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Analyzing, Interpreting, and Communicating Routine Family Planning Data in South Sudan

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CONTENTS

Tables	5
Abbreviations.....	6
Executive Summary	7
Introduction	8
Study Rationale.....	9
Study Objective	9
Methods	10
Study Setting	10
Study Design and Data Collection	10
Sampling Strategy	10
Data Analysis	12
Ethics Review	12
Results	13
FP Data Collection at Health Facilities	13
FP Data Analysis.....	13
FP Data Interpretation.....	13
FP Data Communication and Use	14
Discussion	16
Effectiveness of FP Data Collection at Health Facilities.....	16
Effectiveness of FP Data Analysis	16
Effectiveness of FP Data Interpretation.....	17
Effectiveness of FP Data Communication and Use	17
Recommendations.....	19
Conclusion.....	20
References	21
Appendix 1. Key Informant Interview Guide.....	22
Appendix 2. Health Facility Data Collection Tool	23
Appendix 3. CHD Data Collection Tool.....	26

TABLES

Table 1. Study sites and facilities.....	11
Table 2. Study participants.....	12
Table 3. FP data interpretation	14
Table 4. FP data communication and use at the health facility level	15
Table 5. FP data communication and use at the CHD, SMOH, and MOH level.....	15

ABBREVIATIONS

CHD	county health department
DRC	Democratic Republic of the Congo
FP	family planning
KII	key informant interview
M&E	monitoring and evaluation
mCPR	modern contraceptive prevalence rate
MOH	Ministry of Health
NGO	nongovernmental organization
PHCC	primary healthcare center
PHCU	primary healthcare unit
RH	reproductive health
RHIS	routine health information system
SMOH	state ministry of health
SPSS	Statistical Package for Social Sciences
SSNBSS	South Sudan National Bureau of Statistics
TRI-SS	The Rescue Initiative–South Sudan

EXECUTIVE SUMMARY

Background: South Sudan's modern contraceptive prevalence rate stands at just 2.7 percent, with an unmet need for modern family planning (FP) at 30.8 percent (FP 2020, 2018). Multiple barriers contribute to low FP uptake in South Sudan: inadequate data collection tools and insufficient analysis, interpretation, and communication of data. Research from the Democratic Republic of the Congo (DRC) shows that improved management of FP data enables stronger ownership of program results at the health facility and community levels, empowering community members and providers to increase FP uptake (Ho & Wheeler, 2018). The purpose of the study was to explore how effectively FP data in the routine health information system (RHIS) are analyzed, interpreted, and communicated, and it discusses barriers to RHIS data use and ownership in two states in South Sudan, to inform policy and programmatic decision making.

Methods: The study used a cross-sectional observational design with quantitative and qualitative approaches to data collection and analysis. Data were collected from 178 health facilities across 17 counties in two states in South Sudan: Central Equatoria and Western Equatoria. Data collection entailed individual questionnaires administered to health facility staff, key informant interviews (KIIs), and direct observation at points of service delivery. Data were analyzed using the statistical package for social sciences (SPSS) and a qualitative pattern-matching approach. The process involved reviewing the data collection forms, coding, data entry, and analysis. The data were triangulated by comparing responses from the questionnaires to the KIIs.

Results: Just over half (55.8%) of the 172 health facilities assessed that should be collecting FP data do collect FP data. Only 16 percent of the county health departments (CHDs) assessed, and fewer than six percent of the health facilities assessed, carry out FP data analysis. Two hospitals, two primary healthcare centers (PHCCs), and one primary healthcare unit (PHCU) had the capacity to interpret analyzed FP data. Only four health facilities (2.3%) out of a total of 172 displayed information on new FP users (disaggregated by all methods, natural methods, oral pills, condoms, Depo-Provera shots, implants, intrauterine contraceptive devices, tubal ligation, and vasectomy). Five health facilities (2.8%) displayed information on the quantity of contraceptives dispensed (condoms, oral contraceptive pills, and Depo-Provera) in the past three months, and four health facilities displayed data on the number of days of stockouts of three tracer FP commodities (condoms, oral contraceptive pills, and Depo-Provera) in the past three months. The major reasons given for lack of data analysis were data not being collected owing to a lack of FP services being offered, poor data analysis skills, and the absence of directive/leadership/guideline(s) for FP data analysis, among others. The major reason given for lack of interpretation of analyzed findings was the lack of skills and technical guidance.

Conclusion: The study found that FP data are not effectively collected, analyzed, interpreted, and communicated in Central Equatoria and Western Equatoria States of South Sudan. This is because of such factors as lack of skills for FP data analysis; lack of guidelines for data collection, analysis, and interpretation; lack of personnel dedicated and trained in FP service provision; and lack of leadership for FP data management and communication. These challenges have limited the information available on FP services and performance for decision making from the health facility to the national level, specifically for policymaking and strategy setting. Recommendations to address these issues are training health facility management and data-specific personnel; providing guidelines on data collection, analysis, and use; improving data infrastructure; holding monthly or quarterly review meetings; and conducting regular supportive supervision visits to health facilities.

INTRODUCTION

An African Union policy brief on FP reported that an estimated US\$1.40 is saved on maternal and newborn healthcare for every dollar invested in FP (2013). A study conducted in the DRC found that good FP data management is linked to increased stakeholder ownership and subsequent increases in FP uptake (Ho & Wheeler, 2018). Unfortunately, South Sudan's health financing is heavily dependent on external donors with the government spending less than one percent of its budget on health. Funding gaps have slowed progress towards increased demand for FP and improved FP services. Consequently, the government is struggling to achieve its FP commitments to increase the modern contraceptive prevalence rate (mCPR) to 10 percent in 2020. The current conflict in the country has substantially added to the existing health systems challenges, further limiting service provision, contraceptive supply chains, supervision visits, and timely reporting as a number of health facilities have become inaccessible or nonfunctional. As a result, FP service uptake has remained low with FP 2020 estimates showing a mCPR of 2.7 percent and an unmet need for modern contraception at 30.8 percent (FP 2020, 2018).

South Sudan's RHIS captures the following client data: age, sex, marital status, education, occupation, current FP method, and whether the client is a new user or a revisit. Information is also collected on the origin of the client (location), contraceptives dispensed at the health facility recorded by contraceptive method, days of stockouts of three tracer FP commodities (condoms, oral contraceptive pills, and Depo-Provera) in the past three months, and people reached with FP information or education (South Sudan Ministry of Health [MOH], 2018).

The departments of family planning at static health facilities provide FP services; however, communication for demand creation takes place during immunization and antenatal visits. IntraHealth, an international nongovernmental organization (NGO) with a focus on HIV/AIDS, works with key populations and provides FP services during HIV outreach visits, but the client information is not shared because of sensitivity. In the past, some NGOs introduced community-based distribution of FP, but these efforts faced resistance from some communities leading to attacks on community health workers. Currently, there is no community health worker program for FP services in South Sudan. In a recent reproductive health (RH) forum, the director general for RH acknowledged the gaps in demand for and access to FP services, emphasizing the need for advocacy to change attitudes about FP at all levels, including parliament.

FP data are collected from the health facilities using a paper-based tool like an FP register. The MOH is developing an FP register with revised indicators including capturing data on Sayana Press, a new self-injectable method recently introduced in South Sudan. Paper-based monthly summaries of facility data are submitted to the CHD. Counties then enter the data electronically into the district health information system (which is based on DHIS 2), run analyses to calculate coverage indicators, and send the reports to the state Ministry of Health (SMOH). The SMOH aggregates the counties' results and sends the state-level indicators to the MOH. NGOs and private clinics operating at the county level report to the counties. Those that operate at the state level send their reports to the SMOH. Feedback should follow an inverse path: from the national MOH to the SMOH, to the CHDs, and lastly to the health facilities (Laku, Camino, Stoops & Ali, 2012).

Although the data management flow described above is consistent with international minimum standards, the RHIS has limited functionality. Data from health facilities are not always complete or reliable; data collection is delayed; and feedback to collecting facilities from the MOH, SMOH, and CHDs is practically nonexistent. Many NGOs and private agencies implementing FP projects do not provide the required data or information to the MOH. As a result of these challenges, FP data are incomplete, not analyzed,

disorganized, or not presented in a user-friendly way, making interpretation difficult and limiting the use of data for health planning (MOH, 2011).

Study Rationale

Although DHIS 2 was introduced in South Sudan in 2010, no government-led evaluation has been conducted of the country's RHIS, and there is no publicly available information on evaluations of FP data in South Sudan's RHIS conducted by implementing organizations. Other than the FP indicators included in DHIS 2, there is no information system in South Sudan specific to FP data, and no study has been done to determine the extent to which DHIS 2 adequately and appropriately produces satisfactory FP reports. Similarly, no research has explored behavioral and organizational factors influencing the effectiveness of FP data analysis, interpretation, and communication, such as data knowledge and skills, culture of information sharing, and motivation to use data.

Study Objective

The purpose of the study was to explore how effectively FP data in the RHIS are analyzed, interpreted, and communicated in two states in South Sudan to inform policy and programmatic decision making. The research was guided by three research questions:

- How and at what level are FP data in the RHIS analyzed?
- At what level of the information chain are FP data in the RHIS interpreted and who is involved in the interpretation of these data?
- What and how are FP data in the RHIS communicated?

The researchers believe that the new knowledge generated through this study will provide baseline data to support program design and intervention planning; support the MOH to develop a more effective FP data management system as part of the RHIS; alert trainers at the national and state level to plan and implement a refresher training program for health facility staff to improve data analysis, interpretation, and communication; and provide information to other researchers to conduct follow-up studies on the use of FP data for informed decision making.

METHODS

Study Setting

South Sudan is the youngest nation in the world, having gained independence from Sudan only in 2011. With an area of 619,758 square kilometers, South Sudan has a total population of 14 million and an annual population growth rate of 3 percent (South Sudan National Bureau of Statistics [SSNBSS], 2008). The country borders Ethiopia, Kenya, Uganda, the DRC, the Central African Republic, and Sudan. According to the World Bank, South Sudan has a young population with 72 percent below the age of 30 years (2017). South Sudan has been politically split into 28 states, but the United Nations Office for the Coordination of Humanitarian Affairs and humanitarian organizations use the original 10 states for planning purposes.

The study was conducted in two states based on the former structure of 10 states: Central Equatoria and Western Equatoria. South Sudan has 64 tribes: 60 percent of them are pastoralists. The dominant religion is Christianity. The majority (83%) of the population is rural, and adult literacy stands at 27 percent (SSNBSS, 2018).

Central Equatoria State

Situated in the south and bordering Uganda and the DRC, Central Equatoria is composed of six counties (Juba, Yei, Kajo Keji, Morobo, Lainya, and Terekeka) with a population of over one million people. More than half (65%) of the population lives in rural areas and most (55%) of the population of 15–24-year-olds is literate (SSNBSS, 2018). Christianity is the dominant religion. There are 70 health facilities: 28 PHCCs, 36 PHCUs, and 6 hospitals.

Western Equatoria State

Located in the southwest part of the country bordering the DRC and the Central African Republic, Western Equatoria is composed of 10 counties (Yambio, Tambura, Nagero, Nzara, Ezo, Ibbra, Maridi, Mvolo, Mundri West, and Mundri East) with over half a million people. A high proportion of the population (84%) live in rural areas. Less than half (43%) of the population of 15–24-year-olds is literate, and Christianity is the most common religion. The state has 46 PHCCs, 165 PHCUs, and 4 hospitals.

Study Design and Data Collection

The study used a cross-sectional observational technique to explore how effectively FP data in the RHIS are being analyzed, interpreted, and communicated to relevant stakeholders. Data on the three research themes were collected using quantitative and qualitative techniques. Qualitative information was collected through KIIs (Appendix 1) and quantitative data were gathered using printed questionnaires (Appendixes 2 and 3). The interview schedule had open and closed-ended questions and explored the effectiveness of data analysis, interpretation, and communication, including knowledge, skills, the culture of information sharing and motivation to use data. The KII guide contained a list of questions related to the three thematic areas of data analysis, interpretation, and communication of data analysis findings.

Data were collected from health facility in-charges (FP providers and medical directors and medical superintendents), data clerks and monitoring and evaluation (M&E) officers, CHD directors, state RH director (M&E staff), and the national MOH RH director (M&E personnel).

Sampling Strategy

The study used a combination of simple random sampling technique, convenience sampling, and cluster sampling. The convenience sampling technique was used because of security issues that constrained

access to certain health facilities and geographical areas within the study population. Although conflict in South Sudan has spread to all parts of the country, the researchers identified the Central and Western Equatoria states because they have fairly stable security and are accessible, in large part, for field data collection and desk reviews. The lot quality assurance Sampling technique that defines a state as a supervision unit and a county as a supervision area was used for sample size estimation. In each county, 19 health facilities were chosen for administration of questionnaires. According to this technique, a sample size of 19 provided an acceptable level of error for making management decisions. Although the minimum sample size is 19, samples larger than 19 are considered to have the same statistical precision as 19 (Uganda Program for Human and Holistic Development, 2006).

Although the original target was 304 health facilities, only 180 were reached because many health facilities were inaccessible or nonfunctional. The facilities were inaccessible because of political insecurity (fighting between rebel forces and government soldiers) that limited or inhibited our safe travel to specific sites. The fact that some of the health facilities we visited were nonfunctioning was attributed to people abandoning their communities because of political insecurity and fighting between armed forces. The medical facilities in these communities were closed because they lacked personnel, medicine and commodities, and basic infrastructure. Therefore, most counties were under-sampled.

Table 1. Study sites and facilities

States	Counties	PHCC	PHCU	Hospital	Private clinic	CHD	Total
Central Equatoria	Juba	7	3	1	3	1	15
	Yei	4	1	1	1	0	7
	Morobo (inaccessible)	0	0	0	0	0	0
	Kajo Keji (inaccessible)	0	0	0	0	0	0
	Lainya (inaccessible)	0	0	0	0	0	0
	Terekeka	7	10	0	0	0	17
Western Equatoria	Yambio	8	9	1	0	1	19
	Tambura	3	15	0	0	0	18
	Nzara	7	13	1	0	1	22
	Mundri East	3	2	1	0	1	7
	Mundri West	2	6	0	0	1	9
	Mvolo	2	3	0	0	1	6
	Ibba	4	14	0	0	0	18
	Maridi	6	12	1	0	0	19
	Ezo	2	18	1	0	0	21
	Nagero (inaccessible)	0	0	0	0	0	0
Total		55	106	7	4	6	178

One staff member was interviewed at each health facility using the KII guide. This included 55 PHCC in-charges, 106 PHCU in-charges, seven hospital in-charges, and four private clinic in-charges. Additionally, six CHD personnel were interviewed. A total of 178 facility-based and county-based personnel participated in the study, as well as one RH director from the SMOH and MOH, respectively (Table 2).

Table 2. Study participants

Job title	Number reached
Health facility in-charges	172
CHD data clerks and M&E officers	3
CHD directors	3
SMOH RH director	1
MOH RH director	1
Total	180

Data Analysis

Quantitative data were analyzed using SPSS, Version 25.0, and qualitative data were analyzed thematically. Raw quantitative data (data from the field) were reviewed, cleaned, coded, and entered into the system. Data were then analyzed using the “Analyse” field in the SPSS window to generate tables and graphs for the answers from the questionnaire. Data cleaning included inspecting the data for completeness and looking for missing responses in the questionnaires. Questionnaires with greater than 10 percent of the responses missing were eliminated. Cross tabulation analyses were run at a confidence interval of 95 percent, giving a margin of error of 5 percent.

The KII responses were recorded, transcribed, and coded. All codes generated were then entered in a code book. Coded themes were sorted to generate thematic frameworks. The coded themes were refined to align with the research questions and summarized.

Ethics Review

The research proposal was presented for ethics approval to the Directorate of Policy Planning, Budgeting, and Research under the MOH, Republic of South Sudan. Approval was granted May 18, 2018. Data collection in the field commenced after ethics approval was granted. Study participants were informed that participation in the study was entirely voluntary. After the researchers thoroughly explained the purpose and procedures of the research, study participants were asked to sign written informed consent forms before beginning any study activities. The data collection tools were pretested for three days and amendments were made before actual field data collection.

RESULTS

FP Data Collection at Health Facilities

Although FP data collection was not one of the research objectives, the research team found it useful to gather information on FP data collection because it provided a basis to proceed with the subsequent questions of FP data analysis, interpretation and communication and, administratively, it helped the research team understand why certain health facilities had no FP data.

Among the 172 sites that should be collecting FP data (client data are not collected at CHDs), only 96 (55.8%) health facilities are. Among these 96 facilities, PHCCs and PHCUs represent the biggest sources of FP data at 47.9 and 46.8 percent, respectively, and hospitals account for 5.2 percent of the FP data collection sites. Although five out of seven hospitals and 46 out of 55 PHCCs collect FP data, the majority of PHCUs do not. Among 106 PHCUs, 61 (57.5%) do not collect FP data. Furthermore, none of the private clinics reached by the research team collect FP data.

Although the data show that the majority of health facilities are collecting FP data, during the in-depth interview session respondents indicated that they do not possess procedure manuals for FP data collection. According to a RH focal point at the MOH, “One of the challenges facing data issues at the health facility is the lack of procedure manuals in some health facilities.”

FP Data Analysis

Family planning data analysis is done using DHIS 2 or by making simple calculations on paper and presenting the data in hand-drawn tables or graphs that are often displayed at health facilities, CHD offices, SMOH, the MOH or NGO offices. Fewer than 6 percent of the health facilities assessed carry out FP data analysis. Among the eight (4.6%) health facilities conducting data analysis, five are PHCCs, two are hospitals, and one is a PHCU. Because none of the private clinics collect FP data, none of them undertake data analysis. Some of the issues reported as challenges to FP data analysis at the health facility include lack of guidelines for indicators (i.e., no indicator reference sheets), missing monthly and annual targets, and lack of skills required for FP data analysis, as explained by one PHCC in-charge: “We do not have guidelines for data collection, analysis and interpretation at this health facility.”

Six CHDs, one SMOH, and the national MOH were reached and interviewed about whether they analyze FP data collected from the health facilities and if so, how they do it. Only one of the CHDs analyzes FP data collected from the health facilities using DHIS 2. The SMOH reported using DHIS 2 to conduct FP data analysis; however, a breakdown of the system at the time of data collection rendered it nonfunctional. At the national MOH, data analysis is conducted using DHIS 2. The M&E officer at the MOH conducts FP data analysis on a monthly basis and on demand.

FP Data Interpretation

Two hospitals had the capacity to interpret analyzed FP data because they had an up-to-date copy of written guidelines on FP indicator definitions and were oriented on how to use them. Likewise, only two PHCCs and one PHCU had the capacity to interpret analyzed FP data because an up-to-date copy of written guidelines was available.

The CHDs had a similar challenge interpreting analyzed FP data with only one (16%) having the capacity to interpret FP data based on available guidelines. The results for the SMOH and the MOH showed capacity to interpret analyzed FP data with up-to-date guidelines on FP indicator definitions. At the health facilities, data clerks interpret analyzed FP data while M&E officers interpret FP data for NGOs, CHDs, SMOH, and the MOH.

Table 3. FP data interpretation

Facility or department	Interprets analyzed FP data
Hospital (n=7)	2 (28.6%)
PHCC (n=55)	2 (3.6%)
PHCU (n=106)	1 (1%)
Private clinic (n=4)	0 (0%)
CHD (n=6)	1 (16.7%)
SMOH department (n=1)	1 (100%)
MOH department (n=1)	1 (100%)

FP Data Communication and Use

As presented in Table 4, only four health facilities (2.3%) out of a total of 172 displayed information on FP new users (for all available methods, i.e., natural methods, oral pills, condoms, Depo-Provera, implants, intrauterine contraceptive devices, tubal ligation, and vasectomy). Five health facilities (2.8%) displayed information on the quantity of contraceptives dispensed (condoms, oral contraceptive pills, and Depo-Provera injections) in the past three months and four health facilities displayed data on the number of days of stockouts of three tracer FP commodities (condoms, oral contraceptive pills, and Depo-Provera) in the past three months.

Eight health facilities (none of which were private clinics) possessed a map of their catchment area. Less than one percent of all health facilities displayed a summary of client demographic information, such as population by target group(s). Only one health facility (a PHCC) received feedback from the CHD on the FP-RHIS report submitted with further guidance and recommendations for actions. Likewise, only one PHCC reviewed their FP/RH strategy by examining service performance targets and actual performance, by month. None of the 178 health facilities sampled reviewed facility personnel performance on a monthly basis.

Table 4. FP data communication and use at the health facility level

Indicator	Hospital n=7	PHCC n=55	PHCU n=106	Private clinic n=4
Displays information on FP new users	2 (28.5%)	1 (1.8%)	1 (1%)	0 (0%)
Displays information on number of contraceptives dispensed	2 (28.5%)	2 (3.6%)	1 (1%)	0 (0%)
Displays data on the number of days of stockouts of FP tracer commodities	2 (28.5%)	1 (1.8%)	1 (1%)	0 (0%)
Displays summary of demographic information, such as client population	1 (14.3%)	1 (1.8%)	0 (0%)	0 (0%)
Has a map of catchment area	2 (28.5%)	5 (9.1%)	1 (1%)	0 (0%)
Has quarterly or yearly feedback meetings on FP-RHIS data with guidelines and recommendations for action	0 (0%)	1 (1.8%)	0 (0%)	0 (0%)
Reviews FP/RH strategy by examining service performance targets and actual performance, by month	0 (0%)	1 (1.8%)	0 (0%)	0 (0%)
Reviews personnel responsibilities by comparing service targets with actual performance, by month	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Only one CHD displayed a summary of information on FP new users, provided feedback to lower levels (health facilities) on the indicators that the health facilities are reporting on, and conducted routine meetings on a quarterly basis for reviewing managerial or administrative matters. None of the CHDs had annual action plans showing decisions based on FP data. Similarly, none of the CHDs published a newsletter as a way of disseminating information. The SMOH displayed summary information on new FP users and provided feedback to lower levels (health facilities and CHDs) on the indicators that they report on. SMOH also conducted a meeting to review managerial or administrative matters in the past three months and had an annual action plan showing decision made based on FP data. The MOH displayed summary information on new FP users, provided feedback to the subnational directors, and had annual action plans showing decisions based on FP data. The Ministry reported that it had published a newsletter in the past three months but does not publish a newsletter or report on a regular basis.

Table 5. FP data communication and use at the CHD, SMOH, and MOH levels

Indicator	CHD n=6	SMOH n=1	MOH n=1
Displays information on FP new users	1 (16%)	1 (100%)	1 (100%)
Provides feedback to lower levels on the FP indicators they report on	1 (16%)	1 (100%)	1 (100%)
Conducts routine meetings to review managerial or administrative matters	1 (16%)	1 (100%)	1 (100%)
Has annual action plans showing decisions based on FP-RHIS information	0 (0%)	1 (100%)	1 (100%)
Has publication in the past three months with examples of FP data being used	0 (0%)	0 (0%)	1 (100%)

DISCUSSION

Effectiveness of FP Data Collection at Health Facilities

The findings reveal a high level of unresponsiveness to FP data collection by health facilities. Although facility reporting forms include specific fields for FP data, the data entry form is simple, and the form requires minimal training, about 44 percent of health facilities do not record FP information. This could be because the need for FP data is not well-communicated or understood by health facility staff; there is lack of motivation for FP data collection; over-stretched staff do not have the time to prioritize FP data collection; and/or more resources are needed in terms of staff training on data collection, record keeping tools and equipment, and personnel for FP data collection.

The degree of data collection varies by facility type; 84 percent of PHCCs and 71 percent of hospitals collect FP data, but only 43 percent of PHCUs do. None of the private clinics in our study collected FP data. The majority (57%) of PHCUs do not collect FP data, and none of the private health clinics collect this data, so is difficult to obtain a clear understanding of the FP situation in the two study states because a significant percentage of FP data are missing.

The responses varied when researchers asked where subjects sent FP reports, or where they sent compiled FP data. Some facilities indicated that the compiled data or FP reports are sent to the CHD and NGO (in circumstances where an NGO is supporting a health facility), whereas other facilities indicated the SMOH and NGO. Under normal circumstances, data collection reports compiled at the health facility are forwarded to the CHD, which then forwards them to the SMOH. This finding implies that facility personnel have not been properly oriented on the reporting procedures.

Most of the health facilities assessed keep copies of the outpatient register and monthly FP-RHIS reports (after sharing with the CHD). This indicates that facility personnel understand the importance of record keeping and having FP information available for future use.

The majority of facilities indicated that they do not possess procedure manuals for FP data collection. This could imply that standard procedures for data collection—including adherence to ethical considerations while collecting FP data, use of specific FP data formats, and observing standard definitions and calculations for FP indicators—may not be followed during data collection. It also points to key aspects of data quality that may be absent from the data collected, including consistency, completeness, accuracy, relevance, and reliability. This partly explains the challenges experienced by M&E personnel at the CHD while dealing with data obtained from the health facilities.

Effectiveness of FP Data Analysis

Although over half of the health facilities assessed carried out FP data collection, there is a wide gap between FP data collection and data analysis, with fewer than five percent of all facilities that collect FP data analyzing them. This gap suggests that facility performance information, such as indicator-target performance, is not readily available to inform decision making on a regular basis. This is presumably the case in other health facilities not reached by the study. The lack of FP data analysis may stem from lack of skills required for FP data analysis or other factors, such as lack of indicator guidance, monthly or annual targets not being communicated or understood by health facility staff, or a culture of recording data solely for the purpose of fulfilling reporting requirements and not appreciating the potential for data use. Data collection and reporting guidelines provided by the MOH have not been shared with many health facilities, CHDs, or SMOH.

Effectiveness of FP Data Interpretation

The study indicates that most health facilities do not interpret data analysis findings. This follows from the fact that most facilities lack data analysis guidelines and therefore do not analyze the data collected. Consequently, little information is available for discussion and action-taking during health facility meetings. Further, the findings reveal that facility meetings are ad hoc—respondents indicated that meetings were held weekly, monthly, biweekly, etc., as needed—which could imply that no standard guidelines have been provided by the CHD, SMOH, or MOH for holding facility-based meetings.

Effectiveness of FP Data Communication and Use

Most health facilities assessed do not display data on FP new users and revisits, for traditional or modern methods, nor do facilities display data on the amount of contraceptives dispensed for both new users and revisit clients; days of stockouts of three tracer FP commodities (condoms, oral contraceptive pills, and Depo-Provera), which are key FP supply chain indicators; or summarized demographic information of health facility clients such as population by target group(s). This implies that little, if any, FP information is being communicated to stakeholders, including clients at the health facilities.

Only one health facility made action-oriented decisions based on FP data analysis and interpretation. This facility reviewed its FP/RH strategy by comparing service performance targets with actual performance, by month. None of the facilities made action-oriented decisions about facility personnel responsibilities by comparing service targets with actual performance, from month to month. Only one health facility made action-oriented decisions to mobilize or shift resources (e.g., FP commodities) based on a comparison of services, and only one health facility made action-oriented decisions to advocate for more resources by showing the gaps in its ability to meet its monthly or annual targets. This suggests that health facilities are not taking actions based on evidence of sound analysis of data or informed discussion of FP issues. It could also imply that decisions, such as clients' most preferred FP method(s), by cohort (e.g., adolescent clients or postpartum women), are not made based on evidence and therefore are not likely to address the real needs of FP, as identified in the health facilities.

Again, very few facilities (2.2%) discussed issues such as data quality or timeliness of reporting in the FP-RHIS, service quality, FP use by clients, FP service coverage, or FP commodity stockouts. This implies that most decisions made pertaining to FP services provision are not based on evidence (or meeting resolutions taken after a data review). This is evidenced by the fact that only five of the 178 health facility respondents answered “yes” to the question, “have you made any decisions based on above discussions?” in relation to the questions of whether the topics of “management of FP-RHIS (data quality, reporting, or timeliness of reporting)” and “FP-RHIS findings (client use, service coverage, or FP commodity stockouts)” were discussed during the past three months.

The study indicates that few health facilities conducted routine meetings in the previous three months to discuss facility-related issues. This infers that facility-related issues that require the attention of all staff may be ignored and that decision making may not be inclusive. As such, decisions taken on FP issues may not reflect the experiences and position of every staff member at the health facility. This also partly explains why no follow-up actions took place regarding decisions made during previous meetings; facility staff are not seen as stakeholders that own the decisions made by management.

Very few facilities kept records of management meetings. This could suggest that health facilities lack reference points, such as meeting minutes to use for future verification of information. Such documents and information may be needed for audit purposes or to check whether or not decision making is evidence-based. This is an information management gap(s) at the health facility-level.

The findings reveal that few health facilities received directives from senior management or CHDs concerning data use at the health facility. This is a data management and communication gap at the CHD and health facility levels that must be addressed if the quality of service and decision making is to improve. Likewise, only one health facility received feedback on its performance and the quality of its services. Effective feedback offers important guidance and provides attainable recommendations for course of action. Effective feedback also validates data collection and reporting, demonstrates that someone is tracking progress, and conveys that data use matters. Yet health facilities are not regularly updated on the performance or quality of their services (in relation to targets and indicators) because this information is only obtainable from the CHD. This explains why only three health facilities made action-oriented decisions regarding FP issues discussed and reported.

No health facility received annual or monthly targets (based on the FP-RHIS information) to guide implementation, M&E, or community outreach activities at the health facility level. This makes it difficult for facilities to make comparisons of actual performance with targets set at the beginning of the month or year. It also makes it hard to establish accountability and determine whether health facilities are meeting clients' needs or using resources efficiently.

Only two facilities received a CHD or MOH FP-RHIS office newsletter during the past three months. This shows the limited availability of FP-related information including county, state, or country-wide FP targets and performance.

Very few health facilities (12) have documentation showing use of information for advocacy purposes. In addition, only one facility conducted advocacy for more resources by showing gaps in the ability to meet targets. This indicates that FP data/information has played a limited role in the country regarding advocacy on FP matters.

Very few health facility in-charges participated in meetings at the CHD to discuss FP-RHIS issues and performance in the past three months. This lack of involvement may be because the CHD did not hold a meeting in the past three months; many facility in-charges were not able to attend the meeting; or, more likely, meeting organizers at the CHD did not feel the need to invite facility in-charges to participate in the meetings. There is a danger in making decisions on FP issues that affect service delivery at the health facility level without providing the space and venue for facility representatives to express their concerns and help craft solutions. Perhaps, owing to issues of hierarchy and authority, the experiences and perspectives of health facility in-charges, who are based at the health facilities and interact directly with clients, are ignored even though they are at the core of FP services delivery. Such decisions may include the amount of resources (e.g., FP commodities and staffing) needed to achieve monthly health facility targets.

The fact that very few health facilities possess an up-to-date copy of written guidance on FP indicator definitions and calculations provided by the National FP Program's M&E Unit suggests that few facilities may be providing services that meet internationally recognized FP practices and standards. This lack of FP indicator guidance also implies that health facilities, in general, lack other FP guidelines and standards of practice, such as provision of youth-friendly FP and RH services or provision of FP services to HIV-positive or postpartum clients. This has negative implications for the country's FP program.

When asked why health facilities do not analyze FP data, respondents gave several reasons: no data analysis focal persons, a lack of skills relevant for data analysis, data not being collected owing to a lack of FP services provided, a lack of guidelines for FP services in the form of indicators, and a lack of leadership for FP data analysis.

RECOMMENDATIONS

Based on the study findings, we developed the following recommendations to improve data collection, analysis, interpretation, and use:

1. Strengthen data analysis capacity at the health facility level by training data-specific personnel. This will also improve the staff's ability to interpret and communicate findings from the data analysis.
2. Provide guidelines on data collection, analysis, interpretation, and use. This will ensure facility-specific performance data are available for decision making.
3. Improve the quality and usability of data infrastructure to strengthen the capacity of data management systems at health facilities. This may include procuring and installing cloud-based data collection and reporting equipment/software.
4. Address the lack of human resources to provide FP services at health facilities by recruiting facility-specific FP and RH personnel. This will help respond to the “lack of FP personnel to provide the service,” which study participants gave as a reason for lack of data collection and analysis at certain health facilities, because no FP services were being provided.
5. Train health facility management on the importance of FP information and how data can be used to track performance. This is in response to study participants indicating “lack of directive/guidance by management” as one of the reasons for a lack of data analysis at health facilities.
6. Improve the information flow and feedback of information to health facilities by higher authorities (CHD, SMOH, and MOH). This will help health facilities understand their performance status and provide the opportunity for dialogue on how FP service delivery can be improved.
7. Invite facility in-charges to CHD meetings where FP data and service delivery will be discussed. Engaging the in-charges in these meetings and giving them a voice will empower them and help achieve a common goal of improved FP outcomes.
8. Hold regular meetings (monthly or quarterly) to review FP targets and performance. Share meeting minutes with health facilities and disseminate strategies and action points to the health facilities.
9. Engage with NGOs, community-based organizations, and faith-based organizations that are operating private clinics and/or implementing FP activities in public facilities, to leverage their resources and support provider trainings for public and private service providers on data collection and analysis.
10. Create a regular schedule for staff from CHDs, SMOHs, or the MOH to conduct supportive supervision visits at health facilities. The visits will allow troubleshooting of any data collection or analysis challenges at the health facility, foster a relationship of collaboration between the different levels of the health system, and provide a clearer understanding of what some of the data challenges are on the ground.
11. Expand the field of research in FP data collection and use to other counties and states in South Sudan to establish whether facilities in other locations are experiencing the same trends regarding FP data collection, analysis, communication, and use and what their data challenges—and solutions—are.

CONCLUSION

The study found that FP data are not collected, analyzed, interpreted, and communicated in the Central Equatoria and Western Equatoria states effectively. This is because of such factors as lack of skills for FP data analysis at the facilities; lack of guidelines for data collection, analysis, and interpretation; lack of personnel dedicated and trained in FP service provision; and lack of leadership regarding FP data management and communication. These challenges have limited the information available on FP services and performance for decision making from the health facility to the national level, specifically for policy making and strategy setting. There is a need to expand the study to cover other counties in South Sudan to determine whether health facilities in those locations have similar patterns of FP data collection, analysis, interpretation, and communication. The recommendations and future course of action will help uncover existing gaps in FP data management and communication and improve decision making for better FP outcomes.

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APPENDIX 1. Key Informant Interview Guide

The Rescue Initiative – South Sudan

Exploring how effectively family planning (FP) data in the routine health information system is analyzed, interpreted and communicated so the information is useful

SMOH/MOH/NGO-Qualitative

Topic Focus	Core Questions	Additional Questions or Prompts	Expansion Material
FP data analysis	How and at what level are FP data in the RHIS analyzed?	<ul style="list-style-type: none"> • How is FP data analysis conducted at the SMOH, MOH or NGO? • Do you use any software? Which one? • What type of FP data analysis is conducted? • Who is responsible for FP data analysis? • Do you have guidelines for data analysis at the SMOH, MOH or NGO? 	<ul style="list-style-type: none"> • What do you see as some of the challenges you face in conducting FP data analysis at the SMOH, MOH or NGO? • What recommendations do you have to improve FP data analysis the SMOH, MOH or NGO?
FP data interpretation	At what level of the information chain is FP data in the routine health information system interpreted and who is involved in the interpretation of this data?	<ul style="list-style-type: none"> • How is FP data interpreted based on analyzed data conducted at the SMOH or MOH? • Who is responsible for FP data interpretation at the SMOH, MOH or NGO? • What references do you have for FP data interpretation? 	<ul style="list-style-type: none"> • What do you see as some of the challenges you face in conducting FP data interpretation at the SMOH, MOH or NGO? • What recommendations do you have to improve FP data interpretation at the health facility, CHD, SMOH, MOH or NGO?
FP data communication and information use	What and how are family planning data in the RHIS communicated?	<ul style="list-style-type: none"> • What type of FP data communication pathways are available at the SMOH, MOH or NGO? • How is FP data communicated to other stakeholders and to the public? • What feedback mechanisms exist and how often is feedback provided? • Who is responsible for FP data communication? • For what purposes are FP routine data/information used? 	<ul style="list-style-type: none"> • In your view, to what extent is routine FP data/information used for decision making at the NGO? • What are your opinions with regard to staff motivation on information use? • What are the key challenges you are facing in using routine FP information? • How do you think the challenges you have mentioned can be addressed?

APPENDIX 2. Health Facility Data Collection Tool

The Rescue Initiative – South Sudan

Exploring how effectively family planning (FP) data in the routine health information system is analyzed, interpreted and communicated so the information is useful

Health Facility Assessment Form

Date.....

Facility Name.....

Facility Type.....

Name of Assessor.....

Name of respondent and title.....

County.....State.....

Q1. FP data collection at the health facility

1.1	Do you collect FP data at this health facility from clients?	1. Yes	0. No		
1.2	If yes, what kind of FP information is collected at this health facility from the client?				
1.3	How often is the information collected?	Daily	Weekly	Monthly	Quarterly
	Where do you send the reports?	CHD	SMOH	MoH	NGO
1.4	Does this facility keep copies of the FP-RHIS monthly reports, which are sent to the CHD?	1. Yes	0. No		
1.5	Does this facility keep an outpatient register?	1. Yes	0. No		
	Does a procedure manual for data collection (with definitions) exist?	1. Yes, observed	0. No		
1.6	If no FP data are collected at the health facility, why not?				

Q2. FP data processing and analysis at the health facility

2.1	Do you compile the FP data collected from the clients?	1. Yes	0. No			
2.2	How often to you compile the data?	Daily	Weekly	Bi-weekly	Monthly	Quarterly
2.3	Where do you send the compiled data?	CHD	SMoH	MoH	NGO	
2.4	Who's responsible for compiling FP data at this health facility?					
2.5	If no FP data are compiled at the health facility, why not?	1. Yes	0. No			
2.6	Is FP data analysis happening at this facility?	1. Yes	0. No			
2.7	If yes, do data processing procedures or a tally sheet exist?	1. Yes, observed	0. No			
2.8	Does the facility produce the following:					
2.8.a	Calculate FP indicators per facility catchment area	1. Yes	0. No			
2.8. b	Compare with other health facilities, county or national targets	1. Yes	0. No			
2.8. c	Compare among types of services coverage (CoCs, PoPs, Depo-Provera, Injection, IUCD, Tubal Ligation, Vasectomy)	1. Yes	0. No			
2.8. d	Compare FP data over time (monitoring over time)	1. Yes	0. No			

2.9	If no FP data analysis is conducted at this facility, why not?	
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Q3. FP data interpretation at the health facility

3.1	Does this facility interpret the analyzed data?	1. Yes,	0. No
3.2. a	If yes, does this health facility have an up-to-date copy of written guidance on FP indicator definitions provided by the National Program/M&E Unit	1. Yes, observed	0. No
3.2. b	Does the health facility have an up-to-date copy of written guidance provided by the National Program/M&E Unit on the content of FP services that are related to each indicator measured by the program/project?	1. Yes, observed	0. No
3.3	If no guidance is available, how do you interpret FP data?		
3.4	If no data interpretation is done at the facility, why not?		

Q4. Use of FP data information at the health facility

4.1	Does the facility display the following data? Please indicate types of data displayed and whether the data have been updated for the last reporting period.			If no go to 4.2
	Indicator	2. Type of display (Please tick)		3. Updated
4.1.a	FP new users (all methods, natural methods, oral pills, condoms, Depo-Provera, implants, IUD, tubal ligation and vasectomy)	Table		1.Yes 0. No
		Graph/Chart		
		Map/other		
4.1.b	FP revisits (all methods, natural methods, oral pills, condoms, Depo-Provera, implants, IUD, tubal ligation and vasectomy)	Table		1.Yes 0. No
		Graph/Chart		
		Map/other		
4.1.c	Amount of contraceptives dispensed for both new users and revisits	Table		1.Yes 0. No
		Graph/Chart		
		Map/other		
4.1.d	Days of stock-outs of three tracer FP commodities (condoms, oral contraceptive pills and Depo-Provera) in the past three months	Table		1.Yes 0. No
		Graph/Chart		
		Map/other		
4.2	Does the facility have a map of the catchment area?		1. Yes	0. No
4.3	Does the office display a summary of demographic information such as population by target group(s)?		1. Yes	0. No
4.4	Is feedback (quarterly or yearly) or any other report on FP-RHIS data available, which provides guidelines/ recommendations for actions?	1. Yes	0. No	If no go to 4.6
4.5	If you answered yes to question 4.4, what kinds of action-oriented decisions have been made in the reports (based on FP-RHIS data)? Please check the boxes accordingly			
Types of decisions based on types of analyses				
4.5.a	Review strategy by examining service performance targets and actual performance from month to month		1.Yes	0.No
4.5.b	Review facility personnel responsibilities by comparing service targets and actual performance from month to month		1.Yes	0.No
4.5.c	Mobilizing/shifting resources (FP commodities) based on comparison of services		1.Yes	0.No

4.5.d	Advocacy for more resources by showing gaps in ability to meet targets	1.Yes	0.No	
Discussion and decision based on RHIS information				
4.6	Does the facility have routine meetings for reviewing managerial or administrative matters?	1.Yes	0.No	If no, go to 4.11
4.7	How frequently is the meeting supposed to take place? 4. Weekly 3. After every two weeks 2. Monthly 1. Quarterly 0. no schedule			
4.8	How many times did the meeting actually take place during the last three months? 7. 12 times 6. Between 7 and 11 times 5. 6 times 4. Either 4 or 5 3. 3 times 2. 2 times 1. 1 time 0. none			
4.9	Is an official record of management meetings maintained?	1.Yes	0.No	If no, go to 4.11
4.10	If yes, please check the meeting records for the last three months to see if the following topics were discussed:			
4.10.a	Management of FP-RHIS, such as data quality, reporting, or timeliness of reporting	1.Yes, observed	0. No	
4.10.b	Discussion on FP-RHIS findings such as client utilization, or service coverage, FP commodity stock-outs	1.Yes, observed	0. No	
4.10.c	Have they made any decisions based on the above discussions?	1.Yes, observed	0. No	
4.10.d	Has any follow-up action taken place regarding the decisions made during the previous meetings?	1.Yes, observed	0. No	
4.10.e	Are there any FP- RHIS related issues or problems that were referred to the CHD or State level for actions?	1.Yes, observed	0. No	
Promotion and Use of FP-RHIS information by the CHD, State/MoH level				
4.11	Observed facility received annual/monthly planned targets based on FP-RHIS information	1. Yes	0. No	
4.12	Do facility records for the last three months show that CHD/senior management issued directives concerning the use of information?	1. Yes	0. No	
4.13	Did the facility receive a CHD or national FP- RHIS office newsletter or report in last three months giving examples of use of information?	1. Yes	0. No	
4.14	Does documentation exist showing using information for advocacy purposes?	1. Yes	0. No	
4.15	Did the person in charge of the facility participate in meetings at CHD level to discuss FP-RHIS performance for the last three months?	1. Yes	0. No	
4.16	Please give examples of how the facility uses FP-RHIS information for health system management 0. No examples 1. Yes (details follows)			

APPENDIX 3. CHD Data Collection Tool

The Rescue Initiative – South Sudan

Exploring how effectively family planning (FP) data in the routine health information system is analyzed, interpreted and communicated so the information is useful

County Health Department Assessment Form

Date.....

Name County

Name of Assessor.....

Name of respondent and title.....

State.....

Q1. FP data analysis at the CHD

Data Processing/Analysis					
1.1	Does a database exist to enter and process FP data?	0. No	1. Yes, by paper database	2. Yes, by computer database	
1.2	Does the database produce the following?				
1.2.a	Calculate indicators for each facility catchment area		1. Yes	0. No	
1.2.b	Data summary report for the county		1. Yes	0. No	
1.2.c	Comparisons among facilities		1. Yes	0. No	
1.2.d	Comparisons with county/state/national targets		1. Yes	0. No	
1.2.e	Comparisons among types of services coverage (CoCs, PoPs, Depo-Provera, Injection, IUCD, Tubal Ligation, Vasectomy)		1. Yes	0. No	
1.2.f	Comparisons of FP data over time (monitoring over time)		1. Yes	0. No	
1.3	Do you think that the FP-RHIS procedure manual is user-friendly?		1. Yes	0. No	
1.4	Do you think that the monthly report form is complex and difficult to follow?		0. Yes	1. No	
1.5	Do you find the data software (DHIS) to be user-friendly?		1. Yes	0. No	
1.6	Do you find that information technology is easy to manage?		1. Yes	0. No	
1.7	Do you think that information system design provides a comprehensive picture of health system (FP) performance?		1. Yes	0. No	
1.8	Do you think FP-RHIS has information that is also included in other information systems?		1. Yes	0. No	
1.9	Does the FP-RHIS software integrate data from different information systems?		1. Yes	0. No	
1.20	Does the information technology (Land Area Network [LAN] or wireless network) exist to provides access to information to all county managers and senior management?		1. Yes partially	2. Yes completely	0. No

Q2. FP data interpretation at the health facility

2.1	How does the CHD interpret the analyzed FP data			
2.2.a	Does the CHD have an up-to-date copy of written guidance on FP indicator definitions provided by the National Program/M&E Unit		2. Yes, observed	2. No

2.2. b	Does the CHD have an up-to-date copy of written guidance provided by the National Program/M&E Unit on the content of FP services that are related to each indicator measured by the Program/Project?	3. Yes, observed	1. No
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Q3. Use of FP data (information at the CHD)

Display of information				
3.1	Does the CHD office display the following data? Please indicate the types of data displayed and whether the data are updated for the last reporting period.			If no go to 3.2
	1. Indicator	2. Type of display (Please tick)		3. Updated
3.1.a	FP new users (all methods, natural methods, oral pills, condoms, Depo-Provera, implants, IUD, tubal ligation and vasectomy)	Table		1. Yes 0. No
		Graph/Chart		
		Map		
3.1.b	FP Revisits (all methods, natural methods, oral pills, condoms, Depo-Provera, implants, IUD, tubal ligation and vasectomy)	Table		1. Yes 0. No
		Graph/Chart		
		Map		
3.1.c	Amount of contraceptives dispensed for both new users and revisits	Table		1. Yes 0. No
		Graph/Chart		
		Map		
3.1.d	Days of stock-outs of three tracer FP commodities (Condoms, Oral Contraceptive Pills and Depo-Provera) in the last three months	Table		1. Yes 0. No
		Graph/Chart		
		Map		
3.2	Does the CHD office have a map of the catchment area?	1. Yes	0. No	
3.3	Does the CHD office display a summary of demographic information such as population by target group(s)?	1. Yes	0. No	
3.4	Is feedback, quarterly, yearly or any other report on FP-RHIS data available, which provides guidelines/ recommendations for actions?	1. Yes	0. No	If no go to 3.6
3.5	If yes to 3.4, what kinds of decisions are made in reports of RHIS data/information for actions? Please check types of decision based on types of analysis present in reports.			
Types of decisions based on types of analysis				
3.5.a	Appreciation and acknowledgement based on number/percentage of facilities showing performance within control limits over time (month to month comparisons)	1. Yes	0. No	
3.5.b	Mobilizing/shifting of resources based on comparison by facilities	1. Yes	0. No	
3.5.c	Advocacy for more resources by comparing performance by areas (Payams and Bomas), human resources and logistics	1. Yes	0. No	
3.5.d	Development and revision of policies by comparing types of FP services	1. Yes	0. No	
Discussion and decisions about use of information				
3.6	Does the CHD office have routine meetings for reviewing managerial or administrative matters?	1. Yes	0. No	

3.7	How frequently is the meeting supposed to take place? Circle appropriate answer 1. Quarterly 2. Monthly 3. After every two weeks 4. weekly 0. no schedule			
3.8	How many times did the meeting take place during the last three months? Circle appropriate answer 1. 1 time 2. 2 times 3. 3 times 4. Either 4 or 5 times 6. 6 times 11. Between 7 and 11 12. 12 times 0. none			
3.9	Is an official record of management meetings maintained?	1.Yes	0.No	If no, go to 3.11
3.10	If yes, please check the meeting records for the last three months to see if the following topics were discussed:			
3.10.a	Management of RHIS, such as data quality, reporting, or timeliness of reporting	1.Yes, observed	0. No	
3.10.b	Discussion about RHIS findings such as FP utilization, or service coverage, or FP commodity stock-outs	1.Yes, observed	0. No	
3.10.c	Have they made any decisions based on the above discussions?	1.Yes, observed	0. No	
3.10.d	Has any follow-up action taken place on the decisions made during the previous meetings?	1.Yes, observed	0. No	
3.10.e	Are there any FP-RHIS related issues/problems referred to state/national level for actions?	1.Yes, observed	0. No	
Promotion and use of FP-RHIS information at CHD				
3.11	Did the CHD annual action plan show decisions based on FP-RHIS information?	1.Yes	0.No	
3.12	Did records from the CHD office of last three months show that the CHD/senior management issued directives on use of information?	1.Yes	0.No	
3.13	Did the CHD M&E office publish newsletter/report in last three months showing examples of use of information?	1.Yes	0.No	
3.14	Does documentation exist showing the use of information for FP advocacy?	1.Yes	0.No	
3.15	Does the CHD staff meeting records show attendance of persons in charge of the facilities for discussion on FP-RHIS performance?	1.Yes	0.No	
3.16	Please describe examples of how the CHD office uses FP-RHIS information for health system management 0. No examples 1. Yes (details follow)			

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