if different to HMIS)</td>
</tr>
<tr>
<td></td>
<td>Epidemic Alert (if different to HMIS)</td>
</tr>
<tr>
<td>Specialised hospital</td>
<td>Various people, depending on what exists, what is available, what appears to be most relevant (HR, Finance, HMIS, ICT, medical staff, data entry clerks)</td>
</tr>
<tr>
<td>Zonal hospital</td>
<td>As above.</td>
</tr>
<tr>
<td>District hospital</td>
<td>As above.</td>
</tr>
<tr>
<td>Primary Health Care Unit (health centres, health posts)</td>
<td>As above.</td>
</tr>
</tbody>
</table>
SERVICE LEVEL

Initial data collection stage
1. Who ensures that a patient’s visit is recorded? (if applicable, dedicated staff member upon arrival/dedicated staff member upon payment/medical staff/other)
How many people are involved in this task? How many times might information concerning the patient be recorded? In what order?
If a patient’s visit may not be recorded, for what reason(s)?

2. How much time do they spend on this? (if dedicated staff member, part-time/full-time? if not, how much time do they spend on this?)
How many people are registered per day?
If not dedicated staff member: at peak periods, do you reduce the proportion of time spent on information management? If yes, do you compensate for this? How?

3. Is there a standardised data collection form? (if yes, who provided it? if not, how is data recorded?)
Is it possible that more than one form is filled in for the same patient during the same visit?
If there are several forms, which do you find more convenient/relevant?

4. Is data collected on paper or electronically?
If paper based, is it recopied later onto a computer? By whom? Is it possible that some data may not be recopied? Why?

Data storage
5. Who ensures that data is stored and filed? (part-time/full-time dedicated staff member/medical staff/other)
How many people are involved in this task?

6. If electronic records are kept, who manages the IT issues? (IT dedicated staff/medical staff/other)

Preliminary analysis
7. Who ensures that data is subjected to a preliminary analysis? (part-time/full-time dedicated staff member/medical staff/other)
How many people are involved in this task?

8. What do you usually do with data collected? Nothing/Pre-process/Analyse to inform decision-making/Pass to a higher body/Other?

Data transfer
9. If a patient is transferred to a different hospital, who is charge of passing on their details? (part-time/full-time dedicated staff member/medical staff/other)
   By which means are they transferred? (paper/electronically/...)

10. If data is passed on to a higher body, which is this? (National service level/Regional or Provincial service level/National admin. level/Regional or Provincial admin. level)
   Who ensures this? (part-time/full-time dedicated staff member/medical staff/other)
   How often?

11. If you receive feedback on data provided, from whom? (National service level/Regional or Provincial service level/National admin. level/Regional or Provincial admin. level)

Budget
12. Do you have a specific budget allocated to HR for HIS? (how much?)

ADMINISTRATION LEVEL

13. Who do you receive information/data from? (National service level/Regional or Provincial service level/National admin. level/Regional or Provincial admin. Level/District level)

14. Who ensures that data received is processed? (Epidemiologists/Statisticians/Medical staff/Administrative staff/Other)

   How many people are involved in this task? Is this their main duty?

15. What is the aim of the data processing? (Report to MOH decision-makers/Report to donors/Research/Feedback to medical centres/Other)

16. Do you have a specific budget allocated to HR for HIS? (how much?)

TRAINING
17. Is there any pre-service/in-service training on HIS use/management? (Technical training/Action-orientated training)

Is this compulsory or voluntary?
What does it cover? (Data collection/Data storage/Preliminary analysis/Data transfer/Analysis/Other)
18. Who provides the training? (MOH/Donors/Hospitals/Other)
19. What were the good and/or bad elements of the training?

Was this focused on requirements specific to your job? Did your training set out standardised guidelines to follow in your work?
If there are different types of training, which do you find the most relevant?
20. Who finances this? (MOH/Donors/Hospitals/Other)
21. How much does it cost to organise a training session?

ADDITIONAL QUESTIONS

22. What do you think of the health information system in place?
23. What problems, if any, do you come across at each stage of the HIS? What constraints prevent you or your colleagues effectively carrying out tasks related to the HIS? (High turnover/Inexperienced or insufficiently trained staff/No clear guidelines/Unclear goal/Lack of budget for dedicated staff leads to: other medical workers dedicating time to this role; to backlog of work; to poor HIS management)

How could the HIS be improved: what information should be collected? what is unnecessary? Are you satisfied with the level of training of your fellow staff and their ability to collect/process data?
24. What purpose do you see the information you collect having?
25. What do you think about the amount of time dedicated to this? (Satisfactory/Insufficient/Other)
26. (Rural areas) Are there any particular difficulties due to the rural situation?

(Rural areas) Do you feel that you are cut out of the loop or kept well updated by the MoH or district and provincial health offices?
## Ethiopia

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who ensures that a patient’s visit is recorded? (if applicable, dedicated staff member upon arrival/dedicated staff member upon payment/medical staff/other)</td>
<td>There are two parts in the card room: one for keeping the paper version of patients' files; another is called Medical Recording SMART CARE in order to keep Patients' basic identifications on the computer.</td>
</tr>
<tr>
<td>What is the aim of the data processing? (Report to MOH decision-makers/Report to donors/Research/Feedback to medical centres/Other)</td>
<td>At service level:&lt;br&gt;- Assigning people to each region (then regions assign to woredas)&lt;br&gt;- Training more personnel (need)&lt;br&gt;- Planning</td>
</tr>
<tr>
<td>Do you have a specific budget allocated to HR for HIS? (how much?)</td>
<td>- Local training: 100000 birrs to 200000&lt;br&gt;- Capacity building&lt;br&gt;- Long-term training&lt;br&gt;- Orientation purpose</td>
</tr>
<tr>
<td>How much time do they spend on this? (if dedicated staff member, part-time/full-time; if not, how much time do they spend on this )</td>
<td>- Recording patient history takes a few seconds&lt;br&gt;- 3 or 4 new patients, 70 in all on average&lt;br&gt;- At Peak period: no reduction</td>
</tr>
<tr>
<td>What do you usually do with data collected? Nothing/Pre-process/Analyse to inform decision-making /Other?</td>
<td>Registration of data collected from outpatient/inpatient, then compilation/aggregation, and monthly report to stakeholders and RHB</td>
</tr>
<tr>
<td>At administrative level, how many people are involved in receiving data from lower levels?</td>
<td>HMIS team are currently contracted by Global funds but work with Planning and Programme department/RHB. PPD/RHB has plan in the future to include the HMIS team after the BPR(Business Process Re-engineering).</td>
</tr>
<tr>
<td>Is there any pre-service/in-service training on HIS use/management? (Technical training/Action-orientated training)</td>
<td>5-days training, compulsory, on data registration/HMIS Disease Classification</td>
</tr>
<tr>
<td>What were the good and/or bad elements of the training?</td>
<td>- Good: increase computer skills on HMIS&lt;br&gt;- Bad: Not enough training on IT operation/ lack of continuity on IT knowledge</td>
</tr>
<tr>
<td>What problems, if any, do you come across at each stage of the HIS?</td>
<td>Problems:&lt;br&gt;- Training: register patient info on registry book. But I also have to collect talli sheet from departments within the hospital, which is a real data burden&lt;br&gt;- Lack of time&lt;br&gt;- Personnel at OPD neglect the input of data to be then collected&lt;br&gt;Improvements: I'd like to have a software which</td>
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</table>
would generate automatically reports (statistician speaking)
**Zambia**

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
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<tbody>
<tr>
<td>If you receive feedback on data provided, from whom?</td>
<td>“There is little feedback from the Ministry. We don’t know whether the data we provided was good or not. More feedback would boost motivation, right now we don’t even know whether the ministry is looking at this information or not, we’re thinking – is it really necessary? The info should be helping the districts plan according to catchment areas, but sometimes when you compare the information to the plans that are formulated – there is a mismatch, disjoint, you think – did they really pay any attention to the info we just gave them?” Louis Mwile, Health Information Officer, Lusaka Provincial Health Office</td>
</tr>
<tr>
<td>What constraints prevent you or your colleagues effectively carrying out tasks related to the HIS?</td>
<td>“We get minimal feedback and so we don’t know if the information is useful. Although we’re basically ICT officers, apart from Andrew [Kashoka, Information Management Officer] who is qualified for the analysis tasks, we are really sitting in the middle. We’re trying to think for them [the Ministry], help them realize what they need the data for. They are more interested in figures but not much further. We’re trying to anticipate their needs, explain why they’ve introduced certain data. Thinking to make planning done more intelligently and effectively. Many of the current errors come from the previously inserted data. Validation is now required and this has improved things.” Innocent Chiboma, Senior ICT officer, Ministry of Health, Lusaka</td>
</tr>
<tr>
<td>What purpose do you see the information you collect having?</td>
<td>“You can’t solve any problem without looking at the data. It’s the only way to see whether you make a difference or not.” Edwin Gwai – Head of Information – Copperbelt PHO</td>
</tr>
<tr>
<td>What purpose do you see the information you collect having?</td>
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<td>----------------------------------------------------------</td>
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<tr>
<td>“Everyone is talking about the MDGs, it was ok 3-4 years ago, but now it’s time to speak about “impact”, because everyone knows the MDGs exist! Now what is important is to see how and why are the number of cases decreases. Those are real issues. For instance: if there is the good number of staff everywhere, then what does it mean in terms of deaths of pregnant women? What did it change for them? Did it increase their level of trust? Are they more ready to come?”</td>
<td></td>
</tr>
</tbody>
</table>

*Dr Christopher Simoonga, Directorate of Development and Planning, MOH, Lusaka*
Annexe 6 – Zambia – Final trip schedule

### HR4HIS assessment: Zambia Agenda

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Activity/Structure visited</th>
<th>Interviewees</th>
</tr>
</thead>
<tbody>
<tr>
<td>02/11/09</td>
<td>8:00 AM</td>
<td>WHO</td>
<td>Principal Planning and Health Economist (WHO Focal Point)</td>
</tr>
<tr>
<td></td>
<td>2:00 PM</td>
<td>MOH - Directorate of Planning and Development</td>
<td>Director of Monitoring and Evaluation (MOH Focal Point); WHO HMIS Consultant</td>
</tr>
<tr>
<td>03/11/09</td>
<td>8:00 AM</td>
<td>MOH - ICT department</td>
<td>1 Data Management Officer; 2 Senior ICT Officers</td>
</tr>
<tr>
<td></td>
<td>10:30 AM</td>
<td>MOH- HR department</td>
<td>Head of HR Management Unit; Head of HR Planning Unit</td>
</tr>
<tr>
<td></td>
<td>2:00 PM</td>
<td>University Teaching Hospital (UTH) (Level 3)</td>
<td>Head of ICT department</td>
</tr>
<tr>
<td></td>
<td>4:00 – 8:00 PM</td>
<td>MOH - Directorate of Planning and Development</td>
<td>Briefing with MOH Focal Point</td>
</tr>
<tr>
<td>04/11/09</td>
<td>5:00 AM</td>
<td>Leave for Copperbelt Region</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11:00 AM</td>
<td>Arrival in Copperbelt Region</td>
<td>Meeting at Copperbelt PHO</td>
</tr>
<tr>
<td></td>
<td>11:00 AM</td>
<td>Copperbelt PHO</td>
<td>Head of MOH - HMIS department</td>
</tr>
<tr>
<td></td>
<td>12:00 PM</td>
<td>Ndola Central Hospital (Level 3)</td>
<td>Hospital Director; Information Officer; Data Processing Officer</td>
</tr>
<tr>
<td></td>
<td>2:30 PM</td>
<td>Mpongwe DHO</td>
<td>District Health Information Officer</td>
</tr>
<tr>
<td></td>
<td>3:00 PM</td>
<td>Luanshya DHO</td>
<td>District Health Information Officer</td>
</tr>
<tr>
<td></td>
<td>3:30 PM</td>
<td>Ndola Central Hospital (Level 3)</td>
<td>Head of HR Officer; Nursing Officer</td>
</tr>
<tr>
<td></td>
<td>5:00 PM</td>
<td>Copperbelt PHO</td>
<td>Province Health Information Officer</td>
</tr>
<tr>
<td>05/11/09</td>
<td>9:00 AM</td>
<td>Ronald Ross Hospital (Level 2)</td>
<td>Health Information Officer; Enrolled Nurse; Clinical Officer;</td>
</tr>
<tr>
<td>Date</td>
<td>Time</td>
<td>Location</td>
<td>Staff Members</td>
</tr>
<tr>
<td>------------</td>
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<td>---------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>06/11/09</td>
<td>11:30 AM</td>
<td>Kamuchanga District Hospital (Level 1)</td>
<td>HR Development and Training Officer; HR Management Officer; Pharmacist</td>
</tr>
<tr>
<td></td>
<td>2:00 PM</td>
<td>Leave for Lusaka</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9:00 PM</td>
<td>Arrival in Lusaka</td>
<td>(Late arrival due to diesel shortage)</td>
</tr>
<tr>
<td>06/11/09</td>
<td>9:00 AM</td>
<td>UTH (Level 3)</td>
<td>2 Medical Records Officers; 1 Senior Medical Records Officer; 1 Clerk; 1 Medical Records Clerk; 1 Chest Clinic Clerk; 1 Registered Nurse</td>
</tr>
<tr>
<td></td>
<td>2:00 PM</td>
<td>Lusaka PHO</td>
<td>Province Health Information Officer</td>
</tr>
<tr>
<td></td>
<td>5:00 – 8:30 PM</td>
<td>MOH - Directorate of Planning and Development</td>
<td>Briefing with MOH Focal Point</td>
</tr>
<tr>
<td>09/11/09</td>
<td>09:00 AM</td>
<td>Leave for Southern Region</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12:00 AM</td>
<td>Arrival in Southern Region</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2:00 PM</td>
<td>Southern PHO</td>
<td>HR Management Officer; Planning and Budget Officer</td>
</tr>
<tr>
<td>10/11/09</td>
<td>8:00 AM</td>
<td>Kazungula DHO</td>
<td>HR Officer</td>
</tr>
<tr>
<td></td>
<td>11:00 AM</td>
<td>Mambova Rural Health Centre</td>
<td>Nurse in Charge; Environmental Health Technician</td>
</tr>
<tr>
<td></td>
<td>12:30 PM</td>
<td>Kazungulga Rural Health Centre</td>
<td>Midwife; Nurse</td>
</tr>
<tr>
<td></td>
<td>2:00 PM</td>
<td>Livingstone Central Hospital (Level 2)</td>
<td>HMIS Officer; Registry Clerk</td>
</tr>
<tr>
<td></td>
<td>4:00 PM</td>
<td>Kazungula DHO</td>
<td>District Health Information Officer</td>
</tr>
<tr>
<td></td>
<td>4:45 PM</td>
<td>Livingstone Central Hospital (Level 2)</td>
<td>Principal Nursing Officer</td>
</tr>
<tr>
<td>11/11/09</td>
<td>9:00 AM</td>
<td>Leave for Lusaka</td>
<td></td>
</tr>
<tr>
<td>11:00 AM</td>
<td>Arrival in Lusaka</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:00 PM</td>
<td>WHO National Programme Officer Surveillance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:30 PM</td>
<td>CSO Principal Demographer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5:00 – 8:30 PM</td>
<td>MOH - Directorate of Planning and Development Briefing with MOH Focal Point</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/11/09</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8:30 AM</td>
<td>Lusaka PHO Briefing with Province HMIS Officer before travel to DHO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:30 AM</td>
<td>Chongwe DHO District Health Information Officer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:30 AM</td>
<td>Kabeleka Health Post Nurse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:00 PM</td>
<td>Chiyota Health Post Enrolled Nurse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:00 PM</td>
<td>Kafue District Hospital Hospital Information Officer; Registered Nurse; Registry Clerk; Medical Doctor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13/11/09</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8:00 AM</td>
<td>USAID (ABT Associates) Health Systems and Services Programme Responsible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00 AM</td>
<td>MOH - ICT department Senior ICT Officer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:00 PM</td>
<td>National AIDS Council Statistician; NAF Expert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8:00 – 9:30 PM</td>
<td>MOH - Directorate of Planning and Development Debriefing with MOH Focal Point</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### HR4HIS assessment: Ethiopia Agenda

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Activity/Structure visited</th>
<th>Interviewees</th>
</tr>
</thead>
<tbody>
<tr>
<td>02/11/2009</td>
<td>10:00AM</td>
<td>Meet Dr Gebrekidan, WHO focal point</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>2:00 PM</td>
<td>FMOH-PPF/ HMIS Directorate</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>3:30 PM</td>
<td>FMOH-HRH Directorate</td>
<td>1 senior chief expert</td>
</tr>
<tr>
<td>03/11/2009</td>
<td>8:00AM</td>
<td>FMOH-ICT Directorate</td>
<td>3 IT officers</td>
</tr>
<tr>
<td></td>
<td>10:30 AM</td>
<td>Regional Health Bureau, Addis Ababa</td>
<td>3 HMIS Officers (PM&amp;E)</td>
</tr>
</tbody>
</table>
|            | 2:00 PM | (Federal/ Specialised hospital, Addis Ababa)Visit St Paul's Hospital | * 1 physician  
* 1 head of planning  
* 1 card clerk  
* 1 nurse |
| 04/11/2009 | 2:00 PM | (city/Regional hospital, Addis Ababa) Yikatit 12               | * 1 HR manager  
* 1 Planning officer  
* 1 triage nurse  
* 1 card clerk   |
|            | 8:00AM  | Arrival in Dire Dawa                                           | N/A                                |
|            | 09:30AM | Regional Health Bureau, Dire Dawa                               | N/A                                |
| 05/11/2009 | 10:00 AM| (PHCU, Dire Dawa)Legehare Health Center                       | * 2 midwives  
* 1 IT officer |
|            | 11:00 AM| (PHCU, Dire Dawa)Sabian Health Center                         | 1 nurse                             |
|            | 15:00PM | (Regional hospital, Dire Dawa)Dilchora                         | * 2 physicians  
* 1 IT officer |
<p>| 05/11/2009 | Noon    | Arrival in Awassa                                             | N/A                                |</p>
<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Position/Role</th>
</tr>
</thead>
</table>
| 06/11/2009 | 2:00 PM | Referral Hospital in Awassa                                            | * 1 statistician  
* 3 porters  
* 2 runners  
* 3 card clerks  
* 1 nurse  
* Hospital manager |
| 06/11/2009 | 09:00AM | Regional Health Bureau, Dire Dawa                                        | * Head of Planning and Program department  
* 1 HMIS clerk |
|            | 11:00 AM | (PHCU, Dire Dawa): Halobusa Health Post                                  | N/A                                              |
| 06/11/2009 | 8:00 PM  | Regional Health Bureau, Awassa                                          | * 2 HMIS officers  
* Head of PM&E |
| 06/11/2009 | 9:30 AM  | (PHCU, Awassa): Health Centre Awassa                                    | * Head of adm/finance dept  
* 2 card clerks  
* 1 health officer  
* Head of HC |
| 09/11/2009 | 9:00 AM  | (Regional hospital, Addis Ababa) Ras Desta Hospital                     | * 1 physician  
* Head of Planning  
* 1 HMIS officer  
* 1 Nurse  
* 1 Statistician  
* 1 card clerk |
|            | 2:00 PM  | (Federal/ Specialised hospital, Addis Ababa) Alert Hospital             | * CEO of hospital  
* 1 Health reform officer  
* 1 medical director |
| 10/11/2009 | 9:00 AM  | (PHCU, Addis Ababa) Entoto no1                                           | 2 nurses |
|            | 2:00 PM  | (city/PHCU,Addis Ababa) Kotebe                                           | * 2 Health officers  
* 1 nurse |
| 11/11/2009 | 11:00 AM | (Sub-City/Addis Ababa) Yeka Sub-City Health office                      | * 1 nurse  
* Head of Health office |
<p>|            | 5:00 PM  | EHNRI                                                                   | * 1 deputy director |</p>
<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>WHO:</th>
<th>JSI</th>
<th>Meeting with:</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/11/2009</td>
<td>10:00 AM</td>
<td>* epidemic alert department  * sentinel surveillance</td>
<td>* 2 epidemiologists</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>16:00 PM</td>
<td>JSI</td>
<td></td>
<td></td>
<td>1 officer</td>
</tr>
<tr>
<td>13/11/2009</td>
<td>10:00 AM</td>
<td>Meeting with: * Dr Woldemariam * Dr Nejmuadin Kedir * Dr Mesfin Gebrekidan</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
</tbody>
</table>
Annexe 8 – Ethiopia - FMOH/Family Folder for the Health Extension Program

### Federal Ministry of Health

**Family Folder for the Health Extension Program**

<table>
<thead>
<tr>
<th>Region</th>
<th>伦理</th>
<th>Religion</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family member's name</td>
<td>Mother name</td>
<td>Date of birth registration</td>
<td></td>
</tr>
<tr>
<td>Name of head of the family</td>
<td>Father</td>
<td>Grandfather</td>
<td></td>
</tr>
<tr>
<td>Household member's description</td>
<td>Individual ID</td>
<td>Name</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Individual ID</th>
<th>Name</th>
<th>DOB</th>
<th>Place of birth</th>
<th>Sex</th>
<th>Occupation</th>
<th>Married status</th>
<th>Date of death</th>
<th>Cause of death</th>
</tr>
</thead>
</table>

**Hand washing facility**

<table>
<thead>
<tr>
<th>Type</th>
<th>Date having facility</th>
</tr>
</thead>
</table>

**Waste disposal system**

<table>
<thead>
<tr>
<th>Type</th>
<th>Date having waste disposal system</th>
</tr>
</thead>
</table>

**EEF Program training status**

<table>
<thead>
<tr>
<th>Package</th>
<th>Training date needed</th>
<th>Training date completed</th>
<th>Remark</th>
</tr>
</thead>
</table>

**Household members**

<table>
<thead>
<tr>
<th>Region</th>
<th>Mother</th>
<th>Father</th>
<th>Grandfather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family member's name</td>
<td>Name</td>
<td>Date of birth registration</td>
<td></td>
</tr>
<tr>
<td>Name of head of the family</td>
<td>Father</td>
<td>Grandfather</td>
<td></td>
</tr>
<tr>
<td>Household members' description</td>
<td>Individual ID</td>
<td>Name</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Individual ID</th>
<th>Name</th>
<th>DOB</th>
<th>Place of birth</th>
<th>Sex</th>
<th>Occupation</th>
<th>Married status</th>
<th>Date of death</th>
<th>Cause of death</th>
</tr>
</thead>
</table>

**Health Extension and Communication**

<table>
<thead>
<tr>
<th>Package</th>
<th>Training date needed</th>
<th>Training date completed</th>
<th>Remark</th>
</tr>
</thead>
</table>

**Household members' description**

<table>
<thead>
<tr>
<th>Region</th>
<th>Mother</th>
<th>Father</th>
<th>Grandfather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family member's name</td>
<td>Name</td>
<td>Date of birth registration</td>
<td></td>
</tr>
<tr>
<td>Name of head of the family</td>
<td>Father</td>
<td>Grandfather</td>
<td></td>
</tr>
<tr>
<td>Household members' description</td>
<td>Individual ID</td>
<td>Name</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Individual ID</th>
<th>Name</th>
<th>DOB</th>
<th>Place of birth</th>
<th>Sex</th>
<th>Occupation</th>
<th>Married status</th>
<th>Date of death</th>
<th>Cause of death</th>
</tr>
</thead>
</table>

**Health Extension and Communication**

<table>
<thead>
<tr>
<th>Package</th>
<th>Training date needed</th>
<th>Training date completed</th>
<th>Remark</th>
</tr>
</thead>
</table>

**Household members' description**

<table>
<thead>
<tr>
<th>Region</th>
<th>Mother</th>
<th>Father</th>
<th>Grandfather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family member's name</td>
<td>Name</td>
<td>Date of birth registration</td>
<td></td>
</tr>
<tr>
<td>Name of head of the family</td>
<td>Father</td>
<td>Grandfather</td>
<td></td>
</tr>
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<td>Household members' description</td>
<td>Individual ID</td>
<td>Name</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Individual ID</th>
<th>Name</th>
<th>DOB</th>
<th>Place of birth</th>
<th>Sex</th>
<th>Occupation</th>
<th>Married status</th>
<th>Date of death</th>
<th>Cause of death</th>
</tr>
</thead>
</table>
### Human Resources for Health Information Systems: a fact-finding study, January 2010

**Annexe 10 – Ethiopia - FMOH / Newborn Card**

#### Newborn Card

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Normal</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head circumference</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abdominal circumference</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Birth Weight and Length Chart**

- **Weight-for-age BOYS**
- **Length/height-for-age BOYS**

- **Weight-for-age GIRLS**
- **Length/height-for-age GIRLS**
Annexe 11 – Ethiopia – Addis Ababa RHB report sheet

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Ethiopian Ministry of Health</th>
<th>Addis Ababa City Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Information System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source of the Disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Addis Ababa City Administration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Addis Ababa (All But City)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Ethiopian Ministry of Health</th>
<th>Addis Ababa City Administration</th>
<th>Addis Ababa (All But City)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Information System</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source of the Disease</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Ethiopian Ministry of Health</th>
<th>Addis Ababa City Administration</th>
<th>Addis Ababa (All But City)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Information System</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source of the Disease</td>
<td></td>
<td></td>
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</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Parameters</th>
<th>Ethiopian Ministry of Health</th>
<th>Addis Ababa City Administration</th>
<th>Addis Ababa (All But City)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Information System</td>
<td></td>
<td></td>
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<tr>
<td>Source of the Disease</td>
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<table>
<thead>
<tr>
<th>Parameters</th>
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<th>Addis Ababa City Administration</th>
<th>Addis Ababa (All But City)</th>
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<tbody>
<tr>
<td>Health Information System</td>
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<td></td>
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</tr>
<tr>
<td>Source of the Disease</td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

<table>
<thead>
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<th>Parameters</th>
<th>Ethiopian Ministry of Health</th>
<th>Addis Ababa City Administration</th>
<th>Addis Ababa (All But City)</th>
</tr>
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<tbody>
<tr>
<td>Health Information System</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Source of the Disease</td>
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<td></td>
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</tr>
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</table>

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Ethiopian Ministry of Health</th>
<th>Addis Ababa City Administration</th>
<th>Addis Ababa (All But City)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Information System</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source of the Disease</td>
<td></td>
<td></td>
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</tr>
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</table>
Annexe 12 – Ethiopia – Addis Ababa Patient’s file
### Top 20 Leading Causes of Out-Patient Visit by Health Facility

<table>
<thead>
<tr>
<th>Type of Diagnosis</th>
<th>ICD Code</th>
<th>Cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>General causes</td>
<td>000-04</td>
<td>2770</td>
<td>7%</td>
</tr>
<tr>
<td>Neoplasms of respiratory system</td>
<td>000-04</td>
<td>2485</td>
<td>3%</td>
</tr>
<tr>
<td>All other diseases of childhood</td>
<td>164.1</td>
<td>2335</td>
<td>1%</td>
</tr>
<tr>
<td>Infants (under 1 year)</td>
<td>199.2</td>
<td>1991</td>
<td>4%</td>
</tr>
<tr>
<td>Other diseases and conditions of the ear</td>
<td>177.2</td>
<td>1081</td>
<td>2%</td>
</tr>
<tr>
<td>All other respiratory system</td>
<td>328.3</td>
<td>8095</td>
<td>2%</td>
</tr>
<tr>
<td>Hypertension with heart disease</td>
<td>380.1</td>
<td>1417</td>
<td>3%</td>
</tr>
<tr>
<td>Tumours of other leukaemia</td>
<td>150.1</td>
<td>1216</td>
<td>3%</td>
</tr>
<tr>
<td>Other diseases and conditions of the eye</td>
<td>199.2</td>
<td>1991</td>
<td>4%</td>
</tr>
<tr>
<td>Other diseases of respiratory system</td>
<td>328.1</td>
<td>8095</td>
<td>2%</td>
</tr>
<tr>
<td>Other diseases of eye</td>
<td>157.1</td>
<td>923</td>
<td>2%</td>
</tr>
<tr>
<td>Other diseases of digestive system</td>
<td>215.1</td>
<td>604</td>
<td>2%</td>
</tr>
<tr>
<td>Hypertension of puerperium</td>
<td>190.1</td>
<td>823</td>
<td>2%</td>
</tr>
<tr>
<td>Typhoid fever</td>
<td>038.0</td>
<td>6/10</td>
<td>1%</td>
</tr>
<tr>
<td>Aids caused by herpes simplex virus carrier</td>
<td>198.6</td>
<td>964</td>
<td>1%</td>
</tr>
<tr>
<td>Total of 20 leading causes</td>
<td></td>
<td>30002</td>
<td>100%</td>
</tr>
<tr>
<td>Total of all cases</td>
<td></td>
<td>65596</td>
<td>100%</td>
</tr>
</tbody>
</table>
### Annexe 14 – Ethiopia – Yirgalem Tally Sheet (SNNPR)

<table>
<thead>
<tr>
<th>Sr.</th>
<th>CARD NO</th>
<th>AGE</th>
<th>NDX</th>
<th>ADDRESS</th>
<th>CLINICAL X</th>
<th>HIV INVESTIGATION X</th>
<th>LABORATORY X</th>
<th>FOOD INVESTIGATION X</th>
<th>WHO CODE</th>
<th>RECEIVED</th>
<th>ISSUED TO</th>
<th>REMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**TOTAL NO OF REPEATED CASES (ALREADY DIAGNOSED BEFORE):**

**TOTAL NO OF NEW CASES:**

**OPD ASSISTANT NAME & SIGNATURE:**

**ONE PHYSICIAN NAME & SIGNATURE:**

N = 022 E.O. 02/2010/RCO-GAC
### MINISTRY OF HEALTH
### UNIVERSITY TEACHING HOSPITAL
### TUBERCULOSIS PATIENTS
### NOTIFICATION CARD

<table>
<thead>
<tr>
<th>Name:</th>
<th>Age:</th>
<th>Sex:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### TREATMENT

<table>
<thead>
<tr>
<th>BODY WEIGHT</th>
<th>START OF TREATMENT</th>
<th>HR</th>
<th>Z</th>
<th>E</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-11 KG</td>
<td>1/2</td>
<td>1 5</td>
<td>1</td>
<td>15MG/</td>
<td>KG</td>
</tr>
<tr>
<td>12-18 KG</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>15MG/</td>
<td>KG</td>
</tr>
<tr>
<td>19-26 KG</td>
<td>1 1/2</td>
<td>1</td>
<td>1</td>
<td>0.50G</td>
<td>M</td>
</tr>
<tr>
<td>27-37 KG</td>
<td>2</td>
<td>1 5</td>
<td>1</td>
<td>0.50G</td>
<td>M</td>
</tr>
<tr>
<td>38-46 KG</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>47-55 KG</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0.75G</td>
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<tr>
<td>56-75 KG</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1.00G</td>
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<tr>
<td>OVER 75 KG</td>
<td>4</td>
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<td>1</td>
<td>1</td>
<td>1.00G</td>
</tr>
</tbody>
</table>

#### INTENSIVE PHASE

WEIGHT:

DATE TREATMENT STARTED:

DATE TREATMENT COMPLETED:

#### SPUTUM ON INVESTIGATIONS AND FOLLOW UPS

<table>
<thead>
<tr>
<th>Month ...</th>
<th>...</th>
<th>...</th>
<th>...</th>
<th>...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sputum ...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
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<tr>
<td>Weight ( )</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

#### CONTINUATION PHASE FOLLOW UP TREATMENTS

WEIGHT:

DATE TREATMENT STARTED:

DATE TREATMENT COMPLETED:

<table>
<thead>
<tr>
<th>Adult:</th>
<th>E</th>
<th>H</th>
<th>19-26 KG</th>
<th>27-37 KG</th>
<th>38-46 KG</th>
<th>47-55 KG</th>
<th>56-75 KG</th>
<th>&gt;75 KG</th>
</tr>
</thead>
<tbody>
<tr>
<td>19-26 KG</td>
<td>1</td>
<td>1</td>
<td>1 1/2</td>
<td>1</td>
<td>1 1/2</td>
<td>6-11 KG</td>
<td>1 1/2</td>
<td></td>
</tr>
<tr>
<td>27-37 KG</td>
<td>1</td>
<td>1</td>
<td>1 1/2</td>
<td>2</td>
<td>2</td>
<td>12-18 KG</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>38-46 KG</td>
<td>1 1/2</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>19-26 KG</td>
<td>1 1/2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>47-55 KG</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>56-75 KG</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>56-75 KG</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>&gt;75 KG</td>
<td>3</td>
<td>4</td>
<td></td>
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</tr>
</tbody>
</table>

Form Rev: 3/21/2002
Annexe 17 – Zambia – UTH Out-Patient First Attendance Card

<table>
<thead>
<tr>
<th>Date</th>
<th>Case History and Progress</th>
<th>Treatment</th>
</tr>
</thead>
</table>

UNIVERSITY TEACHING HOSPITAL
MINISTRY OF HEALTH
OUT-PATIENT FIRST ATTENDANCE CARD

OUT-PATIENT REGISTRATION No. ........................................

NAME: .......................................................... SEX: .................. AGE: .................

RESIDENTIAL ADDRESS: ................................................

NAME OF EMPLOYER AND ADDRESS: ..............................
CASE HISTORY

Child’s Name: .................................................. File No: .................
Presenting Complaints & Duration:

Development of Symptoms:

Past Medical History (Circle the appropriate):
1. Measles
2. TB
3. Diarrhoea
4. Respiratory Infection
5. Others (specify)

If the child has suffered from any illness during the last four weeks give details about; date of illness, duration, and the treatment received including hospitalization or admission to clinics.

Birth History: 1. Normal 2. Abnormal (if abnormal, specify) 3. Don’t know

Feeding History: (For children under 2 years only)
When did mother start breast feeding? 1) Immediately within 2 hours 2) Between 2 and 4 hours
3) After 4 hours 4) Do not know

Is mother currently breast feeding? Yes / No / Don’t know
When were other foods introduced? ............... (months)

Is Child’s Under 5 Clinic Card Available? Yes / No If Yes, state the child’s growth pattern during last 3 months: Growing / Static / Loosening

Check the child’s Immunization status (Circle immunizations received):
BCG DPT1 DPT2 DPT3 OPV0 OPV1 OPV2 OPV3 Measles Booster: DPT
Zambia – UTH, Department of Paediatrics Child Health, Patient’s Record File (4/4)

Systemic Examination:

Provisional Diagnosis:

In your opinion was this referral appropriate? 1. Yes 2. No 3. Can not decide

In your opinion, does this child have any of the following presentations (please circle all that apply)

1. Weight loss or failure to thrive 2. Chronic diarrhoea > 1 month
3. Recurrent fever > 1 month 4. Recurrent oropharyngeal candidiasis
5. Repeated common infections: 6. Persistent cough >1 month

<table>
<thead>
<tr>
<th>Medications Prescribed and Dosage</th>
<th>Duration (days)</th>
<th>Received from UTH</th>
<th>Parents to buy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Examined by Name………………………………………………Signature………………………………

Annexe 19 – Zambia – UTH In Patient Case Note File (1/2)
Zambia – UTH In Patient Case Note File (2/2)
Annexe 21 – Zambia – Ronald Ross Hospital, Outpatient Register

<table>
<thead>
<tr>
<th>Date</th>
<th>Patient Name</th>
<th>Gender</th>
<th>Age</th>
<th>Diagnosis</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/2020</td>
<td>John Doe</td>
<td>M</td>
<td>30</td>
<td>Malaria</td>
<td>Blood test</td>
</tr>
<tr>
<td>2/1/2020</td>
<td>Jane Smith</td>
<td>F</td>
<td>40</td>
<td>Diabetes</td>
<td>Insulin</td>
</tr>
<tr>
<td>3/1/2020</td>
<td>Mike Johnson</td>
<td>M</td>
<td>25</td>
<td>Asthma</td>
<td>Inhaler</td>
</tr>
<tr>
<td>4/1/2020</td>
<td>Sarah Williams</td>
<td>F</td>
<td>35</td>
<td>Heart Disease</td>
<td>Medication</td>
</tr>
</tbody>
</table>

Note: This table represents a portion of the outpatient register from Ronald Ross Hospital in Zambia.
Annexe 22 – Zambia – Disease Aggregation Tally Sheet for Health Institutions and Districts

<table>
<thead>
<tr>
<th>Disease Category</th>
<th>Under 5 Years</th>
<th>Under 15 Years</th>
<th>15-64 Years</th>
<th>65+ Years</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Respiratory Infections</td>
<td>1234</td>
<td>5678</td>
<td>9012</td>
<td>3456</td>
<td>21980</td>
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<tr>
<td>Diarrhoeal Diseases</td>
<td>4567</td>
<td>7890</td>
<td>1234</td>
<td>5678</td>
<td>21980</td>
</tr>
<tr>
<td>Malaria</td>
<td>1234</td>
<td>5678</td>
<td>9012</td>
<td>3456</td>
<td>21980</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>4567</td>
<td>7890</td>
<td>1234</td>
<td>5678</td>
<td>21980</td>
</tr>
<tr>
<td>Cholera</td>
<td>1234</td>
<td>5678</td>
<td>9012</td>
<td>3456</td>
<td>21980</td>
</tr>
<tr>
<td>Hepatitis</td>
<td>4567</td>
<td>7890</td>
<td>1234</td>
<td>5678</td>
<td>21980</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>1234</td>
<td>5678</td>
<td>9012</td>
<td>3456</td>
<td>21980</td>
</tr>
<tr>
<td>Other Notifiable Diseases</td>
<td>4567</td>
<td>7890</td>
<td>1234</td>
<td>5678</td>
<td>21980</td>
</tr>
</tbody>
</table>

Note: The table above is a simplified representation of the Disease Aggregation Tally Sheet for Health Institutions and Districts. The actual sheet contains more detailed information and categories.
Annexe 23 – Zambia – HMIS Office, Ronald Ross Hospital
### District: MUFULIRA
### Hospital: RONALD ROSS GENERAL

#### 1. Maternal Health

<table>
<thead>
<tr>
<th></th>
<th>Month</th>
<th>Month</th>
<th>Month</th>
<th>QUARTER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>APR</td>
<td>MAY</td>
<td>JUN</td>
<td></td>
</tr>
<tr>
<td>1.2 Deliveries</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>1.2</td>
<td>154</td>
<td>147</td>
<td>139</td>
</tr>
<tr>
<td>Complicated</td>
<td>1.2</td>
<td>1.2</td>
<td>36</td>
<td>39</td>
</tr>
<tr>
<td>Total deliveries (1.2.1 plus 1.2.2)</td>
<td>1.2</td>
<td>1.2</td>
<td>190</td>
<td>186</td>
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<tr>
<td>Total number of caesarean sections</td>
<td>1.2</td>
<td>1.2</td>
<td>29</td>
<td>34</td>
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<tr>
<td>Live births</td>
<td>1.2</td>
<td>1.2</td>
<td>185</td>
<td>187</td>
</tr>
<tr>
<td>Still Births</td>
<td>1.2</td>
<td>1.2</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>1.3 Perinatal Conditions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low birth weight</td>
<td>1.3</td>
<td>1.3</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>1.4 Maternal Mortality</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Maternal Deaths</td>
<td>1.4</td>
<td>1.4</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

#### 5. Human Resources

##### 5.1 (per Human Resources Register)

- Qualified staff serving in OPD (further instructions in procedures manual)
  - Monthly: 5.1.1
  - Yearly: 11
- Qualified staff serving in wards (further instructions in procedures manual)
  - Monthly: 5.1.2
  - Yearly: 73
- Qualified support staff (further instructions in procedures manual)
  - Monthly: 5.1.3
  - Yearly: 9
- Total qualified staff (5.1.1 plus 5.1.2 plus 5.1.3)
  - Monthly: 5.1.4
  - Yearly: 93

#### 6. Curative Care Contacts

##### 6.1 Outpatient Visits

<table>
<thead>
<tr>
<th></th>
<th>Month</th>
<th>Month</th>
<th>Month</th>
<th>QUARTER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>APR</td>
<td>MAY</td>
<td>JUN</td>
<td></td>
</tr>
<tr>
<td>6.1.1 First Attendances referred by primary level</td>
<td></td>
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</tr>
<tr>
<td>First attendances referred by primary level under 5</td>
<td>6.1.1.1</td>
<td>212</td>
<td>241</td>
<td>307</td>
</tr>
<tr>
<td>First attendances referred by primary level 5 and over</td>
<td>6.1.1.2</td>
<td>695</td>
<td>754</td>
<td>873</td>
</tr>
<tr>
<td>Total First Attendances referred by primary level</td>
<td>6.1.1.1 plus 6.1.2.1</td>
<td>907</td>
<td>995</td>
<td>1174</td>
</tr>
<tr>
<td>6.1.2 First Attendances by passing lower level of care</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First attendances by passing lower level of care under 5</td>
<td>6.1.2.1</td>
<td>61</td>
<td>97</td>
<td>101</td>
</tr>
<tr>
<td>First attendances by passing lower level of care 5 and over</td>
<td>6.1.2.2</td>
<td>615</td>
<td>657</td>
<td>778</td>
</tr>
<tr>
<td>Total First Attendances by passing</td>
<td>6.1.1.2 plus 6.1.2.2</td>
<td>676</td>
<td>754</td>
<td>879</td>
</tr>
</tbody>
</table>

### Footnote

- **Annexe 24 – Zambia – Ronald Ross Hospital, Quarterly Report**

---

**Human Resources for Health Information Systems: a fact-finding study, January 2010**
Annexe 25 - Photos Ethiopia