ASSESSMENT OF THE ROUTINE HEALTH MANAGEMENT INFORMATION SYSTEM IN NIGER STATE, FEDERAL REPUBLIC OF NIGERIA

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ASSESSMENT OF THE ROUTINE HEALTH MANAGEMENT INFORMATION SYSTEM IN NIGER STATE, FEDERAL REPUBLIC OF NIGERIA

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ACRONYMS

DHIS	District Health Information System
FMOH	Federal Ministry of Health
HMIS	Health Management Information System
IT	Information Technology
LGA	Local Government Area
M&E	Monitoring and Evaluation
MS	Microsoft
PRISM	Performance for Routine Information System Management
RHIS	Routine Health Information System
SMOH	State Ministry of Health
UPS	Uninterrupted Power Supply
USAID	United States Agency for International Development
v1, v2	Version 1, 2

ACKNOWLEDGMENTS

EXECUTIVE SUMMARY

The goal of this assessment was to evaluate the Routine Health Information System (RHIS) in Niger state. Objectives were to identify the strengths, weaknesses, threats, and opportunities of the Health Management Information System (HMIS) unit in the state and its local government areas (LGAs) with a view to identifying risks that pose a threat to the implementation of the District Health Information System (DHIS) version two (v2) software in the state. The Federal Ministry of Health (FMOH) previously selected the DHIS v1 as its software of choice for routine data management but owing to improvements in the system is considering migration of the country to the DHIS v2 platform. Implementation of DHIS v2 is intended to improve the flow of data from the LGAs to the State Ministry of Health (SMOH) and subsequently the FMOH.

The study used a questionnaire-based assessment and key informant interviews of staff of the HMIS unit in the SMOH and the health department in each of five selected LGAs. Six management assessment questionnaires were administered: one to the HMIS/Monitoring and Evaluation officer at the state level and one to each of the five LGA officers. Also, key informant interviews were held with representatives from state and LGA HMIS offices. Interview responses were documented in written notes, typed into electronic data files, and analyzed logically.

The SMOH office had three computers, two of them functional. Internet service was available to the state office via a USB Internet modem. DHIS v1 was not in use: the SMOH used a Microsoft Excel spreadsheet to record data received from the LGAs. Of the 25 LGAs in the state, 24 (96 percent) had reported their data to the SMOH in the month preceding the assessment. The SMOH had a deadline for the receipt of reports from the LGAs but did not track which LGAs met it.

DHIS v1 was not installed at the two LGA offices that had functional computers (and of course it was not installed in those lacking computers). Internet service and a constant electrical supply were not available in any LGA office. The proportion of health facilities reporting into the HMIS at each LGA ranged from 85 to 100 percent, with Shiroro lowest and Bida highest. (These percentages are much higher than those observed in Imo and Kebbi states [Makinde, Enemuo et al., forthcoming, and Makinde, Ohadi et al., forthcoming]). The deadline for receipt of reports from facilities varied by LGA, as did the observed timeliness of report submission. Only two LGAs (Shiroro and Wushishi) recorded when the health facility reports were received.

The assessment identified numerous challenges that pose a risk to DHIS v2 implementation. First, DHIS v2 relies on the availability of computers at the LGA offices that would be used to enter the data into the system, but three LGAs lacked functional computers. DHIS v2 also requires Internet service, which was lacking in all five LGA offices. Last, processes were not in place to ensure that the data reported by health facilities to the LGA offices were true figures, which calls into question the data's reliability; As few as 50 percent of facilities in an LGA had filed reports in the month preceding the assessment. For the HMIS to deliver good data, processes defining how the data are collected must be clearly written with assigned responsibilities. Policymakers need to base their policies on evidence from HMIS data. Reviewing data from a reliable HMIS would improve policy makers' understanding of the system and the financial implications of running an efficient system.

1. BACKGROUND

Niger state is located in Nigeria's North-Central geopolitical zone. Created in 1976 from the former North-Western state, it was divided into 25 local government areas (LGAs) that are grouped into three senatorial zones. It shares boundaries with Kaduna state and the Federal Capital Territory to the east, Kebbi and Zamfara states to the north, and Kwara and Kogi states to the south. Figure 1 shows a map of the state with the senatorial zones and LGAs.

FIGURE 1: MAP OF NIGER STATE SHOWING THE THREE SENATORIAL ZONES AND LGAS

According to the 2006 national population census, the state had almost 4 million inhabitants (Federal Republic of Nigeria Official Gazette, 2009). It covers a land mass of 76,481 km2. The people are predominantly farmers. The state government runs several secondary health facilities, while the LGAs operate the primary health care clinics. Table 1 lists some of the state's basic health indicators.

TABLE 1: HEALTH INDICATORS FOR NIGER STATE

Indicator	Statistics
Infant mortality rate*	77/1000 live births
Under 5 mortality rate*	157/1000 live births
HIV prevalence**	4.0%
Women who gave birth in past 5 years and who received antenatal care (ANC) from a skilled provider*	37%

Sources: * National Population Commission and ICF Macro (2009) (North-Central zone data).

** Federal Ministry of Health (2010).

2. INTRODUCTION

The assessment of the Health Management Information System (HMIS) of selected states in Nigeria came about as a result of efforts of the Federal Ministry of Health (FMOH), the United States Agency for International Development, and Health Systems 20/20 to improve routine disease surveillance in the country. Discussions revealed the importance of assessing the readiness of the state ministries of health (SMOHs) and LGA health departments to adopt the District Health Information System (DHIS) version 2 (v2) software. Health Systems 20/20 was asked to identify the strengths, weaknesses, opportunities, and threats of DHIS v2's deployment.

The FMOH had selected DHIS version 1 (v1) as its platform for managing routine health data in 2006 (FHI, 2008). At that time, DHIS v1, which was based on a Microsoft Access background database, was being deployed. That version was, however, found to have limitations that made it difficult to enter data across multiple sites, so it was difficult to compare data across geographical locations. At any point in time, each LGA where DHIS was deployed could have a different instance of the database operating. Because the databases did not directly "speak" to each other, huge running costs were assumed to ensure that the databases were continuously synchronized.

Recognizing this limitation as significant, DHIS developers built the second version on a web-enabled platform to address the multi-location difficulty. This version facilitates the deployment of a single, countrywide database that can be accessed remotely via the Internet, thereby eliminating the data comparison difficulty. This single management level also reduces information technology (IT) management costs.

Though DHIS v2 has the potential to reduce IT management cost, it is still necessary to ensure that the processes for data collection at the states and LGAs are optimal. That is, ensuring the readiness for DHIS v2 deployment alone will not ensure that the quality of the data the FMOH receives is high enough. Thus, Health Systems 20/20 performed a comprehensive assessment of the HMIS at the state and LGA levels to holistically assess the challenges at state and LGA collection points and offer solutions that would result in better functioning of the national health information system and ultimately better data.

The Performance for Routine Information System Management (PRISM) Assessment tool, which had been developed by MEASURE Evaluation and previously used and validated in several countries, was adapted to the Nigerian context and used as the assessment tool.

3. METHODOLOGY

Sampling: Five LGAs were conveniently selected to represent two urban (Chanchaga and Bosso), two rural (Wushishi and Shiroro), and one semi-urban (Bida) LGAs.

Data Collection Tool: The PRISM framework and tools developed by MEASURE Evaluation were adopted for the study. The tools were grouped into two parts, the performance assessment component and the organizational and behavioral assessment component. The performance assessment component was directed at the technical leads in the state and LGA HMIS offices, and the organizational and behavioral component was directed at workers in the HMIS/ Monitoring and Evaluation (M&E) unit of the SMOH and the LGA health departments. All the facility-level pages of the PRISM tools were excluded from this assessment as the scope of this assessment did not include assessing the facilities.

- Performance Assessment Component

  This part of the tools was targeted at the technical leads in the HMIS/ M&E unit of the SMOH and the LGA health department. It consists of four subcomponents:

  - Quality of data assessment form, assesses the quality of the data reported from the lower level (LGA for state and health facilities for the LGAs)

  - Use of information assessment form, assesses the ability of the unit to utilize information

  - RHIS management assessment form assesses the availability of guidelines and processes for health data management.

  Office checklist assesses the availability of essential office equipment and other resources necessary for the optimal functioning of the DHIS v2.

- Organizational and Behavioral Assessment Component

  This component was targeted at staff of the HMIS unit at the state and LGA level, including the leads. It assesses the respondent's perspective of the organization's behavior with regard to how decisions are made and the general operations of the HMIS unit.

Process: Six management assessment questionnaires were administered: one to the HMIS/M&E officer at the state level and one to each of the five LGA officers. Also, key informant interviews were held with representatives from state and LGA HMIS offices. Interview responses were documented in written notes, typed into electronic data files, and analyzed logically.

4. FINDINGS

4.1   STATE ASSESSMENT

4.1.1 QUALITY OF DATA

The 25 LGAs in the state were required to report their data to the state HMIS office but did so irregularly. During the two months preceding the assessment, 21 (84 percent: first month) and 24 (96 percent: second month) LGAs reported their data for those reporting periods into the system (Figures 2 and 3). The deadline for LGAs to submit monthly reports to the state is the seventh of month following the month of data collection (e.g., the June report is due to the state on July 7). Despite having such deadline, the SMOH does not record the dates when the data forms are received, so it was impossible to assess the timeliness of submissions. DHIS v1 was not installed at the office; the office enters the data from the LGAs on a Microsoft (MS) Excel spreadsheet. This spreadsheets can produce summary reports for each LGA and compare different LGAs' health indicators.

**FIGURE 2: DISTRIBUTION OF LGAS REPORTING
AND NOT REPORTING FOR THE FIRST MONTH REVIEWED**
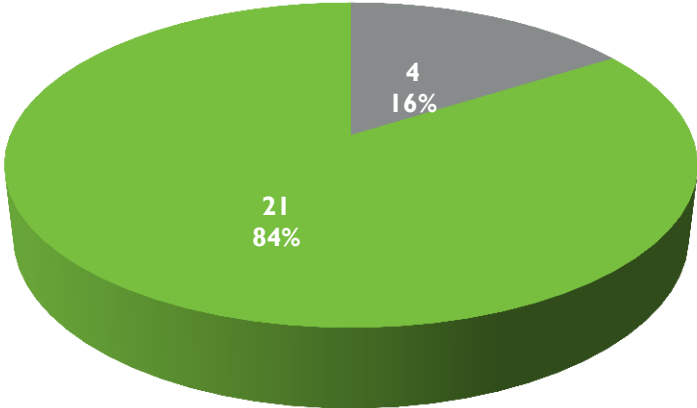
■ LGAs not reporting   ■ LGAs reporting

**FIGURE 3: DISTRIBUTION OF LGAS REPORTING
AND NOT REPORTING FOR THE SECOND MONTH REVIEWED**

1
4%

24
96%

■ LGAs not reporting　　■ LGAs reporting
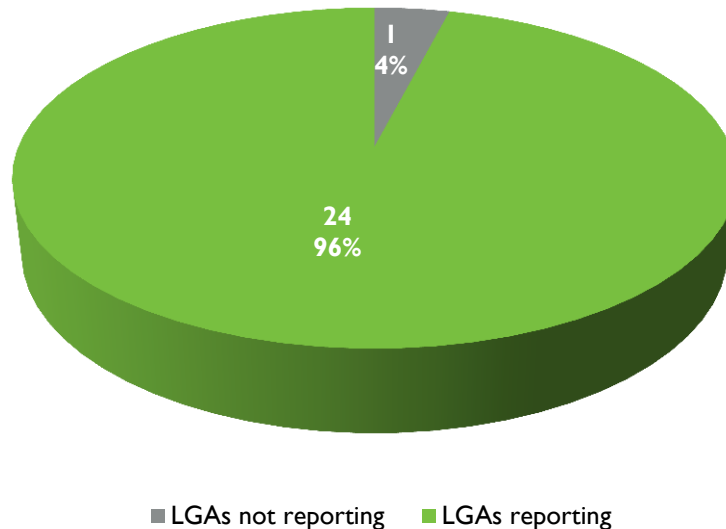
4.1.2 USE OF INFORMATION

The state HMIS office compiles the reports it receives from the 25LGAs and then uses the data to produce reports. In 2011, the SMOH produced the 2006–2010 health statistics bulletin, while early in 2012 it produced the 2011 health statistics bulletin. No public display of health indicators related to maternal and child health, facility utilization, or disease surveillance was observed at this office. However, some of these indicators can be produced from the MS spreadsheet. A map of the state was displayed showing the various LGAs but not demographic information on the state or its LGAs.

4.1.3 OFFICE CHECKLIST

Three computers were available at the state HMIS office, two of them in working condition. No data backup units (CDs or USB hard drives) were available. One of two printers was functional. The office had a USB Internet modem with an active subscription. Power was interrupted daily; the office had no generator to provide backup electricity, but it did have two uninterrupted power supply (UPS) units that temporarily power computers in such situations.

4.1.4 RHIS MANAGEMENT

The state HMIS office does not prominently display a mission statement. The office has a management structure for making RHIS-related strategic and policy decisions. No distribution list or documentation of past RHIS monthly report distribution was available. There was an RHIS situation analysis report that was less than three years and a valid RHIS five-year plan. An RHIS schedule for supervisory visits was available and supported by reports showing the visits had been done.

4.2 LGAS

4.2.1 QUALITY OF DATA

The five LGAs kept copies of monthly reports received from health facilities and made them available to us. The number of health facilities expected to report to their respective LGAs ranged from 25 in Bida to 124 in Shiroro The actual number of facilities reporting varied somewhat by LGA; at the high end, Bida had a 100 percent reporting rate and, at the low end, Shiroro had 85 percent (Figure 4). Only Shiroro and Wushishi recorded the dates on which they received the reports. Similarly, the completeness of the facility reports during the two months preceding the assessment varied. Bida recorded 100 percent completeness for the two months preceding the survey. No LGA had DHIS or any other electronic platform for recording their data, making computation of any indicator a manual process.

FIGURE 4: HEALTH FACILITIES REPORTING AND NOT REPORTING, BY LGA
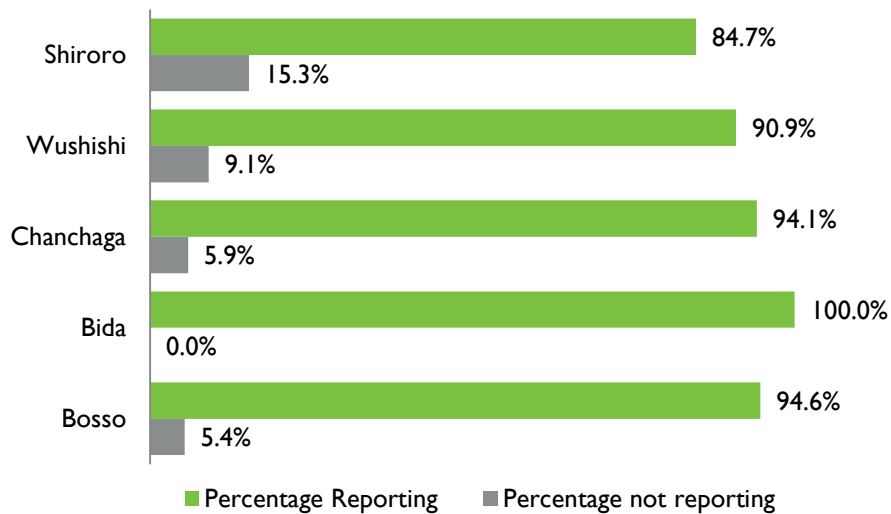
4.2.2 USE OF INFORMATION

The five LGAs compiled data received from the health facilities, but only Shiroro, Bida, and Bosso used those data to generate reports. These reports covered immunization, disease surveillance, nutrition, maternal and child health, and family planning. The three LGAs that received reports from health facilities gave feedback to those health facilities. Shiroro, Wushisi, Bida, and Bosso displayed some health information on disease surveillance, child health, and maternal health; only Chanchaga had no chart or graph. All LGAs had maps showing their catchment area, which is commendable. However, demographic information was not displayed in Bida or Bosso.

4.2.3 OFFICE CHECKLIST

Computers were available in all the LGAs, but the only functional ones were one of the two computers in Bida and the only one in Bosso. Chanchaga and Wushishi's computers were still in the supply boxes. Data backup units like CDs and flash drives were available in Bida, Chanchaga, and Shiroro. Only Boda had a functional printer; printers Chanchaga and Wushishi were still in their supply boxes. Internet service was not available in any LGA, but some HMIS officers occasionally used public Internet facilities

to communicate. No office had a landline or mobile phone. Power was interrupted daily in all LGAs, but none had a generator. None of the rooms where computers were kept was air conditioned. Distribution of overall and functioning IT equipment is in Table 2.

TABLE 2: DISTRIBUTION OF IT OFFICE EQUIPMENT, BY LGA

LGA	Type	Total	Functional*
Bosso	Computers	1	0
	Printers	1	0
	UPS units	1	0
	Generators	0	0
	Telephone	0	0
Bida	Computers	2	1
	Printers	1	1
	UPS units	1	0
	Generators	0	0
	Telephone	0	0
Chanchaga	Computers	1	0
	Printers	1	0
	UPS units	1	0
	Generators	0	0
	Telephone	0	0
Wushishi	Computers	1	0
	Printers	1	0
	UPS units	0	0
	Generators	0	0
	Telephone	0	0
Shiroro	Computers	1	1
	Printers	1	1
	UPS units	0	0
	Generators	0	0
	Telephone	0	0

* One means yes (present or functional), and zero means no (not present or nonfunctional).

4.2.4 RHIS MANAGEMENT

No LGA displayed a mission statement. Only Bosso had a management structure for making RHIS-related strategic and policy decisions. Bosso, Bida, and Shiroro had situation reports that were under three years old. No LGA had a five-year plan for the entire LGA health department or the HMIS unit. Only Shiroro had a schedule for supervisory visits; it also had reports indicating they had been made.

4.3 ORGANIZATIONAL AND BEHAVIORAL ASSESSMENT

Table 3 presents the number of respondents (from the state M&E unit and LGA health departments) who agreed, disagreed, or held neutral attitudes toward statements from the organizational and behavioral assessment section of the PRISM Tools. Measures of these determinants indicate how these staff respond to data-related duties and their performance in meeting their HMIS responsibilities.

All respondents agreed that decisions were based on facts/ evidence. Most (80 percent) disagreed with a statement that decisions were based on personal liking, and most agreed that decisions were based on health needs (80 percent) and cost considerations (80 percent). Most, but not as many (70 percent) agreed that decisions were based on political interference and comparisons of data with strategic health objectives (70 percent). (See statements identified with the numbers D1–10.)

All felt that their superiors sought feedback from concerned persons, and 90 percent felt superiors emphasized data quality in monthly reports. Other comments on superiors generally indicated that they (superiors) were thought to have positive attitudes toward and approaches to their work (statements S1–8).

Statements indicating that health department staff had positive attitudes toward their work were also generally, but not particularly strongly, favorable. These statements about punctuality, commitment, and being rewarded for good work were scored between 60 and 80 percent. Statement about health department staff's capacities and willingness to perform HMIS tasks also received strong but not glowing marks, although two received 90 percent: "can evaluate whether the targets or outcomes have been achieved" and "are made accountable for poor performance." (P1–17)

Respondents' feelings about HMIS were stronger: 90 percent felt that "collecting information is appreciated by co-workers and superiors," that "collecting information gives me the feeling that data is needed for monitoring facility performance," and that "collecting information is meaningful for me" (BC1–6).

TABLE 3: ORGANIZATIONAL AND BEHAVIORAL ASSESSMENT

Organizational and Behavioral Assessment					
Statement ID	Statement	Disagree	Neutral	Agree	Total
In health department, decisions are based on:					
D1	Personal liking	8 (80%)	0 (0%)	2 (20%)	10
D2	Superiors' directives	2 (20%)	0 (0%)	8 (80%)	10
D3	Evidence/facts	0 (0%)	0 (0%)	10 (100%)	10
D4	Political interference	3 (30%)	0 (0%)	7 (70%)	10
D5	Comparing data with strategic health objectives	2 (20%)	1 (10%)	7 (70%)	10
D6	Health needs	1 (10%)	1 (10%)	8 (80%)	10
D7	Considering costs	1 (10%)	1 (10%)	8 (80%)	10

Organizational and Behavioral Assessment

Statement ID	Statement	Disagree	Neutral	Agree	Total
In health department, superiors					
S1	Seek feedback from concerned persons	0 (0%)	0 (0%)	10 (100%)	10
S2	Emphasize data quality in monthly reports	1 (10%)	0 (0%)	9 (90%)	10
S3	Discuss conflicts openly to resolve them	3 (30%)	0 (0%)	7 (70%)	10
S4	Seek feedback from concerned community	2 (20%)	0 (0%)	8 (80%)	10
S5	Use HMIS data for setting targets and monitoring	3 (30%)	1 (10%)	6 (60%)	10
S6	Check data quality at the facility and higher level regularly	2 (20%)	1 (10%)	7 (70%)	10
S7	Provide regular feedback to their staff through regular report based on evidence	4 (40%)	0 (0%)	6 (60%)	10
S8	Report on data accuracy regularly	2 (20%)	2 (20%)	6 (60%)	10
In health department, staff					
P1	Are punctual	1 (10%)	1 (10%)	8 (80%)	10
P2	Document their activities and keep records	3 (30%)	1 (10%)	6 (60%)	10
P3	Feel committed in improving health status of the target population	2 (20%)	1 (10%)	7 (70%)	10
P4	Set appropriate and doable target of their performance	1 (11%)	1 (11%)	7 (78%)	9
P5	Feel guilty for not accomplishing the set target/performance	2 (20%)	0 (0%)	8 (80%)	10
P6	Are rewarded for good work	4 (40%)	0 (0%)	6 (60%)	10
P7	Use HMIS data for day to day management of the facility and LGA/State	2 (20%)	2 (20%)	6 (60%)	10
P8	Display data for monitoring their set target	1 (10%)	2 (20%)	7 (70%)	10
P9	Can gather data to find the root cause(s) of the problem	1 (10%)	1 (10%	8 (80%)	10

	Organizational and Behavioral Assessment				
Statement ID	**Statement**	**Disagree**	**Neutral**	**Agree**	**Total**
P10	Can develop appropriate criteria for selecting interventions for a given problem	1 (10%)	2 (20%)	7 (70%)	10
P11	Can develop appropriate outcomes for a particular intervention	1 (10%)	2 (20%)	7 (70%)	10
P12	Can evaluate whether the targets or outcomes have been achieved	1 (10%)	0 (0%)	9 (90%)	10
P13	Are empowered to make decisions	1 (10%)	1 (10%)	8 (80%)	10
P14	Able to say no to superiors and colleagues for demands/decisions not supported by evidence	2 (20%)	1 (10%)	7 (70%)	10
P15	Are made accountable for poor performance	1 (10%)	0 (0%)	9 (90%)	10
P16	Use HMIS data for community education and mobilization	2 (20%)	1 (10%)	7 (70%)	10
P17	Admit mistakes for taking corrective actions	1 (12.5%)	0 (0%)	7 (87.5%)	8
Personal					
BC1	Collecting information which is not used for decision making discourages me	2 (20%)	1 (10%)	7 (70%)	10
BC2	Collecting information makes me feel bored	9 (90%)	1 (10%)	0 (0%)	10
BC3	Collecting information is meaningful for me	1 (10%)	0 (0%)	9 (90%)	10
BC4	Collecting information gives me the feeling that data is needed for monitoring facility performance	1 (10%)	0 (0%)	9 (90%)	10
BC5	Collecting information gives me the feeling that it is forced on me	8 (88.9%)	0 (0%)	1 (11.1%)	9
BC6	Collecting information is appreciated by co-workers and superiors	1 (10%)	0 (0%)	9 (90%)	10

5. CHALLENGES

The challenges that the Niger state HMIS faces are numerous. We limit our focus here on those that would affect implementation of DHIS v2. The SMOH and LGAs are in different phases of readiness, and while they will both need aggressive interventions to strengthen their systems, the main areas of need will differ. We classify the challenges into two areas: basic infrastructure problems and system problems.

Basic infrastructure problems: The office equipment required for central deployment of DHIS v2 (with connections to a central server) is absent in all LGA offices. Also, LGAs that experience power interruptions daily must get alternative power sources.

System problems: Better processes for data collection and the transmission and use of data must be institutionalized. Also, routine data quality audits must be included as a monthly process by LGA officers with the SMOH providing overarching supervision of the LGAs. Only one LGA carried out supervisory visits to the health facilities, a practice that should be the standard.

6. RECOMMENDATIONS AND CONCLUSION

Since DHIS v2 will be a central repository controlled by the FMOH, the SMOH and LGAs should be engaged in the process of achieving that objective. Such engagement should be undertaken with the intent of getting LGAs' full acceptance for the model of deployment. Having them thus engaged will ensure continued support for a centrally controlled system. If costs will be borne by the LGAs, the initial agreement must state clearly how much/ or what proportion of funding each arm of the government will contribute to its maintenance.

Computers in Chanchaga and Wushishi should be set up and used for the purpose for which they were bought. Internet connectivity must be made available to the LGA offices so they will be able to connect to the DHIS v2 database and update their data.

In addition to updating infrastructure at the LGAs, the processes that generate the data must be strengthened. The need for supervisory visits to health facilities needs to be emphasized. There should also be a process for ensuring that visits are routinely done to prevent reporting poor data to the national HMIS.

A performance-based incentive scheme could encourage constructive rivalry among the LGAs.

7. REFERENCES

FHI (Family Health International). 2008. *Supporting Nigeria's Efforts to Transform Data Management.* Available at http://www.fhi360.org/en/CountryProfiles/Nigeria/res_DHIS.htm/.

Federal Ministry of Health. 2010. *National HIV Sero-prevalence Sentinel Survey 2010*. Abuja: FMOH.

Federal Republic of Nigeria Official Gazette. 2009. Legal notice on publication of 2006 census final results. Official Gazette of the Federal Republic of Nigeria 96(2). February 2009.

Makinde, OA, Enemuo J, Adeleke O, Ohadi EM, and Osika JS. Forthcoming. *Assessment of the Health Management Information System in Imo State, Federal Republic of Nigeria*. Bethesda, MD: Abt Associates, Health Systems 20/20.

Makinde, OA, Ohadi EM, Adeleke O, Umar C, Dieng A and Osika JS. Forthcoming. *Assessment of the Health Management Information System in Kebbi State, Federal Republic of Nigeria*. Bethesda, MD: Abt Associates, Health Systems 20/20.

MEASURE Evaluation. 2011. *Performance of Routine Information System Management (PRISM) Tools*. University of North Carolina at Chapel Hill, Carolina Population Center. http://www.cpc.unc.edu/measure/publications/ms-11-46d/.

NPC ([Nigeria] National Population Commission) and ICF Macro. 2009. *Nigeria Demographic and Health Survey 2008*. Abuja: NPC and ICF Macro.