

# ASSESSMENT OF NATIONAL HEALTH INFORMATION SYSTEMS

MINISTRY OF HEALTH AND SOCIAL SERVICES  
(MOHSS), REPUBLIC OF NAMIBIA

**MAY 2012**

This publication was produced for review by the Namibia MOHSS HIS Technical Working Group (TWG) technical and financial support from United States Agency for International Development. It was prepared by Tariqul Khan and Duncan Edwards through the Global Health Technical Assistance Bridge Project.



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This document was submitted by Development and Training Services, Inc., with CAMRIS International and Social & Scientific Systems, Inc., to the United States Agency for International Development under USAID Contract No. **AID-OAA-C-12-00004**.

## ACKNOWLEDGMENTS

The assessment team is grateful first and foremost to everyone from the Government of the Republic of Namibia (GRN), especially the Ministry of Health and Social Services (MOHSS), who made themselves available for our visits and answered the many questions we asked. We also extend heartfelt thanks to the many individuals from national, regional, district, and community institutions and facilities and from nongovernmental organizations who were interviewed and who took serious interest in sharing their information and experiences with the team. It is impossible to overemphasize the overwhelming support and cooperation that the team received from everyone!

We are particularly grateful to Mr. Kahijoro Kahuure, MOHSS permanent secretary, and Dr. Norbert P. Forster, deputy permanent secretary for their sincere support for this process and for creating an enabling environment for the whole exercise. Our special gratitude goes also to Mr. Puumue Katjuanjo and the whole HIS Technical Working Group (TWG) of the MOHSS for their guidance, availability, valuable insights, openness, and close cooperation with the team throughout the process. Without their support, we would not have been able to complete the assessment and formulate the necessary recommendations and reports.

We would also like to thank the managers of all the directorates, divisions, and subdivisions for all their help and their willingness to make themselves, their staff, and their systems available. Particularly useful was the remarkable cooperation from Mr. J. Mudjuu of the MOHSS IT Office, Ms. Hilma Nangombe of Policy Planning & Human Resource Department (PPHRD), Mr. Stefanus van Staden of the Office of the Prime Minister, and Mrs. Lusia N. Hamumokola of the Ministry of Finance. Very special thanks, too, to Michael de Klerk of the Directorate of Special Programs Response Monitoring & Evaluation (RM&E) unit and Erwin Nakafingo of the Primary Health Care Epidemiology unit. Our grateful thanks to them for their support.

Special thanks goes to Susna De, systems strengthening and capacity development advisor, USAID/Namibia Health Office, who played a critical role in working with the HIS TWG and the team to make this assessment truly country-owned and country-led. The team is also grateful to thank Robert Festus, Renee Liebenberg, and Marita Cloete of USAID/Namibia for their preparatory and logistical support during this exercise.

Finally, the assessment team thanks the members of the GH Tech Bridge Project team for their assistance with preparation and logistics.

Despite our best efforts, factual errors may appear in the report. These must be considered the responsibility of the authors, who tried to grasp the vast nature and complexity of the whole Namibia HIS environment—61 different systems and databases—in a relatively short period. They are certainly not attributable to either the MOHSS or USAID.

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## ACRONYMS

AFP	Acute flaccid paralysis
AMR	Adverse medicine reaction
ART	Antiretroviral therapy
AU	African Union
BDM	Birth, death, and marriage
BPA	Business Process Analysis
CBS	Central Bureau for Statistics
CDC	Centre for Disease Control
CMS	Central Medical Store
CSO	Civil society organization
DHIS	District Health Information System
DHS	Demographic and Health Surveys
DP	Development partner
DPPHRD	Directorate of Policy Planning and Human Resource Development
DQA	Data quality assurance
DSA	Daily subsistence allowance
DSP	Directorate of Special Programs
EDT	Electronic dispensing tool
EOL	End of life
EPI	Extended Program for Immunization
EPMS	Electronic Patient Management System
ERP	Enterprise resource and planning
ETB	Electronic TB Manager
ETR	Extended TB Register
FBO	Faith-based organization
FH	Family health
GF	Global Fund
GRN	Government of the Republic of Namibia
HCMS	Human capacity management system
HIS	Health information system
HISP	Health information systems programme
HIV/AIDS	Human immunodeficiency virus/acquired immunodeficiency syndrome
HR	Human resources

HRIMS	Human resource information management system
HRM	Human resource management
HRMS	Human resource management system
ICT	Information and Communication Technology
IDSR	Integrated Disease Surveillance and Response
IFMS	Integrated Financial Management System
IHCIMS	Integrated Health Care Information Management System
IHO	Intermediate Hospital Oshakati
IPD	In-patient department
LAN	Local area network
M&E	Monitoring and evaluation
MC	Male circumcision
MIS	Management information system
MOF	Ministry of Finance
MOGECW	Ministry of Gender Equality and Child Welfare
MOH	Ministry of Housing
MOHA	Ministry of Home Affairs
MOHSS	Ministry of Health and Social Services
MOU	Memorandum of Understanding
MPLS	Multiprotocol Label Switching
MRLGHRD	Ministry of Regional Local Government Housing and Regional Development
NACS	Nutrition assessment counseling and support
NAMBTS	Namibia Blood Transfusion Service
NDP	National Development Plans
NDW	National Data Warehouse
NGO	Non-governmental organization
NHTC	National Health Training Center
NIP	Namibia Institute of Pathology
NMPC	National Medicines Policy Coordination
NMRC	National Medicines Regulatory Council
NNT	Neonatal tetanus
NPC	National Planning Commission
NRPA	National Radiation Protection Authority
OPD	Out-patient department
OPM	Office of the Prime Minister

PCR	Polymerase chain reaction
PEPFAR	Presidents Emergency Plan for AIDS Relief
PHC	Primary health care
PMIS	Pharmacy management information system
PMS	Performance management system
PPP	Public-private partnership
PS	Private sector
RMS	Regional Medical Store
SADC	Southern African Development Community
SDSC	Systems Development Standards Committee
SITHIS	Systems and IT Coordination Body for HIS
SPM	System for program monitoring
STI	Sexually transmitted infection
SWS	Social welfare services
TB	Tuberculosis
TIDB	Therapeutic Information Database
TIPC	Therapeutic Information and Pharmacovigilance Centre
TOR	Terms of reference
TWG	Technical Working Group, MOHSS
UN	United Nations
UNFPA	UN Population Fund
UNICEF	UN Children Fund
UPS	Uninterruptible power supply
USAID	United States Agency for International Development
VCT	Voluntary counseling and testing
WAN	Wide area network
WHO	World Health Organization



## EXECUTIVE SUMMARY

An integrated, unified, and effective health information system (HIS) is essential to upgrade the quality of health service delivery and improve health outcomes. The *Health and Social Services Review 2008* found that the Namibian Ministry of Health and Social Services (MOHSS) has fragmented systems managed by different divisions in different directorates. To better inform the HIS reform effort of the current Government of the Republic of Namibia (GRN), MOHSS recently requested USAID/Namibia's support for a comprehensive HIS assessment. The objectives of the assessment, as stated in the MOHSS letter from the Permanent Secretary (March 23, 2011), were

- to inventory the numerous HIS-related information systems and databases within the MOHSS;
- to provide a comprehensive understanding of their content, data elements, associated reporting burden, and how these information systems are used and by whom; and
- to help identify strengths and weaknesses and therefore formulate recommendations to inform planning efforts.

This assessment is therefore the result of a joint initiative between a USAID/Namibia-sponsored external team and the MOHSS HIS Technical Working Group (TWG). Although USAID/Namibia sponsored the assessment, it and the TWG together made this assessment truly country-owned and country-led process. It was guided and managed by the TWG, and the TWG chair took the overall lead.

In seeking a more effective, more unified HIS, the GRN has taken commendable steps. The two most noteworthy recent ones are

- formulating and putting into operation the TWG to guide the process, and
- approval and implementation (underway) of a new ministry HIS Directorate to act as general coordinator and steward for Namibia HIS.

The ministry has also embarked on an aggressive phased approach to fast track the HIS modernization process under the technical guidance of the TWG. The GRN, along with all other stakeholders, including development partners (DPs), clearly recognize the urgent need for a more unified, integrated, and effective HIS.

However, there is still much to be done. Much of the effort to date has been uncoordinated and directed mostly to isolated technical aspects of the HIS and not to institutional, coordination, and other behavioral aspects. Especially at the national level, until very recently leadership was tentative and uncoordinated and there was too little political support for HIS strengthening. Until the new directorate was created, there was no single body to lead and coordinate the HIS. There is as yet no mechanism to effectively engage the leadership of MOHSS and other national agencies in this process, and there is currently no up-to-date HIS strategic plan or policy. In its detailed review, the team concluded that while there are pockets of good systems, databases, and practices both within and beyond MOHSS, all current HIS data systems are fragmented, disintegrated, and generally rudimentary. It also found that the HIS currently lacks

comprehensive monitoring and evaluation (M&E), although there are individual M&E strategies for some vertical programs. The team strongly recommends an initiative to involve all stakeholders in putting in place a framework to manage M&E activities at all levels. A number of DPs have supported MOHSS efforts, especially in relation to emergency disease response initiatives. However, one of the results of donor funding of specific health priorities has been that vertical programs have been established within or even outside the MOHSS. In terms of the principle of a unified and integrated HIS, this was counterproductive. Often these programs had their own central staff and data collecting enterprise that was not properly coordinated with other aspects of the HIS.

The assessment team did an extensive document review, conducted 76 group and individual meetings, reviewed 61 systems/database, made site visits, and interviewed over 100 people. The HIS weaknesses, gaps, and challenges that were identified HIS are grouped below within four broad thematic areas. Each problem must be addressed if the HIS is to serve its purpose of providing reliable and timely information for planning and decision making and supporting day-to-day healthcare management on all fronts.

## **DATA AND INFORMATION**

- Currently across the systems and databases there is no common patient identification number and agreed standard or definition for various data elements.
- There is no agreed roadmap or framework for such central aspects of system design as requirements gathering, interoperability, system documentation, user interfaces and roles, data collection, access and dissemination, and general nature, size, and complexity.
- Some vital systems documentation, including source codes, is either the property of outside developers or simply not available or accessible to MOHSS technical staff.
- Multiple systems offer similar or duplicated functionalities and some are not being used to their fullest capability.
- Multiple systems and channels collect similar information but with process and methodological differences and integration issues, which cause data discrepancies.
- Multiple isolated, ad hoc, and parallel systems, databases, and data collection processes have been created due to inadequate coverage of information by the primary systems or a lack of coordination with already operational institutional systems and processes.
- Inadequate training and understanding, questionable skills, poor work ethics and practices, rapid staff rotation, and heavy turnover at all levels seriously affects the timeliness and quality of data, which undermines the entire operation.
- Because there is a lack of interoperability, information is often extracted into printed format from multiple electronic systems (e.g., the Electronic Patient Management System [EPMS], the Extended Tuberculosis Register [ETR], private sector HIV data, MediTech, and SysPro), then manually re-entered in other electronic systems or MOHSS Summary Forms (e.g., Mister Sister Mobile Health Services, PharmAccess, the Integrated Financial Management System [IFMS]).



- Data aggregation processes are inadequate and automated data validation tools are insufficient in various systems.
- Most HIS officers and M&E data clerks do not understand the data substance well enough to do any more than a cursory check of gaps and completeness, and programs do not have enough subject experts to verify or review data.
- The number of clinical and data entry staff at most levels and facilities is inadequate.

## **TECHNOLOGY, PROTOCOLS, AND THE HUMAN INTERFACE**

- A large number of systems, databases, and processes are fully manual, paper-based, or only partially electronic, and to a large extent formats are either fragmented or nonstandard. This adds significantly to work burdens and seriously undermines efficiency.
- Due to a lack of standardized automated reporting mechanisms, most reports and templates (including data submissions) are manually filled in and calculated, making them prone to error and again adding significantly to the work burden; and information/reports display and dissemination are generally in static format (e.g., the new Web portal of the National Data Warehouse [NDW]).
- The infrastructure for both local and wide area information and communication technology (ICT) is either inadequate or totally absent, and a lack of required hardware and software at multiple levels essentially make inaccessible key current systems (e.g., the Human Resource Information Management System [HRIMS], IFMS) and most planned systems (e.g., the Integrated Health Care Management System [IHCIMS], the Human Capacity Management System [HCMS]). This also means that facilities are not properly operational and interlinked throughout the health system.
- ICT capacity limitations and aspects of systems design add significant tedious manual work because national and regional staff must integrate multiple copies of similar but isolated databases.
- The work and reporting burden is exacerbated by the lack of standardized data collection tools, which is often the result of too frequent and uncoordinated additions and updates.
- Excessive time is spent on program indicator reporting forms (tools).

## **INFORMATION PRODUCTS, DATA USE, AND KNOWLEDGE MANAGEMENT**

- There are few real-time or structured data products and little ready access to data.
- There are very few knowledge management products to facilitate learning, experience-sharing, and best practices.
- There is a lack of ownership, understanding, and use of data at the point of collection for patient services and management.
- Adequate and structured supportive supervision is lacking and feedback mechanisms are ineffective and uncoordinated at all levels.
- Analytical capacity, resources (including human), practices, and tools are limited.

- There is a lack of demand, use, and ownership of data and information at all levels (user, beneficiary, and management), even for decision making and planning.

## **MANAGEMENT, COORDINATION, AND IMPLEMENTATION**

- In general, the skills available do not meet the required, relatively higher, degree of basic computer and specific system user literacy, system administrator competencies, and technical support capacity that are critical for some current and most upcoming systems (e.g., IHCIMS, HCMS).
- Operational processes, such as data submission protocols, tend to be nonexistent, ill-defined, duplicative, or poorly enforced, and a lack of clarity about roles and responsibilities causes problems related to data collection, quality, and ownership, as well as undermining planning and management.
- Because there is a lack of uniformity in data collection tools (often because of too frequent and uncoordinated program additions and updates) and in data and definition standards across the health system, the results are data discrepancies, distribution non-equilibrium, and a tremendous waste of resources.
- Duplicate, parallel, and excessive data collection tools and reporting burdens, mostly due to numerous vertical programs, add to the work burden and interfere with data collection, quality, and—most important—service delivery.
- There is no strategy, system, or plan in place for coordinated and structured data quality assessment (DQA) at any level.
- There is a general lack of accountability for resources and results, and inefficient sharing of resources across many programs and systems.
- Most health managers, who are generally clinicians, do not have the managerial and business skills needed for HIS monitoring, planning, and implementation.
- Weak in-house technical capacity and a lack of external support for necessary customization of systems (e.g., District Health Information System [DHIS] 1.4, NDW) dam up the flow of information.
- There is little or no dialog and coordination among key entities (both intra-MOHSS and interagency) and programs for critical activities (including system-related development and issues) that have direct operational impact.
- A large number of systems are currently designed and used only for vertical disease program information, and the technical resources available are not used to their fullest extent or shared for better integration.
- There is no formal platform or mechanism (though some ad hoc and very informal ones) for people engaged in similar business operations or with vested interest in IT and systems across the health sector to share ideas and strategies and work together to standardize and scale up new developments.
- Human resources and technical capacity are insufficient to provide the necessary HIS and IT support to both local levels and MOHSS headquarters.

- The systems development and IT support structure within the MOHSS is somewhat fragmented due to a lack of clarity about roles.
- Many systems and staff, including M&E data clerks throughout the country, are being funded to a large extent by donor programs without there being any clear plan for sustainability when current project support ends.
- Current policy and management practices force use of old dial-up technology to transfer data in most places instead of the faster and more reliable 3G technology.
- There is widespread resistance to use of new systems, processes, and technology, and inadequate associated change management strategy.

Based on findings and conclusions throughout the assessment, and keeping in mind the demands related to effective launch of the new HIS directorate, the overarching recommendations of the team for building up HIS are these:

1. Identify a single national champion with political will and support who can help raise the profile of the new HIS Directorate and mobilize people at all levels of the health system to facilitate adoption of a stronger, more unified HIS.
2. Provide sufficient influence, human and financial resources, and technical/advisory expertise (especially over the next 12–18 months) for the HIS directorate to be able to perform all its vital and mandated functions—more effective strategic planning, coordination of all stakeholders, and carrying out all activities necessary to realize HIS plans, including recommendations made by this assessment.
3. Immediately create a formal and inclusive MOHSS-wide Systems and IT Coordination Body for HIS (SITHIS) with clearly defined terms of reference) for all systems/ICT review and selection, development, integration, coordination, and deployment activities. Members should represent both intra- and inter-ministry and sectoral stakeholders (for the HIS directorate, all or preferably a subset of members from an internal HIS Systems Development Standards Committee (SDSC) team, which is described in the detailed recommendations matrix in Annex B, could be the official representative in this SITHIS).

In addition to these umbrella recommendations, comprehensive recommendations from a systems-strengthening perspective are summarized in the next section, and shown in more detail (along with illustrative activities) in Annex B.

Although the assessment identified many weaknesses, the team believes that in addition to the strengths noted in the report for each thematic area, there are significant strategic strengths and opportunities that can be leveraged to build a more effective HIS:

- Most stakeholders recognize the current state of disintegration.
- Most stakeholders agree on the importance of some degree of integration.
- Generally there is a clear sense of urgency.
- Many initial uncertainties about current activities (including the assessment) and HIS as a whole turned into clarity and strength through this assessment process and discussions.
- There is a relatively wide network of data (although program-based) and M&E clerks are already in place at local (region and district) levels.

- A number of new systems (e.g., IHCIMS, HCMS, DHIS 2.0, NDW) could provide integration and efficiencies across the system.
- There are pockets of continuing efforts at coordination in creating interoperability among current and new systems (e.g., IHCIMS and Namibia Institute of Pathology [NIP]).
- A number of very sound and technically competent professionals are in place (although scattered) in various parts of the system.
- A coordination and management body for HIS – the HIS Directorate – has been approved and is now becoming operational.

The team also identified the following risks and success factors critical for the new directorate's HIS roadmap and processes:

- GRN leadership, ownership, and effective coordination
- Necessary influence and resources for the new directorate
- Evidence-based and situational strategy, planning, operational plans, and implementation
- Phased action plans that prioritize high-impact Quick Wins to produce Rapid Results that will build initial confidence, trust, and momentum
- Results-based management (RBM), accountability, transparency, and effectiveness
- Infrastructure and capacity, especially at lower levels
- Effective participation by all stakeholders, including civil society and the private sector
- Unified stakeholder commitment and support for an integrated and unified HIS
- HIS staff commitment to putting the system first

#### **United States Government (USG) Agencies:**

- Readiness and openness: USG and its implementing partners
- Integrated approach (alignment and coordination) to support
- An agreed-upon country-led process for identifying and mobilizing future support for HIS
- Support that is demand-driven only; fully aligned with MOHSS and HIS strategies, plans, and priorities; and targeted to build on country systems for sustainability
- Patience: managing expectations.

It will be critical for the stakeholders assessment and the Business Process Analysis (BPA) process to vet the findings and recommendations of this assessment that are relevant to each and align them with their analysis and final direction to make them part of a single agreed set of recommendations that can be fed into the drafting of HIS strategy, policy, and operational/action plans.

The assessment team believes that to unify the HIS it will require that the GRN take a holistic and sustained approach; central to success will be effective operation of the new HIS

Directorate, along with continuous coordinated commitment from all stakeholders, especially DPs. If the whole process is country-led and country-owned, Namibia will be able to create an HIS that will help decision makers to discuss policy effectively, monitor and plan how to deal with health problems, promote equity, allow citizens to make informed health choices, and improve governance and accountability throughout the health sector—all ultimately to the benefit of health outcomes. The team feels strongly that such critical ingredients as the many dedicated and competent staff and supporters, the TWG, and the new directorate are ready to take on the challenges to fulfill the HIS mission.



## KEY RECOMMENDATIONS

In addition to the overarching Umbrella Recommendations made above, the team's comprehensive recommendations for the four thematic areas of intervention for the HIS are summarized here, discussed more fully in Section 8, and shown in even more detail (with illustrative activities) in Annex B. The team believes these recommended interventions will lead to sustainable improvements in HIS integration and strengthening, and that they will be most successful if led by the GRN with strategic and technical assistance from DPs and other stakeholders.

### THEMATIC AREA I: DATA AND INFORMATION

#### Information Systems and Databases

1. Define a framework to guide and define different HIS data/information-related standards, under the direction of the current subcommittee for standards.
2. Form a systems development standards committee within the HIS Directorate to define a common framework to be agreed on for such aspects of system design as requirements gathering, interoperability, system documentation, source code and other proprietary issues, user interface and roles, data collection, access and dissemination, and overall nature, size, and complexity.

#### Data Collection

1. Establish systems to ensure that registers and reporting forms are updated and continuously available at all facilities.
2. Establish secure, backed-up data facilities for all systems at all levels.
3. Further strengthen and facilitate mechanisms (both manual and automated) to transfer information and data from facilities to districts to ensure that reports are delivered on time for onward reporting.
4. Select indicators so that those collecting data can actively and effectively use the information at the point of collection for patient care and management.
5. To avoid data discrepancies, align all data collection processes for the same data elements and indicators being collected and used across various systems and programs.

#### Data Quality

1. Mandate a standard data quality assurance (DQA) system that incorporates simple error-checking tools, such as comparing tally sheets to registers, having a second person check data entry, and instituting automated e-validation and derivation tools to ensure data quality.
2. To avoid data discrepancies, standardize definitions and methodologies when the same data elements and indicators are used, collected, and derived across various systems and programs.
3. Reduce the number of data collection tools and reporting forms that clinic and health center workers have to fill out.

## **Data Access**

1. Establish, support, and make robust all mechanisms and processes so clinicians and other health workers have feedback on their patients and their work.
2. Ensure that HIS systems store and provide access to disaggregated facility-level data to regional and central levels.

## **THEMATIC AREA 2: TECHNOLOGY, PROTOCOLS, AND THE HUMAN INTERFACE**

### **Information and Communications Technology**

1. Launch an immediate analysis at each level of the infrastructure requirements (connectivity, equipment, electricity, etc.) for various systems, especially new institutional systems (e.g., IHCIMS, NDW, DHIS 2.0) and national systems (e.g., HCMS, IFMS). Seek solutions (modems, cell phone transmission, and appropriate paper transfer) for sites that will not soon have connectivity.
2. Facilitate coordination with providers of ICT, Internet infrastructure, and other services that will support roll-out of the HIS and related systems.
3. Establish local area networks (LANs)/intranets in all facilities that have or will soon have multiple computers.
4. Establish an HIS technical support team and a network of IT professionals within the new directorate that have both centralized and decentralized capacity to meet programming, updating, and other support needs, such as help desks, antivirus program adoption, and rapid repair and replacement of equipment.
5. Ensure continued GRN sources for funding ICT programs and activities (e.g., Internet infrastructure and connectivity, modems, cell phone technology, 3G, and air time).

### **Hardware and Software**

1. Coordinate activities with other GRN entities, such as line ministries (e.g., OPM, MOF, MOH) that will support the roll-out and maintenance of operational systems (e.g., HCMS, IFMS).
2. Ensure that the HIS and all related systems (commodities, financial, personnel, vital registration, etc.) are open architecture and nonproprietary (to the extent possible) so that they can communicate with each other.
3. Fully implement the HIS systems agreed upon, using the new set of minimum indicators that all stakeholders agree to. *Note:* New systems and programs can be pilot-tested, but should not roll out until the indicator set is agreed.

### **Reporting Burden and Work Load**

1. Using a new set of agreed minimum indicators, create recording and reporting tools that are facility-appropriate (clinics, health centers, hospitals, etc.), and train staff and supervisors in their use.
2. Assess all data, information, and other reporting needs for MOHSS internal and external stakeholders at the national level, and in coordination with others use the results to design automated report templates and tools to drastically reduce the current national burden of manual and repetitive work and reporting.



## **THEMATIC AREA 3: INFORMATION PRODUCTS, DATA USE, AND KNOWLEDGE MANAGEMENT**

### **Information and Data Products**

1. Put on outreach events (not forgetting media) to raise awareness of the importance of information to service provision.
2. Support and help strengthen public data and information access portals that are reliable, relevant, and up-to-date. Produce regular reports from various nodes of the system and provide communication channels and forums to discuss them.
3. Establish a Namibia HIS Key Indicators Database that contains the strategic set of indicators agreed upon by all stakeholders for all MOHSS health programs, administrative areas (HR, finance etc.), line ministries, and sectors relevant to other determinants of health, with a user-friendly query facility; limited analysis including charting; and executive summary briefings.
4. Assess data/information and reporting needs, draft data utilization plans for stakeholders at all levels to improve operations, planning and decision making, and performance management; and design supportive automated analytical tools, reports, and information and knowledge management products. This process should involve all MOHSS stakeholders, especially service providers and managers/ decision makers at all levels; ordinary citizens and community units; and DPs.
5. To support better operation, management, and service delivery, put into operation a program of basic tools and training to promote analytical capacity and practices.

### **Demand and Use by System (Including Beneficiaries) and Decision Makers at all Levels**

1. Make opportunities for strategic dialog and consultations with stakeholders at all levels, including citizens, community units, DPs, implementing partners, and media to raise awareness for a culture shift, and build up citizen demand for information from policy and decision makers.
2. Launch outreach and workshops, especially at service delivery points to raise awareness and appreciation of the importance of information products and their use as essential components of everyday tasks.

### **Culture for Learning and M & E Feedback Loop**

1. Put in place new and reinforce existing M&E frameworks at each level to inform activity management and provide regular feedback.
2. Establish a variety of forums where people can exchange experiences and perspectives and share tools, practices, and concepts for success.
3. Design structured team reviews at each level to clarify and support individual and team commitments to managing with data.
4. Establish a pre-assignment training program for all clinicians and health workers on the management tools they need to do their jobs, such as those for health information, pharmacy management and logistics, etc.
5. Create a training and career path for professional HIS officers that incorporates both diploma and degree programs.

6. Establish on-the-job training and periodic retraining for all managerial, clinical, and HIS staff.
7. Build in formal and informal learning and knowledge components relevant to job responsibilities; provide ways to facilitate self-learning, and establish an incentive system to promote continuing education.
8. Put in place formal short- and long-term training programs, especially in new systems and programming areas, so as to improve the computer and technical capacity of staff throughout the HIS.

## **THEMATIC AREA 4: MANAGEMENT, COORDINATION, AND IMPLEMENTATION**

### **Institutional Effectiveness**

1. Identify a single highly-placed national champion who can mobilize people at all levels of the health system to influence and facilitate implementation of a strong and unified HIS.
2. Raise the profile of the new HIS Directorate through advocacy and awareness campaigns.
3. Identify a champion in each relevant national and subnational agency who can mobilize people and activities at all levels of the agency to help put in place a well-integrated HIS.
4. Establish a new or reinforce any existing interagency HIS coordinating body with an official mandate and high-level representation to work with TWG to generate political support, set direction, and oversee a visible national HIS strengthening effort.
5. Institutionalize a change management strategy for all HIS personnel, targeted especially at tackling behavioral changes where there is widespread resistance to use of new systems, processes, and technology.

### **Supportive Supervision**

1. Train supervisors and offer them on training and refresher training specifically for managing HIS and staff.
2. Put in place a supervision and support system with sufficient resources to routinely provide support to each level on data collection, quality, management, and utilization.
3. Provide regular supportive supervision, mentorship, and feedback at all levels; leave a written record of action points, advice, and understandings.

### **Policy and Planning**

1. Carry out a transparent, broad-based multi-stakeholder process, involving the private sector, faith-based organizations (FBOs), and civil society organizations (CSOs) for preparing an HIS strategy that is aligned with the national development agenda and the MOHSS strategy, and is totally based on evidence, such as the results of this and the planned stakeholder assessment.
2. Once the HIS strategy is completed, translate it into a series of prioritized action steps to achieve the necessary objectives.
3. Establish new and strengthen current mechanisms to review policy, strategy, and plans at least annually to ensure that programs are on track and continue to be relevant.
4. Under the new HIS Directorate, develop and support a process that will ensure that all government programs and DPs agree to an indicator list, enforce adoption of the list in their

vertical reporting programs, and define a schedule to merge all parallel data systems into the unified HIS.

5. Review, reinforce, and institute robust and effective performance-based accountability mechanisms at all levels and nodes of the system (including all HIS-related programs/projects/activities) to track results and resource usage.
6. Have the HIS Directorate carefully review and make concrete plans for integration, usage, and phase-out aspects of primary (DHIS 1.4, EPMS, SPM etc.) and planned (IHCIMS, NDW, DHIS 2.0) MOHSS systems so as to avoid duplication, gain operational efficiency, and save resources.
7. Reduce the adverse impact on operations and maximize the effectiveness of resources spent (including on training) by addressing critical staff rotation and retention issues.
8. Draft and enforce new operational policies and review and reinforce current ones to clarify roles and responsibilities related to data submission processes and protocols.
9. Establish clear guidelines and policies that outline rules, timelines, and a well-coordinated process for amending both electronic and paper-based documentation, and strictly prohibit any uncoordinated or unauthorized changes.
10. Revise current policies and management practices on use of mobile technology to facilitate more reliable and faster data/information transfer, especially use of 3G technology to replace dial-up modems.

### **Human, Financial, and Other Resources**

1. Provide sufficient human and financial resources that the new HIS Directorate will be able to perform all its vital mandated functions, including better coordination with all stakeholders and carrying out all activities necessary for the HIS implementation plans.

Note: A number of staff currently scattered through numerous organizational units should be brought together to ensure the institutional, experiential, and operational knowledge and expertise that are vital to the efficiency and success of the new directorate and the integration of the HIS.

2. Through careful prioritization and analysis of all goals and activities (both investment and operational), produce a practical, evidence-based, and justified estimate (in line with current international norms) for the required investment in the smooth and effective operation of the HIS as a percentage of the total health sector budget.
3. Ensure expanded and continuous GRN sources for funding staff (including currently seconded staff); technical assistance as needed for currently operational institutional systems (e.g., DHIS 1.4); and acquisition and maintenance of technology and supplies.
4. Provide the staff necessary for effective operation throughout the whole HIS at all levels.

### **Coordination, Collaboration, and Stakeholder Engagement**

1. Build up the new HIS directorate by creating leadership forums that can coordinate a broad variety of stakeholders. This will help to achieve both operational and policy reforms, especially those requiring resources, which will be needed to implement these and future recommendations.
2. Use TWG and the HIS leadership forum to coordinate both systems/tools and resource usage, and possibly share with other programs in need so as to maximize efficiency and facilitate integration.

3. Immediately form an official and inclusive MOHSS-wide systems and IT coordination body for HIS (SITHIS), with clearly defined TOR for all systems development, integration, coordination, and deployment activities, with members from both intra- and inter-ministry and sectoral stakeholders (from the HIS directorate, this group could simply have representatives from the SDSC team outlined under the Data and Information thematic area recommendations).
4. Support the current working group and initiatives by the HIS Directorate to bring together all stakeholders to agree on a minimum set of indicators that will meet all HIS program management and reporting needs. The working group should be institutionalized to ensure continued coordination between stakeholders on indicator management.
5. Put in place and actively maintain an HIS Stakeholders Map for Planning and Implementation that reflects all agreed current and future activities/commitments (from all parties, including the MOHSS internal budget) and incorporate to the extent possible potential interests and commitments expressed by all, including DPs. Use this to identify HIS support strengths and gaps, follow up on commitments, and pursue new support partnerships.
6. Build partnerships with internal and external private bodies to have access to technical expertise relevant to MOHSS state-of-the-art systems development tools.
7. Integrate and align the results of this assessment with the TWG roadmap for building up HIS in general.

## I. INTRODUCTION

The Republic of Namibia, with a population of about 2.2 million, is a member of the United Nations (UN), the Southern African Development Community (SADC), the African Union (AU), and the Commonwealth of Nations. It gained its independence from South Africa on March 21, 1990, following the Namibian War of Independence. It is bordered by Angola and Zambia to the north, Botswana to the east, and South Africa to the south and east.

In the broadest unifying development plan for Namibia, Vision 2030, President Dr. Sam Nujoma set the goal as being “to improve the quality of life of the people of Namibia to the level of their counter parts in the developed world by 2030.” Vision 2030 then states that Namibia will be transformed into a healthy and food-secure nation, in which all preventable, infectious, and parasitic diseases (including HIV/AIDS) would be under secure control, its people would enjoy high standards of living and a good quality of life, and they would have access to quality education, health, and other vital services. Thus, health and health-related outcomes are central to Vision 2030.

To move that vision toward realization, the Third National Development Plan (NDP3) for 2007/2008–2011/12 sets a series of targets that, if realized, would constitute a significant improvement in health indicators, such as reducing the HIV prevalence rate among pregnant 15–19-year-olds from 10.2% to 8% and among 20–24-year-olds from 16.4% to 12%; malaria mortality (per 100,000 persons) from 428 to 210; TB mortality among cases diagnosed from 9% to 7%; infant mortality (per 1,000 live births) from 46 to 38; under-5 mortality (per 1,000 live births) from 69 to 45; and maternal mortality (per 100,000 live births) from 449 to 265. Another goal is to increase national life expectancy at birth from 49 to 51. The NDP3 goes on to set as one of its Goal Strategies to “Maintain sound population and health information systems.”

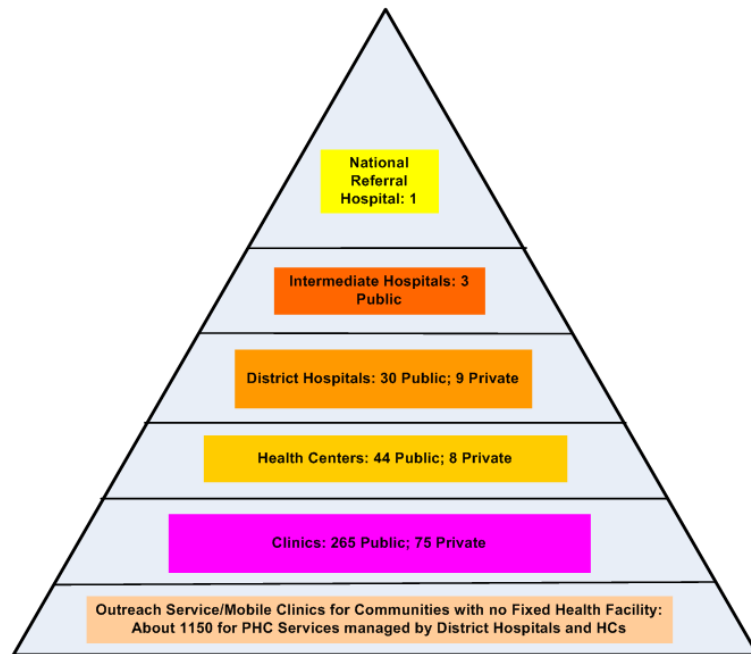
In order to accomplish both Vision 2030 and the NDP, the Namibian Ministry of Health and Social Services (MOHSS) has been given a mandate to oversee, provide, and regulate public, private, and nongovernmental provision of quality health and social services to ensure equity, accessibility, affordability, and sustainability. The Strategic Plan for 2009–2013 states its mission as being “to provide integrated, affordable, accessible, quality health and social welfare services that are responsive to the needs of the Namibian population.” In providing health and social services, the ministry has set itself to achieve one overarching goal: increase life expectancy from 49 to 55 by 2013.

Health services in Namibia can generally be tied to three components: district health services, secondary and tertiary health services, and central support to ministries and the regions. The MOHSS has adopted the primary health care (PHC) approach to delivering health services to Namibians.

Namibia is divided into 13 regions and 34 districts. The MOHSS is

organized into 7 national directorates and 13 regional directorates. The national directorates are: Primary Health Care; Developmental Social Welfare Services; Special Programs (DSP); Tertiary Health and Clinical Support; Finance and Logistics; Human Resource Management and General Services; and Policy, Planning, and Human Resource Development. Currently there are 34 public district hospitals that provide institutional medical and nursing care, including preventive, promotive, and primary and secondary curative health care. They also offer technical and referral support to 44 health centers and 265 clinics.

**Figure 1: Health Care Delivery Levels and Facilities Namibia**



The costs of running a health facility are very high because Namibia’s low population density of about 2 persons per square km makes it difficult to get facilities close to the people. Government has responded by setting up about 1,150 outreach services/mobile clinics managed by district hospitals and health centers to serve communities lacking access to fixed health facilities. Private for-profit, mainly urban, health facilities include 9 private hospitals with a bed complement of 473 (7 percent of total Namibian hospital beds) and 8 health centers. The 2006 Namibia Demographic and Household Survey (NDHS) reported that 21.1 percent of households live close to hospitals, 7.3 percent close to health centers, and 68.3 percent close to clinics (“close” means less than 5 km in distance or less than 15 minutes travel time to reach the facility).

The health sector has decentralized by devolving authority to the 13 MOHSS regional directorates. Although the central MOHSS supports service provision and management development for the whole health system, the regional directorates oversee service delivery in the 34 health districts. Public health services are provided through the district hospitals, health centers, and clinics. Three intermediate hospitals and one national referral hospital support the district hospitals. Although all levels generate significant amounts of information, their processes and systems are not harmonized to provide comprehensive information for management decision making, or even for improving actual service delivery.

Throughout the years, many development partners (DPs) have contributed to Namibia’s multifaceted efforts to deliver health services, especially its fight to respond to such emergency diseases as HIV and AIDS, tuberculosis (TB), and malaria. One result of donor funding of specific health priorities has been a series of vertical programs established within, and sometimes outside, the MOHSS. Separate and somewhat isolated programs deal with HIV/AIDS, vaccinations, malaria, and TB; often each has its own central staff and data collection enterprises,

and most rest with individual health facilities that offer services. To improve services across the sector, the MOHSS is launching an intensive initiative to unify current health information systems (HIS). The goal is to operationalize a unified national HIS that will efficiently support evidence-based planning and decision making at all levels.

## **BACKGROUND AND OBJECTIVE**

The GRN has put quality of life, specifically the health of its citizens, at the center of all its development strategies and plans. An integrated and effective HIS is essential to upgrade the quality of health services and improve health outcomes. The HIS is the principal entry point for timely data and channel for the information and knowledge exchange that are critical to facilitating evidence-based planning and decision-making throughout the system. The GRN and all stakeholders, clearly recognize the urgent need for a strong, integrated HIS; the GRN has shown increasing commitment to making the changes necessary to achieve that.

The Health and Social Services Review 2008 found that the Namibian MOHSS has fragmented HIS, managed by different divisions in different directorates and not necessarily linked. Even when HIS are captured electronically, they run on different software platforms. While each may be useful in its own right, there are obvious overlaps and duplications between systems and problems with data retrieval, utilization, and the reporting burden on health workers. To help address these issues, the MOHSS has recently engaged in an intense planning process and made efforts to unify the HIS to better facilitate management and effective use of health and health-related information to meet the health needs of Namibians. As part of that effort the GRN has already formulated an HIS Technical Working Group (TWG) and approved a new HIS directorate in the MOHSS.

The GRN's recent aggressive move to integrate HIS units is critical to strengthening the HIS as a whole. Developed correctly, the single coordinated system will have sufficient capacity to serve the health information needs of all stakeholders to facilitate evidence-based decision making. To better inform the HIS reform effort, MOHSS sought support from USAID/Namibia for a comprehensive HIS assessment that would (per the letter from the MOHSS Permanent Secretary of March 23, 2011):

- Inventory the numerous systems and databases currently residing within the MOHSS;
- Reach a comprehensive understanding of their contents, data elements, and associated reporting burden, and how they are used and by whom; and
- Help identify the strengths and weaknesses of each and formulate recommendations to inform planning efforts.

## **A COUNTRY-OWNED AND COUNTRY-LED APPROACH**

Country ownership and leadership are the main drivers of sustainability and long-term capacity to plan, implement, manage, and evaluate high-impact development programs. Establishing a country-owned and country-led approach is a complex process with no single formula for success. Innumerable and complex issues, variables, and players need to be analyzed in order to lay the foundation for an effective plan. The process must be flexible yet at the same time robust enough to capture all the emerging realities within the country, especially its political and institutional dynamics. At the heart of the challenge is fostering an environment that encourages sociopolitical, policy, and organizational change that will support achievement of development

goals based on country-owned and country-led principles. In planning for the Namibia HIS assessment, the team looked at four thematic areas (TAs) and their components that it felt are critically necessary to promote, strengthen, and sustain system-wide development that will unify Namibia HIS components. The whole work plan, including this framework, was cleared with the HIS TWG, which has taken the lead in making the assessment truly country-owned and led.

### **Data and Information**

The HIS is the principal entry point for all health and health-related information; however, data are entered through a variety of systems and databases. While it is desirable to have to the extent possible integrated electronic systems and properly structured and standardized databases, well-managed and standardized manual processes can also prove useful until the more desirable electronic system can be attained. The first thing that needs to be done is therefore to learn what actual systems and databases are related to the HIS and acquire full details about each. As with any information system, an HIS program requires an enormous amount of effort to ensure that the data entered are of good quality, and that support systems (collection and quality control tools, supervision, skills, and personnel) are in place to sustain quality. The team looked at the following subcomponents in this thematic area:

- Information systems and databases
- Data collection
- Data quality
- Data access

### **Technology, Protocols, and the Human Interface**

Accurate data for decision making are essential for effective monitoring and evaluation (M&E), and the most critical elements for M&E are the systems, people, protocols, and processes that are used to collect and record data. These systems critically incorporate many information and communication technology (ICT) aspects and hardware and software components as well as the actual human interface between all those and the patients. Critical analysis of many HIS has found that what most affects information collection and its quality are the actual collection load, processes, and reporting burden on the health workers who are trying to provide critical services and record information at the same time. The team therefore looked into this thematic area in terms of three subcomponents:

- Information and communications technology
- Hardware and software
- The reporting burden

### **Information Products, Data Use, and Knowledge Management**

Production of timely, accurate, and reliable data leading to useful health information and knowledge products, and their access modes, analysis, and usage are at the heart of evidence-based planning, policy formulation, decision making, and action. To truly improve health outcomes in Namibia, the HIS is the principal entry point to provide crucial information and knowledge needed for planning and decision making. The whole culture of information generation, knowledge capturing, learning, and use throughout the entire health system from the



community to facilities to district, regional, and central decision makers informs program efficiencies and health outcomes. To trigger a culture shift and build demand for information at all levels, strenuous efforts are needed to promote information use and in turn build and reinforce capacity at all levels to respond to this demand. The team therefore looked into three subcomponents of this thematic area:

- Information and data products
- Actual demand and use by the system (including beneficiaries) and decision makers at all levels
- Culture for learning and the M&E feedback loop

### **Management, Coordination, and Implementation**

The development community is far better at drawing up strategies and plans than actually following them through to completion. Overcoming political and organizational obstacles to effective implementation has not been adequately addressed. Plans and goals have to be connected to implementation through effective management and coordination among all stakeholders. While often the necessary policies and strategies seem to be in place, they prove ineffective in accomplishing change due to ineffective management, coordination, and institutional effectiveness. The team therefore looked into this thematic area in terms of five subcomponents:

- Institutional effectiveness
- Supportive supervision
- Policy and planning
- Human, financial, and other resources
- Coordination, collaboration, and stakeholder engagement.

The team set out to determine (i) if institutional roles and responsibilities for HIS were clearly assigned; (ii) how effectively they are carried out; (iii) if there were sufficient and effective supportive supervision at all levels; (iv) whether there are policy and planning for HIS and how effectively they are enforced; (v) whether resources for activities and plans are sufficient; and (vi) if there is effective intra- and inter-agency coordination to guide and implement HIS strengthening plans.



## **II. ASSESSMENT METHODOLOGY**

The assessment methodology consisted of a thorough analysis of Namibia's HIS in terms of the four thematic areas. This was carried out through review of documents and statistics, interviews with key informants, group meetings, field visits, and detailed review of 61 systems and databases. The two-member assessment team consisted of Mr. Tariqul Khan, team leader, and Mr. Duncan Edwards. The team worked in Namibia from March 19 through April 28, 2012.

### **DOCUMENT REVIEWS**

The team reviewed a large number of background documents provided by the TWG, USAID/Namibia, other MOHSS entities and documents available in the public domain, and requested additional reference materials and documents for review during meetings and interviews. The team also benefitted from reports of previous assessments and planning documents, such as *The Health and Social Services Review 2008*, MOHSS Strategy 2009-2013, and NDP 3. Annex F lists documents collected and reviewed.

### **MEETINGS AND INTERVIEWS**

Over the course of six weeks, the team held 76 group and individual meetings and interviews with a large number of informants, meeting ultimately with over 100 individuals. While the team attended most key discussions together, at times it was necessary to split up to cover all scheduled meetings. Those who joined group meetings or were interviewed were managers and professionals from various MOHSS levels, implementing partners, private providers and associations, line ministries (the ministries of Finance [MOF] and Home Affairs [MOHA]), the Office of the Prime Minister (OPM), and other health stakeholders. Information from all group discussions and individual interviews was recorded in writing and later carefully reviewed and analyzed. Annex E lists all individuals who met with the team.

To facilitate information-gathering and documentation of what emerged from meetings and interviews, the team drafted key questions for each thematic area and subcomponent and a form for taking interview notes. The interviews were copiously documented. This information helped the team to compile a list of problems, issues, strengths, opportunities, and major barriers and proved to be an organized way to cross-check, compare notes, verify, and discuss impressions.

### **FIELD VISITS**

During the course of the assessment, the team visited about 12 clinics, health facilities, and district, intermediate, and national hospitals in the Hardap, Omaheke, Oshana, and Khomas regions. Together and separately the team members met with managers of facilities, service providers, and HIS officers. The team members took detailed notes on discussions and findings, which were later brought together and analyzed.

### **SYSTEMS/DATABASES CATALOG PREPARATION**

A major part of the assessment was review and analysis of 61 systems (paper-based, electronic, and a combination of both), which resulted in production of a detailed catalog of systems and databases. This catalog sets out details in terms of the following four areas in order to provide a comprehensive understanding of each system:

- Key process and qualitative information at-a-glance
- System/database technical information
- Use case flow diagram
- Data dictionary

More details about the content of each of these are outlined in the introduction to the catalog, followed by details for each system/database. This catalog, a key output of this HIS assessment, is listed as Annex C of this main report but it has been compiled into a separate document due to its sheer length (almost 1,400 pages) and size (5.5 MB).

## **DATA SYNTHESIS, FINDINGS, AND RECOMMENDATIONS**

In addition to the information gathered in group discussions and interviews and in the review of documents, systems, and databases, the team also relied on its own technical judgments and observations, following a structured process where interview notes were carefully organized and analyzed, which led to formulation of a very detailed matrix of findings, issues, and gaps in terms of the four thematic areas. The team then used this as the basis for formulating system-wide recommendations. The assessment moved toward identification of concrete system-wide interventions to build toward a well- integrated HIS in Namibia. Central to the team's recommendations are notions of sustainable capacity building and enabling country-led and country-managed approaches to formulating an improved HIS that serves all levels.

The findings and recommendations presented in this report have been discussed widely with the MOHSS, TWG, DPs, and other stakeholders.

## **REPORT PREPARATION AND FINALIZATION**

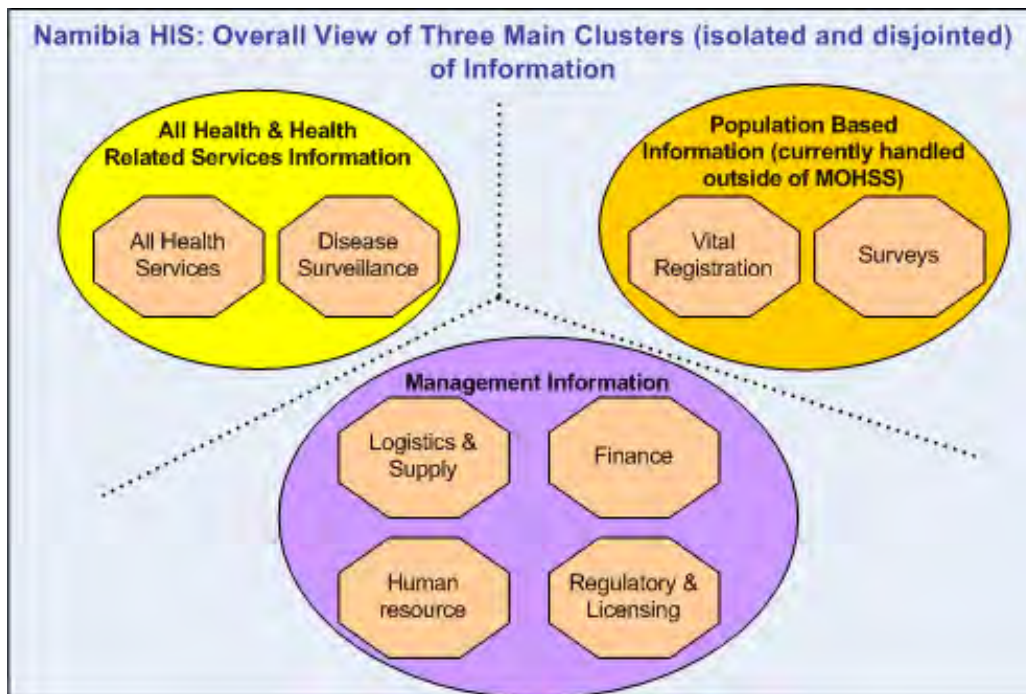
This report presents the final version of the findings, analysis, and recommendations compiled by the team. Each member wrote sections of the report, which were then compiled, coordinated, and organized by the team leader into final form. Both team members then reviewed it again.

### III. CURRENT NATIONAL HIS

#### OVERVIEW

At present the HIS environment of Namibia's MOHSS is a cluster of many individual and generally disconnected systems and databases that collect information on a vast array of health services and related programs. This assessment reviewed what amounted to a mushroom garden of 61 mostly standalone systems and databases, some paper-based, some electronic, and some a combination of both. A detailed catalog of these is attached to Annex C of this report. Data and information being collected or relevant to the HIS can be grouped into three main categories: (i) all health and health-related services information, which covers both health services and disease surveillance; (ii) population-based information, such as vital registration and surveys; and (iii) management information in areas like logistics and supply, finance, human resources (HR), and regulatory and licensing (see Figure 2). While there is a critical need for communication between the three categories, MOHSS is currently directly managing or overseeing collection mostly of health services and management-related information. Population-based information is mostly handled by the Planning Commission and the Central Bureau of Statistics (CBS). Of the 61 systems and databases reviewed, the primary custodians of 53 are units within the MOHSS, and the other 8 are managed by others, such as the Ministry of Finance (MOF), Office of the Prime Minister (OPM), Ministry of Home Affairs (MOHA), and private not-for-profit organizations.

**Figure 2: Namibia HIS—Overall View of the Three Main Clusters of Information**



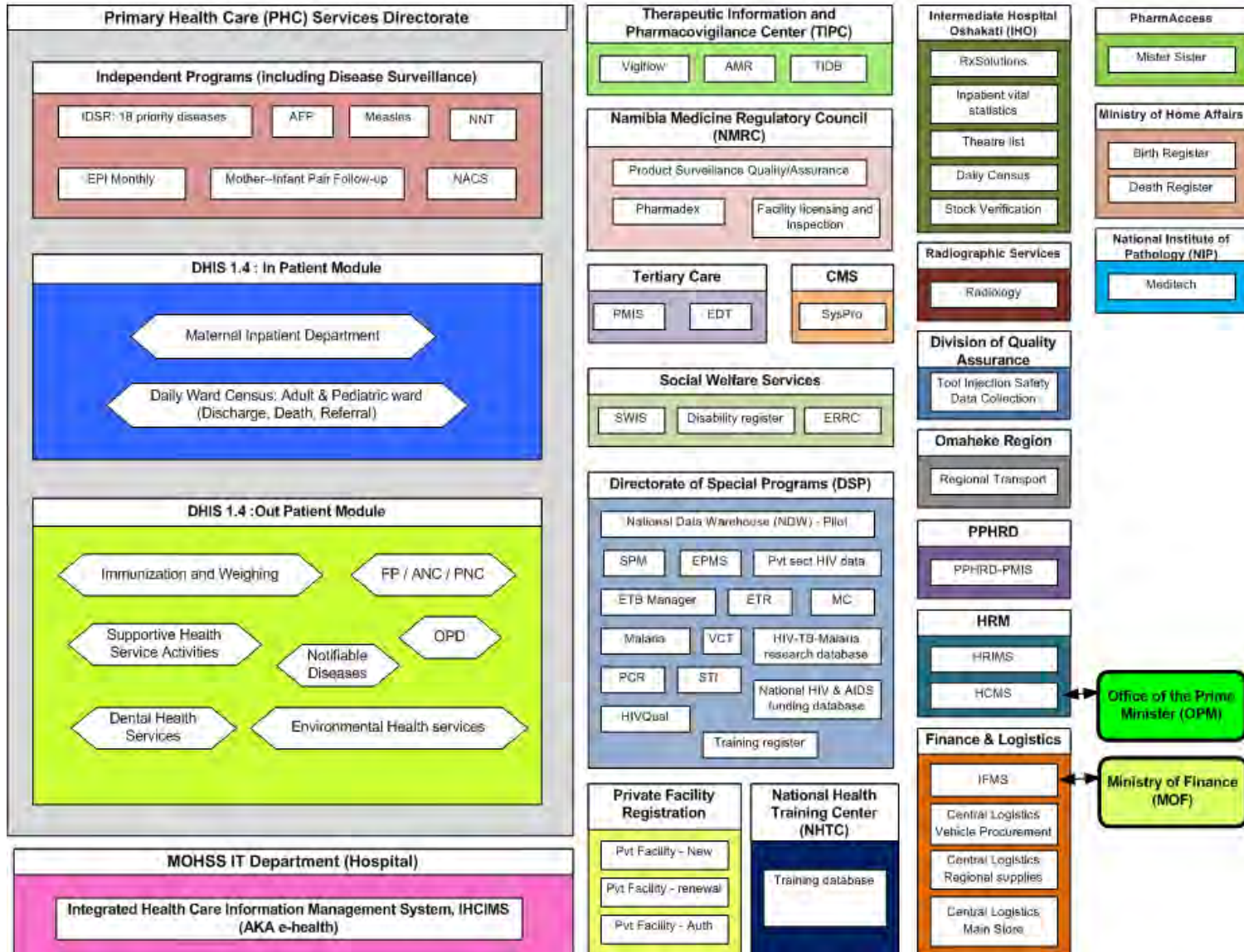
Most of the national systems and databases and their associated health information activities are spread over a number of directorates in the MOHSS. HIS terminology is also used in a most confusing way; for instance, clinical statistics collected by the Primary Health Care unit (PHC) are quite often referred to as the HIS. However, it needs to be clear to everyone that HIS entails a much wider range of information beyond simply routine PHC data. The management information system, which is located in the Directorate of Planning, covers HR, health infrastructure, and logistics, and the Directorate of Special Programs (DSP) handles HIV, TB, and malaria surveillance. The MOHSS also has a number of other information-related systems, databases, processes, and activities. Figure 3 (next page) shows the systems that were reviewed and their isolated and widely dispersed locations both within and outside the MOHSS.

As with systems and databases, HIS activities and the staff associated with them are scattered over different MOHSS directorates, divisions, and subdivisions. In an HIS world where the HR constraints are already serious, this has been a major problem. Currently, relatively few HIS are automated. Few if any of the systems, data sets, and processes communicate with one another. Together various PHC and DSP units manage and maintain about 30 systems. However, even within these directorates, there is no effective integration, communication, or coordination between either the systems or databases and the people and entities managing them. Even disease surveillance subsystems work in isolated electronic systems running in parallel, and they are not yet integrated with health services data collection. HR has an automated payroll system but not a full personnel management system with important facets like leave records modules. There are no automated physical inventory or real property records.

The multiple pharmaceutical distribution systems are mostly electronic but they too are operating in parallel. The Therapeutic Information and Pharmacovigilance Center (TIPC) is maintaining multiple systems that differ very little. The systems of the National Medicines Regulatory Council (NMRC) and Radiographic Services are either paper-based or only semi-electronic. As important as the tasks done by the Policy Planning Human Resources Department PPHRD are for evidence-based planning and policies, its system, process, roles, and accountability mechanisms between the various actors are either not clear or simply not followed. Social Services systems and databases are nearly dead because the unit has long been missing an information specialist and data collection processes are not being followed; a number of other systems also seem to have died (e.g., the DSP training database).

While there are pockets of good systems, databases, and practices both within and outside the MOHSS, it seems safe to say that current HIS data systems are fragmented, disintegrated, and to a large degree rudimentary. An effort to incorporate data from private health facilities has not been very successful, both due to poor, unenforced, or, absent policy and perhaps because private providers do not have any incentive or simply do not see the need to submit reports.

**Figure 3: Today's Namibia HIS World—Systems/Databases**



As for organizational structure, the HIS system is supposed to work through the three-tier central, regional, and district administrative structure. However, there has been no single MOHSS structure for coordinating HIS until the very recent approval of the HIS Directorate, which is not yet truly operational. Systems, staff, and management responsibility are spread over multiple directorates and subunits, creating a totally confusing, unstructured, and uncoordinated environment with no hope of organized HIS management. Currently there is no formal structure for intra- or intersectoral coordination of HIS. Thus, across the board in Namibia coordination of HIS and related systems and activities is dysfunctional—feeble almost to the point of nonexistence.

Policies and strategies for HIS are noticeably lacking. While there are a number of national and health sectoral policies and strategies, there is currently no HIS-specific strategy or policy. However, the TWG-guided roadmap for HIS strengthening has a concrete plan to formulate a new HIS strategy followed by a policy phase.

The whole situation has had a tremendous negative impact on data collection, quality, processing, dissemination, and actual use. The vicious cycle of unreliable data collection and production exacerbates the continuing problem of little or no use of data in actual planning, decision making, and delivery of patient care and other health services.

## **HIS DATA SOURCES**

Throughout the Namibia HIS, information is gathered from a variety of sources. All these sources are clustered and described in the following broad operational and administrative categories.

### **Routine Service Data**

Routine service data (both inpatient and outpatient) is managed by the PHC and collected from patient service records and reporting from health workers at various types of facilities. Routine health data is collected through a network of health facilities (government, faith-based, nongovernmental, and private) that are distributed throughout the country. Service delivery points complete paper summary forms and submit them to the district every month. Data are then transmitted from the district to the regional and then the regional to the national level.

### **Disease Surveillance**

IDSR (Integrated Disease Surveillance and Response) data are also managed by the PHC and again collected based on patient service records and health worker reporting. This information is collected in four categories: 18 priority diseases, AFP (acute flaccid paralysis), measles, and NNT (neonatal tetanus). These data are also collected through a network of health facilities throughout the country. However, service delivery points complete the reporting forms and submit them to the district level weekly rather than monthly.

### **Program-Specific M&E**

A significant amount of program-specific monitoring takes place in Namibia, mostly for HIV and AIDS, TB, and malaria programs. Program-specific data collection all starts at a facility and is generally captured by the health worker, in usually standard but at times multiple registers, when a patient presents with specific symptoms of a given disease or when a patient requests specific services, such as voluntary counseling and testing (VCT).



## **Tertiary Care**

The Tertiary Health Care department gathers data primarily through the Pharmacy Management Information System (PMIS) and the Electronic Dispensing Tool (EDT). This information is all sourced from the health workers at clinics and larger facilities that operate ART (antiretroviral treatment/therapy) clinics, and who are required to capture the information from patient booklets.

## **Social Welfare Services Information**

Social workers at each facility are the primary sources of social welfare information, with district and regional offices becoming involved when there is a specific relationship to persons with disabilities and to drug rehabilitation.

## **Therapeutic Information and Pharmacovigilance Centre (TIPC)**

To gather information the TIPC uses such systems as Adverse Medicine Reactions (AMR), Vigiflow, and the Therapeutic Information DataBase (TIDB). All these rely on direct interaction between the source of data and TIPC itself, either in person or via telephone, fax, or e-mail.

## **National Medicines Regulatory Council (NMRC)**

Regulatory information, which includes facility licensing, quality assurance, and product registration, is also gathered directly when the source of the information or a request interacts with the NMRC itself.

## **Administrative Records**

Administrative records, which are central to management information, relate to finance/budget physical assets, HR, and logistics and supply systems. Currently, there is no interoperability between these and HIS systems. Moreover, there is very little communication between them, which means that many decisions are being made in silos without vital information from other systems—a significant waste of resources.

In today's environment, HR human resource and financial information is captured by district and regional HIS staff. These systems are centralized, but connectivity issues have prevented them from being fully utilized.

## **Census and Surveys**

These population-based sources of information are currently handled outside the MOHSS. The CBS, managed by the National Planning Commission, which is part of the Office of the President, is responsible for the census and household surveys. It is also responsible for analysis of vital events data collected by the Ministry of Home Affairs.

## **Vital Statistics**

Vital statistics, such as birth registration and death notices, are also handled outside the MOHSS processes, by the MOHA. Information relating to vital statistics is gathered initially from (a) the parents of a newborn child; (b) the family of a recently deceased person; or (c) a local health worker who can assist when someone in either of the previous categories has limited literacy. The data are collected first at facilities through registers and standard paper-based birth registration forms. The regional office then prepares summary forms and sends both the individual and the summary forms to the national MOHA birth, death, and marriage (BDM) office.

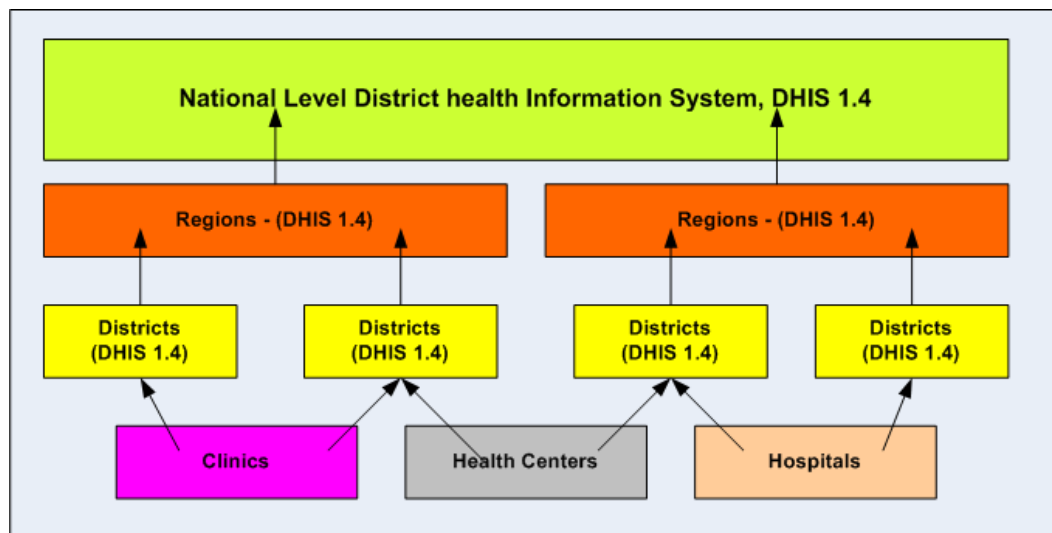
Some sources mentioned provide detailed, others only aggregated, information; some provide both, sometimes for different purposes.

## HIS STRUCTURE AND DATA FLOW

From a structural perspective, the MOHSS has recognized the need for data to be gathered throughout the HIS and has therefore placed people within the structure to assist with gathering data:

- HIS staff and officers are deployed throughout the PHC system at clinics, health centers, and district and regional offices. They are primarily responsible for processing and transferring all PHC-related routine services data.
- Data and M&E clerks at all levels are at the heart of the information collection process but generally focus on program-specific data (on HIV and AIDS, TB, and malaria). Their specific functions are data gathering, cleansing (pre-validation), and capturing. These clerks, however, are currently funded by such donors as the U.S. Centers for Disease Control (CDC), USAID, and the Global Fund (GF).
- Senior data clerks attached to the Regional Councils are responsible for verifying quarterly data.
- Sectorial data clerks are also employed at four umbrella organizations to gather data from civil society organizations (CSOs), the private sector (PS), nongovernmental organizations (NGOs), and faith-based organizations (FBOs). To encourage reporting, from time to time they try to provide small incentives, such as training, which can help in the process. Senior and sectorial data clerk positions are already part of the MOHSS payroll structure.

**Figure 4: Current PHC Data Flow**



As far as data flow is concerned, data are generated at the facilities and passed up the chain, typically on paper, to the district. Data are also passed laterally to vertical programs, such as HIV and AIDS, malaria, and TB, bypassing traditional intermediate steps, to be collected and analyzed by the parent unit at the national level.

PHC data generally start at the facility, where they are entered into registers or tally sheets, then summarized and written onto monthly paper-based summary forms. The summary forms are then sent to the district HIS officer, who validates them for obvious errors before entering the information into the District Health Information System (DHIS 1.4). These summaries are due to reach the district HIS officer within five days of the end of any given month. Excel-based summaries are extracted for reporting purposes and a copy of the updated system database is sent to the regional offices. District data are expected to reach the regional office before the seventh of the month. All district data are then imported into a regional database, which is used to create the regional summary. A regional summary file is then generated and sent to the national office, where it is combined in the DHIS 1.4 system with other regional data to create a final summary of the national statistics; this is expected to be complete by the tenth of each month.

PHC inpatient data follow a very similar path from point of capture in a hospital ward on daily tally sheets through monthly summarization for a district HIS staff member to capture into DHIS.

All disease surveillance data flow directly from the point of entry (forms at facilities) straight through to the National Epidemiology Department for capture in standalone versions of the IDSR database based on EPI Info (EPI = Extended Program for Immunization), which is built on MS Access (one each for AFP, NNT, and measles; another for the other 18 priority diseases). These data are captured and sent ad hoc rather than on a specific schedule.

Program-specific data start with forms completed at various health facilities. The flow of data then varies according to the specific program, with some programs capturing data electronically at the district, others at the regional, and some only at the national level. Most data are only captured monthly, but the malaria program, which had a specific requirement for weekly data, started its own process to accommodate that. HIVQual data are captured only every six months, which is contrary to the majority of PHC systems in use at the present time.

The Pharmadex and Facility Licensing systems, which fall under the NMRC, and the Disability Register, which falls under Social Welfare Services, both collect data directly from applicants. All applications received are processed directly by the national office and responses given directly to the applicant. Such applications are received ad hoc, not on any set schedule.

There are other systems where the data normally flow directly from the source to national staff; examples would be the AMR, Vigiflow, and TIDB systems managed by the TIPC. In these cases, incidents and queries lodged either in person or via telephone, fax, or e-mail are handled ad hoc.

Social Services information starts in the registers held at each community facility. The district social worker summarizes data by social problem for transmission to the regional social worker. Information from all regions, together with data received from the four intermediate hospitals, is combined to create a national figure for reporting purposes.

The schedule for capturing tertiary healthcare data varies widely. Information is captured daily into the EDT system and PMIS tally sheets, but the facilities only complete and submit PMIS summary sheets quarterly.

Administrative information held within the Human Resource Information Management System (HRIMS), soon to be replaced by the HCMS, and the IFMS is another classic case of ad hoc

processing with functions only performed as required. Some checks are performed on the HRIMS side when the regional supervisor verifies captured data against other GRN sources of information.

Information relating to new births may be either collected at the local hospital where the birth occurred or in the case of a home birth reported to a local hospital or Home Affairs office soon afterward. The arrangement is the same for deaths except that deaths at home may also be reported at a local police station. Any of these actions involves the completion of paper forms, and the district register will also be completed at some point. Registration forms for births and deaths are sent to the regional office every month; from these regional summaries are compiled and sent to the national office. The national office files all the paperwork and completes the required index register. There is a pilot project underway at Katatura Hospital to replace the paper process for recording new births/deaths with direct systems input, but the pilot is limited to the Khomas Region.

As can be surmised, data can take a variety of routes, standards, and processes through the Namibian HIS from when they are captured to when they get summarized and reported.

## **INFRASTRUCTURE AND TECHNICAL ISSUES**

Throughout the HIS, both local and wide area ICT infrastructure are either minimal or totally absent; the situation is similar for hardware and software at numerous levels. Along with making even routine data operation a challenge, this means that essentially existing systems (e.g., HRIMS, IFMS) and undoubtedly planned systems (e.g., IHCIMS, HCMS) are simply inaccessible in most regions and districts; it also means that facilities are prevented from being properly operational and interlinked throughout the health system. Below, key aspects of this problem are discussed.

### **Network**

Although this may sound harsh, reliable ICT infrastructure for the HIS is almost nonexistent. Still, a few programs and projects have undertaken some excellent initiatives that have succeeded in connecting the sites where they need to operate. For instance, the Namibia Institute of Pathology (NIP) has a multiprotocol label switching (MPLS) backbone that connects 38 labs and 20 smaller sites; it also has a connection between the Windhoek Central Medical Store (CMS) and the Regional Medical Stores (RMSs) in Rundu and Oshakati to service the needs of their SysPro system. Unfortunately, these isolated initiatives do not do much for the grand scheme of the HIS as a whole.

A situational analysis is currently underway to investigate connecting all 34 district hospitals, but again this is seen as a specific project to service hospital requirements as part of the impending rollout of the IHCIMS. Nothing was mentioned about this link possibly being used to service and accommodate the ICT requirements of other systems, such as HRIMS/HCMS or IFMS.

A few of the larger clinics, hospitals, and regional offices normally have a local area network (LAN) in place, and some locations even have a server, depending on their requirements. Of the 61 systems documented during the assessment, 19 are fully paper-based—no PC or server required—10 run on some form of server, and the majority are running on standalone PCs or laptops.

## **Data Transfer**

Facilities are required to submit data regularly so as to complete the district, regional, and national figures. However, they are not given the proper tools to do so. The situation is currently so bad in some places that individual sites are resorting to old analogue (dial-up) modems and phone lines or using their personal 3G modems to send and receive data in a timely manner.

## **Desktops**

A distinct lack of basic desktop computing technology was evident, especially in lower-level facilities such as clinics and health centers. Normally the only machines in place are the few provided through a specific program or for a specific purpose rather than for general use. Some desktop computers are newer models, but the majority observed were old and slow, which means that capturing data would take even longer than it should.

## **Electricity**

While none of the sites we visited complained about serious problems with electricity, many had no backup electrical power. Larger sites had uninterruptible power supplies (UPSs) designed to keep IT servers alive, and some offices had small local UPSs in place to keep a PC active for short periods, but this was certainly not the situation everywhere. Generators were rare, and some had not been tested for a long time.

## **DATA REPORTING, MONITORING, AND EVALUATION**

While effective monitoring should ideally mean continuous review of the performance of all the components in the project to ensure that input deliveries, work schedules, targeted outputs, and other required actions are proceeding according to work plans, currently the principal use of data collected in the HIS is for reporting. Facility performance is normally judged by whether the officer submits reports on time, not on the accuracy or completeness of the data. Data from each level or region are supposed to be used as the basis for supervision at the level below, but this rarely happens. Often health workers at a facility feel that the summaries they were creating would simply disappear upstream, and they would hear very little or nothing about it again—like a “big black hole.” Even some district summaries suffer the same fate because regions are not providing the downstream feedback they should. Regional and national reporting seems relatively better organized, and there is regular communication between these levels.

In the current HIS, data travel from facilities to districts to regions to the center, but not much information travels back to the originating sources, which suggests one-way or synchronous communication. In a knowledge-based health care delivery system, two-way or asynchronous communication is preferred, implying communication through-put and feedback loops where data are gathered, transformed, and communicated both ways. Health workers are not often visited by line managers to fulfill the M&E requirement. Some line managers admitted that they do not have enough time to perform the mandated number of visits, and when they do visit, they are so rushed that they cannot spend quality time with the team to discuss and rectify problems.

Staff must also contend with the sheer volume of reports submitted at all levels within the HIS, some detailed, some summarized. Comments made to the team suggest that certain reports containing information similar to what is in another report are simply overlooked; otherwise, the clinical work would not get done. It also appears that, during some supervisory visits,

information from tally sheets and monthly summaries did not match, nor did information match between district summaries and the regional summary created from them. There is thus a serious data quality issue, most likely due to the enormous workload.

Donor-supported vertical programs may make more use of data, but significant use of data for management purposes awaits a serious shift in the culture of data use.

## **HIS INDICATOR FRAMEWORK AND COVERAGE**

A large number of indicators are reported through the various arms of the HIS. Yet they still fall short of many individual program management requirements. Because of this, and the poor quality of the data, there are many program-specific vertical reporting systems. Current practices for using data collected vary from one program to the next because there has been no previous significant effort to standardize either the indicator itself or the way it is collected. Most programs that require calculated indicators also require that health workers enter the 'result' of the calculation on the summary form, which makes the job easier for the person collating the information but creates an enormous amount of additional work for the person completing it.

Generally, indicators are defined in terms of a specific program and therefore incorporate specific disease, age categories, and sometimes other information directly in their names, e.g., "Number children < 5 diagnosed with TB." Breaking up an indicator into individual components for recording purposes—'disease,' 'age category'—would allow for better manipulation and summarization later. The volume of data being collected also varies according to each program or project; health workers may be required to provide anywhere from 5 to 50+ indicators for a specific system.

PHC systems record information at patient level and there is a fairly high degree of common demographic information. There is also often commonality in terms of the application used, e.g., Epi Info, so with some thought and planning consolidation could be achieved. On average, PHC systems require health workers to capture 39 indicators for each of the 7 systems. For instance:

- AFP requires 70 fields of information, including numerous lab results gathered over time, so it is a fair amount of work to capture all of them. The basic demographics are fairly common.
- NNT requires capture of 60 fields of case-based information; again the basic demographics are fairly common.
- For measles there are 45 fields including some lab results; basic demographic information is similar.
- IDSR requires 25 pieces of information, including commentary, which requires more thought by the health worker. The demographics required are very limited.
- EPI Monthly has 17 fields on the tally sheet (visual inspection), only 7 fields on the summary (also visual), and the demographics follow the same basic trend.
- Nutrition Assessment Counseling and Support (NACS) records 9 observation fields, 5 treatment fields, and 6 patient demographic fields. Ultimately, though, only 3 indicators are used.

- Mother/Infant Pair has 4 fields for location, 13 for information about the child, and 14 for information about the mother, including basic demographics.

DSP-supported systems (outside the DHIS system) are split between those gathering patient-level information and those gathering summarized data. The information required therefore varies and covers areas like patient demographics, facility location, reporting period, lab results, and of course program-specific information. These systems require submission of an average of 60 indicators for each of the 11 systems.

- EPMS stores 5 local fields, 7 basic demographic fields, and 54 fields related to specific diseases.
- PCR stores 3 local fields, 3 basic demographic fields, and 22 disease-specific fields.
- HIVQual has only 2 location fields, 1 relating to time-based information, 5 for basic demographics, and 40 for disease-specific information.
- PS HIV data consists of 1 time-based information field, 7 location and demographics fields, and 54 HIV/ART disease-specific fields.
- VCT captures 4 location fields, 1 time field, 5 demographic fields, and 24 program-specific fields.
- The Extended TB Register (ETR) captures 2 location fields, 7 demographic fields, 6 fields for disease-specific information, and 22 for limited lab results.
- ETB Manager holds 43 examination-related fields and 13 patient information fields.
- The System for Program Monitoring (SPM) currently monitors 94 indicators for specific diseases.
- Male Circumcision (MC) has limited information requirements: 2 fields for location, 2 for time-based information, and 25 that are program-specific.
- Malaria has 2 fields for location, 4 relating to time, and 27 that are disease-specific.
- Sexually Transmitted Infections (STI) requires 4 fields for location, 2 for time, and 163 that are disease and age specific.

The 10 high-level data sets within the DHIS system contain only summarized information that is tied back to a facility and reporting period using a common standard. Of course, the sheer volume of data they require is enormous; the actual number of indicators ranges from 5 to 201, giving an average of 54 indicators for each data set.

PPHRD is managing to consolidate all the information above plus more from other sources. It currently submits 189 indicators to the national level (this requirement is currently being reviewed). These indicators highlight information dealing with 9 areas of operation: health, social welfare, transport, human and financial resources, nutrition, morbidity, mortality, and general management.

There appears to be no standardization. Common data should be standardized as far as possible; e.g., unlike the current practice, the same age categories should be used for all diseases and programs. This will, of course, require input from all parties to agree on categories to be used.

The same is true for defining indicators. There needs to be clear, standard, agreed definitions of common indicators across all programs and systems. In general, every data element should be defined so well that people know what data to capture or how to correctly calculate a result if needed.

The bottom line is that the set of basic indicators must be winnowed down so that the data collected are efficient, reliable, high-quality, timely, and useful at the service point where they are collected all the way to the highest program and political levels.

## **BURDEN OF REPORTING FORMS ON THE FACILITY**

Through exhaustive investigation,, the team concluded that, depending on the actual services they must provide, every day a facility health worker may be required to complete up to 25 different forms or registers (e.g., PHC: 7–8; vertical disease programs: 6–7; disease surveillance: 4–7; vital statistics: 2–4), and another 8 summary forms must be completed daily, weekly, or monthly. For each outpatient visit there are about 9 facility forms or registers to be completed daily (more if more than one service is provided in a single visit), and the information is then compiled in at least two manual monthly summary forms:

A facility health worker may have to complete up to 25 different forms and registers every day. There are also as many as 8 different summary forms that must be completed daily, weekly, or monthly.

- Cash register
- Receipt book
- Patient passport (created if required)
- Patient passport updated with observations
- Patient booklet updated
- Outpatient Division (OPD) tally sheets (malaria, STI, immunization, radiology, etc.)
- Service registers (ETR, ETB, pre-ART, chronic ART, IPT , VCT)
- Sample requisition forms for NIP tests (depending on service)
- Monthly service summaries (one for each service provided)
- OPD register
- OPD monthly summary forms

Each inpatient stay requires that at least the following six hospital forms be completed daily, and the information is then compiled in a manual monthly summary form:

- Midnight census form
- Vital statistics form
- Operating room form ((if theatre time is required)



- Stock verification form (completed monthly)
- Patient passport updated with observations/medications
- Patient booklet updated
- Inpatient Division (IPD) monthly summary form

There are another eight or so forms that may need to be completed daily depending on disease or program requirements. Some of these programs also require the information to be manually summarized every month, but ALL of this information, as well as the OPD and IPD information, is entered on the PMIS monthly summary sheet.

- IDSR-18/AFP/NNT/Measles (separate entry forms):
  - Case information form
  - Sample requisition forms for NIP tests
- Social worker
  - Client intake form
  - Social services register
  - Monthly summary form (one per social problem)
- PCR
  - Service information form
  - Sample requisition forms for NIP tests
- Nutrition (NACS)
  - Register
  - Monthly summary
- Mother/infant pair
  - Information form (A4 sheet)
  - Monthly summary
- DQA - monthly summary (tool injection safety data collection quality control sheet)
- PMIS monthly summary sheet

Beyond the clinical forms that are required, there are also about four administrative monthly/ad hoc forms to be completed and five ad hoc clinical forms relating to births and deaths.

- Administrative forms
  - Treasury order forms (T8) for logistics
  - Needs request forms for equipment

- HR forms for new employees (ad hoc)
- Payroll forms for new employees (ad hoc)
- Vital statistics forms
  - Births in hospital
    - Birth register
    - Birth form
  - Births at home form
  - Late births form
  - Death notification form

## **PARALLEL SYSTEMS/DATABASES AND DUPLICATION**

The national system's capacity is poor in many areas; there are shortcomings in the systems for data collection, reporting, analysis, and dissemination, and a lack of indicator coverage. This has had serious implications for the data needs and reporting requirements of DPs and to a somewhat lesser extent for MOHSS program offices. Many DPs have invested in stopgap measures and established parallel systems. Even though this is not ideal, it was done more out of necessity because when these systems were created, there was no way to integrate them with one another to share information. For instance, all these systems require a way to identify a patient, either by name or number, yet one system that had already created a unique patient identifier was not able to share that with another system. Moreover, even though unique patient numbers were created in a number of systems, there was no consistency in how they were specified—number of characters and digits, all numbers, mixed alphas and numbers, etc.—which now means that the ID for a patient in one system cannot be matched to information relating to the same patient in another system.

The ultimate result was that, instead of strengthening the national system, these investments made it even more fragmented. Most of these parallel systems are in one way or another supported by DPs. Moreover, while these parallel systems are usually required to report to their corresponding or controlling units at the MOHSS or the DP, they are only encouraged, not required, to report to the national system.

There are also systems that are actually performing double-entry, such as the Electronic TB Register (ETR), which captures monthly summaries on a manual Excel spreadsheet and is also importing district data into the national ETR database, which could then produce the same summaries. The malaria program, on the other hand, is capturing a subset of program-related indicators into DHIS for all suspected cases (only a subset because the DHIS system does not have all the indicators necessary for program reporting) and is sending manual weekly paper forms stating the number of proven cases. The duplication was created because DHIS provides only monthly figures, and the malaria program must react to weekly numbers to prevent outbreaks. The real problem with this decision lies in the definition of the information: one system counts suspected, the other proven cases. The knock-on effect is that the numbers will never match and data quality again suffers.

Vertical programs often get data from various facilities, and sometimes from districts, using their own forms and data transmission procedures. Not only does this massively increase workloads, but no program produces consistent data that can be used for management decisions. By investing in stopgap measures and parallel systems, DPs actually share a great deal of responsibility for the current fragmented state of the national HIS.

## **KEY STAKEHOLDERS**

An array of stakeholders are directly linked to the MOHSS and its operations through such aspects as actual health service delivery, management, and operations; that fact significantly affects both current and future needs for the HIS to influence effective information flow and evidence-based policy, planning, decision making, and implementation. These stakeholders consist of a wide range of parties from both within and outside the GRN. While this assessment did not look into all possible stakeholders, it did observe some who may have important connections to or implications for the HIS.

### **Line Ministries and Other GRN Agencies**

**The Office of the Prime Minister (OPM):** The OPM manages public service staff rules, policies, and procedures. The OPM IT Office therefore leads an effort to provide the software and systems necessary for human resources management (HRM) to all line ministries, including MOHSS. The current system, the Human Resource Information Management System (HRIMS), has been in operation for about 12 years and the OPM has declared that it has reached its end of life (EOL) and will no longer be supported. The new GRM HRM is the Human Capacity Management System (HCMS), which will replace the HRIMS in coming months. This system has not yet been rolled out to line ministries; it is operational only at the OPM itself. In one of the early pilots, it was due to be rolled out to MOHSS by June 2012.

**Ministry of Finance (MOF):** The MOF provides the actual financing for MOHSS health care and social services activities and supports tenders. The MOF IT office manages the effort to provide the software and systems necessary for financial management to MOHSS and other line ministries. The current system is the Integrated Financial Management System (IFMS), with such modules as accounts payable, accounts receivable, budget, payroll, daily subsistence allowance (DSA), procurement, cash collections, and stores. The operations most used by MOHSS are procurement and payroll; at the regional level the most-used module is payroll alone, mainly because of slow connectivity and human capacity issues.

**Ministry of Home Affairs (MOHA):** MOHSS is closely associated with the MOHA on two fronts: issuance of work permits and visas for personnel and civil registration. This assessment looked specifically into civil registration in terms of births and deaths. Both the birth registration and death notification systems are totally paper-based and all paper records coming through the Regional Home Affairs Office are kept at the MOHA Birth, Death, and Marriage Unit. MOHSS has access to monthly standard statistical reports and ad hoc reports upon request, but these data are not part of the HIS. MOHA's first computer-based pilot at the Katatura hospital is now capturing birth records from registration forms into an electronic file for the Khomas region only.

### **Ministry of Regional Local Government Housing and Regional Development**

**(MRLGHRD):** MRLGHRD works with MOHSS in areas like provision of reliable water, electricity, and sanitation services, and in implementation of numerous decentralized functions. In the HIS-related work, the DSP collects data through its RM&E unit's System for Program Monitoring (SPM), which is designed to collect, analyze, report, and use routine non-health-facility-based HIV/AIDS, TB, and malaria data, which is coordinated through the MRLGHRD. M&E officers are placed in each regional council to collect data for a standard set of indicators and report back to the R-M&E unit quarterly and annually, based on the type of data (regional council HIV activities, funding, etc.). The regional M&E officers are the principal liaison between these data and the HIS.

**Ministry of Education (MOE):** MOE provides assistance in HR development for the health sector and also supports the MOHSS PHC school health programs. Currently, however, no data from the MOE are being integrated into the HIS.

**Ministry of Gender Equality and Child Welfare (MOGECW):** The MOHSS and the MOGECW find common ground in the provision of social welfare services. Currently, however, no MOGECW data are being integrated in any form into the HIS. Even actual service provision is only minimally synchronized.

### **Development Partners**

A number of DPs are providing technical and financial support for a wide range of activities, among them service delivery and collection and dissemination of health-related information. During this assessment of HIS, the DPs that were found to be supporting activities that had clear implications for the HIS and related activities are the CDC, the Global Fund, Japan International Cooperation Agency (JICA), the President's Emergency Plan for AIDS Relief (PEPFAR), UN AIDS, the UN Population Fund (UNFPA), UNICEF, USAID, and the World Health Organization (WHO). In Namibia's fight to respond effectively to disease emergencies like HIV/AIDS, TB, malaria, and prevention of mother to child transmission (PMTCT) of HIV/AIDS, the support of these DPs is critical. However, one of the results of major donor funding of different health priorities has been the emergence of vertical programs within, or even outside, the MOHSS. Often these programs have their own central staff and data-collecting enterprises that are not properly coordinated.

### **Faith-Based Organizations**

Catholic Health Services, Lutheran Health Services, Anglican Health Services, and other FBOs are helping Namibia to provide health care. Often, while the FBOs own the land and premises of clinics, health centers, and even district-level hospital service points, the GRM pays such operational costs as medicine, equipment, and most HR. The facilities are directly linked to HIS and submit service delivery data using the same process and protocols as GRN facilities, sending it up through the levels. They also provide annual financial reports to the MOHSS.

### **The Private Sector**

The private sector is regulated by the Hospital and Health Facilities Act of 1994 (Act No. 36 of 1994). Private facilities are licensed to provide health services to all patients; they generally complement public services. In 2006, 844 private health facilities were registered with or licensed by the MOHSS; these are mostly in urban areas. Coordination between the private sector and the MOHSS in collecting statistics such as service data is extremely tenuous.

Generally, either there is no process, or there is one and it is not followed. For example, HIV data are meant to be collected from all nine private medical aids (insurers) in Namibia, but only four are currently submitting data, and only two of those use the agreed process. However, PharmAccess is a good example of both private nonprofit service delivery and data submission. It regularly contributes service and other vital statistics to the HIS using the standard MOHSS tally and summary forms.

## **CURRENT INSTITUTIONAL SYSTEMS**

There are a handful of institutional systems in use throughout the Namibian HIS. A few are program-specific, such as the electronic patient management system (EPMS) and EDT, or facility-specific, like IHCIMS, but others are spread more widely in terms of the data that they collect, e.g., PMIS, DHIS, IFMS, and HRIMS.

**DHIS (version 1.4)** contains over 3,200 different elements of information assembled into multiple data sets, each according to the program or project for which it is being recorded. Although input screens are designed to mimic paper capture forms for easier input, the information is still being captured in multiple isolated copies of the software installed across all districts. Manual work is required to pull the information together to form a national summary.

**EPMS** contains data specific to patients being treated for HIV, and **EDT** captures dispensing information for the same patients. Both of these systems work very well in the ART clinics but they do not share information. The fact that EPMS, the tool that collects patient data, and EDT, the dispensing tool, are not integrated is a significant problem in itself. **IHCIMS** (also known as E-Health) is designed to hold both patient and dispensing information in a much more integrated way that would allow better correlation of the data without manual intervention. At this point, however, this system is planned for hospitals only and is as yet used only at the Windhoek Central Hospital.

**PMIS** carries information on a number of operational indicators, gathered from all facilities. The indicators relate to stock management and availability of medicines, rational use, quality of care, medicine financing, and some HR issues. It is currently being evaluated to make a transition to a better and more reliable system and database environment. This could be the ideal opportunity to coordinate this well with others and explore possibilities for both current and upcoming tools.

**IFMS** is the national financial management system used throughout the HIS and other line ministries. From the MOHSS perspective, the widely used procurement and payroll modules allow the Finance and Logistics office to approve requests and orders remotely and quickly. Similar approvals are required for new employees to be entered into the IFMS for payroll purposes. Also, because connections are very slow, only these two modules are used much in the regions.

**HRIMS** is an internally developed application that was put in place about 12 years ago to capture all HR-related records electronically—attendance, staff planning, etc. Now in the EOL stage, it is being replaced by the Oracle-based HCMS (also referred as HRMS).

**Meditech** is an enterprise resource and planning (ERP) system that the NIP has bought and is using to manage all the aspects of its laboratories throughout the country, from stock management to sample processing and results-gathering. Meditech is centralized: all 38

laboratories communicate with one server housed in Windhoek. Another 20 sites are able to view their results online via a terminal connection to the same server.

**SysPro** is another ERP system that has been installed at the Central and Regional Medical Stores. System modules deal with quantification, forecasting, planning and procurement, stock supply and management, and sales and distribution. Even though this system is internationally renowned, the Namibian HIS still relies on support from South Africa through the EOH company. As hard as EOH tries, SysPro still does not integrate the CMS and RMSs well, or pull together the CMS and the IFMS system used to manage supplier payments; information is currently printed from SysPro and then entered into IFMS.

## **NEW SYSTEMS DEVELOPMENT AND DEPLOYMENT PLANS**

When deployed and fully implemented, new systems currently being pilot-tested may have significant institutional and operational implications for both the HIS and the MOHSS as a whole.

### **Human Capacity Management System (HCMS, aka HRMS)**

HCMS, the new HR management system currently being piloted at the OPM and soon to replace HRIMS for all line ministries, is also known as HRMS, and in the Namibia health system, the acronyms are used interchangeably.. A standardized fully Web-based product based on the Oracle E-business suite, HCMS will encapsulate all current HRIMS functionalities and much more to heighten efficiency both generally and in day-to-day HR management work. Among the functions its well-integrated modules can manage are these:

- The organizational structure
- Skill and competency management
- Health and welfare plans (medical, dental, vision, pension)
- Insurance and retirement planning
- Payroll
- Leave
- Management document creation (handbooks, training manuals, reference materials)
- Oracle HR self-service (for employees to access information)

MOHSS is one of the early pilots; the system was set for deployment there by June 2012. As part of the preparation, five trainers from each ministry are being trained. The trainers and their ministries will then be responsible for training more people (cascade model), down to the regional levels. This would be a central access system only, with no decentralized installation. Throughout the country, to access the system users will have to connect over the Web to the central OPM server.

When fully operational, HCMS would significantly relieve the manual HR-related work burden. However, certain issues must be looked at carefully. Today's network and Web connectivity issues even at the regional level will continue to be a barrier to access and use of HCMS unless they are addressed soon. Currently MOHSS awareness of the imminent deployment is quite low, and there seems to be no clear plan to build the necessary human capacity to handle this,

especially locally. The MOHSS therefore needs to draft a plan immediately, with intense coordination with the OPM IT Office to take action to prepare for this migration, because although OPM delivers the system and trains people centrally, responsibility for access and decentralized use basically still lies with the MOHSS.

### **Integrated Health Care Information Management System (IHCIMS, aka E-Health)**

The new IHCIMS is also an Oracle Web-based application; it has already been piloted and is now operational in Windhoek Central Hospital. Rollout to the other 33 district and intermediate hospitals will be phased in, starting with the Intermediate Hospital Oshakati (IHO), where network installation is already complete, followed immediately by Rundu (assuming that network is installed on time).

This application manages all hospital departments from patient registration through outpatient or inpatient treatment, diagnostic testing, billing, and ultimately discharge. Based as it is on the Oracle E-Business Suite, all the modules are very well integrated so that information entered at any point is automatically available to be viewed by any other department; for instance, a doctor creates a prescription in the system, which the pharmacy can begin to fill immediately so that it is ready when the patient or ward sister arrives to pick it up. E-Health allows all aspects of patient information and such services as drugs to be maintained and managed together, whereas today these aspects are captured and maintained in multiple isolated systems that do not communicate with each other.

Navayuga InfoTech, the implementing partner for IHCIMS, has launched a concerted effort to build solid local capacity for support and sustainability by forming partnerships with UNAM and PolyTech, from which Navayuga is sourcing local talent. Because this process started some time ago, there are already a number of skilled local people involved in the rollout and training for E-Health. As the rollout continues, further regional and district recruitments are planned.

The rollout plan, however, relies on a sound wide area network (WAN) backbone and good human capacity and support structure. It should only be deployed after current infrastructure is assessed and ICT requirements are not only identified but also installed. Given the sheer size and complexity of the system, in its current form IHCIMS would be well suited for district hospitals that have the necessary ICT and human capacity. Also, once rolled out to every location, constant technical support for both trouble-shooting and training users will be absolutely critical. It is the team's opinion that IHCIMS in its current form would not yet be suitable for facilities like health centers and clinics. For them, a lighter version should be explored.

### **National Data Warehouse (NDW)**

The new NDW is a concept that emerged about three years ago but was then focused on the HIV and AIDS program. Although it is still in its infancy, the thought process has already been expanded to incorporate all current programs and diseases.

In the early stages the NDW will still be only a Web-based presentation layer drawing on static reports created in other systems but standardizing their presentation; it would be accessible from anywhere with an Internet connection. Future phases will be geared to obtaining data directly from other systems (primarily DHIS 2.0) rather than just presenting static reports.

Ultimately the NDW would become the single centralized location for multiple reports on healthcare and related information.

Plans are also underway to interface the NDW with other new systems like IHCIMS, as well as current ones like NIP's Meditech, to gain access to the most up-to-date information possible.

### ***District Health Information System (DHIS 2.0)***

DHIS 2.0 is the upgrade of version 1.4, which is the current basis for a number of programs within the Namibian HIS. DHIS 2.0 is Web-based; version 1.4 is a Windows 32-bit application. This transition to Web-based makes the application more versatile and much easier to upgrade. Assuming the network backbone is in place in all healthcare facilities, use of DHIS 2.0 will address a number of current problems and workload issues related to sharing information, collating information for district and regional summaries, etc.

There are plans for DHIS 2.0 to capture data at a patient level rather than just at summary levels. To do this would require that some other applications now in use be consolidated with DHIS 2.0, allowing the health worker to enter data only once and the system to automatically extract summarized information directly. This would not only relieve the work burden on health workers, it would also improve data quality because it would minimize opportunities for error in the summarization process.

### ***Possible Overlaps***

As new systems and tools are pilot-tested, what is missing is the most important piece: coordination. Currently there is very little coordination between parties related to either new or old systems. Ways to avoid potential overlaps and coordination issues have not been well-thought-out, which means there is a risk of significant functional and operational overlaps both between the new systems themselves and between new and old systems. For example, if DHIS 2.0 moves into handling patient data, there will be overlaps with systems like EPMS. On the other hand, IHCIMS can easily integrate patient, dispensing, and management data. There needs to be careful analysis beforehand to ensure that the most effective systems are retained.



## IV. KEY FINDINGS AND CONCLUSIONS

### DATA AND INFORMATION

Data elements and their definitions are often one of the last things to be addressed in such complex settings as the Namibian HIS, simply because it is more work to discuss and adapt than to create something new. Add to that the complication of systems that are unable to share information and the results are the current Namibian HIS—that “mushroom garden” of systems. Dealing with that requires an enormous amount of effort to ensure that only good-quality data enter the system and that support systems (tools, supervision, and personnel) are in place to keep quality high. Today, the poor quality of data entered into the system makes the entire structure nonfunctional. Registers are incomplete, for instance, and often are filled out not at the time of service but retroactively, tally sheets are not filled out correctly—and these are just symptoms of major problems across the board.

Used properly, information on a large scale, as can be found within the innumerable components of the current HIS, can be extremely powerful—but making it so also takes a great deal of forethought on the part of all players. Addressing the weaknesses and barriers outlined in what follows should help, as will correct planning to minimize input but maximize output. Aggregated challenges, gaps, barriers, and strengths for all components of this thematic area are outlined here.

Among the challenges and gaps identified in this thematic area are these:

- Currently, across all systems and databases there is no common patient identification number and agreed standard or definition for various data elements.
- Nor is there an agreed roadmap or framework for such key aspects of system design as requirements gathering, interoperability, system documentation, user interface and roles, data collection, access and dissemination, and overall nature, size, and complexity.
- Some systems documentation, including source codes, is either the property of the outside developers, or simply not available to MOHSS technical staff.
- Numerous systems offer similar and duplicative functionalities, and others are not being used to their fullest capability.
- Numerous channels collect similar information, causing methodological differences and integration issues that result in data discrepancies.
- Isolated, ad hoc, and parallel systems, databases, and data collection processes were created because of inadequate information/indicator coverage by primary systems or lack of coordination between operational institutional systems and processes.
- Inadequate training and understanding, weak skills, poor work ethics and practices, rapid staff rotation, and lack of retention at all levels seriously affect the timeliness and quality of data and information and thus undermine overall operation.
- Due to lack of interoperability, information must often be extracted in printed form from several electronic systems (e.g., EPMS, ETR, private sector HIV data, MediTech, SysPro),

then manually re-entered into other electronic systems or MOHSS summary forms (e.g., Mister Sister Mobile Health Services, PharmAccess, IFMS).

- Data aggregation processes and methodologies are inadequate and automated data validation tools insufficient in a variety of systems.
- Most HIS officers and M&E data clerks do not understand the substance of the data adequately to allow them to do more than a cursory check of gaps and completeness, and there are not enough subject experts to verify or review data.
- There are too few clinical and data entry staff at most facilities.

Among the barriers to addressing these gaps are:

- System design that is weak, uncoordinated, and unplanned (operational requirement, needs analysis, etc.)
- No unique patient ID across systems
- Lack of technical understanding and capacity
- Inadequate, nonstandard, or overwhelming operational requirements for systems
- Poor policy, enforcement, management, coordination, and stakeholder engagement
- Lackluster or nonexistent accountability mechanisms at all levels
- Commercial licensing barriers
- Inefficient or non-use of materials and HR
- Lack of provision for training

However, some strengths were observed in the area of Data and Information:

- Although they are few, some open source products are in use (e.g., DHIS).
- A number of applications are widely distributed (e.g., DHIS 1.4, EDT, EPMS).
- Roles-based access is inherent in some current and upcoming systems (e.g., ETR, ETB, IHCIMS).
- Electronic input screens identical to corresponding paper forms have helped to reduce human error in data entry (e.g., DHIS 1.4, PCR).
- There are pockets of small but effective home-grown technical initiatives that have significantly improved monitoring capacity, aided managerial interventions, and ultimately contributed to improving service delivery (e.g., three small systems at the IHO).
- Some systems have mobile versions with 3G communication capacity (e.g., EDT, Mister Sister, the Namibia Blood Transfusion Service [NAMBTS]).
- Multiphase patient appointment tracking in EDT has helped to improve patient care.

- Test results at NIP labs are sent automatically from test devices to the Meditech system, considerably reducing the possibility of human error.
- For certain quarterly reports DHIS is already in use as the primary source of information at all levels.
- The NDW prototype has a Web portal for reporting (although static) that is accessible from anywhere that has Internet access.
- IHCIMS is a modularized, highly flexible (power-user configurable) and well-integrated Web-based system based on work flow principles that will help to improve process management and significantly reduce manual data entry and process errors, which will considerably improve data quality and reliability.
- IHCIMS has the capacity to store and track real-time patient data, which should significantly improve patient care management.
- IHCIMS also has the capacity to generate a large selection of hospital-based canned and ad hoc service, operations, and management reports.
- The new HCMS system should result in significant time saving in HR-related operations.

One important note: the planned HCMS, IHCIMS, and NDW are all necessary and well-thought-out on their own right; what is needed is continuous communication between the implementing parties with regard to integration, interoperability, avoiding duplications, and general coordination and information-sharing. That will ensure that these systems have solid grounding, as will future systems with which they need to share information.

## **TECHNOLOGY, PROTOCOLS, AND THE HUMAN INTERFACE**

Accurate data for decision making are essential for effective M&E, and the most critical M&E elements are the health information systems used to collect and record data. These systems have many ICT components. It is almost considered a requirement today for systems to provide the infrastructure applications need for efficient operation. Some detailed infrastructure and technical findings have already been discussed.

Vertical program funding characteristically includes support for information systems to capture performance data linked to specific disease and health accounting codes. Although these data satisfy accounting and program reporting requirements for policy and program planning where disassociated aggregate data suffice for resource capitalization, they have little relevance for, and generally do not much affect, health outcomes. Health outcomes improve only when a care provider understands the patient holistically and treats the whole person. Aggregating the data can then inform reporting. In theory, this is what should be happening; in practice, the provider has little time to engage with the patient and record the encounter or health event as it occurs.

Lack of human resources, especially at points of care provision, is unanimously understood to be the central issue. HR not only impacts M&E and the HIS but also service delivery. Because health care providers are also responsible for capturing patient data and tabulating, tallying, summarizing, and collating them daily, weekly, and monthly for submission, their time is split between essential client care and the necessity of reporting. The three components of this thematic area that were assessed were ICT, hardware and software, and the work/reporting

burden. Aggregated challenges/gaps, barriers, and strengths for this thematic area as a whole are outlined below:

Among the challenges and gaps identified in this thematic area are these:

- A large number of systems, databases, and processes are totally manual, paper-based, or only partially electronic and to a large extent either fragmented or in nonstandard format. This adds significantly to the work burden and undermines process efficiency.
- Because automated reporting mechanisms are not standardized, most reports and templates (including data submissions) are manually filled in and calculated, making them error-prone as well as very burdensome; display and dissemination of information and reports are generally in static format (e.g., the new NDW portal).
- Weak or nonexistent local and wide-area ICT infrastructure and a lack of the necessary hardware and software at several levels essentially make existing systems (e.g., HRIMS, IFMS) inaccessible and similarly affect planned systems (e.g., IHCIMS, HCMS), as well as preventing facilities throughout the health system from being properly operational and interlinked.
- ICT capacity limitations and aspects of systems design add a significant and tedious manual work burden at national and regional levels when multiple copies of the same data from isolated databases must be integrated.
- Lack of standardized data collection tools often results in too frequent and uncoordinated additions and updates, again adding to the reporting burden.
- Excessive time is spent on program indicator reporting forms (tools).

Among the barriers to addressing these gaps are

- Limited management appreciation of the value, efficiency, and long-term cost savings of ICT investments
- Inadequate or nonexistent ICT infrastructure
- Weak or unplanned system design or no real system or database in place
- Poor policy, enforcement, management, coordination, and stakeholder engagement
- Inadequate technical skills
- Lack of and inefficient use of material and human resources
- Lack of provision for training
- Unavailability of help-desk support when equipment or protocols fail

However, some strengths were observed in the area of Technology, Protocols, and the Human Interface:

- NIP is already connected to 38 labs through an MPLS cloud that performs certain operations and to 20 ARV clinic sites for results retrieval alone.

- An analysis of network infrastructure is being conducted now at all 34 district hospitals, which should inform deployment of new systems.
- IHO has state-of-the-art local ICT infrastructure in the shape of a network cable (CAT6) throughout its buildings; this should make seamless the adoption of systems like IHCIMS (E-Health).
- About 1,700 PCs, 80 servers, UPSs, and printers contributed by the Indian Government are to be in place by the end of June 2012 to facilitate IHCIMS roll-out.

## **INFORMATION PRODUCTS, DATA USE, AND KNOWLEDGE MANAGEMENT**

Production of quality data leading to useful health information and knowledge products and data access, analysis, and usage are at the heart of evidence-based planning, policy formulation, decision making, and action. Reliable information needs to be available in the right format at the right time. In the quest to improve health outcomes in Namibia, the HIS is the principal point at which to access crucial information and knowledge. However, after detailed review, the assessment team found that in the Namibian health system, demand for information and knowledge products for analysis, learning, planning, and decision making is noticeably low.

Data dissemination and use seem to be generally inadequate for all HIS data. Most systems lack features to facilitate analysis and use of information for decision making. HIS-related flagship reports and other MOHSS publications are often outdated or too narrowly disseminated. While many directorates, divisions, and subdivisions periodically issue reports, these are not distributed widely, and usually others (especially external audiences) are simply not aware that they exist. Respondents reported that in most cases plans cannot be translated into effective actions because they are rarely linked to the underlying information from HIS systems and reports. There is not enough attention or resources given to publication and dissemination of data, information, and periodic reports, let alone investment in generating and analyzing information and creating knowledge management products to facilitate learning and sharing of experiences and best practices. Also, very little is being done on any sort of evaluation. While in the long run impact evaluations are critical, the practice of having interim or midpoint evaluations done as well as final evaluations is critical to align work being done with stated goals and to document lessons learned for future program design.

At every level the culture of generating information and capturing and using it is severely underdeveloped. To trigger a culture shift and build demand for information throughout the system, serious efforts are needed to promote information use and build capacity at all levels to respond. If the outcome of a healthier Namibian population is to be realized, there is urgent need for readily available and accessible HIS data as a public good, both to empower targeted beneficiaries and for planning, management, and decision making. Reliable digital and paper-based information products and other knowledge-based goods should be readily available and accessible. The three components this assessed under this thematic area were information and data products, actual demand and use, and culture for learning and M&E feedback loop.

Among the challenges and gaps identified in this thematic area are the following:

- There are few real-time or structured data products and little ready access to data.
- There are very few knowledge management products to facilitate learning, experience-sharing, and best practices.
- At the point of collection there is a lack of understanding, ownership, and use of data for patient services and management, or for decision making and planning.
- Missing at all levels is adequate and structured supportive supervision, and feedback mechanisms at all levels are ineffective and uncoordinated.
- Analytical capacity, resources (including human), practices, and tools are all limited.

Among barriers to addressing the gaps and weaknesses are:

- An underdeveloped culture of information generation and use
- A virtually nonexistent culture of learning and understanding of data use
- Use of data use not institutionalized because data are unreliable and there are competing reporting requirements
- Inadequate resources, especially human capital
- Lack of analytical capacity
- Weak policy, enforcement, planning, management, and coordination

However, some strengths were observed in the area of Information Products, Data Use, and Knowledge Management:

- There are forums for presenting, discussing, and analyzing information about what does and does not work and areas of potential improvement (e.g., the annual pharmacists forum, the TB Program quarterly review meeting, the biannual quality review workshop for HIVQual, the annual social welfare forum).
- A number of program areas are setting quarterly reporting goals and monitoring progress through the DHIS system.
- Multisectoral supervision is done from a number of program sides (although the time and attention given to specific programs are still a serious concern) and a written report is shared with the facility.

## **MANAGEMENT, COORDINATION, AND IMPLEMENTATION**

Most institutions are far better at drafting strategies and plans than at effectively implementing them. Success of the outcomes needs to be considered as important as vision, strategies, and plans. A number of MOHSS national departments and divisions are responsible for managing key aspects of the HIS in a coordinated way to support smooth and effective HIS at all levels. The institutions need sufficient organizational, human, technical, and technological capacity to manage and coordinate human, financial, and material resources and operations. If these are to be

effective, they must also have genuine stakeholder engagement and coordination to support HIS strengthening across the whole health sector.

Coordination and effective HIS management are essential for effective service delivery. Broadening coverage of the population across a vast country places significant pressure on the ability of HIS-related institutions (particularly the new HIS Directorate) to effectively organize and manage resources so as to maximize the health impact of improving HIS. It is therefore critical to ensure that such capabilities are developed and maintained.

Unless GRN exercises effective leadership to ensure compliance with current and new HIS policies and strategies, both within government and from stakeholders, and institutions have plenty of capacity, parallel systems (and agendas) will continue to undermine coordination and resource use. Furthermore, without adequate resources for HIS operations—in particular staff who have the requisite skills, especially at the data generation level—there will be trouble for the HIS strengthening plan. The five components of this thematic area that were assessed were institutional effectiveness; supportive supervision; policy and planning; human, financial, and other resources; and coordination, collaboration, and stakeholder engagement.

Among the Management, Coordination, and Implementation challenges and gaps identified are the following:

- In general, skills do not meet the critical, required, relatively higher, degree of basic computer and specific system user literacy, system administrator competencies, and technical support capacity.
- Nonexistent, ill-defined, duplicative, poorly enforced processes (such as data submission protocols), and lack of clarity about roles and responsibilities not only raise issues about data collection, quality, and ownership but also undermine the entire planning and management process.
- Lack of standardized data collection tools (often because of too frequent and uncoordinated program additions and updates) and of data and definition standards across the health system result in data discrepancies, distribution disequilibrium, and a tremendous waste of resources.
- Duplicate, parallel, and excessive numbers of data collection tools cause a heavy reporting burden, mostly due to numerous vertical programs; they have negative effects on data collection, quality, and, most important, service delivery.
- There is no strategy, system, or plan for coordinated and structured DQA at any level.
- There is a general, troubling, lack of accountability for resources and results, and inefficient sharing of resources across many programs and associated systems.
- Most health managers, who are generally clinicians, do not have the managerial and business skills necessary for monitoring, planning, and implementation.
- In-house technical capacity and external support are lacking for customizing systems (e.g. DHIS 1.4, NDW) as needed to speed the flow of information.

- There is little or no dialog and virtually no coordination and communication amongst key entities (intra MOHSS and inter agency) and programs for critical activities (such as system-related development) that have direct operational impact.
- A large number of systems are designed and used only for vertical disease programs, and the technical resources available are not used to their fullest extent or shared for better integration.
- There is no formal mechanism for people engaged in similar business operations or who have vested interest in IT and systems across the health sector to discuss ideas and strategies for standardizing and scaling up new developments.
- HR and technical capacity are insufficient to provide the necessary HIS and IT support to both local levels and MOHSS headquarters.
- Within the MOHSS, systems development and the IT support structure are fragmented because of a lack of clarity about roles.
- Many systems and staff, including M&E data clerks nationwide, are currently funded by donor programs with no clear plan for sustainability when the current support ends.
- Current policy and management practices are forcing use of old dial-up technology in most places rather than using faster and more reliable 3G technology.
- Resistance to use of new systems, processes, and technology is widespread, and the associated change management strategy is inadequate.

Among the barriers to addressing these gaps are the following:

- Poor management, coordination, and stakeholder engagement with a unified HIS
- Lackluster policy, planning, and enforcement
- A general lack of awareness of the real and potential impact of weak Management and Coordination.
- Lack of provision for training
- Lack of technical capacity, resources, and follow up

However, some strengths were observed in the area of Management, Coordination, and Implementation:

- A few systems have helped to streamline previously resource- and time- consuming processes (e.g., IFMS has reduced paper work, and DSA and payroll are now 100% electronic, with no check printing).
- In a few situations, there are good examples of partnerships for useful technical skills and local capacity building between MOHSS and local organizations (e.g., NDW's second prototype and Polytech; IHCIMS with UNAM and Polytech), and there are plans to make use of local expertise to roll out new systems.



- Large number of M&E data clerks (although-program based) are already in place in regions and districts.
- Centralized printing of registers and forms helps to bring uniformity to printed versions across the country.
- The few public-private partnership (PPP) initiatives and associated information systems offer opportunities not only to expand services to hard-to-reach groups but also to share health information with the HIS (e.g., PPP between MOHSS and PharmAccess for PHC- Mister Sister Mobile Health Services).



## V. UMBRELLA RECOMMENDATIONS

Based on the findings and conclusions of the assessment, and keeping in mind demands related to effective operation of the HIS Directorate and the efforts needed to move toward a unified HIS for Namibia, the team's three umbrella recommendations to help build up the HIS are these:

1. Identify a single high-level national champion with the political will and support to help raise the profile of the new HIS Directorate and mobilize people at all levels of the health system to facilitate implementation of a stronger, more unified HIS.
2. Ensure that the HIS Directorate has sufficient influence, human and financial resources, and technical/advisory expertise (especially for the next 12 to 18 months) to be able to perform all its vital mandated functions, such as better and more effective strategic planning, coordination with all stakeholders, and carrying out all activities necessary for HIS implementation, including all agreed recommendations of this assessment.
3. Immediately establish a formal and inclusive MOHSS wide Systems and IT Coordination Body for HIS (SITHIS) with clearly defined terms of reference for all systems/ICT review and selection, development, integration, coordination, and deployment. It should be composed of members from both intra- and inter-ministry and sectoral stakeholders (for the HIS Directorate, all or preferably a subset of the members from the internal Systems Development Standards Committee [SDSC] team [see the Data and Information recommendations in the matrix]) could be the official representative in the SITHIS).



## **VI. DISCUSSION OF RECOMMENDATIONS**

In general, the recommendations detailed and exemplified in Annex B are highly geared to streamlining and strengthening both current and new systems, processes, and entities throughout the whole HIS. Realization of these recommendations through a well-coordinated GRN approach (not piecemeal, which has been typical so far), i.e., by the MOHSS, its HIS directorate, and all stakeholders, will be a substantial move forward that will in turn contribute to a more effective HIS with increased access, quality, efficiency, and equity.

When the recommendations and associated illustrative activities in Annex B and the discussion that follows this are reviewed, the following should be kept in mind:

- A component is a smaller, self-contained part of a larger entity (a thematic area).
- Illustrative activities are just examples of types of activities that may be necessary in order to realize a particular recommendation. While the full set of recommendations is broad and complete, the associated list of activities may not be. For each recommendation, the team listed possible activities for illustrative purposes only; creating an exhaustive list will have to be explored and decided by the TWG and the HIS directorate as for each recommendation they move to build action plans that specify not only the action but also the timeline, the parties responsible, the results intended, costing, etc.).

### **DATA AND INFORMATION**

Because data and information are building blocks for any HIS, they need to be fully appreciated to extract maximum benefit for all parties to the HIS. This section also touches on aspects of design that should be inherent when a system is required to share information or integrate with any other application that is part of the same system. The team has grouped its recommendations according to the four components for the thematic area, in which each recommendation should trigger different actions for fulfillment of the area goals.

#### **Information Systems and Databases**

The HIS is the principal entry point for all health and health-related information; however, entry is actually done through all the associated systems and databases. The recommendations for this component will help to address the core issue of standards for both existing and new HIS systems and databases. Without standards, interaction between various component systems would be almost impossible. Some intended outputs for this component are the following:

- A common framework for different HIS data/information-related standards is defined and activated.
- An internal SDSC becomes operational.
- The SDSC defines a common framework for such aspects of system design as requirements gathering, interoperability, system documentation, source code and other proprietary issues, user interface and roles, data collection, access and dissemination, and general nature, size, and complexity.

- A roadmap is in place to align, consolidate, or phase out any fragmented and unused systems (decided in coordination with the SITHIS team described in the Management, Coordination and Implementation recommendations).
- A plan is in place for phased migration of all current manual, paper-based, and partially electronic systems to standardized computer-based systems as defined.
- Interfaces between systems are in place for seamless automatic information and message transfer.

### **Data Collection**

It is hoped that the recommendations under this component will help produce more robust and standardized mechanisms to collect data, institute better transfer mechanisms to ensure that data are received promptly by the intended recipient, and ensure that data being collected are usable by both parties. Some intended outputs of this component are as follows:

- Systems capacity is reinforced with a better supply of data tools, without stock-outs, at all appropriate levels.
- Data are at all times secured and backed up.
- Existing mechanisms are built up to facilitate transfer of information and data from facilities to districts and regions promptly to support the requirement for onward reporting.
- Indicators are defined and collected so that the person collecting them can use the information effectively.
- All data collection processes are aligned with the same data elements and indicators being used and collected throughout the system.

### **Data Quality**

Because the team believes that inadequate data quality mechanisms are undermining the usability of the data being collected, recommendations in this area are designed to ensure that processes used to collect data also ensure both consistency and accuracy. Some intended outputs of this component are the following:

- A DQA system is instituted to ensure data quality.
- To avoid discrepancies, standard definitions and methodologies are enforced across systems for the same data elements and indicators for information collection.
- Once a list of indicators is agreed on, the number of data collection tools and reporting forms at clinic and health center facilities are reduced.

### **Data Access**

Collecting data means little if it cannot be seamlessly accessed for analysis and reporting. Collecting accurate and standardized data quickly is only the first step; using the data in a way that ensures better planning and decision making is the ultimate goal. Recommendations in this section are designed to ensure that the right people have access to the right data at the right time. Some intended outputs for this component are the following:

- Robust mechanisms and processes are in place, supported, and strengthened for health workers to get feedback on their patients and their work, i.e., have access to the data they produce.
- Storage and access to disaggregated facility-level data are insured at the regional and central levels.

## **TECHNOLOGY, PROTOCOLS, AND THE HUMAN INTERFACE**

Technology in the work environment is often misunderstood. Often administrative managers do not fully understand the cost aspect of ICT. The recommendations and illustrative activities in this area hope to allow for better understanding of what is actually required, with regard to both infrastructure and any additional equipment, but also to show how investment in this area can help to reduce the HIS workload burden of health workers in the field. The team has grouped its recommendations in the following three components; each recommendation should trigger different actions to fulfill area goals.

### **ICT**

ICT can be viewed literally as the backbone of any HIS. Without a correct appreciation for this requirement and an understanding of the associated investment, a fully integrated HIS will remain a dream. Recommendations made for this component are aimed at addressing current infrastructure deficiencies at all levels within the HIS. Some intended outputs of this component are the following:

- An immediate process is launched to determine what ICT infrastructure (connectivity, equipment, electricity, etc.) is needed at each level for both existing and planned institutional and national systems.
- Suitable solutions are identified for remote sites that will not soon have connectivity.
- Coordination with providers of ICT solutions and Internet infrastructure and services is effective in supporting rollout of the HIS and related systems.
- LANs/intranets of multiple computers are operational in all facilities.
- Help desks and other technical services support implementation.
- GRN funding for ICT programs and activities is ensured.

### **Hardware and Software**

If the ICT infrastructure is the backbone of any HIS, hardware and software should be considered its ribs and internal organs. Together with the recommendations immediately preceding and following, recommendations in this section are aimed at ensuring that any system that forms part of the HIS should conform to minimum requirements before being fully implemented. Some intended outputs of this component are the following:

- Coordination mechanisms are effective, as are facilitating activities with other GRN entities, such as line ministries, that will support roll-out and maintenance of operational systems.
- To the extent possible, HIS and all related systems are open architecture and nonproprietary.

- HIS systems are fully operational using the new minimum set of indicators agreed by all stakeholders.

### **Reporting Burden and Work Load**

This section is directly associated with both data quality and service delivery. It is often easy for those in a regional or national office to ask for specific indicators when they do not understand the current workload and reporting burden already placed on the people they ask to collect the information. The huge workload created to fill and complete dozens of forms, at times mere duplications, is seriously compromising the quality of both service and information. Recommendations for this component hope to minimize the workload burden on people especially at clinics and health centers. Some intended outputs for this component are the following:

- Facility-appropriate recording and reporting tools are created using a new minimum set of indicators agreed by all stakeholders.
- Staff and supervisors are trained in the use of the new tools.
- Data/information and all reporting needs have been assessed, and automated report templates and tools have been designed that slash manual and repetitive work.

### **INFORMATION PRODUCTS, DATA USE, AND KNOWLEDGE MANAGEMENT**

As was previously demonstrated, demand for information and knowledge products to use in analysis, learning, planning, decision making, and public awareness is exceptionally low. To improve this area, the team believes that the HIS needs to (1) produce better quality, on-time, ready-to-use information and data products; (2) build up information demand, supply, and use; (3) build human capacity through learning and knowledge management; and (4) raise public awareness by disseminating information products to different audiences. The team has grouped its recommendations in the three area components, and each recommendation should trigger different actions toward fulfillment of broader area goals.

#### **Information and Data Products**

Recommendations for this component will help supply information and data products to meet demand and facilitate increased use of information. The goal is to make automated, smart, timely, and relevant reports and information products available for all HIS constituencies. A key objective is to break the vicious cycle of poor data quality, limited data availability, and failure to use data in planning and decision making. Some intended outputs of this component are the following:

- HIS produces quarterly print and electronic materials on health information and its usefulness and distributes them at all levels.
- A user-friendly, reliable, and up-to-date Web-based public health information database, the Namibia HIS Key Indicators Database, is not only established but readily accessible.
- Data needs have been assessed at all levels, and responsive analytical tools and knowledge management products have been designed.



- Data utilization plans and supporting products have been prepared for stakeholders at all levels to improve operations, planning, decision making, and performance management.

### **Actual Demand and Use by System Beneficiaries and Decision Makers**

Recommendations for this component will help put in place triggers and facilitate a culture shift to build demand for information at all levels and increase information use, resulting in evidence-based practices and decision making. Some intended outputs of this component are the following:

- Mechanisms and opportunities are in place for effective strategic dialog, and consultations with stakeholders at all levels raise awareness of HIS products and services and stimulate demand for them at all levels, but especially from policy and decision makers.
- Outreach and workshops are launched at all levels, especially service delivery points, to raise awareness and appreciation of the importance of HIS information products and their use as essential for doing everyday tasks.

### **Culture for Learning and M&E Feedback Loop**

The recommendations and illustrative activities for this component are targeted to build capacity for learning and promote a culture of M&E and evidence-based practices and decision making. Recommendations for strengthening pre- and in-service training and making the public more aware of information, outputs, and services are all targeted toward ultimately improving service delivery through effective learning, M&E, and decision making. The team believes that adequate follow-up and proper implementation of these recommendations will result in stronger institutions and curricula for pre-service, in-service, and user- and facility-focused training that will help build the long-term capacity of the MOHSS and other stakeholders to better direct, manage, and finance health programs through vital use of the HIS. They will also contribute to institutionalization of data analysis and best practices, and build up transparency and accountability at both national and local levels through improved M&E systems. Some intended outputs of this component are the following:

- M&E frameworks at each level are implemented to support activity management.
- Formal and informal learning and knowledge components relevant to institutional responsibilities (e.g., learning missions, mobile health knowledge express) are built, including ways to facilitate self-learning, with an established incentive system for that.
- Pre-service, in-service, and formal training and a career path are established for HIS officers.
- At all levels decision making (especially service delivery) is clearly influenced by knowledge and information.
- Use of knowledge-based practices, including what does and does not work, is encouraged and incentivized.
- Forums and mechanisms are in place for people to exchange experiences and perspectives and share tools, practices, and concepts for success.
- Team workshops are held at all levels to teach staff how to manage with data and use knowledge and information products in carrying out everyday tasks, including decision-making.

- Formal short- and long-term training programs are put in place for new systems and programming areas to improve the computer and technical capacity of HIS staff at all levels.

## **MANAGEMENT, COORDINATION, AND IMPLEMENTATION**

Recommendations and illustrative activities for this thematic area are targeted to improving management, coordination, and efficiency for all HIS stakeholders. This will be accomplished by carrying out recommended activities to support management capacities at all levels for better coordination and impact; improving resource management, transparency, and accountability; making capacity building efforts more effective and sustainable; increasing resource allocation for priority HIS interventions; and supportive supervision. The team believes the recommendations listed under the five components address all the management and coordination issues previously discussed. These recommendations should trigger actions that will address specific weaknesses and move the HIS toward its broader goals.

### **Institutional Effectiveness**

As the HIS Directorate becomes operational, how effective the HIS strengthening plan will be will largely depend on its profile and the influence it has to carry out its roles. Adoption of the recommendations in this component will ensure that the directorate becomes effective as an institution by raising its profile and by having the necessary political support at the highest level of the GRN. Some intended outputs of this component are the following:

- A high-profile national HIS champion who can influence and facilitate implementation of a strong and unified HIS has been identified and is on board.
- The HIS Directorate has the necessary mandate, authority, and influence to achieve the targeted results.
- One champion in each key national and subnational agency is identified who can mobilize people and activities at all levels of that agency to help implement a well-integrated HIS.
- A change management strategy for all HIS levels and personnel is institutionalized.

### **Supportive Supervision**

Recommendations for this component will support stronger supervision throughout the HIS and will promote supervision standards that can make the HIS more effective. Some intended outputs for this component are the following:

- Structured tools and trainings on supervision developed.
- Adequate resources allocated to facilitate implementation of the supervision system.
- Feedback mechanisms established between different levels on data collection and use.
- Communications initiated on expectations and requirements between and within each level.
- Feedback mechanism operational between the HIS and health data users. Improved collection and use of data.

### **Policy and Planning**

Recommendations for this component will help make operational both current and new HIS policies, strategic plans, and attendant standards. This will help translate the policies into

prioritized and budgeted implementation plans and improve operational efficiency by enforcing policies. Some intended outputs of this component are the following:

- HIS strategy completed and translated into prioritized action steps to achieve objectives.
- Indicator list agreed and its adoption enforced for both government and DP programs.
- Strict guidelines in place for amend tools and uncoordinated or unauthorized changes prohibited.
- HIS Directorate and other HIS entities held to account for results and resource usage.
- HIS institutional and individual responsibilities clearly defined and well understood.
- Concrete plans in place for integration, usage, and phase-out aspects of primary current and planned systems so as to avoid serious duplication and waste of resources.

### **Human, Financial, and Other Resources**

Recommendations for this component will address the general underfunding for the HIS in terms of financial, material, and human resources; the goal is to help ensure that HIS activities have enough funding to succeed. Some intended outputs of this component are the following:

- Long-term GRN funding for the new HIS Directorate ensured and provided so it can perform all vital and mandated functions, including better coordination of all stakeholders and carrying out all activities necessary for strengthening the HIS.
- A critical mass of staff brought to the HIS Directorate from multiple organizational units to amass the critical institutional, experiential, and operational expertise needed to ensure the efficiency and success of the new HIS.
- HIS staff adequate and with the right skills to effectively carry out its roles and functions.
- Practical, evidence-based, and justified target set for HIS investment as a percentage of the total health budget (in line with international norms) and effectively operational .
- Greater HR capacity with enhanced skills and improved understanding by all health sector staff of their contribution to HIS functions.

### **Coordination, Collaboration, and Stakeholder Engagement**

Issues related to coordination, collaboration, and stakeholder engagement, both within and outside MOHSS, in one way or another underpin most of today's HIS problems.

Recommendations for this component will help the HIS Directorate to provide coordination and direction to all stakeholders in building up the HIS. Some intended outputs of this component are the following:

- Effective intra- and intersectoral coordination mechanisms are operational for better HIS support.
- MOHSS-wide SITHIS is operational, with clearly defined TOR for all systems development, integration, coordination, and deployment activities.
- The TWG is institutionalized to ensure that there is an agreed minimum set of indicators that will meet all HIS program management and reporting needs.

- The HIS Stakeholders Map for Planning and Implementation is completed and regularly updated to reflect all agreed current and future commitments for the HIS.
- There are more partnerships with internal and external private bodies so as to access specific HIS technical expertise
- Results of this assessment are integrated and aligned with the TWG roadmap for HIS strengthening.

## VII. HIS DIRECTORATE

The HIS is the principal source of timely data and channels for the information and knowledge exchange that is critical in facilitating evidence-based planning and decision making at all levels. Because the GRN, along with all other stakeholders including DPs, clearly recognizes the urgent need for a stronger, integrated HIS, GRN has embarked on an intense phased approach to help build up the HIS so that it can support better decision making, effective policy dialog, better coordination, monitoring and planning for health problems, greater equity, informed citizen health choices, and more effective governance and accountability in the health sector—all ultimately to enhance health outcomes for Namibians. As part of its recent aggressive action on that agenda, the MOHSS not long ago established the HIS TWG, and the GRN has approved a HIS Directorate at the MOHSS. The new directorate will be the ultimate custodian of the Namibia HIS. Although the new directorate officially opened in April 2012, it is not yet in full operation. While the MOF has issued the necessary certificates, actual disbursements from the operational budget have not yet begun. The TWG has been leading the planning effort for the new directorate and is currently working on a phased staffing plan. The directorate will also have a research wing.

Approving the new directorate was the single most important step the GRN has taken to realize its aspirations for an effective HIS designed to help improve health outcomes. It will bring urgently needed discipline and coordination to the HIS environment. However, if it is to be successful, it must have sufficient influence, human and financial resources, and technical and advisory expertise. Perhaps its most important function will be to hold itself accountable for reporting timely, transparent, and relevant information to all stakeholders about processes and progress for HIS strengthening.



## VIII. STRATEGIC STRENGTHS AND OPPORTUNITIES

While strengths specific to each thematic areas have already been discussed, the team was also convinced that there are broader strategic and highly beneficial strengths and opportunities that can be built on to move the HIS agenda forward. Among them are these:

- Most stakeholders recognize the present degree of disintegration.
- Most stakeholders agree that integration is important.
- Generally, there is a clear sense of urgency.
- Many initial confusions and uncertainties about current activities (including the assessment) and HIS as a whole were transformed into clarity and strength through the assessment process and discussions.
- There is already in place a relatively wide network of data (although much is program-based) and M&E clerks in the regions and districts.
- Several new systems (e.g., IHCIMS, HCMS, DHIS 2.0, NDW) can promote integration and efficiencies across the system.
- There are pockets of effort to create and coordinate systems interoperability (e.g., IHCIMS and NIP).
- There are very sound and technically competent professionals within the system, although they are scattered.
  - I The HIS Directorate has been approved to serve as the coordination and management body for HIS.





## IX. CRITICAL RISKS AND SUCCESS FACTORS

Recognizing that a well-coordinated and effective national HIS is absolutely essential to improve the quality of health services and to enhance health outcomes, with support from DPs and other stakeholders, GRN has moved aggressively and shown clear commitment to strengthen processes and systems relevant to the HIS. Also, DPs such as the

CDC and USAID, among others, seem willing to help the GRN to make the health system more efficient. However, the ultimate quest for an HIS depends on certain critical success factors and must avoid a number of risks. What is needed is a risk assessment and mitigation program that is reviewed annually.

A few strategic, well-thought-out 'Quick Win' initiatives designed to achieve dramatic Rapid Results could critically boost confidence and trust and build momentum.

### SUCCESS FACTORS

#### **GRN Leadership, Ownership, and Effective Coordination**

Committed ownership and effective leadership and coordination together are the heart of a unified HIS. GRN has demonstrated its commitment to the health sector by approving the HIS Directorate. However, from an operational perspective, the directorate does not as yet have sufficient resources, authority, or capacity to take the lead. For that reason, ownership, leadership, and coordination pose critical risks. Also, there need to be sufficient political ownership and effective joint coordination both within and above the MOHSS, in the OPM, Planning Commission, Vision 2030 Secretariat, MOHA, and MOF, which must be willing to make the investments necessary to make the HIS succeed.

#### **Influence and Resources for the HIS Directorate**

There is a significant shortage of human, technical, and financial resources and lack of a single mechanism that has real authority to ensure coordination and synergy among parallel HIS planning, development, and implementation functions. Moreover, the technical and human resources that are in place are not being used optimally due to lack of coordination, leadership, training, equipment, and action planning. These stand out as serious threats to HIS success.

#### **Evidence-based Situational Strategy, Planning, and Operational Action**

It is critically important that all strategies and planning, particularly the drafting of the HIS strategy, is participatory, evidence-based, situational, and aligned as needed with national and MOHSS strategies and priorities. It will be critical to use the extensive results from both this assessment and the expected stakeholders assessment. The strategy should then be reviewed periodically to ensure its continuing relevance as situations change.

#### **Phased and Prioritized Action Plans that Produce Quick Wins**

Once the HIS strategy is completed, it will be critical to translate it into prioritized action steps toward ultimate goals. To ensure that the strategy becomes reality, short-, medium-, and long-term action plans with actions, results, and responsibilities prioritized should be drawn up with broad consultation. Many recommendations of this assessment need to be translated into specific actions. When the new directorate is officially launched, it would be critical to

undertake strategic and well-thought-out Quick Win initiatives targeted to achieving high-impact Rapid Results; that would boost confidence and trust and build further on current momentum.

### **Results-based Management for Accountability and Transparency**

It is vital that the HIS Directorate practice results-based management (RBM) to keep itself focused on results rather than simply on activities and outputs. One aspect of that would be to adopt results-based rather than traditional M&E, which simply monitors activities. This might be the single most important factor for the directorate to hold itself accountable and ensure that all stakeholders are aware of how HIS strengthening is proceeding.

### **Infrastructure and Capacity, Especially at Lower Levels**

How useful the HIS can be depends on the accuracy and timeliness of the information that it provides. That in turn depends on the accuracy of information at its point of entry (community, household, or facility) and how quickly it can be transformed and transmitted. Capacity and infrastructure problems at local facilities can drag down the HIS. This assessment found that ICT infrastructure in regions and districts is insufficient for either transmitting data or accessing institutional and national systems.

### **Participation by all Stakeholders**

It is crucial that broad participation by all stakeholders in critical activities, such as preparation of the HIS strategy, be not only allowed but advocated and encouraged. It is especially important to bring civil society and the private sector into every phase of HIS strengthening plans and strategies.

### **Unified Stakeholders' Commitment and Support**

Stakeholders appear to be in agreement about the importance of a unified HIS. However, the path to achieving this is both daunting and complex, and there will be winners and losers in the process. Anything short of genuine commitment and unified support from all stakeholders could jeopardize the success of the HIS. There needs to be promotion of open and honest dialog about the positions of various stakeholders in the HIS plan and activities.

### **HIS Staff Commitment to Putting the System First**

Anything short of an absolute commitment on the part of the staff involved to the national interest in having a unified and effective HIS to inform planning and decision making would seriously jeopardize the objective.

### **Readiness and Openness: USG and its Implementing Partners**

This commitment will require on the part of all USG agencies and their IPs a different level of readiness and different tools for managing partnerships and the support provided. The most important benefit of working through GRN systems and structures would be to ensure the sustainability of GRN capacity development. However, full reliance on GRN systems may require that all parties revise their expectations, which will in any case need to be managed effectively to ensure that proposed interventions get the support they need from both the GRN and the USG.

### **Integrated Approach (Alignment and Coordination)**

To a large degree HIS is a cross-cutting issue. It will naturally cross paths with activities in other projects of the USG and other DPs. Without care, full awareness, and complementary and

integrated action, there may be a serious risk of duplication. What is needed are more effective and transparent communications between stakeholders about HIS challenges, such as the parallel systems for collecting information for vertical disease programs; this can be achieved through the HIS discussion forums.

### **A Country-Led Process for Mobilizing Support**

The HIS Directorate needs to agree with all interested USG agencies on a process to identify needs and mobilize the desired support for all HIS-related activities. Support should be demand-driven; fully aligned with MOHSS and HIS strategies, plans, and priorities; and targeted only to building up Namibia's systems for sustainability.

### **Patience: Managing Expectations**

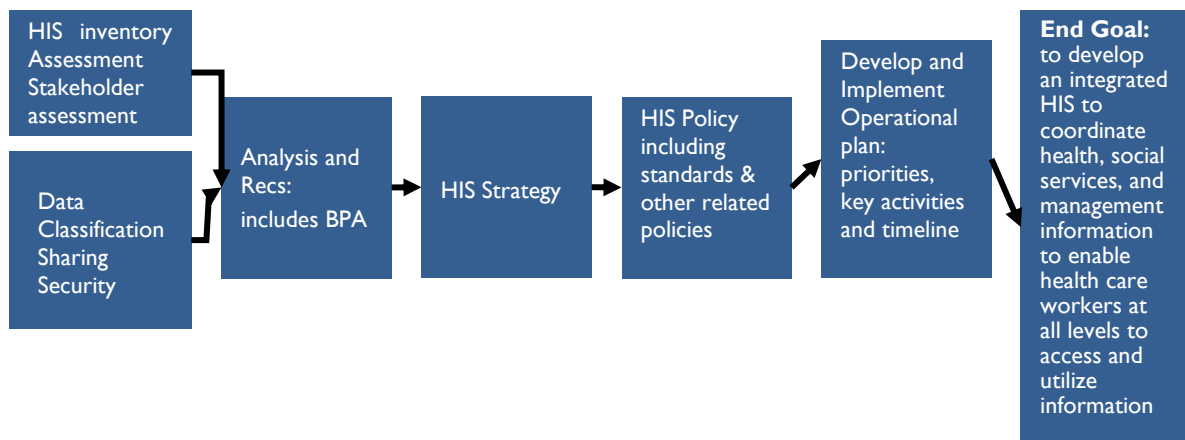
As the HIS Directorate starts its operations by moving the current initiative to integrate the country-led HIS to a different level, new processes, principles, and mechanisms will come into play. During this building phase, patience needs to be heightened and expectations managed in recognition of realities, always with an eye on integration.



## X. ALIGNMENT WITH THE TWG ROADMAP FOR UNIFYING THE HIS

This assessment has been a critical point in an intense phased approach to strengthen the HIS so that it can support evidence-based decision making and planning. The assessment team is convinced that it will be critical to align the results of this assessment with the TWG roadmap for strengthening the HIS and associated activities. The TWG has defined the ultimate destination of its roadmap as being “to develop an integrated HIS to coordinate health, social services, and management information to enable health care workers at all levels to access and utilize information.” In pursuit of this end, the TWG has identified the strategic activities shown in Figure 5.

**Figure 5: Roadmap for Health Information System (HIS) Strengthening in Namibia**



**Source: HIS TWG**

This assessment is the starting point for some of the activities the TWG has planned. The four thematic areas identified in this assessment cut across the whole HIS, and the recommendations were directed to the same end goal as the TWG. Because the assessment findings and recommendations (along with illustrative activities) would therefore be critical input to future HIS strengthening activities, they need to be incorporated into discussion and analysis of both the planned stakeholders assessment and the follow-up process of further analysis and finalization of recommendations. It will be absolutely critical for both the stakeholders assessment and the BPA process to align relevant findings and recommendations of this assessment to their analysis and plans for the future, so that ultimately is only a single, agreed set of recommendations to be fed into HIS strategy, policy, and operational plan development.



## **XI. CONCLUSION**

A functional, strong, unified HIS is central to improving the quality of health services and thus health outcomes in Namibia. To demonstrate this connection, a full results chain showing the impact of a functional HIS is shown in Annex D. The HIS is the principal entry point for timely data and the channel for the information and knowledge exchange that is essential for evidence-based planning and decision making. In seeking a unified HIS, the GRN has taken commendable steps, the most noteworthy being the formation of a TWG to guide the HIS strengthening process, and the approval and organization of the MOHSS HIS Directorate to coordinate and act as steward for Namibia's HIS. The MOHSS has also recently embarked on a phased but aggressive approach to fast-track the HIS strengthening process, with TWG guidance. This assessment has been the critical beginning of that approach. The TWG's bold roadmap for building up the HIS also includes the stakeholders assessment, BPA, formulation of HIS strategy and policy, and drafting of operational plans—all directed to achieving its goal. There also seems to be clear agreement among most stakeholders on the importance of a well-integrated HIS.

Despite these achievements, as this report shows, there are some significant barriers on the path to a sound, effective and unified HIS. But while there are critical risks, there are also strategic strengths and opportunities that can be built upon to reach the goal. This is indeed a historic, critical, and opportune time for MOHSS and the HIS. The strategy, plans, and tone set in this crucial building phase will drive the Namibia HIS for years to come—directly affecting health outcomes. In a phased approach, the links between phases need to be recognized and acted upon. The GRN must be willing to take further bold steps toward a holistic systems-strengthening approach that will realize its vision for the HIS.

The assessment team has laid out detailed recommendations for systems strengthening across the four broad thematic areas identified for the whole HIS (see Annex B) that can inform GRN actions. The GRN through the MOHSS HIS Directorate must now take the lead in moving the HIS in the right direction. DPs need to step up by channeling their support for the HIS in an integrated and coordinated manner subject to national plans and systems. With the commitment of all stakeholders to a country-owned process for building up the HIS, Namibia can soon have a health information system that will allow decision makers to have more effective policy dialogs, monitor data, and plan for health solutions, as well as promote equity, empower citizens to make informed health choices, and improve governance and accountability in the health sector—all ultimately for a more healthy Namibia.





## **ANNEX A. SCOPE OF WORK**

**Global Health Technical Assistance Project  
GH Tech Bridge  
Contract No. AID-OAA-C-12-00004**

### **SCOPE OF WORK**

**(Revised 4-11-12)**

- I. TITLE: USAID/NAMIBIA: ASSESSMENT OF HEALTH INFORMATION SYSTEMS IN THE MINISTRY OF HEALTH AND SOCIAL SERVICES**
- II. PERFORMANCE PERIOD: NOT INCLUDING TIME FOR PREPARATION AND COMPLETION OF REPORT, SIX WEEKS IN-COUNTRY, STARTING ON/ABOUT MARCH 19 2012, PENDING CONSULTANT AVAILABILITY.**
- III. III. FUNDING SOURCE: THIS ASSIGNMENT WILL BE FUNDED BY USAID/NAMIBIA**

#### **IV. IV. PURPOSE AND OBJECTIVES:**

A health information system (HIS) is defined as a “set of components and procedures organized with the objective of generating information that will improve health care management decisions at all levels of the health system” (Lippeveld et al. 2000). The HIS collects data from the health sector and other relevant sectors; seeks to analyze the data and ensure their overall quality, relevance, and timeliness; and converts the data into information for health-related decision making. An HIS in many countries typically relies on paper-based systems at the lowest levels but may be captured electronically at intermediate aggregation levels.

Findings from a recent health and social services systems review (2008) revealed that the Namibian MOHSS has fragmented (and not necessarily linked) HIS, managed by different divisions in different directorates and, where they are captured electronically, running on different software platforms. While each may be useful in its own right, there are some overlaps and duplications between systems as well as challenges associated with data retrieval, utilization, and the reporting burden on health workers. To help address these issues, the MOHSS will engage in a planning process aimed at integrating health information systems so as to facilitate management and use health and health-related information to meet the health needs of Namibians.

To inform the health information system (HIS) reform effort, a comprehensive HIS assessment has been requested by the MOHSS. Objectives of the assessment as per the MOHSS letter from the Permanent Secretary (March 23, 2011) are to:

- Develop a common understanding of the numerous information systems and databases currently residing within the MOHSS
- Specifically “a comprehensive understanding of their content, data elements, associated reporting burden, and how these information systems are used and by whom”

- Help identify the strengths and weaknesses of existing systems and therefore inform planning efforts

This HIS assessment will entail cataloguing, primarily within the MOHSS, existing health information systems and databases; projected lifecycle of each system for three years, and any known sustainability issues; roles, use cases, and number of users in each role, and the location of system deployment. The catalogue should offer a comprehensive understanding of

- number and types of systems in place (e.g., paper-based versus electronic)
- HIS content and data elements
- the data flow from source to (and through) various reporting levels
- frequency of data capture
- associated reporting burden on data capturers
- how these information systems are used and by whom
- strengths and weaknesses of existing systems including overlap and sustainability
- the usage of the data being captured and its relevancy
- funding of the systems
- accessibility of the data (i.e., who has access to it and how)

The results of this assessment will be utilized by the Namibian HIS Technical Working Group (TWG) and the MoHSS HIS Directorate to begin developing a prioritized roadmap for HIS integration.

## **V. SCOPE OF WORK**

The assessment should be conducted as an independent review of health information systems. In this regard, the activities associated with this assessment will entail the following:

- Review relevant documents, reports, and materials submitted by the HIS TWG chair, with facilitation as needed by USAID/Namibia.
- Meet with the HIS technical working group HIS inventory assessment subcommittee and other key persons for an in-brief on the scope, terms of reference, and deliverables.
- Meet with relevant data users and information system technicians to develop a census and understanding of existing information systems.
- Conduct an assessment process that incorporates key informant interviews and site visits to inventory and assess the current status of the systems currently being utilized to collect health and health-related data in Namibia.
- Provide an overview of how data flow through these HIS to the system owners and how they relate to each other.
- Present results to the stakeholder steering committee to assure understanding and agreement on assessment findings.

### **Illustrative HIS assessment questions:**

- Describe the structure of the information systems:
  - Are they manual, electronic, or hybrid systems?
  - Are there standard data-collection and reporting forms that are systematically used? (list form titles and scan and attach examples)
  - Is data recorded with sufficient precision or detail to fully support and be utilized in management reports?
  - If/where they are electronic, what databases are they run on?
- How is the information directly used by consumers of system?
- What are the strengths and weaknesses of each information system? (from a technical and data user's perspective)
  - Is the system well-documented (in writing) in terms of what is reported to whom and how and when reporting is required?
  - Are the reasons for capturing the various data elements clearly described for the data capturers? Do data capturers have clearly defined responsibilities?
  - Are data quality challenges identified and are mechanisms in place for addressing them?
  - For those systems or components that are computer-based, does the system contain edit checks to verify data entry as it occurs?
    - Does the system contain quality check reports that can be run in order to examine system data and possible data anomalies?
  - Are there clearly defined and followed procedures to reconcile discrepancies?
- How do the information systems compare with one another—specifically in terms of duplications? How is data collected and entered at the health care provider level (estimate work burden, time, etc.)?

Assessment questions will be finalized during the Team planning meeting and will be provided to USAID/Namibia for review and approval.

## **VI. METHODOLOGY:**

1. **Document review:** Consultants will review relevant documents and materials submitted by USAID/Namibia prior to their arrival in country and during their in-country work. Depending on when the Team can begin work, the Team Lead will remotely develop a draft workplan and submit it to USAID/Namibia and the TWG for feedback. The Team Lead will incorporate feedback into the original draft. Upon arrival in-country the Team will meet with USAID and the TWG to finalize the workplan and stakeholders list and discuss the high-level communication plan going forward.
2. **Team planning meeting (TPM):** The assignment work will commence with a two-day TPM. This meeting will allow the Team members to meet with the USAID/Namibia staff to be briefed on the assignment. It will also allow USAID/Namibia to present the Team with the purpose, expectations, and agenda of the assignment. In addition, the Team will: clarify

team members' roles and responsibilities; review and develop final evaluation questions; review and finalize the assignment timeline and site visit calendar and share with USAID; develop data collection methods, instruments, tools, guidelines, and analysis; review and clarify any logistical and administrative procedures for the assignment; establish a team atmosphere, share individual working styles, and agree on procedures for resolving differences of opinion; develop a preliminary draft outline of the Team's report; and assign responsibilities for the final report.

3. **Key informant interviews:** Interview MOHSS and all relevant NGO management (and possibly other Ministries with information systems) to determine the overall characteristics and management of the systems, user roles and use cases, and whether or not the existing reports and other inputs from the system are sufficient to support job responsibilities.
4. **Site visits** to inventory and assess the current status of the systems currently being utilized to collect health and health-related data in Namibia.
5. **Develop inventory of existing systems:** Engage the MOHSS to develop an inventory of systems. Submit the inventory to the TWG.
6. **Develop data meta-dictionary:** List data sets, data elements, system of record for this data, and description and characterization of data elements.
7. **Develop mid-level use case analysis** for each system that describes user roles, general workflows, and lists of data utilized.

USAID/Namibia will provide a detailed contact list of key informants and key points of contact to the consultants during the document review period, so planning can begin for appointments, interviews, and site visits, which can be set up for the Team's arrival in-country. USAID/Namibia will also provide a draft schedule for field visits, including duration of stay at various sites to inform the Team's time in-country.

## VII. TEAM COMPOSITION, SKILLS, AND ROLES

The assessment team will consist of two consultants: one international consultant and, if feasible, a local or regional consultant.

- **Team Leader:** Should have master's degree in health information, public health, or related field. Should be familiar with the WHO Health Metrics Network (HMN) process for developing an integrated and linked health information system. Extensive experience in discovery, documentation, and analysis of data systems and providing holistic system enumeration, including use case analysis, is preferable. Should have experience with using a variety of health information systems beyond epidemiological and utilization data (e.g., other management-related information, such as financial information systems, HR information systems). Should have the ability to translate programmatic technical language so that it can be readily understood by health stakeholders.
- Team member with a baccalaureate degree, or host country equivalent, in the field of computer science, information systems management, statistics, health informatics, or related field. Should have a minimum of 2 years work experience in the development, operation, management, and utilization of computer systems. Experience in health informatics is favorable. Attention to detail and experience with data analysis is a must.

## Relationships and Responsibilities

- The Team Leader will have the overall responsibility to implement the project and interact with USAID/Namibia POC as well as the TWG. S/he will provide leadership during all phases of the project. S/he will be responsible for leading the development and finalization of key documents and for interacting with stakeholders.
- Consultant Conflict of Interest. To avoid conflicts of interest (COI) or the appearance of a COI, review previous employers listed on the CVs for proposed consultants and provide additional information regarding any potential COI.

## Estimated Level of Effort (LOE)

Task/Deliverable	Team Leader LOE (days)	Team Member	Est. Timeline (pending consultant availability)
Read background documents. Prepare draft workplan for HASC. Incorporate HASC feedback into the workplan.	2	3	o/a March 12, 2012
Travel to Namibia	2	1	o/a March 17-19
Team Planning Meeting (with up to one day for in-briefing with USAID and meeting with the TWG).	1	1	o/a March 20
Assessment work			
Meet with all relevant HIS stakeholders (each MOHSS directorate, donor, and NGO stakeholders)	1	1	o/a March 22
Conduct site visits (includes in-country travel days) and review information systems	20	20	o/a March 23- 12
Discussion, analysis and draft report preparation	4	4	o/a April 13-17
Presentation of findings to Stakeholder Steering Committee	1	1	o/a April 18
Debriefing to MOHSS senior management and Steering Committee	1	1	o/a April 19
Complete report draft – revise report and incorporate debriefing comments into draft report	2	2	o/a April 20-21
Return travel	2	1	o/a April 22-23
Steering Committee sends technical feedback/comments on draft report to GH Tech (within 5 days of submission)	0	0	o/a April 27
Consultants revise/finalize report	5	6	o/a April 28-May 4
Steering Committee reviews/signs off on final report (within 5 days of receipt)	0	0	o/a May 11
Only if GH Tech receives the unedited approved draft by May 1 can it edit and finalize formatted public report; otherwise it will be completed through another mechanism	0	0	May 12
Total LOE	41	41	

A six day work week in country is authorized.

An additional 7 days of LOE is approved to finish the field work and assist with the report writing.

## VIII. LOGISTICS

GH Tech will provide:

- International travel to and from the consultant's point of origin and Namibia. GH Tech will provide full-fare economy. Business Class is NOT authorized.
- GH Tech consultant per diem and lodging expenses.
- Country cable clearance. Please note: **a formal electronic country clearance (eCC) request is not necessary; instead, an informal email request directly to Melissa Jones, Director of HIV/AIDS and Health Office, USAID/Namibia will suffice. Ms. Jones will provide an e-mail concurrence upon receipt of this request.**

USAID/Namibia will provide

- Mission Point of Contact: Ensure constant availability of the Mission Point of Contact person(s) to provide technical leadership and direction for the consultant team's work.
- Visitors will not have an EA and therefore will need to work out of their hotel/lodging or a designated work space (tbd). They will need prior approval to bring any laptop into the USAID office for any meetings or briefings.
- USAID/Namibia will provide a USAID/Namibia car and driver for use by GH Tech consultants only when other USG staff members accompany them.

## IX. DELIVERABLES:

Assessment Work Plan including revised assessment questions, detailed approach/methodology (including draft forms used for the discovery and documentation of systems) to be used, including the documents to review, key informants to interview, and plans for analysis and dissemination of findings. The team leader will submit the draft assessment work plan to USAID/Namibia and GH Tech prior to in-country arrival (only if team composition and timing allow); and the final to be submitted after the in-country TPM. USAID/Namibia will then review the proposed work plan/methodology and submit comments to the team leader prior to in-country work commencing. The assessment team will revise the work plan/methodology and send the final version to USAID/Namibia and GH Tech. The work plan must be approved prior to the initiation of the interviews and site visits.

Concise weekly status and progress reports: to be delivered to MOHSS TWG designates during a weekly status meeting.

Presentation slides (in MS PowerPoint) used during stakeholder meeting and debriefing to USAID/Namibia staff on the preliminary findings and recommendations. The PowerPoint presentations will be shared with GH Tech prior to the USAID and stakeholder debriefings.

Draft report in English no longer than fifty pages with an executive summary, introduction, methodology, findings, and recommendations that address each of the three objectives and subsequent questions with bibliography and annexes. The Team Leader will submit the first draft report to USAID/Namibia and GH Tech at the end of the assessment team's in-country visit.

The Mission will provide consolidated, written comments to the evaluation team and GH Tech within 5 working days of receiving the draft report.

Final report will address the Mission's comments. The Team Leader will submit the final unedited report to USAID/Namibia and GH Tech within 5 working days after the Team receives consolidated comments from USAID. The final report shall

- present a thoughtful, well-researched, and well-organized effort to objectively reflect the findings of the assessment.
- address all assessment questions.
- include the SOW as an annex.
- explain in detail the assessment methodology; the tools used in conducting the assessment, such as questionnaires and checklists, should be included as an annex in the final report.
- discuss limitations to the assessment methodology, if any.
- Present findings as analyzed facts based on evidence and data and not based on anecdotes. Findings should be specific, concise, and supported by strong quantitative and qualitative evidence.
- properly identify sources of information.
- support recommendations by a specific set of findings.
- recommendations should be action-oriented, practical, and specific, with defined responsibility for action.

Only if the final draft is approved by USAID/Namibia on or prior to May 1, 2012, will GH Tech provide the edited and formatted final document. Otherwise, USAID/Namibia will need to go through another mechanism to finalize the report. Procurement-sensitive information will be removed from the final report and incorporated into an internal USAID Memo. The remaining report will then be released by GH Tech as a public document on the USAID Development Experience Clearinghouse (DEC) (<http://dec.usaid.gov>) and the GH Tech project web site ([www.ghtechproject.com](http://www.ghtechproject.com)).

## **X. RELATIONSHIPS AND RESPONSIBILITIES**

**GH Tech** will coordinate and manage the assessment team and will undertake the following specific responsibilities throughout the assignment:

- Recruit and hire the evaluation team.
- Make logistical arrangements for the consultants, including travel and transportation, country travel clearance, lodging, and communications.

**USAID/Namibia** will provide overall technical leadership and direction for the evaluation team throughout the assignment and will provide assistance with the following tasks:

### **Before In-Country Work**

- SOW. Respond to queries about the SOW and/or the assignment at large.

- Consultant Conflict of Interest (COI). To avoid conflicts of interest or the appearance of a COI, review previous employers listed on the CVs for proposed consultants and provide additional information regarding potential COI with the project contractors evaluated/assessed and information regarding their affiliates.
- Documents. Identify and prioritize background materials for the consultants and provide them to GH Tech, preferably in electronic form, at least one week prior to the inception of the assignment.
- Local Consultants. Assist with identification of potential local consultants, including contact information.
- Site Visit Preparations. Provide a list of site visit locations, key contacts, and suggested length of visit for use in planning in-country travel and accurate estimation of country travel line items costs.
- Lodgings and Travel. Provide guidance on recommended secure hotels and methods of in-country travel (i.e., car rental companies and other means of transportation) and if necessary, identify a person to assist with logistics (i.e., visa letters of invitation, etc.).

### **During In-Country Work**

- Mission Point of Contact. Throughout the in-country work, ensure constant availability of the Point of Contact person and provide technical leadership and direction for the Team's work.
- Meeting Space. Provide guidance on the Team's selection of a meeting space for interviews and/or focus group discussions (i.e., USAID space if available, or other known office/hotel meeting space).
- Meeting Arrangements. Assist the Team in arranging and coordinating meetings with stakeholders.
- Facilitate Contact with Implementing Partners. Introduce the Evaluation Team to implementing partners and other stakeholders, and where applicable and appropriate prepare and send out an introduction letter for Team's arrival and/or anticipated meetings.

### **After In-Country Work**

- Timely Reviews. Provide timely review of draft/final reports and approval of deliverables.

## **XI. XI. MISSION CONTACT PEOPLE/PERSONS**

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**XII. COST ESTIMATE – TBD**

To be provided by GH Tech for this activity.

**XIII. REFERENCES (MOHSS DOCUMENTS) TO BE PROVIDED TO GH TECH AS SOON AS POSSIBLE.**

- Ministry of Health and Social Services and ICF Macro (2010). Namibia Health Facility Census 2009. Windhoek, Namibia. MOHSS and ICF MACRO
- Ministry of Health and Social Services (2010). National Health Policy Framework 2010-2020. Windhoek, Namibia.
- 2008 Ministry of Health and Social Services Health systems assessment
- 2009-2013 MOHSS Strategic Plan
- GFATM RCC proposal
- National Strategic Framework
- HMN assessment 2006



## ANNEX B. DETAILED HIS ASSESMENT RECOMMENDATIONS AND KEY ILLUSTRATIVE ACTIVITIES MATRIX

- Comprehensive system-wide recommendations with illustrative activities in the four thematic areas (TA) of the Assessment Framework and their components. The recommendations are geared toward streamlining and strengthening both current and new systems, processes, and entities throughout the whole health care system.
- A component is a smaller, self-contained part of a larger TA.
- Illustrative activities are examples of types of activities that may need to be carried out in order to realize a certain recommendation. While the full set of recommendations is itself broad, complete, and system-wide, the associated list of activities may not be exhaustive. For each recommendation, the team listed possible activities for illustrative purposes only, but an exhaustive list of activities must be explored and specified by the TWG and the HIS Directorate as they agree upon recommendations and move to build associated action plans to implement it, specifying actions, schedule, responsible parties, results desired, costing, etc.

Thematic Area I: Data and Information		
Component	Recommendation	Illustrative Activities
Information Systems and Databases	<ul style="list-style-type: none"> <li>• The current subcommittee for standards should define a framework within which HIS data and information-related standards would be defined.</li> </ul>	<ul style="list-style-type: none"> <li>• Explore and lay out a standard mechanism or practice for setting agreed upon standards and defining data elements and validation rules.</li> <li>• Explore and lay out a strategy for introducing the use of a common patient ID across various systems.</li> </ul>
	<ul style="list-style-type: none"> <li>• Form an internal HIS Directorate Systems Development Standards Committee (SDSC) to define a common framework to be agreed upon for such aspects of system design as requirements gathering, interoperability, system documentation, source code and other proprietary issues, user interface and roles, data collection, access and dissemination, and overall nature, size and complexity.</li> </ul>	<ul style="list-style-type: none"> <li>• Use the results from the HIS assessment to draft a specific roadmap to align, consolidate, or phase out fragmented and unused systems (work in coordination with the SITHIS team described under the Management, Coordination and Implementation TA recommendations).</li> <li>• Use the results from the HIS assessment as the basis for develop a roadmap to migrate all current manual, paper-based, and partially electronic systems to standardized computer-based systems in line with the defined framework.</li> </ul>

Thematic Area I: Data and Information		
Component	Component	Component
		<ul style="list-style-type: none"> <li>• Use the results from the HIS assessment to initiate dialogs to build interfaces between existing systems for seamless automatic information and message transfer so as to avoid manual extraction and recapture of information between electronic systems.</li> <li>• Have all new system and database development initiative, content, design, and integration aspects cleared by the committee.</li> <li>• , and draw up strategies for full utilization and define training and resource needs.</li> </ul>
		<ul style="list-style-type: none"> <li>• Approach developers of all current systems and acquire all documentation, including source code (to the extent possible) that pertains to each system they developed.</li> <li>• Use the results from the HIS assessment to identify systems with duplicate functionalities and plan possible consolidation or phase-out strategies.</li> <li>• Using the results from the HIS assessment, draft a plan to further increase the adaptability and coverage of primary systems and consolidate or phase out isolated, ad hoc, and parallel systems and databases that were created due to inadequate coverage of information and indicators by primary systems or due to lack of coordination with already operational systems and processes.</li> <li>• Use the results from the HIS assessment to identify systems that are not currently used to their full potential</li> </ul>

<b>Thematic Area I: Data and Information</b>		
<b>Component</b>	<b>Component</b>	<b>Component</b>
<b>Data Collection</b>	<ul style="list-style-type: none"> <li>Establish systems to ensure that updated registers and reporting forms are continuously available at all facilities.</li> </ul>	<ul style="list-style-type: none"> <li>Seek support through central logistics to find local partners for printing, distribution, and resupply logistics at regional, district, and clinic levels.</li> </ul>
	<ul style="list-style-type: none"> <li>Establish secure, backed-up data facilities for all systems at all levels.</li> </ul>	<ul style="list-style-type: none"> <li>Acquire uninterruptible power supplies for all facilities with functional ICT</li> <li>Establish protocols for storing data on- and offsite.</li> <li>Set out archiving strategies; make use of existing tools as much as possible,</li> <li>Define automation concepts to instill user discipline.</li> </ul>
	<ul style="list-style-type: none"> <li>Further reinforce and facilitate mechanisms (both manual and automated) to transfer information and data from facility levels to districts to ensure that reports are delivered on time for onward reporting.</li> </ul>	<ul style="list-style-type: none"> <li>Provide connectivity between sites, either permanent or mobile (3G), to allow direct data transfer.</li> <li>Where connectivity issues prevent direct data transfer, provide each facility with memory sticks to facilitate easier transfer of data.</li> </ul>
	<ul style="list-style-type: none"> <li>Choose indicators so that staff collecting them can actively and effectively use the information collected in patient care and management at the point of collection.</li> </ul>	<ul style="list-style-type: none"> <li>Support development of sector M&amp;E and to facilitate analysis and utilization of data at each level, especially at the point of collection, for service planning and delivery, commodities, etc.</li> </ul>
	<ul style="list-style-type: none"> <li>Align all processes for collecting the same data elements and indicators across all systems and programs to avoid discrepancies.</li> </ul>	<ul style="list-style-type: none"> <li>Review current tools for programs that have common or similar elements or indicators, and work with relevant parties to align a common collection process.</li> </ul>

<b>Thematic Area I: Data and Information</b>		
<b>Component</b>	<b>Component</b>	<b>Component</b>
<b>Data Quality</b>	<ul style="list-style-type: none"> <li>Establish and mandate a standard data quality assurance (DQA) system; e.g., adopt simple error-checking tools, such as comparing tally sheets to registers; have a second person check data entry; and use automated E-validation and derivation tools to ensure reliable data quality.</li> </ul>	<ul style="list-style-type: none"> <li>Develop DQA standards through the TWG.</li> <li>Define data quality control systems and tools for quality control at each level and revise them regularly the systems change, and put in place logistics to facilitate data quality control.</li> <li>Conduct baseline and annual audits.</li> </ul>
	<ul style="list-style-type: none"> <li>To avoid data discrepancies, standardize definitions and methodologies when the same data elements or indicators are used, collected, and derived across various systems and programs.</li> </ul>	<ul style="list-style-type: none"> <li>Launch a process to review and identify all common elements and indicators within current tools for different programs, and agree on standard definitions and calculation methodologies for them.</li> <li>Institutionalize the agreed definitions and methodologies</li> </ul>
	<ul style="list-style-type: none"> <li>Reduce the number of data collection tools and reporting forms health center and clinic health care workers have to fill out.</li> </ul>	<ul style="list-style-type: none"> <li>Follow the recommendations and activities outlined under the Management, Coordination, and Implementation TA to launch a GRN process to involve all stakeholders in a dialog to agree on a minimum set of indicators, consolidate tools, and remove parallel data collection and reporting.</li> </ul>
<b>Data Access</b>	<ul style="list-style-type: none"> <li>Establish, support, and reinforce robust mechanisms and processes so clinicians/health workers have feedback on their patients and their work.</li> </ul>	<ul style="list-style-type: none"> <li>Create new, or strengthen current, forums that provide feedback to, and participatory discussions for, clinicians and other health workers.</li> </ul>
	<ul style="list-style-type: none"> <li>Ensure that HIS systems store and provide regional and central access to disaggregated facility-level data.</li> </ul>	<ul style="list-style-type: none"> <li>Revise and enforce data submissions policies and protocols.</li> <li>Revise current or draft new rational aggregation methodologies that capture the essential primary keys. Using use-case analysis, at each level and data node provide algorithms that extract the essential data needed</li> </ul>

Thematic Area 2: Technology, Protocols, and the Human Interface		
Component	Recommendation	Illustrative Activities
ICT	<ul style="list-style-type: none"> <li>Launch an immediate process to determine what infrastructure (connectivity, equipment, electricity, etc.) will be required for various systems, especially new institutional (e.g., IHCIMS, NDW, DHIS 2.0) and national systems (e.g., HCMS, IFMS) at each level. Seek solutions (modems, cell phone transmission, and appropriate paper transfer) for sites that are not expected to have connectivity soon.</li> </ul>	<ul style="list-style-type: none"> <li>Launch immediate formal dialog with the OPM IT Office to determine all ICT configuration needs for the rollout of HCMS in MOHSS headquarters, regions, and districts.</li> <li>Launch immediate formal dialog with the MOF IT Office to determine all ICT configuration and improvements needed to facilitate better connection and use of IFMS at regions, and possibly districts.</li> <li>Launch an immediate dialog through the MOHSS Systems and IT Coordination Body for HIS (see TA 4 below) between various parties within the ministry about ICT configuration needs for better operationalization of MOHSS systems, such as IHCIMS, NDW, and DHIS 2.0.</li> </ul>
	<ul style="list-style-type: none"> <li>Facilitate coordination with providers of ICT, Internet infrastructure, and services that can support roll-out of the HIS and related systems.</li> </ul>	<ul style="list-style-type: none"> <li>Launch a review process well in advance for all roll-outs, identify sector partners, and appoint a coordination committee to draw up partnership MOUs.</li> </ul>
	<ul style="list-style-type: none"> <li>Establish local area networks/ intranets in all facilities that have or will soon have multiple computers.</li> </ul>	<ul style="list-style-type: none"> <li>Install and configure self-organizing mesh networks router technology to cover small facilities and surrounding accessible areas to allow public health facilities and the public to access data and information on shared services.</li> <li>Put in place a pay-as-you-go arrangement to generate revenues to support maintenance and systems upgrades.</li> </ul>
	<ul style="list-style-type: none"> <li>Establish an HIS technical support team and a network of IT professionals within the new Directorate so that there is both centralized and decentralized capacity to meet programming, updating, and other continuing support needs, such as help desks, antivirus program installation, and rapid equipment repair and replacement.</li> </ul>	<ul style="list-style-type: none"> <li>Provide technical and customer service training to technical staff at all levels who interface with program units and service points</li> <li>Train staff on use of modern systems and IT support and on project management tools.</li> <li>Until internal capacity is there, contract with an on-call technical support unit that can respond to service requests within 24 hours.</li> </ul>

Thematic Area 2: Technology, Protocols, and the Human Interface		
Component	Recommendation	Illustrative Activities
	<ul style="list-style-type: none"> <li>Ensure continued GRN sources for funding ICT programs and activities (e.g., Internet infrastructure and connectivity, modems, cell phone technology, 3G, and air time).</li> </ul>	<ul style="list-style-type: none"> <li>Raise awareness and appreciation of ICT investments and Identify GRN funding sources.</li> <li>Provide advocacy and support for the costing and inclusion of more ICT in the budget for the health sector.</li> <li>Negotiate cooperative agreements and provisions through PPP.</li> <li>Devise schemes to motivate private health care operations to report data over ICT channels.</li> <li>Incentivize the public to access public health services using mobile technology.</li> </ul>
Hardware and Software	<ul style="list-style-type: none"> <li>Coordinate activities with other GRN entities, such as OPM and line ministries (e.g., MOF, MOH), that will support roll-out and maintenance of key operational systems (e.g., HCMS, IFMS).</li> </ul>	<ul style="list-style-type: none"> <li>Start a dialog through SITHIS (the MOHSS Systems and IT Coordination Body for HIS with the Inter Agency Coordination Body for HIS.</li> </ul>
	<ul style="list-style-type: none"> <li>Ensure that the HIS and all related systems (commodities, financial, personnel, vital registration, etc.) are open architecture and nonproprietary (to the extent possible) so that they can communicate with each other.</li> </ul>	<ul style="list-style-type: none"> <li>Through the Systems Development Standards Committee (SDSC): <ul style="list-style-type: none"> <li>Draft standard operation protocols that define an open architecture data standard and data messaging protocols using Web services or other communication protocols.</li> <li>Establish uniform unique identifiers for all patients and for all health personnel.</li> <li>Embed primary keys in databases that allow for cross database inquiries.</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>Fully implement agreed HIS systems based on new minimum indicators agreed by all stakeholders. <b>Note:</b> New systems and programs can be pilot-tested but should not roll out until an indicator set has been agreed upon.</li> </ul>	<ul style="list-style-type: none"> <li>Draw up a careful roll-out plan that takes the quality of infrastructure, both technical and human, into consideration.</li> <li>Do not attempt to roll out any new system nationwide all at once; , take a phased approach.</li> </ul>



<b>Thematic Area 2: Technology, Protocols, and the Human Interface</b>		
<b>Component</b>	<b>Recommendation</b>	<b>Illustrative Activities</b>
<b>Reporting Burden and Work Load</b>	<ul style="list-style-type: none"> <li>Using a new minimum agreed indicators, create recording and reporting tools that are facility-appropriate (e.g., for clinics, health centers, or hospitals), and train staff and supervisors in their use.</li> </ul>	<ul style="list-style-type: none"> <li>Follow the recommendations and activities outlined under the Management, Coordination and Implementation TA to launch a GRN process to bring all stakeholders to a dialog to create a minimum set of indicators, consolidate tools, and removal parallel data collection and reporting.</li> <li>Use the results from this assessment, especially the qualitative information and diagrammatic use-case analysis in the Systems and Databases catalog, to analyze the all data exchange points from raw data entry at registry, through facility unit management, and district, regional, and central program and administrative units.</li> </ul>
	<ul style="list-style-type: none"> <li>Assess the data/information and reporting needs of MOHSS headquarters internal and external stakeholders, and in coordination with others, design automated report templates and tools to drastically cut down on the current national manual (and repetitive) reporting burden.</li> </ul>	<ul style="list-style-type: none"> <li>See recommendations and activities outlined in the Information Products, Data Use, and Knowledge Management TA.</li> </ul>

<b>Thematic Area 3: Information Products, Data Use, and Knowledge Management</b>		
<b>Component</b>	<b>Recommendation</b>	<b>Illustrative Activities</b>
<b>Information and Data Products</b>	<ul style="list-style-type: none"> <li>Put on outreach events (including media) to raise awareness of the importance of information to service provision.</li> </ul>	<ul style="list-style-type: none"> <li>Form partnerships with the private sector and CSOs to launch public awareness and outreach programs for target groups at all levels, such as community dialog, academic and radio discussion forums, house visits, and billboard messages.</li> </ul>
	<ul style="list-style-type: none"> <li>Support and help reinforce public data and information access portals that are reliable, relevant, and up-to-date. Produce regular reports from various nodes of the system and provide channels and forums to discuss them.</li> </ul>	<ul style="list-style-type: none"> <li>Prepare and distribute quarterly print and electronic materials on health information.</li> <li>Provide free access to a Web-based Public Health Information Database (through the Namibia HIS Key Indicators Database).</li> <li>Partner with telecoms to provide free access to essential health information via mobile phones.</li> </ul>
	<ul style="list-style-type: none"> <li>Establish a Namibia HIS Key Indicators Database containing strategic individuals agreed upon by all stakeholders for all MOHSS health programs, administrative areas (HR, finance, etc.), line ministries, and sectors relevant to other determinants of health, with a user-friendly query facility, limited analysis including charting, and executive summary briefings.</li> </ul>	<ul style="list-style-type: none"> <li>Begin dialog through the TWG and the SITHIS to strategize with stakeholders, first to get buy-in and then to formulate information, design, and access requirements for the Namibia HIS Key Indicators Database</li> </ul>
	<ul style="list-style-type: none"> <li>Assess data/information and reporting needs; draft data utilization plans for various stakeholders at all levels to improve operations, planning and decision-making, and performance management; and design automated analytical tools, reports, and information and knowledge management products. This process and the associated solution design should bring in all MOHSS stakeholders, including service providers and / decision makers at all levels, ordinary citizens, community units, and development partners.</li> </ul>	<ul style="list-style-type: none"> <li>Assess information needs at all levels and design analytical tools, and responsive information and knowledge management products.</li> <li>Consult stakeholders at all levels to develop data utilization plans for them.</li> <li>Translate plans and requirements into automated report templates and other knowledge and information products (use existing easy- to-use tools, such as MS Excel for automated report templates).</li> </ul>

<b>Thematic Area 3: Information Products, Data Use, and Knowledge Management</b>		
<b>Component</b>	<b>Recommendation</b>	<b>Illustrative Activities</b>
	<ul style="list-style-type: none"> <li>Develop and implement a program of basic tools and trainings in order to institute basic analytical capacity and practices to help support better operation, management, and service delivery.</li> </ul>	<ul style="list-style-type: none"> <li>Create a curriculum that supports training at various levels on the use of analytical tools and practices.</li> </ul>
<b>Actual Demand and Use by the System (including Beneficiaries) and Decision Makers at all Levels</b>	<ul style="list-style-type: none"> <li>Design and implement opportunities for strategic dialog, consultations with key stakeholders at all levels including citizen memberships, community units, development partners, implementing partners, and media to raise awareness for a culture shift, and strengthen the demand for information at all levels by citizens to key policy and decision makers.</li> </ul>	<ul style="list-style-type: none"> <li>Form PPPs to launch workshops and other forums for strategic and consultative dialogs with stakeholders at all levels in order to build information demand.</li> <li>Create incentive structure for using data for making decisions (e.g., performance-based budgeting).</li> </ul>
	<ul style="list-style-type: none"> <li>Launch outreach and workshops at all levels (especially service delivery points) to raise awareness and appreciation of the importance of information products and their use as essential components of everyday tasks.</li> </ul>	<ul style="list-style-type: none"> <li>Identify suitable regional and local partners to plan and launch workshops to help institutionalize the use of knowledge and information products.</li> <li>Increase awareness of the value of evidence-based decision-making.</li> </ul>
<b>Culture for Learning and M&amp;E Feedback Loop</b>	<ul style="list-style-type: none"> <li>Put in place new (and strengthen existing) M&amp;E frameworks at each level to support activity management and provide regular feedback.</li> <li>Establish a variety of forums where people can exchange experiences and perspectives and share tools, practices, and concepts for success.</li> </ul>	<ul style="list-style-type: none"> <li>Launch and facilitate M&amp;E TWGs or subcommittees for planning and development.</li> <li>Enter into regional and district partnerships to establish forums and launch workshops for exchange of ideas.</li> <li>Facilitate two learning missions a year for every HIS officer, health worker and clinician to cross geographic and administrative boundaries to facilitate hands-on learning, sharing, and documenting best practices.</li> </ul>
	<ul style="list-style-type: none"> <li>Use structured team reviews at each level to clarify and strengthen individual and team commitments to managing with data.</li> </ul>	<ul style="list-style-type: none"> <li>Identify a regional partner to plan and launch team workshops at all levels to institute managing with data—using knowledge and information products for everyday tasks, such as decision-making.</li> </ul>

<b>Thematic Area 3: Information Products, Data Use, and Knowledge Management</b>		
<b>Component</b>	<b>Recommendation</b>	<b>Illustrative Activities</b>
	<ul style="list-style-type: none"> <li>Establish a pre-assignment program to train all clinicians and health workers on the management tools they need to use to do their jobs, such as health information, pharmacy management, and logistics..</li> </ul>	<ul style="list-style-type: none"> <li>Identify and form partnerships with local and regional learning organizations to design and produce a pre-assignment (e.g. one-month) training program.</li> <li>Hold discussions with NHTC to explore broad-based partnership on specific HIS trainings.</li> </ul>
	<ul style="list-style-type: none"> <li>Create a training and career path for professional HIS officers with both diploma and degree programs.</li> </ul>	<ul style="list-style-type: none"> <li>Take steps to recruit for future HIS, including training and development of a career path for current HIS officers.</li> <li>Explore possible partnerships with academia and other private training bodies to draft a specific HIS curriculum, and possibly work toward instituting a national or regional Center of Excellence for HIS training.</li> </ul>
	<ul style="list-style-type: none"> <li>Establish on-the-job training and periodic retraining for all managerial, clinical, and HIS staff.</li> </ul>	<ul style="list-style-type: none"> <li>Provide health managers with the managerial and business skills training they need.</li> <li>Seek technical assistance to build internal training modules on on-the-job training for different levels and personnel.</li> <li>Form an internal core training delivery team.</li> </ul>
	<ul style="list-style-type: none"> <li>Build and actualize both formal and informal learning and knowledge components relevant to job responsibilities; provide ways and means to facilitate self-learning and establish an incentive system for it.</li> </ul>	<ul style="list-style-type: none"> <li>Identify and form regional partnerships to design and launch a Mobile Health Knowledge Express program to be taken to each facility, especially those in remote areas and without Internet access.</li> <li>Devise and implement an incentive system for self-learning.</li> </ul>

<b>Thematic Area 3: Information Products, Data Use, and Knowledge Management</b>		
<b>Component</b>	<b>Recommendation</b>	<b>Illustrative Activities</b>
	<ul style="list-style-type: none"> <li>Design and implement formal short- and long-term training programs, especially in new systems and programming areas, to improve the computer and technical capacity of staff throughout the HIS.</li> </ul>	<ul style="list-style-type: none"> <li>Urgently plan and implement a rigorous set of activities, possibly through technical assistance initiatives, to immediately train a core group (who can then act as local trainers) and build in-house technical capacity and expertise in such systems development aspects as state-of-the-art programming languages, design aspects and methodologies, dissemination techniques, and modern system protocols. This will effectively make it possible to overcome the current vicious paralysis caused by technical skill shortages in the ministry and Namibia generally, which prevents effective customization of existing and development of new applications on time and forces unsustainable measures, such as skyrocketing expenses to bring in international technical and systems experts.</li> <li>Instill in staff at all levels basic computer literacy through official programs, such as the International Computer Driving License (ICDL).</li> <li>Institute system-specific user literacy programs for both current and planned systems, such as DHIS, IFMS, HCMS, and IHCIMS.</li> <li>Design and implement advanced system competency training for systems and IT administrators.</li> <li>Ensure that cascaded training reaches the local level and that the appropriate individuals are trained.</li> </ul>

<b>Thematic Area 4: Management, Coordination and Implementation</b>		
<b>Component</b>	<b>Recommendation</b>	<b>Illustrative Activities</b>
<b>Institutional Effectiveness</b>	<ul style="list-style-type: none"> <li>Identify a single high-level national champion who can mobilize people at all levels of the health system to influence and facilitate implementation of a strong and unified health information system.</li> </ul>	<ul style="list-style-type: none"> <li>Launch consultations of TWG with relevant top-level MOHSS and other management groups and carry out an immediate process to identify a national HIS champion</li> </ul>
	<ul style="list-style-type: none"> <li>Raise the profile of the HIS Directorate through advocacy and awareness campaigns.</li> </ul>	<ul style="list-style-type: none"> <li>Develop an advocacy plan to further raise the awareness of upper management regarding the urgency and importance of strengthening the HIS and supporting the new Directorate.</li> <li>Utilize the results of this HIS Assessment process to advocate for HIS funding, especially for the new Directorate to carry out the activities.</li> </ul>
	<ul style="list-style-type: none"> <li>Identify a champion in each key national and subnational agency who can mobilize people and activities at all levels of that agency to help implement a strong, integrated HIS.</li> </ul>	<ul style="list-style-type: none"> <li>Launch a process through the TWG and the relevant MOHSS management group(s) and carry out an immediate process to identify a champion in each key agency.</li> </ul>
	<ul style="list-style-type: none"> <li>Strengthen any existing or establish a new Inter-Agency HIS Coordinating Body with an official mandate and high-level representation to work with TWG in generate political support, set direction, and oversee a visible national HIS strengthening effort.</li> </ul>	<ul style="list-style-type: none"> <li>Launch a process through the TWG and MOHSS management groups and proceed immediately to identify high-level personnel at partner ministries and agencies.</li> </ul>
	<ul style="list-style-type: none"> <li>Institutionalize a change management strategy for all levels and personnel of the HIS system that will tackle the behavioral changes needed to overcome resistance to use of new systems, processes, and technology.</li> </ul>	<ul style="list-style-type: none"> <li>Assemble a group of individuals with organizational influence and authority.</li> <li>As a team, formulate a vision for the changes desired.</li> <li>Draw up a strategy to implement the changes.</li> <li>Institutionalize the changes.</li> </ul>
<b>Supportive Supervision</b>	<ul style="list-style-type: none"> <li>Establish supervision and refresher training tailored to managing health information systems and their staff.</li> </ul>	<ul style="list-style-type: none"> <li>Seek technical assistance to build modern and standard supervision and refresher training modules.</li> <li>Seek central and regional partners or form an internal core training delivery team.</li> </ul>

<b>Thematic Area 4: Management, Coordination and Implementation</b>		
<b>Component</b>	<b>Recommendation</b>	<b>Illustrative Activities</b>
	<ul style="list-style-type: none"> <li>Develop a supervision and support system with sufficient resources to routinely provide support to each level on all data components of data (collection, quality, management, etc.) and data utilization.</li> </ul>	<ul style="list-style-type: none"> <li>Support implementation of supervision activities, set routine supervision schedules, and supporting their implementation through both government funding and partner support.</li> <li>Use supervision results to improve data utilization and quality at each level.</li> </ul>
	<ul style="list-style-type: none"> <li>Conduct regular supportive supervision and provide mentorship at all levels, with feedback and a written record of action points, advice, and understandings.</li> </ul>	<ul style="list-style-type: none"> <li>Support and strengthen operation-level logistics to facilitate regional, district, and facility supervision.</li> <li>Develop operational standards to guide that support.</li> </ul>
<b>Policy and Planning</b>	<ul style="list-style-type: none"> <li>Carry out a, transparent and broad-based process consulting with multiple stakeholders (the private sector, FBOs, and CSOs) as a basis for preparing an HIS strategy that is aligned with the national development agenda and the MOHSS strategy, and is fully based on evidence, including the results of this and planned stakeholders assessments.</li> </ul>	<ul style="list-style-type: none"> <li>Launch a sincere awareness and advocacy campaign immediately to ensure broad-based participation.</li> <li>Ensure that strategy development is fully evidence-based by including such process outcomes as the results of this HIS assessment and the planned stakeholders assessment.</li> <li>Ensure that the HIS strategy is aligned with the National Development Agenda (goals), Namibia Vision 2030, MOHSS Strategic Plan 2009 – 2013, HIS policy, and other relevant documents.</li> </ul>
	<ul style="list-style-type: none"> <li>Once the HIS strategy is completed, translate it into prioritized action steps to achieve the defined goals.</li> </ul>	<ul style="list-style-type: none"> <li>Set out a system-wide work plan based on accepted recommendations to strengthen HIS.</li> <li>Set specific short-term targets (Quick Wins) that can immediately create impact and build both support and momentums, and adopt the mechanisms needed to meet them.</li> <li>Draw up short, medium-, and long-term implementation plans that specify clearly outcomes, actions, responsibilities, deadlines, and resource needs.</li> </ul>
	<ul style="list-style-type: none"> <li>Establish new mechanisms and reinforce existing ones to review policy, strategy, and plans annually to ensure that implementation is on track and remains relevant as situations change.</li> </ul>	<ul style="list-style-type: none"> <li>Increase capacity in the new HIS Directorate to effectively manage TWGs and other coordinating committees responsible for strategic thinking and planning.</li> </ul>

<b>Thematic Area 4: Management, Coordination and Implementation</b>		
<b>Component</b>	<b>Recommendation</b>	<b>Illustrative Activities</b>
	<ul style="list-style-type: none"> <li>Under the HIS Directorate, draw up and support a GRN process to ensure that all government programs and development partners agree on an indicator list, enforce their adoption of the list in vertical reporting programs and set a schedule for merging all parallel data systems into the unified HIS.</li> </ul>	<ul style="list-style-type: none"> <li>Provide all necessary support to government and partners to facilitate and manage the transition to a unified HIS.</li> <li>Through top leadership and strategic consultations, generate support for indicator list adoption and have it mandated.</li> </ul>
	<ul style="list-style-type: none"> <li>Review and reinforce or institute robust and effective performance-based accountability mechanisms throughout all levels and nodes of the system (including all HIS related programs, projects, and activities to track results and resource usage.</li> </ul>	<ul style="list-style-type: none"> <li>Launch an immediate initiative, guided by the TWG, to set up a subcommittee to strategize and lay out a plan for this, using appropriate technical assistance and advisory support.</li> </ul>
	<ul style="list-style-type: none"> <li>The HIS Directorate should carefully review and make clear and concrete plans for integration, usage, and if necessary phase-out of primary existing (DHIS 1.4, EPMS, SPM etc.) and upcoming (IHCIMS, NDW, DHIS 2.0) MOHSS systems in order to avoid major duplication, gain operational efficiency, and save significant resources.</li> </ul>	<ul style="list-style-type: none"> <li>Launch an immediate review and dialog through the SITHIS (see below), guided by the TWG and the new directorate.</li> <li>Using the results of this HIS assessment, set up broad-based dialog with all users and beneficiaries of systems to better understand the comprehensive need.</li> <li>Hold an open and carefully planned dialog process with all custodians of these systems under the banner of the Directorate, i.e., through the MOHSS SITHIS.</li> </ul>
	<ul style="list-style-type: none"> <li>Reduce adverse impacts on operations and maximize effectiveness of resources spent (including on training) by addressing critical staff rotation and retention issues.</li> </ul>	<ul style="list-style-type: none"> <li>Revise current policies and management practices on staff rotation to set a minimum length of service at any location so as to reduce the adverse impact on operation and maximize effectiveness of resources spent on training.</li> <li>Through broad-based discussions with relevant parties, devise an incentive system to reduce staff retention problem at all levels.</li> </ul>
	<ul style="list-style-type: none"> <li>Draft new operational policies or review, strengthen and enforce existing ones, clarifying the roles and responsibilities of various entities related to data submission and protocols.</li> </ul>	<ul style="list-style-type: none"> <li>Establish and follow data submission protocols and clarify roles.</li> <li>Strictly adhere to policies and protocols for data clearance, accountability, and ownership, especially by the regional</li> </ul>



<b>Thematic Area 4: Management, Coordination and Implementation</b>		
<b>Component</b>	<b>Recommendation</b>	<b>Illustrative Activities</b>
		<p>management (not the HIS staff).</p> <ul style="list-style-type: none"> <li>• Devise schemes to motivate the private sector to report data.</li> </ul>
	<ul style="list-style-type: none"> <li>• Set clear guidelines and policies outlining rules, timelines, and a well-coordinated process for amending current tools (electronic and paper-based), and strictly prohibit any uncoordinated or unauthorized changes outside the guidelines.</li> </ul>	<ul style="list-style-type: none"> <li>• Review current guidelines and processes, revise if necessary, and issue strict directives and mandates to all programs and their managers laying out the procedure for any amendment to rules.</li> <li>• Once the minimum set of indicators is agreed upon, revision and changes should be done only at specific intervals, ideally every two years.</li> </ul>
	<ul style="list-style-type: none"> <li>• Revise current policies and management practices on use of mobile technology to facilitate more reliable and faster data/information transfer, especially adopting 3G technology to replace old dial-up modems.</li> </ul>	<ul style="list-style-type: none"> <li>• The new Directorate and the TWG should recognize the long-range benefit of using 3G rather than any potential misuse and cost implication.</li> <li>• Advocate and generate support for 3G use and institute favorable management practice and policy throughout the system.</li> </ul>
<b>Human, Financial, and Other Resources</b>	<ul style="list-style-type: none"> <li>• Provide sufficient human and financial resources so that the HIS Directorate can perform all its vital and mandated functions, especially better coordinating stakeholder activities and carrying out all necessary activities in HIS implementation plans.</li> <li>• Note: A number of staff currently placed throughout organizational units should be brought together for critical institutional, experiential, operational knowledge and expertise that would be vital for the efficiency and success of the HIS Directorate and for the unification of the HIS.</li> </ul>	<ul style="list-style-type: none"> <li>• Assess and define all resource needs.</li> <li>• Use the HIS Stakeholders Map for Planning and Implementation (described below) to hold dialog with all parties, including GRN entities (such as MOHSS internal units) and development partners.</li> <li>• Identify funding sources and form partnerships to expand funding from future budgets.</li> </ul>
	<ul style="list-style-type: none"> <li>• Through careful prioritization and analysis of all goals and activities (both investment and operational), identify a practical, evidence-based, and justified estimate in line with current international norms, for the required investment in HIS as a percentage of the total health sector budget to</li> </ul>	<ul style="list-style-type: none"> <li>• Launch an immediate process, guided by the TWG, to get appropriate short-term international experts (possibly through technical assistance to work with current staff to start this activity.</li> </ul>

<b>Thematic Area 4: Management, Coordination and Implementation</b>		
<b>Component</b>	<b>Recommendation</b>	<b>Illustrative Activities</b>
	ensure its smooth and effective implementation and operation.	<ul style="list-style-type: none"> <li>The new directorate and TWG are to take the results of this initiative and advocate intensely (through the national HIS champion, DPs, and elsewhere to advocate that high-level national management and entities create the necessary awareness and build political support for actual GRN budget allocation to meet this HIS target in the national budget and in the MOHSS budget line.</li> </ul>
	<ul style="list-style-type: none"> <li>Ensure expanded and continuous GRN sources for funding staff (including absorbing currently seconded staff) and intermittent and needed technical assistance for operational institutional systems (e.g. DHIS 1.4), acquiring technology and supplies, and maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>Working with the national champion and the MOHSS leadership forums, raise awareness and build political support for GRN absorption being the key to sustainability.</li> <li>Identify funding sources and form partnerships for assure additional funding in future budgets</li> <li>Provide necessary intermittent as-needed technical assistance to build or increase in-house capacity to facilitate smooth operation and improve data flow in current systems that are being used extensively, such as DHIS 1.4.</li> </ul>
	<ul style="list-style-type: none"> <li>For effective operation, provide all the staff needed throughout the whole HIS system across all levels.</li> </ul>	<ul style="list-style-type: none"> <li>Assess staffing needs for the HIS system across all levels.</li> <li>Identify and mobilize support, form partnerships, and develop mechanisms to address staffing needs.</li> </ul>
<b>Coordination, Collaboration, and Stakeholder Engagement</b>	<ul style="list-style-type: none"> <li>Strengthen the HIS Directorate by creating leadership forums that coordinate a broad range of stakeholders in order to promote achievement of operational and policy reforms, especially those whose resources will be needed to implement recommendations, as well as others that may eventually come to the fore.</li> </ul>	<ul style="list-style-type: none"> <li>Better coordinate and expand active participation of the TWG and other coordinating committees.</li> <li>Have the TWG work through any existing Development Partners Group to coordinate the support of donors and their implementing partners for national HIS plans and activities.</li> <li>Identify a process to ensure that all stakeholder objectives and activities are aligned with the HIS objectives and strategy and are funded.</li> </ul>

<b>Thematic Area 4: Management, Coordination and Implementation</b>		
<b>Component</b>	<b>Recommendation</b>	<b>Illustrative Activities</b>
	<ul style="list-style-type: none"> <li>Use TWG and the HIS leadership forum to coordinate general systems and tools, resource usage, and possible sharing across programs in order to maximize efficiency and facilitate integration.</li> </ul>	<ul style="list-style-type: none"> <li>Create a matrix of all resources (human, financial, technical, etc.) available in programs that could possibly be shared with other programs.</li> <li>Hold a dialog with both internal and external partners, especially DPs, to reach agreement on resources that may be shared or redistributed.</li> </ul>
	<ul style="list-style-type: none"> <li>Immediately form an inclusive formal MOHSS-wide Systems and IT Coordination Body for HIS (SITHIS) with clearly defined terms of reference for all systems development, integration, coordination, and deployment activities, with members from both intra- and inter-ministry and sectoral stakeholders (from the HIS Directorate, this group could simply have representatives from the SDSC team noted in the Data and Information TA recommendations).</li> </ul>	<ul style="list-style-type: none"> <li>The new directorate and the TWG should immediately launch a dialog to plan for this and reach out to other ministries and sector counterparts to get their buy-in and active participation in forming and operationalizing SITHIS.</li> <li>SITHIS should carefully review the results of this assessment and devise alternatives and phased plans to remove or integrate parallel or duplicative in either function or coverage, nonoperational, and redundant systems.</li> <li>SITHIS should carefully review the results of this assessment and devise alternative plans to phase out many stand-alone systems and use current or new institutional systems that can or would be able to cover the business and operational needs currently served in isolation by stand-alone systems. For example, investigate the capabilities of such systems as IHCIMS to bring together operations like patient information, service provision, drug dispensing. first to district hospitals and large health centers for now, and then explore lighter solutions for facilities like clinics and health centers.</li> </ul>
	<ul style="list-style-type: none"> <li>Support the TWG and the HIS Directorate initiative to bring all stakeholders together to agree on a minimum set of indicators that will meet all HIS program management and reporting needs. For this the TWG should be further institutionalized to ensure continued coordination on indicators between stakeholders .</li> </ul>	<ul style="list-style-type: none"> <li>Use the TWG and the new directorate to strengthen the relevant subcommittee to better coordinate a process for a multistakeholder HIS coordinating committee charged with revising a comprehensive set of indicators.</li> </ul>

<b>Thematic Area 4: Management, Coordination and Implementation</b>		
<b>Component</b>	<b>Recommendation</b>	<b>Illustrative Activities</b>
	<ul style="list-style-type: none"> <li>Develop and maintain an HIS Stakeholders Map for Planning and Implementation that reflects all agreed current and future activities and commitments (from all parties, including the MOHSS internal budget), and to the extent possible with potential interests and commitments in various areas expressed by all, including development partners. Use this to identify HIS support strengths and gaps, follow-up on commitments, and pursue new support partnerships.</li> </ul>	<ul style="list-style-type: none"> <li>The directorate and TWG should launch immediate dialog with each other and MOHSS management team to plan for this.</li> <li>The 'HIS Stakeholders Map for Planning and Implementation' can be designed around the various TAs of this assessment (and their components), laying out current and projected activities along with actual and potential contributions.</li> </ul>
	<ul style="list-style-type: none"> <li>Develop partnerships with internal and external private bodies to gain access to specific technical expertise relevant to MOHSS systems development needs and use of state-of-the-art technology.</li> </ul>	<ul style="list-style-type: none"> <li>Dialog with private technical entities and academia to determine the availability of the latest skill sets and technologies.</li> <li>Organize a formal internship program with UNAM, Polytech, and other private academic institutions to build up local capacity.</li> </ul>
	<ul style="list-style-type: none"> <li>Integrate and align the results of this assessment with the TWG roadmap for overall HIS strengthening.</li> </ul>	<ul style="list-style-type: none"> <li>Use these assessment findings and recommendations (along with illustrative activities) as input into activities in the general HIS strengthening process. More specifically, make them part of the discussions and analysis for both the planned stakeholders' assessment and the follow-up process of further analysis and finalization of recommendations that would also include the BPA.</li> <li>The stakeholders and the BPA process are to vet the findings and recommendations of this assessment and align them with their analysis and final plan to make them part of a single agreed set of recommendations, to be fed into the process for drafting the HIS Strategy, Policy, and Operational Plan development.</li> </ul>

## **ANNEX C. SYSTEM/DATABASE CATALOG**

As part of the assessment, a total of 61 systems of different forms (paper-based, electronic, and combination of paper and electronic) were reviewed and analyzed. Based on the review and analysis, a detailed systems/databases catalog was produced. This catalog lays out key information and details under the following four areas in order to provide a comprehensive understanding of various aspects of each system:

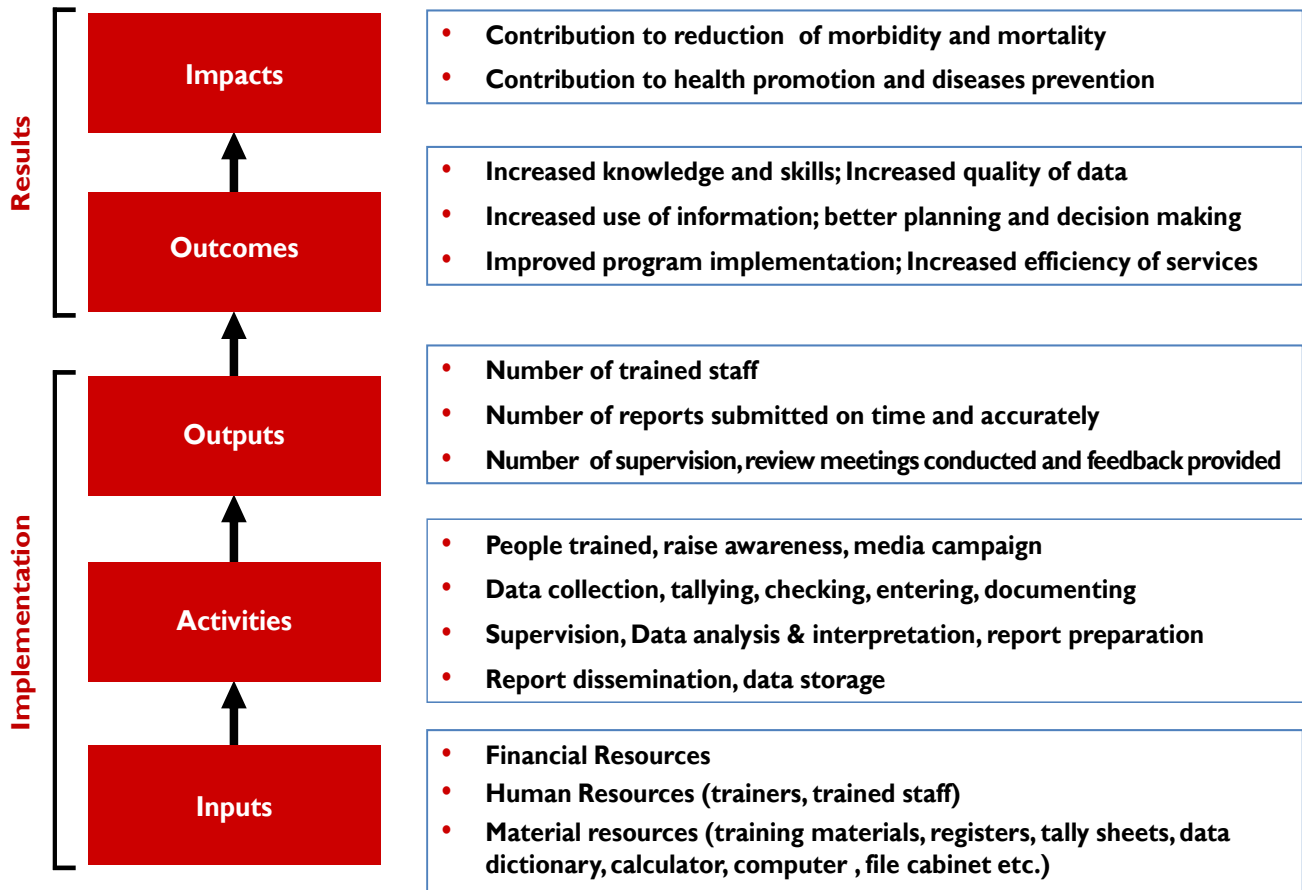
1. Process and Qualitative Information At-a-Glance
2. System/Database Technical Information
3. Use Case Flow Diagram
4. Data Dictionary

More details about the content of each of the four areas are outlined in the introduction section of the catalog, followed by the actual details of each system/database. This Systems/Databases Catalog, a key output of this HIS assessment, although listed under Annex C of this main assessment report, has been compiled into a separate companion publication due to the sheer length (almost 1,400 pages) and size (5.5 MB) of the document. As such, the team requests all interested readers to review the companion publication titled:

*ASSESSMENT OF NATIONAL HEALTH INFORMATION SYSTEMS  
MINISTRY OF HEALTH AND SOCIAL SERVICES (MOHSS), REPUBLIC OF NAMIBIA  
ANNEX C: SYSTEMS AND DATABASES CATALOG*



## ANNEX D. RESULTS CHAIN: DEMONSTRATION OF IMPLEMENTATION AND IMPACT OF THE HEALTH INFORMATION SYSTEM







## ANNEX E. LIST OF PEOPLE MET AND/OR INTERVIEWED

(by Organization)

Name	Organization	Department	Position / Designation
Michael Rodriguez	Abt Associates	HS 20/20	Namibia Team Leader, Health Systems Strengthening
Vincent Shaw	HISP		Senior Consultant
J. C. Smith	MOF	IT	IT
Lusia N. Hamumokola	MOF	IT	Deputy Director
Saima Sakaria	MOHA	BDM	Control Officer
Dr. Norbert P. Forster	MOHSS		Deputy Permanent Secretary
L. N. Karises	MOHSS		Deputy Director, Finance
Obert Mutabani	MOHSS		
Barnabus Kirwisa	MOHSS	CMS	Distribution Pharmacist
Gilbert Habimana	MOHSS	CMS	Chief Pharmacist
Girma Tadesse	MOHSS	CMS	IT specialist
Harriet Lema	MOHSS	CMS	Procurement Pharmacist
David Hughes	MOHSS	Disability Directorate, SWS	
Anna Jonas	MOHSS	DSP	Chief Health Program Administrator
Anna Thobias	MOHSS	DSP	Chief, Health Program
Claudia Mbapaha	MOHSS	DSP	
E. R. Rimako	MOHSS	DSP	Senior Health Program Administrator (SHPA)
Epafra Anyolo	MOHSS	DSP	MC Program Coordinator
Michael de Klerk	MOHSS	DSP	Data Manager, RM&E
Michael Gawanab	MOHSS	DSP	
Uakurama Ambrosius	MOHSS	DSP	Chief Health Programme Administrator
Clothilde Narib	MOHSS	DSP	M&E Officer
Sarah Tobias	MOHSS	DSP	STI & Condom Program Coordinator
Sylvester D'Almeida	MOHSS	DSP	Data Analyst, RM&E

Name	Organization	Department	Position / Designation
V. Mogotsi	MOHSS	DSP	Chief Health Program Administrator (CHPA)
Yusuke Tanaka	MOHSS	DSP	Senior Technical Advisor
Cuthbert Chibango	MOHSS	ERRC	Social Worker
Dr. Andrew Agabu	MOHSS	FH	Mother-Infant Pair Follow-Up Program
Franscina Rusberg	MOHSS	FH	Mother-Infant Pair Follow-Up Program
Martina Allies	MOHSS	FH	
Marjorie van Wyk	MOHSS	FH	Nutrition Program
Clive Platt	MOHSS	Finance & Logistics	Deputy Director
M. Amukwaya	MOHSS	Gobabis District	District TB Coordinator (DTC)
M. V. Maliti	MOHSS	Gobabis District	DHIS
Alberto Diergaardt	MOHSS	Hardap Region, Groot Aub Clinic	VCT Counselor
Muriel Williams	MOHSS	Hardap Region, Groot Aub Clinic	Nurse
(name not available)	MOHSS	Hardap Region, St. Mary's District Hospital	Hospital Social Worker
(name not available)	MOHSS	Hardap Region, St. Mary's District Hospital	ART Clinic
Archie Shikemeni	MOHSS	HRM	Human Resource Management and General Services
Dr. Shannon Kakungulu	MOHSS	IHO	Medical Superintendent
Fileman Helao	MOHSS	IHO	IT Coordinator
Koneka Avia	MOHSS	IHO	MIS Officer
Miriam Mathews	MOHSS	IHO	Nurse
J. Mudjuu	MOHSS	IT & Physical Facility Management	Acting Deputy Director
S. K. Swartz	MOHSS	MIS	Senior Health Program Administrator (SHPA)
Hedwig Rikambura	MOHSS	NHTC	
Jeanette Leboea	MOHSS	NHTC	
Bayobuya P. Phulu	MOHSS	NMPC	Senior Pharmacist

<b>Name</b>	<b>Organization</b>	<b>Department</b>	<b>Position / Designation</b>
Kennedy Kambyambya	MOHSS	NMPC	Chief Pharmacist
Johannes #Gaeseb	MOHSS	NMRC	Registrar of Medicine
Pascal Rite	MOHSS	NMRC	Senior Pharmacist
Vera Uushona-Mikka	MOHSS	NRPA	
Dr. Ikandi	MOHSS	Omaheke Region	Chief Medical Office (CMO)
E. Kamboua	MOHSS	Omaheke Region	Chief Clerk: Transport
Puumue Katjjuanjo	MOHSS	Omaheke Region	Regional Director
Rauna Visagie	MOHSS	Omaheke Region	Data Clerk
Katrina Tjongarero	MOHSS	Omaheke Region, Otjinene HC	Registered Nurse
Winnie Indala	MOHSS	Omaheke Region, Otjinene HC	Registered Nurse
Emely Matenga	MOHSS	Omaheke Region, Witvlei Clinic	Registered Nurse
Petrina Afrikaner	MOHSS	Omaheke Region, Witvlei Clinic	Community Counselor
Damien	MOHSS	Oshana Region	Oshakati ART clinic
Elizabeth Theophilus	MOHSS	Oshana Region	Oshakati ART pharmacy
Helena Namadhila	MOHSS	Oshana Region	Oshana Regional IFMS
Laimi Mbeeli	MOHSS	Oshana Region	Oshana Regional HR
Josephine Augustinus	MOHSS	Oshana Region	Acting Regional Director
Edward Muchadey	MOHSS	Oshana Region, Oshakati Pharmacy	Pharmacist
Stanslauc Madende	MOHSS	Oshana Region, Oshakati Pharmacy	Principal Pharmacist
Abraham Blom	MOHSS	Pharmaceutical Services	Information System Administrator
Jennie Lates	MOHSS	Pharmaceutical Services	Deputy Director
B. M. Kambatuku	MOHSS	PHC	Supervisor: Gobabis District
Clementine Muroua	MOHSS	PHC	Deputy Director
Dr. Sikota Zeko	MOHSS	PHC	
Emmy-Else Hango	MOHSS	PHC	
Erwin Nakafingo	MOHSS	PHC	
Johannes Shivute	MOHSS	PHC	

Name	Organization	Department	Position / Designation
Melody Mabuku	MOHSS	PHC	Facility Registration
Primus Shilungu	MOHSS	PHC	
Stefanus Chiyesu	MOHSS	PHC	
Hilma Nangombe	MOHSS	PPHRD	Head: Mgmt Info & Research
Joleen Smith	MOHSS	PPHRD	
Conrad Abrahams	MOHSS	Radiographic Services	
Nicolette Bloodstaan	MOHSS	Radiographic Services	
Helen Mouton	MOHSS	Social Welfare Services	
Assegid T. Mengistu	MOHSS	TIPC	Advisor
Petrus Shaama	MOHSS	Windhoek Central Hospital	Chief Control Officer: Administrative Support Services
Benjamin Onger	MSH		SysPro support
David Mbirizi	MSH		Country Director
Jacob Kawonga	MSH		M&E Advisor
Samson Mwinga	MSH		Developer
Victor Sumbi	MSH		Tools general support
Rob Wilkinson	NAMBTS		General Manager
Kaggere Shivananjai Suresh	Navayuga Infotech Pvt. Ltd.		Director & Vice President: Operations & Business Development
Prashanth Sharma	Navayuga Infotech Pvt. Ltd.		Project Manager
Siva Subrahmanyam	Navayuga Infotech Pvt. Ltd.		Project Manager
Gottfried Uaaka	NIP	IT	
Mathew Amunyela	NIP	NIP, Regional (IHO)	
Stefanus van Staden	OPM	IT	Director
Bas Rijnen	PharmAccess		Operations Manager
Ingrid de Beer	PharmAccess		General Manager
Andy Chun-Sheng	SiLNAM		Senior Software Engineer

Name	Organization	Department	Position / Designation
Ida Bouwer	University Research Co. LLC (URC)		M&E officer
Robert Festus	USAID	Health Office	
Susna De	USAID	Health Office	Systems Strengthening and Capacity Development Advisor
Roselina de Wee	WHO		



## ANNEX F. REFERENCES

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