Data Quality Audit Report

6TH ROUND

Based on the data quality audit visits in 7 districts of Uttar Pradesh during 7-10 August 2019

PREPARED BY
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LIST OF ABBREVIATIONS

AdRO	Additional Research Officer
ANC	Ante Natal Care
CH	Child Health
CHC	Community Health Centre
CMS	Chief Medical Superintendent
CMO	Chief Medical Officer
DH	District Hospital
DEO	Data Entry Operator
DCH	District Combined Hospital
DPM	District Program Manager
DWH	District Women Hospital
DG FW	Director General Family Welfare
DG MH	Director General Medical Health
FP	Family Planning
FRU	First Referral Unit
HEO	Health Education Officer
HM	Hospital manager
HMIS	Health Management Information System
M&E	Monitoring and Evaluation
MH	Maternal Health
MO I/c	Medical Officer In charge
RSK	RogiSahayta Kendra
SHI	State Health Index
SN	Staff Nurse
JSSK	Janani Shishu Suraksha Karyakakram
UPHMIS	Uttar Pradesh Health Management Information System
UPNHM	Uttar Pradesh National Health Mission
UPTSU	Uttar Pradesh Technical Support Unit

Content

1. EXECUTIVESUMMARY

Data quality audit is a supportive supervision approach with an objective to identify the data quality gap and suggest the corrective action for data quality improvement. In view of the same, the state data quality audit team was constituted in the month of January 2018 and five rounds of audit were conducted by the team in 108 block level and DH facilities of 36 districts till March 2019. The previous round of audit had also showed the sustainable improvement in the data quality of audited facilities.

The 6th round of data quality audit was planned and conducted in 21 facilities (14 block facilities and 7 DH facilities) acrossseven districts which included Deoria, Farrukhabad, Kasganj, Mainpuri, Pilibhit, Sitapur and Varanasi between 7-10thAugust 2019.The data audit was conducted with the help of the revised structured tool comprised of 66 critical data elements covering antenatal care, delivery/newborn care & complication, family planning, child health, mortality details and hospital services. This covers all the data elements of ranking and NITI Aayog's SHI indicators with few additional critical indicators of state priority.

The findings of 6th round of data quality audit suggest that about half (53%) of the reported data elements were matching with the source documents available at facilities. However, the matching of data elements varied significantly across different domains and by type of facility. Delivery (94%), mortality (73%) and newborn health (67%) were havinga better level of matching while newborn complication (34%), maternal complication (44%) and child health (40%) were having a very low level of reported data quality. Similarly, DWHs (60%) was having a better level of data matching with source documents in comparison to CHCs (47%).

Different facilities and domains were having different data quality issues but some of the general reasons of data quality issues identified during audit include poor and non-uniform availability of source documents (only 29% of data elements of four major domains were having a provision in registers to record the information). Accountability of staff for reporting of data elements was lacking (ranges from 33% of facilities in child health to 76% of facilities in delivery care). Information was available in the register but monthly summary was not prepared. Monthly summary preparation ranges from 14% in child health to 52% in delivery care of its respective related data elements.

Non-functional validation committee meeting specifically at district hospital and block level (about 67% of audited facilities where validation committee meetings were not held). Lack of understanding on some of the data elements (maternal and new born complication and ante natal care) were also identified as the factors for low data quality during supportive supervision process with facility staff.

Based on the gaps identified, the action plan was developed for each of the audited facilities and shared with facility in charge for corrective actions. The action plan includes the gaps, suggestive

actionable point, person responsible, and timeline. The feedback meeting was also held with all the blocks to share the findings with all the blocks of the district for overall improvement in data quality of a district.

2. BACKGROUND

The availability of good quality data is critical for any program reviews, planning and prioritization. Uttar Pradesh has developed and implemented a robust data system which provides a holistic platform to obtain all the critical data required for the identification of low performing indicators, low performing geographies and factors associated with low/high performance of indicators.

In this regards, monthly facility wise government data portals(HMIS/UPHMIS) are the primarily reliable source for data use at all levels of health system and it is critical to have availability of high quality data. Moreover, UP Health dashboard (district and block ranking based) has also been developed based on HMIS/UPHMIS data and using by the health officials at different level for review and planning of health programs. Recognizing the criticality of reporting of quality data, the state has initiated the concept of data quality audit to improve the data quality and availability of the government data system (HMIS/UPHMIS). The state data quality audit team was constituted in the month of January 2018 and five rounds of audit were conducted by the team in 108 facilities of 36 districts till March 2019.

Data quality audit is a supportive supervision approach to improve the data quality of the government data system by assessment of data quality issues at facility level and suggest corrective actions. This process includes the gap identification, joint problem-solving, hand hold support and capacity building. The primarily includes validating the reported data with source document, identifying the gaps and developing the capacity of facility staff on reporting of accurate data.

Data quality framework of factors affecting data quality

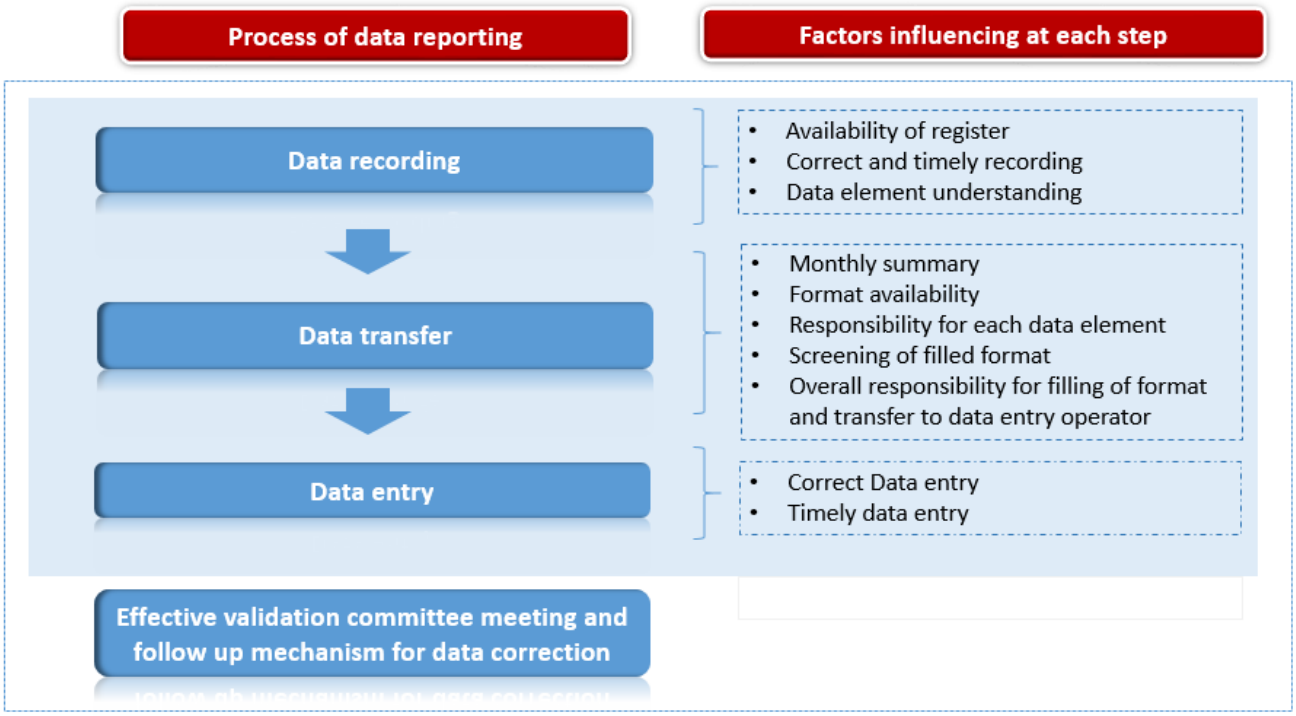
The data quality audit also includes the identification of reason for any data quality issue. The reason and factor for any data quality issue can be explained by data quality framework *(Figure 1, Data Quality Framework)* which lists the critical components at each steps to ensure the reporting of quality data. There are different steps involved in the process of data reporting for any facility.

The complete process of correct reporting of data from service delivery to portalcan be classified into 3 steps process, a*) Data recording, b) Data transfer and c) Data entry*. There are multiple factors at each step which may affect the process to ensure the reporting of correct data.The gap in any of the component at any step may affect the reporting of quality data.

The correct *"Data recording"* may be affected by the availability of registers, correct and timely recording, and data element understanding.The timely and accurate *"Data transfer"*from source

document to data entry operator may be affected by monthly summary preparation of data elements, format availability, responsibility of reporting to each data element in the format and screening of filled formats. Further, *"Data entry"* of reported data on the prescribed format must be done correctly and it may also be affected wrong entry and delay in data entry by data entry operator.
Besides, the 3 steps process for data reporting, there is validation committee meeting concept at district and block levels which is meant to implement the steps of correct data reporting. If validation committee meeting is conducted effectively and follow up mechanism is ensured on monthly basis, there is high chance to report correct data on the portal which can be used for the review or planning monitoring to ensure effective implementation of different health programs.

Figure 1 Data Quality Framework



It is, therefore, important to understand the issues and challenges at each step so that effective measures couldbe taken to strengthen the data quality.

3. OBJECTIVES OF THE DATA AUDIT

Theoverall goal of the data audit activity wasto ensure availability of quality data for decision making. Keeping in view the issues and challenges of data quality in HMIS/UPHMIS in the state following objectives have beendecided for the audit activity:

1. To validate and improve the data quality of key critical data elements
2. To assess the system level gap in the reporting of quality data

3. To assess recording and source document availability for key critical data elements

4. METHODOLOGY

The state had issued a letter (संख्या- **SPMU/NHM/M&E/2019-20/26/3420**) for data audit visits by the state team in the month of August 2019.

4.1 Audit area and audit team

Sixth round of data audit was conducted during 7-10th August 2019. Seven teams were constituted for audit in seven selected districts comprises members from NHM, Directorate and UPTSU.The list of districts and details of team are given below in the Table 1.

Table 1: Data Quality Audit Team

Team	Team Members	Department	Date of Visit	Selected District
Team 1	Dr.Rajeshkumar,JD	DGMH	07 to 09 August 2019	Farrukhabad
	Mr.RajanPrasad,Div PM Kanpur	NHM		
	Mr.ArpitSrivastava,Cosultant(RI)	NHM		
	Dr.Prahlad	UPTSU		
Team 2	Mr. Yogesh Chandra,ADRO	DGFW	07 to 09 August 2019	Kasganj
	Mr.Pawankumar,Div PM-Aligarh	NHM		
	Mr. Nazir Haider	UPTSU		
Team 3	Mr.Manojkumar,ADRO	DGFW	07 to 10th August 2019	Pilibhit
	Moh.Shahid,Div PM-Bareilly	NHM		
	Mr.BishambharDayal,(Const-MH)	NHM		
	Mr. Puneet	UPTSU		
Team 4	Mr.D.KSrivastava,ADRO	DGFW	07 to 09 August 2019	Sitapur
	Mr.RajaramYadav,Div PM-Lucknow	NHM		
	Ms.Neelima Pathak(Const-Blood cell)	NHM		
	Ms. Charu Yadav	UPTSU		
Team 5	Dr.AjaiGhai,JD-MCH	DGFW	07 to 09 August 2019	Manipuri
	Mr. Manish Kumar Soni,(Const-FP)	NHM		
	Mr.D.P Singh, PC-EMTS	NHM		
	Mr. Anand Singh	UPTSU		
Team 6	Mr. VedPraksh,ADRO	DGFW	07 to 10th August 2019	Deoria
	Mr. ArvindPandey,Div PM-Gorakhpur	NHM		
	Mr. JamalAhmed,PC-Trg	NHM		
	Mr. Ishan Tripathi	UPTSU		

Team	Team Members	Department	Date of Visit	Selected District
Team 7	Mr.SVPPankaj,DGM-M&E	NHM	07 to 09 August 2019	Varanasi
	Mr.Virendra Pratap(ADRO-D&E-cell)	DGFW		
	Mr. Arvind Kumar Srivastav,Div PM-Varanasi	NHM		
	Mr. Neeraj	UPTSU		

The districts were selected based on the following criteria:

- 5 districts- Randomly selected
- 1 district- Random selection among top 5 in district performance ranking (July 19)
- 1 district- Random selection among bottom 5 in district performance ranking (July 19)

Further, two block facilities and one district hospital werechosenfor the audit in each district. The block facilities were identified based on the reporting ofnon-zero data elements. One good performing and one poor performing block facility were selected for the audit. District Women Hospital (DWH) or District Combined Hospital (DCH) as per availability in the district wereselected.This exercise has been done by the state and the list was shared with the data audit team.Thus, in total, 21 facilities from 7 districts were identified and auditedduring the process.

Table 2: List of district hospital facilities selected for audit

Sr. No.	District	Block	Facility	Facility HMIS code	Type of facility
1	Mainpuri	Mainpuri	District Women Hospital	407270	DWH
2	Kasganj	Kasganj DHQ	District Women Hospital Kashi Ram Nagar	454992	DWH
3	Pilibhit	Pilibhit DHQ	District Women Hospital Pilibhit	353455	DWH
4	Deoria	Deoria DHQ	DH District Hospital Female	399141	DWH
5	Farrukhabad	Farrukhabad DHQ	DWH Ram Manohar Lohiya	413195	DWH
6	Sitapur	Sitapur DHQ	District Women Hospital Sitapur	397152	DWH
7	Varanasi	Varanasi DHQ	District Women Hospital Varanasi	396978	DWH

Table 3: List of block facilities selected for audit.

Sr. No.	District	Block	Facility	Facility HMIS code	Type of facility
1	Mainpuri	Bewar	BCHC Bewar	396860	BCHC
2	Mainpuri	Kurawali	BCHC Kurawali	399820	BCHC
3	Kasganj	Amapur	BCHC Amanpur	402179	BCHC
4	Kasganj	Soron	BCHC Soron	402177	BCHC
5	Pilibhit	Barkhera	BPHC Barkhera	331552	BPHC
6	Pilibhit	Bilsanda	BCHC Bilsanda	331581	BCHC
7	Deoria	Bhagelpur	BPHC Bhagalpur	463132	BPHC
8	Deoria	Selampur	BCHC Salempur	399130	BCHC
9	Farrukhabad	Kamalganj	BCHC Kamalganj	412356	BCHC
10	Farrukhabad	Nawabganj	BCHC Nawabganj	387179	BCHC
11	Sitapur	Aeliya	BPHC Aliya	397132	BPHC
12	Sitapur	Hergaon	BCHC Hargoan	397143	BCHC
13	Varanasi	Cholapur	BCHC ColapurMch	396891	BCHC
14	Varanasi	Sewapuri	BPHC Sewapuri	396885	BPHC

4.2 Process

The data quality audit is a supportive supervision approach to improve the data quality of the government data system (HMIS/ UPHMIS). This process includes the hand hold support, joint problem-solving and capacity building.

The major steps to conduct the data quality audit includes following:

- **Identification of facilities** to be audited
- **Visit and conduct audit**: The audit includes the **matching of reported data value in HMIS and UPHMIS with source documents** and identify the reasons of identified gaps, if any.
- **Preparation and sharing of action plan** based on data quality issues identified with facility in charge. The action plan for each of the audited facilities were developed and attached as annexure 1.
- **Feedback meeting** with all the concerns responsible for reporting

4.3 Tool used for data audit

Astructured tool encompasses of 66 critical data elements was developed and used for 6th round of data quality audit. It covers following domains *(Table 2)*:

Table 4 Domains covered in data quality audit checklist

#	Domain	# of data elements form HMIS and UPHMIS
1	Antenatal care	10
2	Delivery/newborn care & complication	23
3	Family planning	5
4	Child health	9
5	Mortality details	6
6	Hospital services	13
	Total	**66**

The data elements were selected considering indicators recommended by NITI AAYOG's state health index, district/ block ranking, and current program priority.

The revised tool also captures system level gaps in ensuring reporting of quality data. This primarily includes format availability, validation committee, summary preparation, person responsible etc. Separate section was added on source document availability to understand the variation and availability of records across different facilities. The tool is attached as *Annexure 2*

The data quality assessment of data collected on tool was done on five major parameters defined as below:

- **% of matched-** Data elements reported value matched with the value recorded in source document.
- **% of over reported-** Reported value of the data element is greater than the value recorded in source document.
- **% of under reported-** Reported value of the data element is less than the value recorded in source document.
- **% of not able to audit-** Data elements for which team was not able to auditsource documents were not available at facility

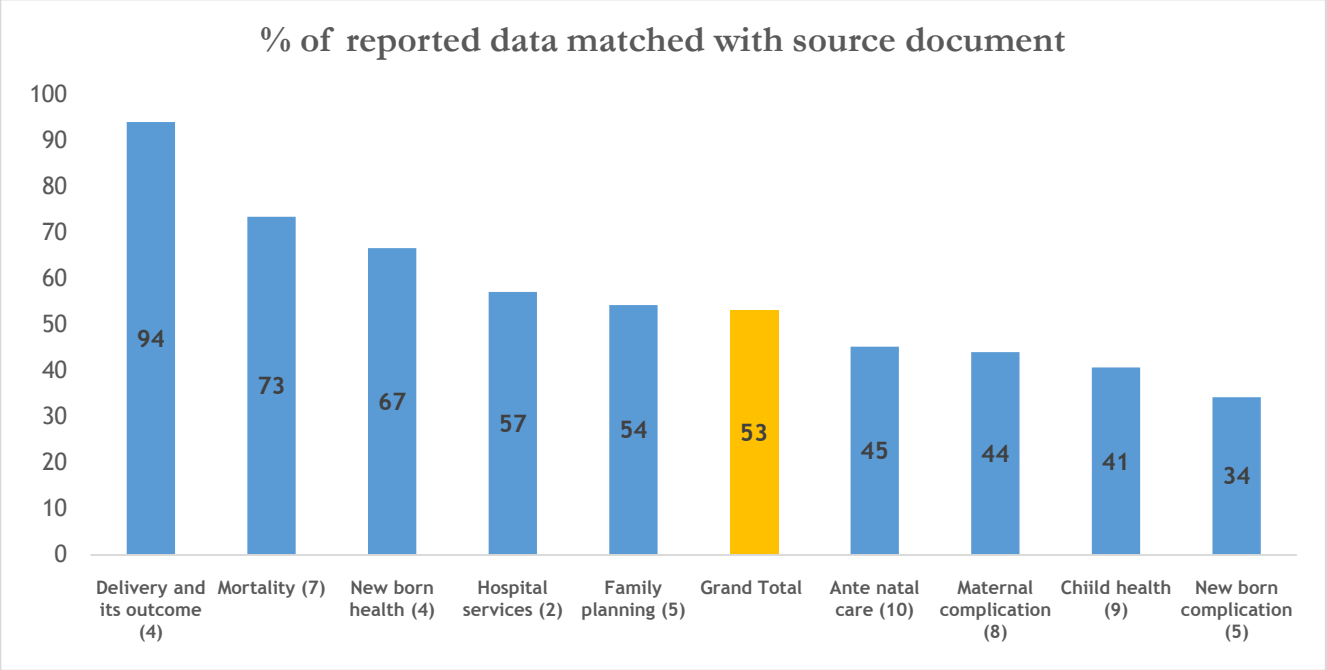
4.4 Data and period of audit

HMIS and UPHMIS reported data on UPHMIS portal for the month June 2019 was decided to be audited.

5. DATA AUDIT FINDINGS

The reported value of 66 data elements*(listed in data quality audit tool)* in the portal for the month of June 2019 was matched with available records at the facility.These 66 data elements were spread across 9 different domains. The summary of data audit by different domains are given in Fig 1 and Table 3.

Fig 2 Domain wise matching of reported value with source document



The overall matching of audited data elements remained low.Only 53% of the reported value matched with data available in source document.Moreover, the matching of data elements variedsignificantly across different domains. Delivery (94%), mortality (73%) and newborn health (67%) was found with better level of matching while newborn complication (34%), maternal complication (44%) and child health (40%) were having a very low level of reported data quality.

Besides matching, many of the data elements werealso found as over reported and under reported. Interestingly, the maternal complications and new born complications were the domains where significantly bothover and under reporting was observed.Also, many of the data elements across different domains were not even able to be auditeddue to non-availability of documents at facilities. Overall, there were17% of the cases which were not able toaudited by the team. This ranges from 1% in delivery to 48% in child health. The details are given in Table 5.

Table 5 Data audit summary

Domain	% of matched with source	% of over reported	% of under reported	% of not able to audit
Ante natal care (10)	45	15	18	22
Delivery and its outcome (4)	94	1	4	1
Child health (9)	41	5	6	48
Family planning (5)	54	23	10	13
Hospital services (2)	57	14	21	7
Maternal complication (8)	44	22	29	5
Mortality (7)	73	1	13	13

Domain	% of matched with source	% of over reported	% of under reported	% of not able to audit
Newborn complication (5)	34	25	33	8
Newborn health (4)	67	20	6	7
Grand Total	**53**	**14**	**16**	**17**

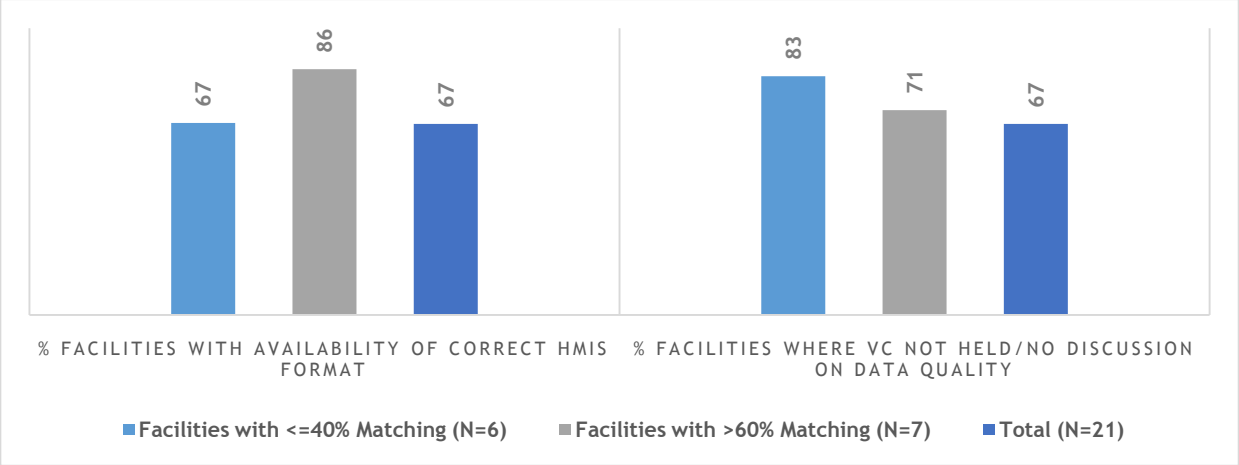
Assessment of process related Gap

There are many factors which affect the reporting of quality data *(Figure 1, Data quality framework)*. It is essential to have these components in place at facility for reporting of quality data. The revised checklist had also captured the different factors (availability of correct format, validation committee meeting, nodal person for data reporting, training etc) which can affect the data quality of facility.

a. Format availability and validation committee meeting

The availability of correct HMIS format and quality validation committee meetingis considered as important practice at facility for reporting of quality data.

Figure 2 Status of format availability and validation committee



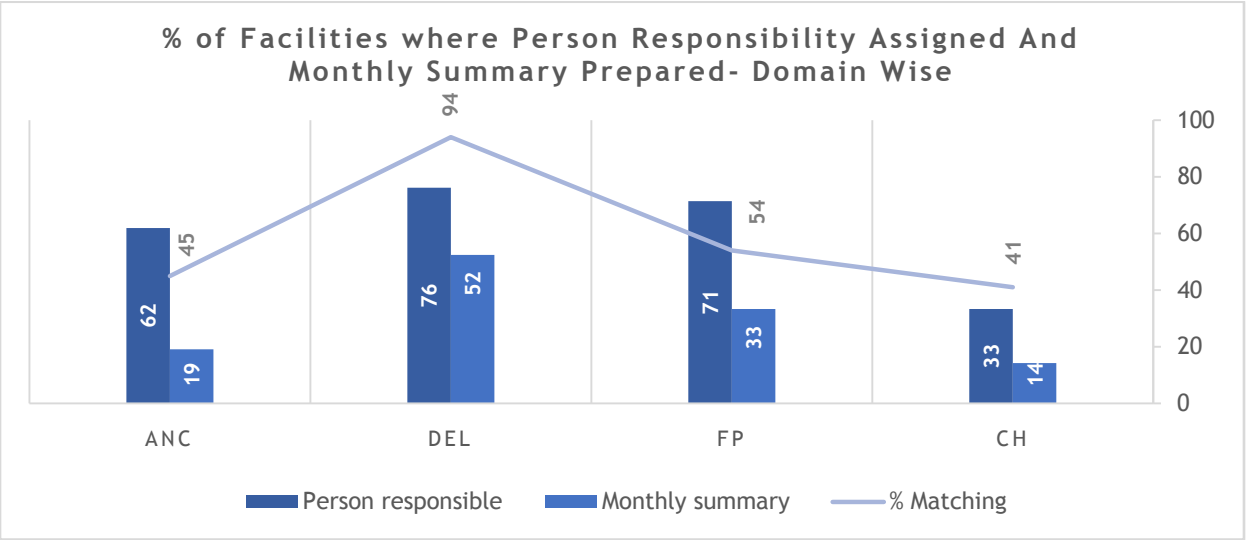
Findings of the assessment revealed the fact that about one-third (33%) of the facilities were not having availability of correct HMIS format and two-third (67%) of the facilities were not conducting validation committee meeting properly (not held or no discussion on data quality). Figure 3 clearly shows that the facilities following correct practices such as ensuring the implementation of correct HMIS format or facilities having validation committee meetings or other discussion on data quality aspect were certainly having a better quality of data.

The facilities with greater than 60% matching of reported data with source document were found to have a better availability of HMIS format (86%) and comparatively better validation committee meeting situation in comparison to facilities with less than 40% matching where correct format availability is only 67% and more than 4/5th(83%) of the facilities were not conducting validation committee meeting.

b. Person responsibility and monthly summary preparation

Domain-wise person responsibility and monthly summary preparation of all the data elements are critical for reporting of quality data from facilities. However, the status of person responsibility assigned to specific individuals and monthly summary prepared by the facility staff were significantly low across most of the domains except *"Delivery" and "Family Planning*" to some extent. The practice of monthly summary preparation was observed very low for "*Ante natal care (19%)*" and "*Child Health (14%)*". The low level of data quality of "*Child Health"*related data elements can also be further explained as only 33% of the facilities had assigned responsibility for reporting of respective data elements of the domain*(figure 4)*.

Figure 3 Percent of facilities with domain wise person responsibility and monthly summary preparation

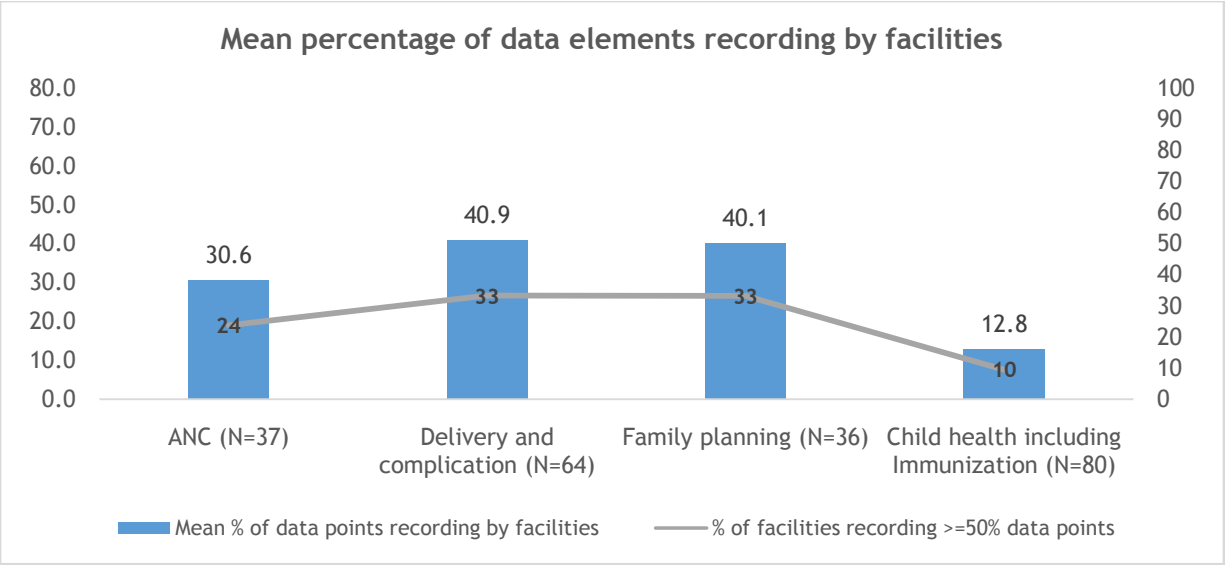


c. Source documents availability for recording of data elements

The availability of registers with provision of recording of information are the base for reporting of accurate information on monthly basis. Besides audit of 66 data elements, the recording provision of 4 critical domains *(ANC, Delivery, Family Planning, Child Health)* with availability of different type of registers in the facility were also assessed during the audit*(Figure 5)*.

Out of 217 data elements assessed related to the 4 domains, less than two-fifth (29%) of the data elements were currently recorded by the audited facilities. This ranges from 13% of child health (out of 80 data elements) to 41% of delivery and complication (out of 64 data element) related information.

Figure 4 Data Elements recording by Facilities



It was also interesting to learn that availability of source documents across different facilities were non uniform and varied significantly. Different facilities were maintaining different sets of source documents based on their need and recommendation by any officials. For instance, average number of registers maintained by district hospitals to capture information related to delivery room and complications were 23 and it ranges from 4 to 35 registers. Also, about half of all the registers were developed manually by the staff and no standard template was available *(Table 4)*.

Table 6 Number of source documents maintained at facility

Domain	Average number of source documents (Min- Max)			
	DH		CHC	
	All	Manual	All	Manual
Ante natal care	4(1-9)	2(0-5)	2(0-7)	1(0-3)
Delivery/Newborn care & complications	23(4-35)	11(0-18)	16(3-36)	6(0-15)
Family planning	8(0-20)	1(0-8)	6(0-16)	1(0-8)
Child health	3(0-11)	2(0-9)	2(0-6)	1(0-3)

6. MAJOR CHALLENGES

Several challenges were observed during the data quality auditthat towards the low data quality status. The following challenges were observed by team during data audit:

a. **Availability of correct HMIS format:** About 1/3rd of the audited facilities were using a wrong HMIS format. The wrong formats were having a data element which are similar to

new data elements but different in data definition. This leads to wrong reporting of the information by facility staff. For example:

Wrong Format	New Format
Number of pregnant women tested for Haemoglobin (Hb)	Number of PW tested for Haemoglobin (Hb) 4 or more than 4 times

The major reason for using wrong HMIS format was identified as incorrect printing of format at district level which leads to availability of wrong format with all the facilities

b. **Non-functional validation committee meeting:** The validation committee was constituted with an objective to validate the reported data and ensure the quality of reported data. But, it was observed that about two-third (67%) of the visited facilities (block facility and DH) were either not conducting themeeting or there was no discussion on data quality as per minutes of the meeting found at the facility.

c. **Absence of preparation of monthly summary in a register:** HMIS and UPHMIS are the two monthly reporting portals which require a monthly compilation of information from the source documents. ANC and CH were the domains where monthly summary was prepared for less than 20% of the data elements. However, it was also observed that monthly summary preparation was usually less across most of the domains. The absence of monthly summary leads to wrong or blank reporting of the services provided by the facilities.

d. **Non-uniform and non-availability of source documents (registers):**Correct and optimal recording of individual information in register is the base for any reporting. The correct recording involves the availability of source document and having a provision to record all the information supposed to be reported without any duplication. The non-uniform and unavailability of source documents were observed as the major bottleneck for reporting of quality data. There was no provision of recording of more than three-fifth (71%) of the data elements (in four major domains) of HMIS/UPHMIS which were supposed to be reported by the facilities. This varied significantly for different domains and facilities but overall level remained low across all the domains (10% of recording provision in child health to 41% in delivery and complications).

Besides this, a huge disparity in available number of registers was also observed among different facilities. Also, about 50% of the registers were manually prepared by facility staff which had duplicate information and added burden to the data capturing.

7. SUGGESTIVE SOLUTIONS

a. Standardization of source documents

The availability of non-uniform registers causes lot of burden on facility staffs which further leads to duplication of their efforts too. There is a need to review the available registers and recommend a standard register to fulfill all the program need. This can be done in following 2 ways:

- Assessment of need and development of comprehensive registers to be maintained at each level of the facility can be done
- A pilot with comprehensive registers can be done in 2 districts with redesigned comprehensive registers
- Committee comprising different program nodals (Directorate & NHM) can be formed to redesign the comprehensive registers for different level of facilities

The committee may further finalize the source document for each level of facility considering the need of all the program without any duplication.

b. Continuous follow up visit and hand hold support by divisional M&E hub

The supportive supervision visits to blocks and districts by divisional M&E hub is a major gap. It is important to have a supportive supervision visits of the districts by divisional M&E for continuous improvement in data quality. The divisional M&E officer must build the capacity of district and block level staff to analyze and report the quality data. Initially, the visit plan of the divisional M&E can be developed and monitored from state with the help of UPTSU.However, it is equally important to priorities the facilities/blocks by the divisional M&E officers. This prioritization can be based on the identified gaps through data analysis.The continuous support by divisional M&E hub will also strengthen the validation committee meeting at district and block level.

c. Hospital/ Quality manager are suggested to be the nodal for data quality and data use at district hospitals

It would be good to re-emphasize that hospital managers as a nodal for ensuring data quality and data use at district hospitals. They can also be included in all HMIS/UPHMIS related meetings at district. **In the absence of hospital manager, RSK managers can be given a charge** for all these responsibilities. Guideline with all the responsibilities/ activities to ensure data quality and data use can also be shared with them

d. State validation meeting with divisional M&E hub

The data quality based review of divisional M&E hub is currently missing from the system. A quarterly state level validation committee meeting can be a good platform to review the data quality of the state with divisional M&E hub and their accountability can also be established.

e. Centralized printing/ or printing guideline of HMIS/ UPHMIS format

The wrong printing of HMIS format at district was identified as one of the challenge. The centralized printing at state/or printing guideline with *"CDR file"* need to be shared with districts.

f. Intense data use at facility level

The intense use of data at facility level (DH and CHC) can be one of the strategy to promote/ensure the data quality. Once the data analysis starts happening, more gaps will be identified and hence the appropriate steps will be taken to correct the same. This will become the routine activities rather than specific and planned activity.

8. GLIMPSES OF DATA AUDIT

Picture 2 Feedback meeting in district Deoria under the chairmanship of CMO

Picture 1 Data quality supportive supervision by state team at DWH Mainpuri

Picture 1 Feedback meeting on data quality findings in District Varanasi

Picture 2 Data Quality supportive supervision at CHC Aeliya District Sitapur

Picture 3 Data Quality Supportive Supervision at CHC Kamalganj, District Farrukhabad