Comparing Data Reported using the National Health Management Information System and data Declared/Validated on the PBF Declaration forms in Fundong Health District

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Introduction

The Cameroon Government through the Ministry of Health (MOH) introduced the National Health Management Information System (NHMIS) tool in the country in 1995 to harmonize the data collection process within the health system at all levels(1). Before this time, the MOH had no harmonized tool for health information and the different health facilities within the health system had varied data collection tools. The major role of the NHMIS involved data collection to show case the country's health status, data quality enhancement and proper definition of each indicator therein, thorough data analysis at all levels of the health system and informed decision making by actors, timely feedback at all levels, enabling access of data at all levels to development partners and prompt epidemiological surveillance and timely intervention in the case of an epidemic (2). The elements of an effective SNIS are its relevance, how it satisfies clearly defined and quantified public health goals, **its performance**, does it work with efficient methods and tools and competent professionals? **its usefulness**, how is it used by its targeted audience (decision makers, health professionals, community stakeholders) and **its consistency**, are the various stakeholders and information sources well-coordinated?

The setting of institutional mechanisms and incentives in order to introduce an evidence base decision making process has been seen by many scholars as important and a major need. Thus Performance based financing at implementation had as one of its principles to strengthen the health system not leaving out the SNIS. In this light, the data reported in the project at the level of the health facility is supposed to be consistent with data reported in the NHMIS. This study sought to find out if this is actually the case on the field.

The Cameroonian government with the support of the World Bank fund is currently piloting PBF in 4 regions in Cameroon (Littoral, East, North-West and South-West).

The health sector support Investment Project (HSSIP) in Cameroon is currently implementing PBF in public, private and faith-based organization (FBO) facilities across 26 districts in the Littoral ,Northwest, Southwest and East regions of Cameroon, covering a total population of 2.5million.

Four of these 26 districts are in the Northwest region that is Fundong, Ndop

Nkambe, and Kumbo-East were this survey will be carried out.

The PBF project in Cameroon has the following key features:

- Performance contracts are signed between a Performance Purchasing Agency (PPA) and health facilities. These performance contracts govern results-based payments to facilities, and performance bonuses from facilities to their health workers.
- The purchased outputs from health facilities include service output indicators for priority services. These outputs are verified by the third parties (i.e. the PPA).
- Facilities have the management autonomy to use PBF payments based on priorities identified in their business plans, including to offer health worker performance or retention bonuses or to purchase inputs.
- Facilities have the management autonomy to decide the level of performance bonuses to their health workers within limits defined by the contracts between the PPA and health facilities.
- Facilities also have the management autonomy to hire and fire staff hired with PBF revenues.
- Facilities have the autonomy to procure medicines from government-approved distributors and retail outlets, and not be obliged to procure their medicines from any single source.

Alongside the implementation of this PBF project, the World Bank is conducting an impact evaluation in 3 of the 4 regions (East, North-West and South-West).

The study has a *pre-post with comparison* design, relying primarily on experimental control. Individual health facilities in health districts included in the project in each region have been randomized to one of the 4 study groups (**T:** PBF with health worker performance bonuses; **C1:** Same per capita financial resources as PBF but not linked to performance; **C2:** No additional resources but same supervision and monitoring as PBF arms and T and C1; **C3:** Status quo).

Problem Statement

The NHMIS tool has played a major role in the collection of vital health information and other relevant data in the Cameroon Health System at all levels. At the level of the health facilities, the head of the health facility or other related health personnel do not have a good mastery of this tool. This tool is required to be filled by health facilities on a monthly basis and transmitted to the District Health Service for onwards transmission to the Region. Unfortunately enough, the data that is filled on this tool is most often not consistent with those reported in other projects. Most chief of health units always fill this tool just to satisfy the purpose of filling and do not really take time off to cross check data with the impression that reports sent to the Regional and Central level are not fully exploited. The NHMIS is fragmented by other reporting tools in vertical programmes and Health Units head see it as a lot of work filling and completing the NHMIS.

With the advent of PBF, District Medical Teams have evaluated on this tool to see the timeliness and completeness rate of health facilities effectively reporting using this tool. In performance based financing health facilities are supposed to report to the project using the declaration validation form for project indicators. The main question that arises is whether the data that health facilities declare to the PBF Project using the declaration validation forms is concordant with the data that is reported using the NHMIS tool.

Operational Terms

The following operational terms have been used in this case study:

Under Reporting: These are health facilities reporting less in the NHMIS compared to data in the PBF declaration validation forms in absolute terms for the same indicators with an errormargin greater than 10%.

Consistency: These are health facilities having concordant data for the same indicators in the NHMIS and PBF declaration validation forms with an error margin within 10%.

Over reporting: These are health facilities reporting more in the NHMIS compared to data in the PBF declaration validation forms in absolute terms for the same indicators with an error margin greater than 10%.

Level of Consistency: Level of consistency has been set at 90%

Conceptual Model/Framework

Logic model

This study uses a logic model to describe specific activities and interventions of PBF and describe how they improve the collection and use of health data. A logic model describes the main components of an intervention and how they are intended to work together to reach measurable objectives.

The use of a logic model allows for critical assessment of program impact pathway theory and assumptions; appropriateness and completeness of activities (process); and indicators of outputs (direct products of program activities), outcomes (specific changes in program participants' behavior, knowledge, skills, and level of functioning), and impacts (the fundamental intended or unintended change occurring in health facilities, communities or systems as a result of program activities)
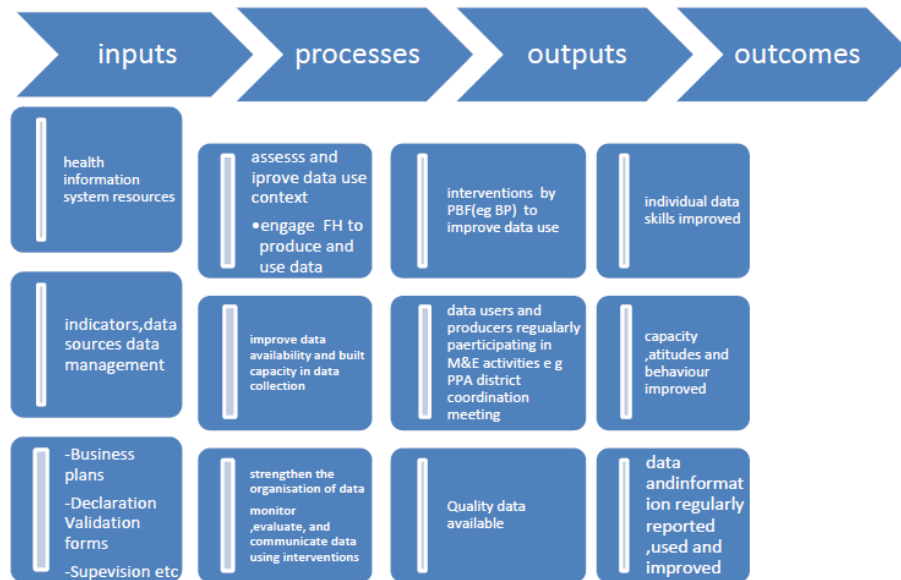
Figure 1. Logic model for strengthening the reporting and use of health data

The logic model presented in this article maps out how the intervention inputs and activities are expected to influence the outputs and eventual outcome of regular data reporting and use in program review, planning, advocacy, policy development and other decision making processes.

General Objective

To compare the data that is reported using the NHMIS and that declared using the PBF declaration/validation forms for some selected indicators in Fundong Health District during the Period January to July 2014 for consistency.

Specific Objectives

- To compare the data validated by district supervisors to data declared in the NHMIS.
- To compare the reporting trends for data validated and data reported in the NHMIS by status of health facility.
- To assess reporting using both tools by category(T, C1 and C2)
- To make feasible recommendations for improvement

Methodology

At the outset 6 indicators that were reported in the NHMIS that are defined same in the PBF declaration validation forms were identified and selected. The NHMIS tool was obtained from the DHS Fundong and part obtained from the Regional Delegation of Health covering the period January to July 2014. A questionnaire was created in EPI-info and data reported on the NHMIS for the selected indicators were entered on this application. Data declared in the PBF project for the aforementioned indicators was equally entered on this tool. This data was then analyzed on EPI-info by running frequency. P-values could not be used for this study because we had a sample of 14 health facilities. Three cut off categories (under reporting, consistent, and over reporting) were used to interpret the results.

Results obtained

Status of Health Facility

Of the 14 health facilities that were involved in the study in Fundong Health District, 8 (57.1%) were Public while 6(42.9%) were confessionals.
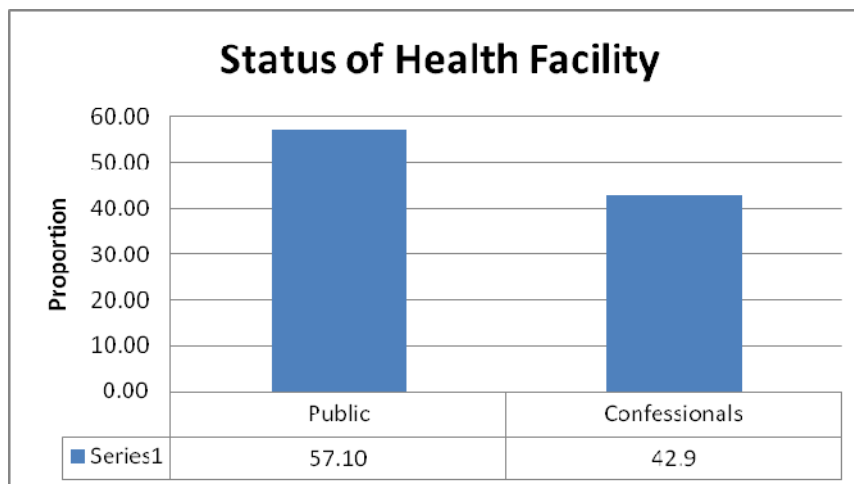
Figure 2: Status of Health Facilities

Qualification of Staff

In all there were 9 state registered nurses (SRN) and 5 Nursing Assistant (NA) as facility heads for the 14 health facilities that were under study. The qualification of the staff was stratified by status of health facility and it was observed that out of the 9 state registered nurses, 6 (66.7%) were from the Public whereas3(33.3%) were of the confessional. Out of the 5 nursing assistants that existed, 2(40%) were public and 3(60%) were confessionals. From this, it can be deduced that the Public had more SRN (6) than the confessionals (3) meanwhile the confessionals had more NA (3) than the Public (2).

Table 1: Qualification of Staff stratified by status of health facility

	SRN	NA	Total
Public	6(66,7%)	2(40%)	8
Confessionnal	3(33,3%)	3(60%)	6
Total	**9**	**5**	**14**

Comparing Data Reported Using the SNIS and the PBF Declaration/Validation forms

The table below shows the state of reporting in the NHMIS compared to the PBF data which is verified and validated. This has been done per indicator and reporting was categorized into 3 groups. Either a health facility is underreporting, reporting consistently in both tools or over reporting. From the analysis below the indicator in which the highest level of consistency was recorded in both tools was FP: Permanent methods (94.9%) as reported by the 14 health facilities in the study. For the 6 indicators that were considered in this case study, only FP: permanent methods was above 90% consistency. In reality, we expect a 100% consistency even though for this study, the level of consistency was set at 90%.

Table 2: Summary State of reporting in the NHMIS compared to validated data from January to July 2014 per indicator

Indicators	% of HF Under reporting in NHMIS	% of HFs with Consistent Data both tools	% of HFs Over reporting in NHMIS	Total
Children Completely Vaccinated	27,6	55,0	17,4	100,0
Deliveries	32,0	53,0	15,0	100,0
FP: Pills and Injectables	19,4	72,5	8,1	100,0
FP: IUCD and Implants	4,2	87,7	8,1	100,0

FP: Permanent Methods	0	100	0	100,0
STI treated	40,8	43,8	15,4	100,0

State of Reporting by Status of Health Facility

From the tables below it can be observed that public health facilities were seen to be more consistent in reporting using the NHMIS than the confessionals. On the other hand, confessionals were seen to be underreporting using the NHMIS than the public health facilities while Public health facilities were observed to over report using the NHMIS. This case study therefore portray that public health facilities have the tendency of inflating figures in the NHMIS than when they are reporting using the PBF declaration validation form. They report well on the PBF declaration/validation forms because they are aware that this data will be verified and validated but are non chalant with the NHMIS since they know that this data is not verified. Conversely confessional health facilities tend to underreport using the NHMIS. This could be interpreted that Confessional health facilities tend to conceal relevant information.

Table 3: State of Reporting for Children Completely vaccinated by Status of Health Facility Cumulative January to July 2014

Indicator	State of Reporting	Status of HF	
		Public	Confessionnal
Children Completely Vaccinated	% of HF Under Reporting	13,3	14,3
	% of HFs with Consistent Data	28,5	26,5
	% of HFs Over Reporting	14,3	3,1
	Total	**100**	

Table 4: State of Reporting for Deliveries by Status of Health Facility Cumulative January to July 2014

Indicator	State of Reporting	Status of HF	
		Public	Confessional
Deliveries	% of HF Under Reporting	10	22
	% of HFs with Consistent Data	35,6	16,3
	% of HFs Over Reporting	8,8	6,3
	Total	**100**	

Table 5: State of Reporting for FP: Pills and Injectables by Status of Health Facility Cumulative January to July 2014

Indicator	State of Reporting	Status of HF	
		Public	Confessional
FP: Pills and Injectables	% of HF Under Reporting	15,3	4,1
	% of HFs with Consistent Data	32,7	39,8
	% of HFs Over Reporting	6,1	2
	Total	**100**	

Table 6: State of Reporting for FP: IUCD and Implants by Status of Health Facility Cumulative January to July 2014

Indicator	State of Reporting	Status of HF	
		Public	Confessional
FP: IUCD and Implants	% of HF Under Reporting	2,1	2,0
	% of HFs with Consistent Data	49,0	38,8
	% of HFs Over Reporting	3,1	3,1

	Total	100

Table 7: State of Reporting for FP: Permanent Methods by Status of Health Facility Cumulative January to July 2014

Indicator	State of Reporting	Status of HF	
		Public	**Confessional**
FP: Permanent Methods	% of HF Under Reporting	0	0
	% of HFs with Consistent Data	57,1	42,9
	% of HFs Over Reporting	0	0
	Total	**100**	

Table 8: State of Reporting for STIs treated by Status of Health Facility Cumulative January to July 2014

Indicator	State of Reporting	Status of HF	
		Public	**Confessional**
STI Treated	% of HF Under Reporting	20,4	20,4
	% of HFs with Consistent Data	24,5	16,3
	% of HFs Over Reporting	11,2	5,1
	Total	**100**	

Reporting by Category

The figures below present the state of reporting by category of health facilities per indicator.
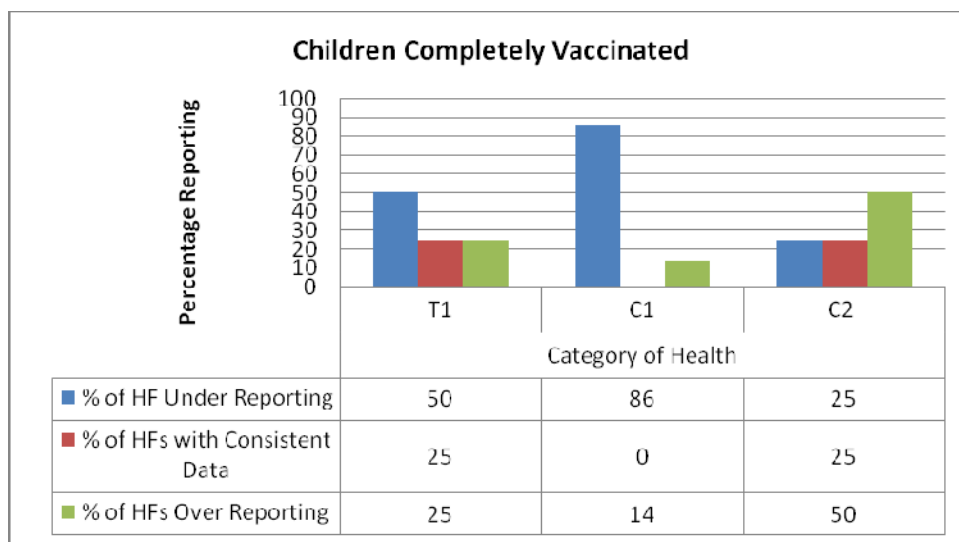

Figure 3: Reporting for Children Completely Vaccinated by Category of Health facility
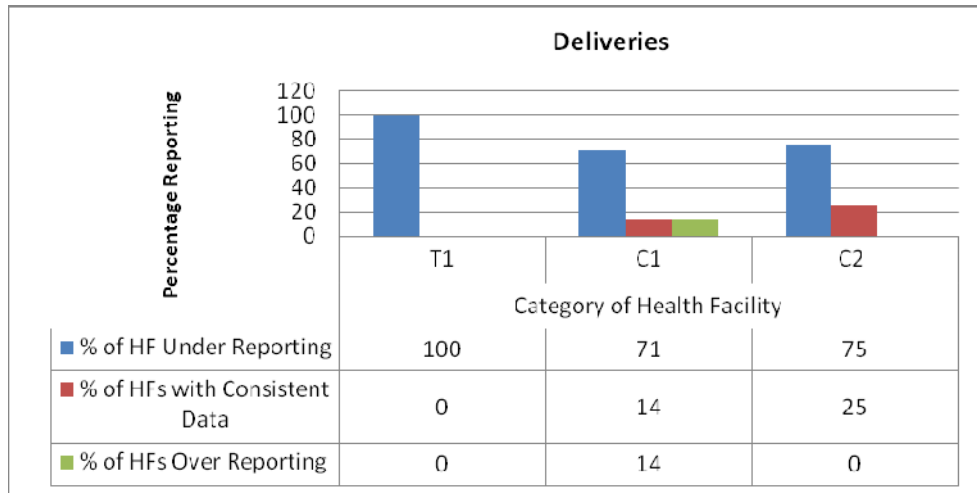
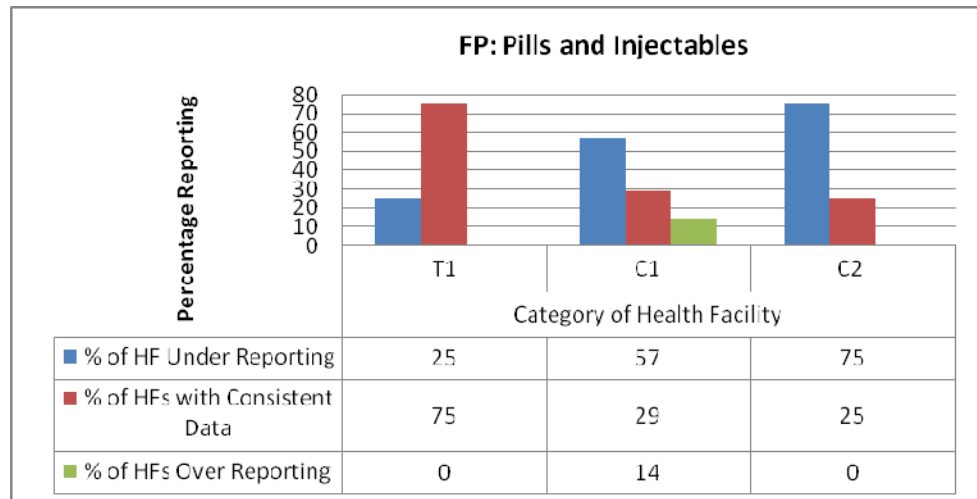**Figure 4:** Reporting for Deliveries by Category of Health facility

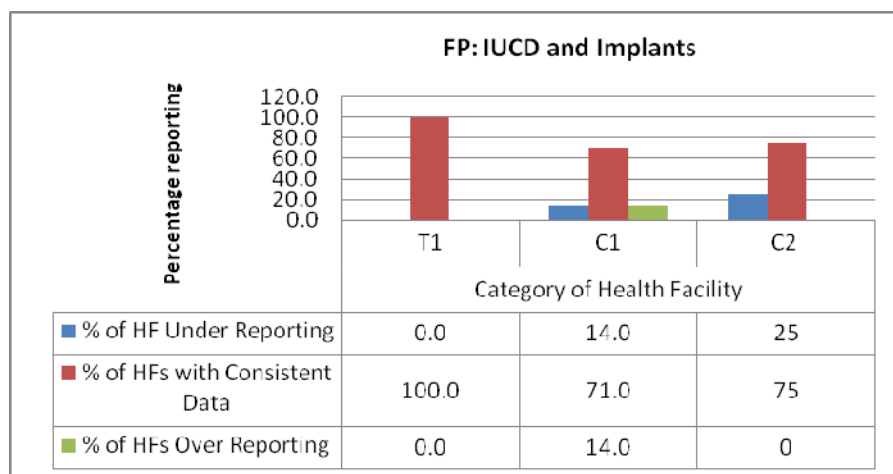**Figure 5:** Reporting for FP: Pills and Injectables by Category of Health Facility

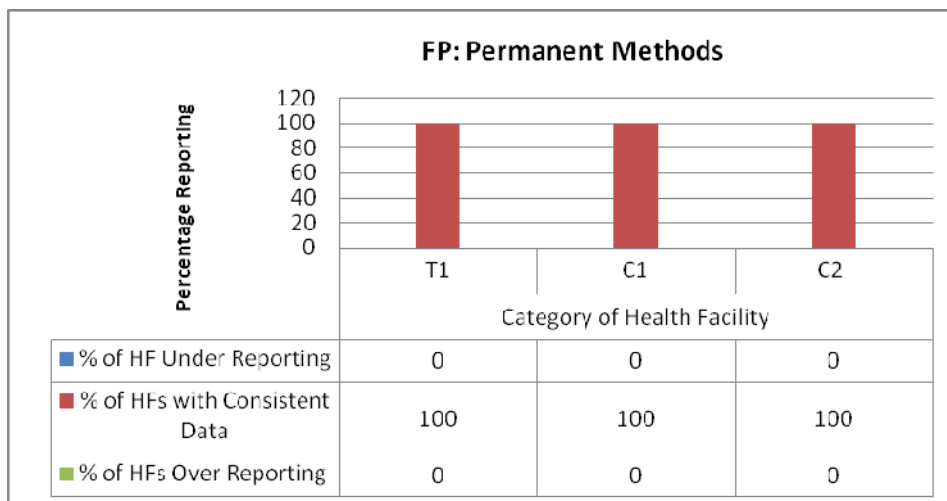**Figure 6:** Reporting for FP: IUCD and Implants by Category

FP: Permanent Methods

	T1	C1	C2
% of HF Under Reporting	0	0	0
% of HFs with Consistent Data	100	100	100
% of HFs Over Reporting	0	0	0

Figure 7: Reporting for FP: Permanent Method and Implants by Category

STI Treated

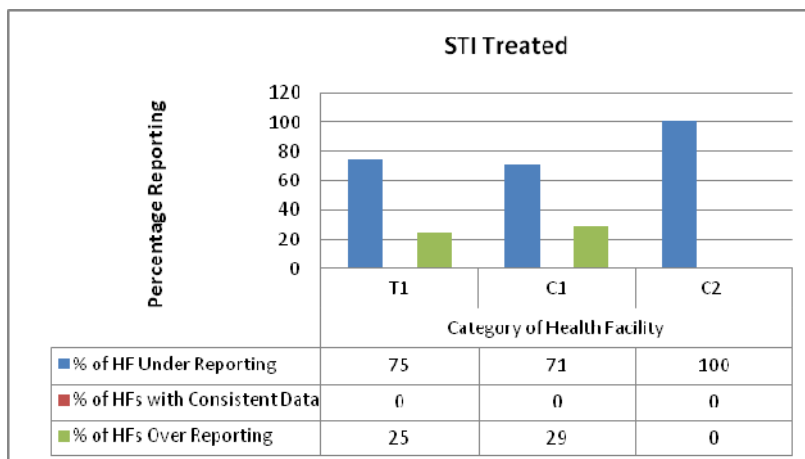|	T1	C1	C2
% of HF Under Reporting	75	71	100
% of HFs with Consistent Data	0	0	0
% of HFs Over Reporting	25	29	0

Figure 8: Reporting for STI Treated by Category

Conclusion

Our study portray that out of 6 indicators only 1(16.6%) attended 90% consistency for the 14 health facilities in the study meaning that the data reported in the NHMIS compared to the PBF declaration validation form is grossly inconsistent. Public health facilities were observed to be over reporting in the NHMIS while confessionals were under reporting. Summarily the data reported in the NHMIS is not consistent with the data reported in the PBF declaration validation form implying that data from NHMIS is not reliable.

Recommendations

The Regional Delegation of Health should train and retrain health facility heads and other health personnel on proper reporting in the NHMIS.

Health facilities should always compare data reported in the NHMIS with data reported in other vertical programmes with similar indicators like PBF.

The Regional Delegation of Health in collaboration with the PPA should refresh health facility heads on generating data from the NHMIS, analyzing and use the data in decision making in relation to their business plan.

The District Medical Team should carry out supervision of NHMIS at the level of the health facility regularly for consistency with other programmes.

References

[1]. Report A. African development fund. 2000;(March).

[2]. Merit I, Process R. Reinforcing the Health Information System to Step up the Viabilization of Health Districts Policy brief July 2010. 2010;(July):1–11.