

## ABSTRACT

This chapter looks at national and international trends in health information systems. The organisation and development of the South African national health information system over the past five years is discussed within this context. A health management information system fundamentally requires the use of health information at policy, health system and health service levels to support management decisions.

The chapter explores the importance of locating a health management information strategy within a conceptual framework that captures the fundamental essence and purpose of HMIS. This framework should guide the identification and implementation of the most appropriate programmes and activities. To obtain such a conceptual framework requires further development work with relevant stakeholders.

South Africa has seen many achievements in the strengthening of its health management information system. However, one of the key challenges remains to get managers at the various levels of the health system to use the available information optimally in order to inform decision making. These decisions are required around all aspects of the health system including identification of health needs and priorities, health systems and service planning, monitoring progress in implementation and evaluation of the impact of interventions, health policy, programme design and resource allocation.

Monitoring and evaluation is a vital component of any health system but it cannot take place without good quality data. The national Department of Health and National Treasury have been instrumental in leading the institutionalisation of the use of routine health information for planning and monitoring. The Provincial Strategic Plans and the District Health Planning Guidelines are two examples that are briefly discussed.

Finally some recommendations are made to strengthen the health management information system in South Africa.

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## INTRODUCTION

There is growing awareness that health decisions based on expediency and political opportunism lead to ineffective and inefficient use of resources, while use of data for evidence-based decision making leads to better health systems and service management. Because of the increasing international emphasis on results-based management and performance-based funding, the need for sound data generated through reliable and transparent information systems is growing.

The role of health information systems is to timely generate, analyse and disseminate sound data for public health decision making. A health information system (HIS) is part of the health care system and can be viewed as an “integrated effort to collect, process, report and use health information and knowledge to influence policy making, programme action and research”.<sup>1</sup>

*“It is not because countries are poor that they cannot afford good health information; it is because they are poor that they cannot afford to be without it.”<sup>2</sup>*

All governments need good quality information on which to base policy and management decisions. The need is particularly acute where resources are limited and the cost of unwise allocation of funds is very high. However, useful information is often unavailable in resource-poor developing countries due to an under investment in the systems for data collection, analysis, dissemination and use. As a result, decision makers are unable to make decisions based on objective and verifiable information.

Reliable and timely health information is an essential foundation for public health action.

Information is crucial for the identification of health needs and priorities, for health systems and service planning, to track progress in implementation and evaluate the impact of interventions, and to make evidence-based decisions on health policy, programme design, and resource allocation.

## DRIVERS OF THE NEED FOR INFORMATION

Few countries have sufficiently strong and effective health information systems in place. Frequently where data is available, it is often out of date and of questionable

accuracy. A number of factors have coincided to render the unprecedented push for strengthened health information systems. Reporting on progress towards achieving specified targets for specific indicators has become more important with the introduction of performance-based allocations in several international initiatives such as the Global AIDS Vaccine Initiative (GAVI), the Global Fund to fight AIDS, TB and Malaria (GFATM) and the President’s Emergency Plan for AIDS Relief (PEPFAR). Countries also need to assess and report progress towards the attainment of the Millennium Development Goals (MDGs).

## DEVELOPMENT CHALLENGES OF HEALTH INFORMATION SYSTEMS

Health information systems have evolved in an erratic, piece-meal manner, largely due to administrative, economic, legal and donor pressures. This has resulted in fragmentation of health information systems, the dispersal and dilution of responsibility, and competing interests of different role-players from different sectors. Responsibility for health data is divided across different ministries or sectors and coordination and sharing of data is often a huge challenge. For example, vital registration – counting births and deaths – a basic building block of the HIS, is undertaken by the Department of Home Affairs in South Africa (SA). The departments of Health and Home Affairs are currently collaborating to improve the quality of vital registration data.

Health service delivery related information systems are weak in many developing countries. Health workers are overburdened with excessive data and reporting demands due to multiple, poorly coordinated systems which often duplicate collection effort and fail to deliver timely, accurate and complete data. Although much health systems data is collected at lower levels of the health system, little is stored and analysed in a meaningful manner. In addition, there is inadequate access to information from support systems such as human resources and financial systems and linkages of these to routine health information. This results in managers not being able to have a comprehensive picture of what they are doing.



Health information systems are further fragmented by disease-specific programme requirements, such as for TB, HIV and Child Health. This often creates multiple parallel systems of data collection. This in turn, burdens front-line health workers by duplicating collection effort and resources, diminishing worker morale and jeopardising data quality.

### INTERNATIONAL PERSPECTIVE

At a global level, there is an increased demand for accountability and evidence-based or outcomes-based decision making in policy development, planning, monitoring and evaluation of health services to ensure the best use of limited resources. There is a growing

realisation of the value of good quality routine health information and its potential contribution to strengthening health services if used adequately.<sup>3</sup> From an international perspective, monitoring of the country's progress towards reaching the Millennium Development Goals (MDGs) has great significance for the health sector. The MDGs relevant to health are selected in Table 1 below.<sup>4</sup>

As can be seen from Table 1, to calculate these indicators requires a large collection of data. This may pose a challenge particularly where capacity, infrastructure and systems are currently not in place to collect these data.

TABLE 1:  
Health in the Millennium Development Goals

Health Goals	Health Targets	Health Indicators
Goal 1: Eradicate extreme poverty and hunger	Target 1: Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day Target 2: Halve, between 1990 and 2015, the proportion of people who suffer from hunger	<ul style="list-style-type: none"> <li>◇ Prevalence of underweight children under-5 years of age</li> <li>◇ Proportion of population below minimum level of dietary energy consumption</li> </ul>
Goal 2: Achieve universal primary education	Target 3: Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary education	
Goal 3: Promote gender equality and empower women	Target 4: Eliminate gender disparity in primary and secondary education, preferably by 2005, and at all levels of education by no later than 2015	
Goal 4: Reduce child mortality	Target 5: Reduce by two-thirds, between 1990 and 2015, the under-5 mortality rate	<ul style="list-style-type: none"> <li>◇ Under-5 mortality rate</li> <li>◇ Infant mortality rate</li> <li>◇ Proportion of one-year old children immunized against measles</li> </ul>
Goal 5: Improve maternal health	Target 6: Reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio	<ul style="list-style-type: none"> <li>◇ Maternal mortality ratio</li> <li>◇ Proportion of births attended by skilled health personnel</li> </ul>
Goal 6: Combat HIV/AIDS, malaria and other diseases	Target 7: Have halved by 2015 and begin to reverse the spread of HIV/AIDS  Target 8: Have halved by 2015 and begin to reverse the incidence of malaria and other major diseases	<ul style="list-style-type: none"> <li>◇ HIV prevalence among pregnant women aged 15-24 years</li> <li>◇ Condom use rate of the contraceptive prevalence rate</li> <li>◇ Ratio of school attendance of orphans to school attendance of non-orphans aged 10-14 years</li> <li>◇ Prevalence and death rates associated with malaria</li> <li>◇ Proportion of population in malaria-risk areas using effective malaria prevention and treatment measures</li> <li>◇ Prevalence of death rates associated with tuberculosis</li> <li>◇ Proportion of tuberculosis cases detected and cured under Directly Observed Treatment Short-course (DOTS)</li> </ul>

Source: WHO, 2005.<sup>4</sup>

## THE SOUTH AFRICAN HEALTH MANAGEMENT INFORMATION SYSTEM ENVIRONMENT

The development and strengthening of a comprehensive national health information system has been a policy priority since 1994.<sup>5,6</sup> The development and current state of the Health Management Information System (HMIS) in SA largely reflects the current state of development of the health system in the country as a whole. On the one hand, there have been attempts at integration and consolidation of information whilst on the other there are a number of new and often fragmented developments.

Over the past five years, the focus has been on developing and strengthening the health information system. This remains a challenge that is receiving attention from various quarters, notably the Department of Health (DoH). The quality of Monitoring and Evaluation (M&E) is based upon, and is dependent on, the HIS producing good quality information. With better HIS in place, M&E is expected to improve.

### LEGISLATIVE FRAMEWORK

The National Health Act (Health Act),<sup>7</sup> which came into effect in May 2005, allocates a firm stewardship role to the DoH regarding health information. Specifically, the Act requires that:

*“The national department must facilitate and coordinate the establishment, implementation and maintenance by provincial departments, district health councils, municipalities and the private health sector of health information systems at national, provincial and local levels in order to create a comprehensive national health information system.”*

Provinces and districts also have to “establish and maintain a health information system in line with the national system”.<sup>7</sup> The Act thus provides a clear framework for the use of information in the health sector.

In terms of the Act, all health districts, and the national and provincial DoH are required to prepare three year strategic plans as well as one year operational plans. These plans need to take into consideration the national

strategic priorities and include baseline information as well as set targets based on objective indicators.

The Health Act requires that annual district health plans and annual reports be prepared for each of the 53 health districts, as well as for the nine provincial and national DoH.<sup>1</sup> The Act states “Each district and metropolitan health manager must within the national budget cycle develop and present to the district health council ..... a district health plan drawn up in accordance with national guidelines issued by the Director-General with due regard to national and provincial health policies and the requirements of the relevant integrated development plan prepared in terms of section 25 of the Local Government: Municipal Systems Act, 2000”.<sup>7</sup>

This will undoubtedly result in greater need for human resource, financial and health status information, amongst others, for the completion of these plans.

The South African government has established a Government Wide Monitoring and Evaluation System (GWM&ES) which will coordinate a systematic programme of policy monitoring and evaluation throughout the public sector in SA.<sup>8</sup> The GWM&ES has been designed to be prescriptive and clear in terms of the type of data to be submitted by public entities but accommodative and flexible with regard to data collection processes. The process of development is headed by the policy unit in the Presidency supported by central departments who are responsible for monitoring progress on government departments. The Presidency and Premiers are the principals for the GWM&ES and the system should be able to provide them with reliable information to assess the impact achieved by departmental programmes. In turn, this will influence resource allocation and policy revisions. The GWM&ES will require departmental information and transversal information from central departments. Thus the design of the national and provincial HMIS and M&E systems should be aligned to these reporting requirements.



## FINANCIAL MANAGEMENT AND ACCOUNTABILITY

The introduction of the Public Finance Management Act (PFMA) and the change to a medium-term budget cycle whilst improving budgeting and financial management at national and provincial spheres of government has increased the need for accurate financial information which is linked to other health status, resources and performance indicators.<sup>9</sup>

Collectively, these requirements have contributed to an increased need for accurate information at all levels of the South African health system.

## ORGANISATION AND DEVELOPMENT OF THE SOUTH AFRICA HEALTH MANAGEMENT INFORMATION SYSTEM

The HMIS in SA consists of a number of different components. These components include information on demography, socio-economic status, health status, health resources, health care provision, health care utilisation, health promotion as well as health care coverage. Linked to these, are information systems on support services such as administration, financial management, human resources management, transport, drug supply management and laboratory services management.

Ideally this national HMIS should integrate data from all these various sources and from all service providers, including the private health care sector and not-for-profit sectors, into useful information for a range of decision makers. A listing of these sources of information is shown in Table 2.

TABLE 2:

## Health information sources

Components of the National Health Information System	Authority / Department responsible	Brief description
Vital registration	Home Affairs Department	Births and Deaths
Census 1996 and 2001	StatsSA	Data on population distribution and age breakdown used as the denominator for population based indicators
Surveys	National DoH / MRC / Others	Examples include the demographic and health survey (DHS) and annual antenatal HIV prevalence survey Others include surveys on specific aspects of the health system carried out by provincial health departments, NGOs such as the Health Systems Trust and other organisations
Routine District Health Information System	National DoH / Provinces / Local Government	Includes data sets on: <ul style="list-style-type: none"> <li>✧ Semi-permanent information on facilities (e.g. size of facility, communications, infrastructure)</li> <li>✧ Primary care monthly operational data</li> <li>✧ Hospital monthly operational sets</li> <li>✧ TB Quarterly reports</li> </ul>
Other Routine Information Systems (specific programmes)	DoH / Provinces / Local Government	HIV-related programmatic information around antiretrovirals (ARVs)
Notifiable diseases	National DoH / Provinces / Local Government	List of gazetted notifiable diseases
PERSAL System	National DoH / Provinces	Human resource (HR) system, largely a pay-roll system for the public service, and currently not very useful for HR indicators
Financial Management Systems especially Basic Accounting System (BAS)	National DoH / Provinces	Accounting system which can provide data for financial related indicators
OTHERS		
MEDSAS	National DoH / Provinces	Drug-procurement and management system
District STI Quality of Care Assessment (DISCA) Tool	National DoH Programme managers / Provinces / Others	Tool to assess quality of care for STI programmes
Client Satisfaction Survey (CSS)	National DoH Programme managers / Provinces / Others	Client Satisfaction Survey – conducted as exit interviews of patients from clinics and hospitals
Perinatal Problem Identification Programme (PIIP)	National DoH Programme managers / Provinces / Others	Perinatal Problem Identification Programme – administered in certain hospitals

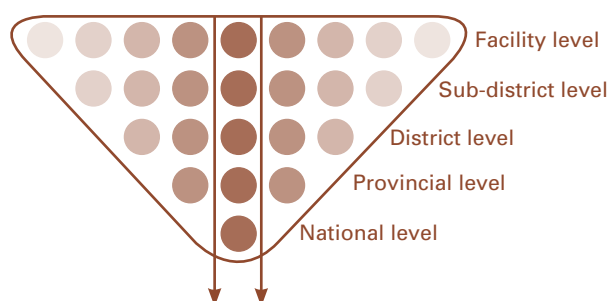
Source: Visser et al., 2005.<sup>10</sup>



## THE NATIONAL HEALTH INFORMATION SYSTEM

The National HIS is a unitary system for reporting both primary health care (PHC) and hospital routine information. Reporting requirements are defined at the national level and lower levels are able to add additional data as they require. Data flows from facility level, through the sub-district and district levels, to the province and then national at defined time lines according to the NHIS / SA Data Flow Policy.<sup>11</sup> (Figure 1).<sup>a</sup>

FIGURE 1:  
The national health information system structure



Source: DoH, 2003.<sup>11</sup>

The District Health Information System (DHIS) is a component of the larger HMIS. It is a system for gathering, analysing, presenting and using aggregated routine information related largely to health service delivery. It is based on the following principles:

- ◆ A decentralised district PHC approach (allows additions to data being collected and promotes the use of these data at the level of collection);
- ◆ An essential data set based on indicators to measure progress towards targets;
- ◆ Inclusion of service providers at all levels of the health care system; and
- ◆ An integrated HMIS systems approach (i.e. an elimination of duplication and parallel information systems).

The priority indicators in SA are listed in the National Indicator Data Set (NIDS).<sup>12</sup>

The DHIS software was adopted for national implementation by the National Health Information System of South Africa (NHIS / SA) Committee in

1999. Data in the DHIS software is collected by health service providers daily, with the aim of monitoring health service provision in an integrated way.

### ACHIEVEMENTS

There have been some successes in the development of the national HMIS. These include remarkable progress in the standardisation and implementation of the routine PHC information system over the last seven years. Over 95% of all public sector facilities submit routine health information regularly on a monthly basis.<sup>10</sup> Data elements and indicators are clearly defined and standardised. Another success has been the training of health workers, at various levels of the health system, in the principles of using information for management and in using the DHIS software.

The DHIS software has been adopted as the software for the capture, reporting and storage in the national HMIS. The NIDS was finalised in mid-2005. All provinces but one are implementing it. The outstanding province has plans for implementation within the 2006/07 financial year.

### CHALLENGES

There are a number of challenges still facing the availability of reliable health and management information in SA. These include:

- ◆ Inadequate investment in the HMIS system.<sup>13</sup> There is a shortage of dedicated health information personnel at hospital, sub-district and district level in some provinces. Skills in understanding computer software, data analysis and interpretation are in short supply. Information Technology infrastructure and support is inadequate. There is a need for staff training and on-going support in all areas of the HMIS.
- ◆ There is still a lack of an information culture in the public health sector, possibly because of a generation of managers who have had insufficient training or experience in HMIS. Evidence has been that there is inadequate use of the available information by managers.<sup>14,15</sup> This will hopefully change over time as more managers gain the necessary skills and experience.

<sup>a</sup> Modified from Heywood A, Rohde J. Using Information for Action. A manual for health workers at facility level. Equity Project.<sup>11</sup>

- ◆ Clear policies and guidelines are needed to guide data management processes and standardise practice at all levels of the system.
- ◆ Managers lack access to integrated, good quality data on which they can base management decisions. A number of parallel, usually paper-based, programme-specific information systems are still in place creating a fragmented information system.
- ◆ Lack of integration of hospital information systems. Aggregated data cannot be extracted from hospital patient administration systems. This results in duplication of data collection efforts in order to obtain routine service related data.<sup>14</sup>
- ◆ Lack of integration of the TB electronic register with the notifiable diseases information system. TB makes up 95% of all notifiable diseases in the country, yet more than half of all new TB cases are not reported through the disease surveillance system. A data exchange mechanism between the TB register and the notification system is being initiated to address this.<sup>10</sup>
- ◆ Inadequate availability of data from other government departments and the private sector in order to obtain a comprehensive picture of population related indicators.
- ◆ There is inadequate feedback to lower levels of the health system. Many managers are uncertain of what feedback is required and they need guidance and support in establishing and strengthening feedback mechanisms. This is potentially a very important tool in improving data quality.

#### A CASE STUDY: AUDIT OF HIS CAPACITY

Health Systems Trust recently conducted an audit of HMIS related human resources and equipment in one province in SA. Some of the findings are reflected below.

##### ◆ **Human resources**

12.7% of HIS staff were still in their posts after 2 years. A significant number, 14.2%, had been employed for 6 months or less and 16.7% of HIS posts were vacant. This situation can potentially compromise staff skills and competence to perform key job functions.

##### ◆ **Percentage of time spent on health information**

On average, HIS staff spent just less than half (46%) of their work time on specific HIS work. The rest of the time was spent on clerical, administrative and ad-hoc tasks.

##### ◆ **Skills in DHIS software**

Data validation and assessment of data quality are key functions of health information staff. Only 40% of information officers reported having good or average skills in data validation and conducting data quality checks. Nearly half (48%) reported good or average skills in using pivot tables and 36% had no skills in pivot table use.

##### ◆ **ICT Infrastructure**

Information and Communication Technology (ICT) infrastructure is vital in enabling the HIS to function. About a third (31%) of staff had no access to the internet, 10% had no printer and 3% had no computer. Two fifths (39%), mostly local government officials, had no access to the provincial intranet and thus did not have access to any data or information loaded there.

An audit such as this can act as a basis for further investigation and informed corrective action. A national audit is planned for the 2006/07 financial year.



## INTRODUCING THE HMIS CONCEPTUAL FRAMEWORK

### WHY DO WE NEED A CONCEPTUAL FRAMEWORK?

A conceptual framework is a formal way of thinking (i.e. conceptualising) about a process or system under study.

It is used to outline possible courses of action or to present a preferred approach to a project. The framework is built from a set of concepts linked to a planned or existing system of methods, behaviours, functions, relationships and objects.

A framework can assist to explain and provide logical guidance on why things are done in a particular way. It can also serve as a demonstration model or a model of best practice to understand and use the ideas of others who have done similar things. It is used to articulate the goals of a unit or programme.

A conceptual framework can be used as a road map. It ensures that all role-players are working towards the same articulated goal. A framework can enhance and facilitate the decision making process in terms of the route to be taken: why certain methods are used and not others to get to a certain end point.

SA does not presently have such a framework to guide the national HMIS strategies. Investments in HMIS are yielding some results, however M&E units are non-existent in many provinces. It is important that as HMIS and M&E practices are linked and that managers are guided by such a road map ('the conceptual framework') to guide the development of HMIS policies, strategies, guidelines and practices, nationally as well as provincially. The national and provincial DoHs are suitably positioned to lead the development of such a HMIS framework collaboratively with all role-players. This is a critical area that requires further development.

## MONITORING AND EVALUATION

Monitoring and Evaluation is a vital yet often neglected aspect of management. M&E can be used by decision makers and policy makers to track progress, report on results, allocate resources, plan and improve service delivery.

Monitoring refers to a systematic, continuous process of collecting and analysing information (specified indicators) to track the implementation of activities against current plans. Monitoring provides regular feedback that helps an organisation track costs, personnel, implementation time and results to compare what was planned to actual events, and to report to management and relevant stakeholders. In its simplest terms, monitoring is collection and analysis of information to track project implementation.

Evaluation is a systematic objective assessment of a project, programme or policy in terms of its design, implementation and results (i.e. the entire process). Evaluation analyses the outcomes and impact of the organisation's work.<sup>16</sup>

When M&E has been undertaken, this information needs to be meaningfully communicated to relevant parties in a format that they can understand and use. Reporting is the timely provision of useful information at periodic intervals. Reporting provides regular feedback on the progress, problems, successes, and lessons of programme implementation and impact.

A number of national frameworks and processes are led by the national DoH and National Treasury to facilitate and support the use of information by managers at provincial and district level. Provincial Strategic Plans (PSP)<sup>17</sup> and District Health Plans (DHP)<sup>18</sup> are two examples of such processes. They are the prescribed reporting requirements for the national DoH and exist to inform M&E processes at various levels in the health system. The ultimate value of having plans is not only to have the information available when needed, but to use the information to improve health sector performance.

The following is a list of indicators of the maternal child and women's health (MCWH) and nutrition programmes extracted from the Provincial Strategic Planning format, and the guidelines for the District Health Planning and Reporting document.

## MCWH AND NUTRITION PERFORMANCE INDICATORS IN THE VARIOUS PLANS

TABLE 3:  
Provincial strategic plans

Incidence of severe malnutrition under-5 years
Incidence of pneumonia under-5 years
Incidence of diarrhoea with dehydration under-5 years
Hospitals offering TOP services
CHCs offering TOP services
Fixed PHC facilities with DTP-Hib vaccine stock-out
AFP detection rate
AFP stool adequacy rate
Schools at which phase 1 health services are being rendered
Immunisation coverage under-1 year
Antenatal coverage
Vitamin A coverage under-1 year
Measles coverage under-1 year
Cervical cancer screening coverage
Facilities certified as baby friendly
Fixed PHC facilities certified as youth friendly
Fixed PHC facilities implementing IMCI
Institutional delivery rate for women under-18 years
Not gaining weight under-5 years

Source: DoH, 2005.<sup>17</sup>

TABLE 4:  
District Health Plans

Low birth weight rate in facility
Weighing rate under-5 years
Not gaining weight rate under-5 years
Severe Malnutrition under-5 years incidence
Vitamin A coverage – new mothers
Vitamin A coverage under-1 year
BCG Coverage
Measles coverage under-1 year
Immunisation coverage under-1 year
Immunisation drop out rate Polio 1st to 3rd dose
Non-polio acute flaccid paralysis (AFP) detection rate
% facilities providing IMCI services
Number of sub-districts implementing the household and community component of IMCI
Incidence of diarrhoea in under-5 years old children
Cervical cancer screening coverage
Women year protection rate
ANC Coverage
ANC visits before 20 weeks rate
Termination of Pregnancy (TOP) rate
% of PHC facilities providing appropriate maternity care
Delivery rate in facility
Caesarean section rate
Stillbirth rate in facility
Delivery rate in facility to women under-18 years
Confidential inquiry into maternal deaths

Source: DoH, August 2006.<sup>18</sup>

Some of the challenges in implementing these planning and reporting requirements include:

- ◆ Fostering an information value and usage culture;
- ◆ Difficulty in collation of data for reports and coordination between various units in the various DoHs (including strategic planning, health information and M&E units);
- ◆ Lack of familiarity with these relatively new reporting requirements;



- ◆ Difference in the nomenclature of the indicators between the Quarterly Reporting System (QRS), the PSP and the DHP;
- ◆ These reports are sometimes large and not easy to complete (e.g. the DHPs); and
- ◆ M&E units in provincial DoHs are not yet well-established.

## CONCLUSION AND RECOMMENDATIONS

In line with international experience, SA is experiencing an unprecedented increase in the demand for an accessible, accurate and integrated health information system that will enable managers to make decisions related to policy formulation, resource allocation and health service performance. This information will also enable these managers to monitor and evaluate programme implementation and progress towards achieving set targets and report on these.

In the move towards achieving this goal, great strides have been made in developing the national HMIS.

However, some challenges require attention:

The development of a conceptual framework for the national health management information system is required to guide the development of HMIS policies, strategies and guidelines. Sufficient resources are required for this process and for strengthening M&E systems.

The human resource capacity for the HMIS needs to be strengthened at all levels of the health system. Dedicated health information staff, with clear roles and responsibilities, need to be appointed from facility to national level. On-going needs-based training and support must be provided to ensure that staff skills, competence and performance are at a satisfactory level.

Sufficient resources need to be allocated to address the Information Communication and Technology (ICT) infrastructure (e.g. computers adequately equipped to deal with the HMIS system, internet and email access and adequate bandwidth). Pooling knowledge and resources across sectors should be strengthened.

The use of information by managers should be strengthened through improving its quality, improving access, presenting and packaging the information according to the needs of the various end-users, focusing on key indicators (small data set) and training managers in information analysis, interpretation and use. A small indicator-based data set, with clear data element and indicator definitions, is key to good quality data.

Feedback should also be prioritised and guidelines provided on the content and frequency of the feedback.

With the call for a comprehensive integrated HMIS, efforts to integrate health status and service related information with service support type data (e.g. financial and HR information) should be fast-tracked. In addition, public sector health information should be linked with information from the private sector as well as to other government departments.

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