

CHAPTER VIII : DATA COLLECTION, MANAGEMENT AND REPORTING

8.1 Introduction

The interventions to ensure fundamental corrections in the existing health care delivery system have increased the demand for data on population and health for use in both micro-level planning and programme implementation. A continuous flow of good quality information on inputs, outputs and outcome indicators facilitate monitoring of the objectives of National Rural Health Mission (NRHM).

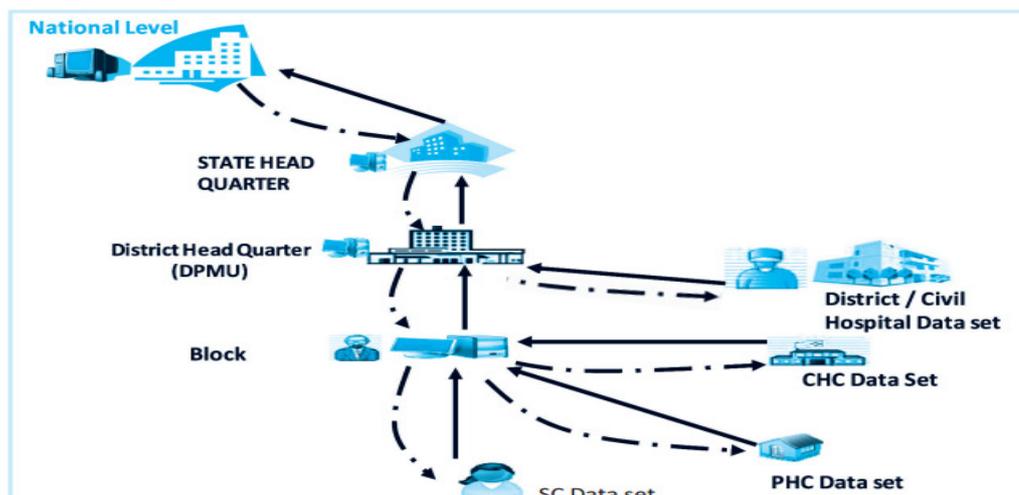
8.2 Health Management Information System

Health Management Information System (HMIS) was conceptualized as a continuous flow of quality information on inputs, outputs and outcome indicators to facilitate monitoring of the objectives of NRHM. The Ministry launched HMIS, a Geographical Information System¹ enabled web-based monitoring system in October 2008 with the objective to record information on health events² and check the quality of services at different levels of health care. NRHM framework envisages intensive accountability structures based on internal monitoring through HMIS. The HMIS comprises data relating to the parameters of service delivery and infrastructure (both physical and manpower) at different levels of the health facilities. The flow of data in HMIS from sub-Centre (SC) to national level is as given in **Diagram-8.1**:

¹ Geographical Information System is a computer based tool that analyses, stores, manipulates and visualizes geographic information on a map.

² **Antenatal Care Services** : number of pregnant women registered and received 3rd& 4th check up etc., **Deliveries**: deliveries conducted at home; deliveries conducted at public health facility etc, **Pregnancy outcome and Details of new born**: live birth; still birth; weight of newborn etc., **Post Natal Care**: women receiving post-partum check up, **Child Immunisation** etc.

Diagram-8.1³: Information flow from SC to national level



(Source: 'Service Providers Manual - Understanding HMIS (Volume-I)')

In part A of this chapter, Audit has compared the data in HMIS with the data in the basic records available at the health facilities. In part B, Audit has analysed the HMIS database provided by the Ministry using IT tools.

PART-A

Comparison of HMIS data with the data in the basic records

8.3 Quality of Data in HMIS

Data quality refers to the extent to which data measures what the stakeholders intend to measure. Data should be checked for quality to minimize errors so that it can be used for decision making. Quality of data in HMIS in terms of completeness, timeliness and accuracy has been discussed in succeeding paragraphs:

8.3.1 Data completeness

For a complete picture of health indicators, all health facilities should report data. Audit noticed that all the facilities were not reporting on the HMIS as explained below:

(i) Reporting by health facilities

The position of health facilities reporting data through HMIS during 2011-16 is depicted in **Table-8.1** below:

³ In the diagram, straight lines represent upward flow of information and the dotted lines represent downward flow of information
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Table-8.1: Details of health facilities not reporting on HMIS

| Sl. No. | Year | Total facilities | Facilities reporting | Facilities not reporting | Per cent facilities not reporting |
|---------|---------|------------------|----------------------|--------------------------|-----------------------------------|
| 1. | 2011-12 | 2,03,245 | 48,655 | 1,54,590 | 76 |
| 2. | 2012-13 | 2,03,245 | 1,07,605 | 95,640 | 47 |
| 3. | 2013-14 | 2,03,245 | 1,67,786 | 35,459 | 17 |
| 4. | 2014-15 | 2,04,449 | 1,79,676 | 24,773 | 12 |
| 5. | 2015-16 | 2,09,964 | 1,96,976 | 12,988 | 6 |

(Source: Month wise status of Data Reporting - Standards Reports on HMIS)

The States with major shortfall as on March 2016 were **Arunachal Pradesh** (32 per cent), **Chhattisgarh** (25 per cent), **Gujarat** (17 per cent), **Manipur** (11 per cent) and **Meghalaya, Mizoram** (19 per cent).

(ii) Incomplete reporting by health facilities

Even in cases where the health facilities were reporting on HMIS, the data was not complete. While such issues were observed in a number of states like **Bihar, Chhattisgarh, Gujarat, Madhya Pradesh, Meghalaya and Uttar Pradesh**, the case of **Bihar** is discussed in **Table-8.2** below:

Table-8.2: Details of data item/services reported by PHC⁴s in Bihar during 2014-15

| Sl. No. | Item code | Data Item/Service | Number of PHCs in the State | Number of PHCs reporting | | | Number of PHCs not reporting data |
|---------|-----------|--------------------------------------|-----------------------------|--------------------------|--------|------------|-----------------------------------|
| | | | | Service available | Number | Total PHCs | |
| 1. | 1.2.b | Emergency services (24 Hours) | 1,883 | No | 915 | 1,515 | 368 |
| | | | | Yes | 600 | | |
| 2. | 1.2.d | In-patient Services | | No | 837 | 1,512 | 371 |
| | | | | Yes | 675 | | |
| 3. | 1.6.1.a | Ante-natal care | | No | 129 | 1,290 | 593 |
| | | | | Yes | 1161 | | |
| 4. | 1.6.1.d | New born Care | | No | 647 | 1,277 | 606 |
| | | | | Yes | 630 | | |
| 5. | 4.1 | Routine urine, stool and blood tests | | No | 774 | 1,034 | 849 |
| | | | | Yes | 260 | | |
| 6. | 4.7 | Rapid tests for pregnancy | No | 576 | 1,025 | 858 | |
| | | | Yes | 449 | | | |
| 7. | 5.17.a | Labour room available | No | 433 | 909 | 974 | |
| | | | Yes | 476 | | | |
| 8. | 9.1 | Citizen's charter (Yes/No) | No | 436 | 814 | 1069 | |
| | | | Yes | 378 | | | |

⁴ Primary Health Centre

| Sl. No. | Item code | Data Item/Service | Number of PHCs in the State | Number of PHCs reporting | | | Number of PHCs not reporting data |
|---------|-----------|---|-----------------------------|--------------------------|--------|------------|-----------------------------------|
| | | | | Service available | Number | Total PHCs | |
| 9. | 9.3 | Internal monitoring (Social audit through PRI/RKS etc.) | | No | 267 | 821 | 1062 |
| | | | | Yes | 554 | | |

It can thus be seen that PHCs were not uniformly reporting on the availability of services making further analysis and taking corrective action difficult. The Ministry stated that it had highlighted the cases of non-reporting or incomplete reporting on various platforms like National level workshops, Regional workshops, National Programme Coordination Committee meetings, visits of senior officials of Ministry etc.

However, incomplete reporting by facilities would have huge bearing on the assessment of outcome indicators and taking remedial measures based on such assessment.

8.3.2 Timeliness of data

The Ministry rolled out the concept of data freezing on HMIS in December 2014, when the data of 2008-09 to 2011-12 was frozen for the first time. The Ministry specified the dates for year wise data freezing as given in **Table-8.3** below:

Table-8.3: Year wise details of HMIS data freezing

| Year | Date of data freezing |
|--------------|-----------------------|
| Upto 2011-12 | 31 December 2014 |
| 2012-13 | 12 January 2015 |
| 2013-14 | 15 February 2015 |
| 2014-15 | 31 August 2015 |
| 2015-16 | 20 August 2016 |

Audit noted that HMIS remained open for modification/addition by the users which resulted in delay of finalization or freezing of data for use by the stakeholders prior to 2014-15.

The Ministry stated that HMIS does not permit users to modify data after freezing. The reply of the Ministry is not tenable because our concern is on delayed freezing.

8.3.3 Accuracy of data in HMIS

Accuracy refers to the correctness of data reported such as actual number of services provided, health events organised etc.

Audit observed significant discrepancies in the data as reported in HMIS *vis-à-vis* the information available as per basic records/registers in the selected health facilities of 14 States. These are discussed State wise in the succeeding paragraphs:

(a) Assam

The discrepancies were noticed under various parameters *viz.*, pregnant women receiving antenatal care (ANC) and postnatal care (PNC), pregnant woman and infants receiving immunization, etc., as per the details given in **Table-8.4** below:

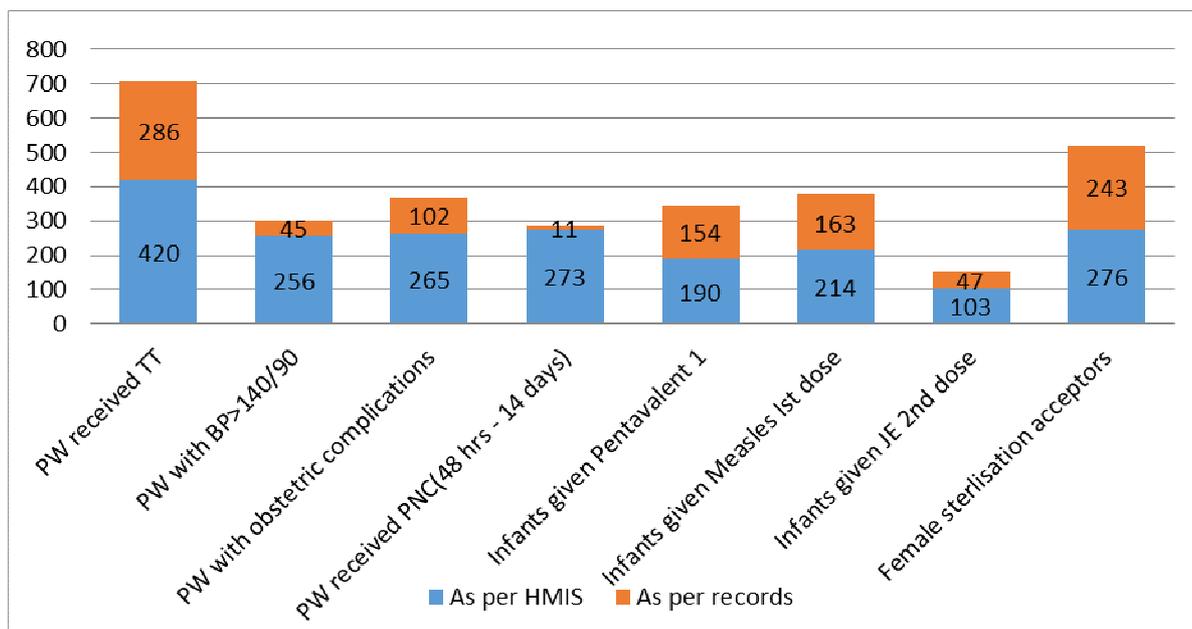
Table-8.4: Discrepancy in data as per HMIS and basic records, Assam for March 2016

| Sl No. | Facility type (Number of facilities) | Data as per | Pregnant women receiving 1st ANC | Pregnant women given TT Immunization | | Pregnant women with Haemoglobin less than 11 grams/dl | Pregnant women receiving PNC between 48 hours and 14 days after delivery | Infants (0 to 11 months old) immunized | Total number of condom pieces distributed |
|--------|--------------------------------------|-------------|----------------------------------|--------------------------------------|-----|---|--|--|---|
| | | | | TT1 | TT2 | | | | |
| 1. | CHC ⁵ (8) | HMIS | 260 | 241 | 219 | 110 | 69 | 7 | 1,060 |
| | | Register | 251 | 217 | 204 | 185 | 57 | 47 | 285 |
| 2. | PHC (30) | HMIS | 340 | 279 | 191 | 226 | 125 | 199 | 1,660 |
| | | Register | 367 | 231 | 134 | 358 | 129 | 179 | 1,535 |
| 3. | SC (41) | HMIS | 362 | 296 | 278 | 128 | 114 | 299 | 2,726 |
| | | Register | 341 | 285 | 222 | 152 | 104 | 296 | 2,488 |

Audit observed similar discrepancies in the seven selected District Hospitals (DHs) as depicted in **Chart-8.1** below:

⁵ Community Health Centre
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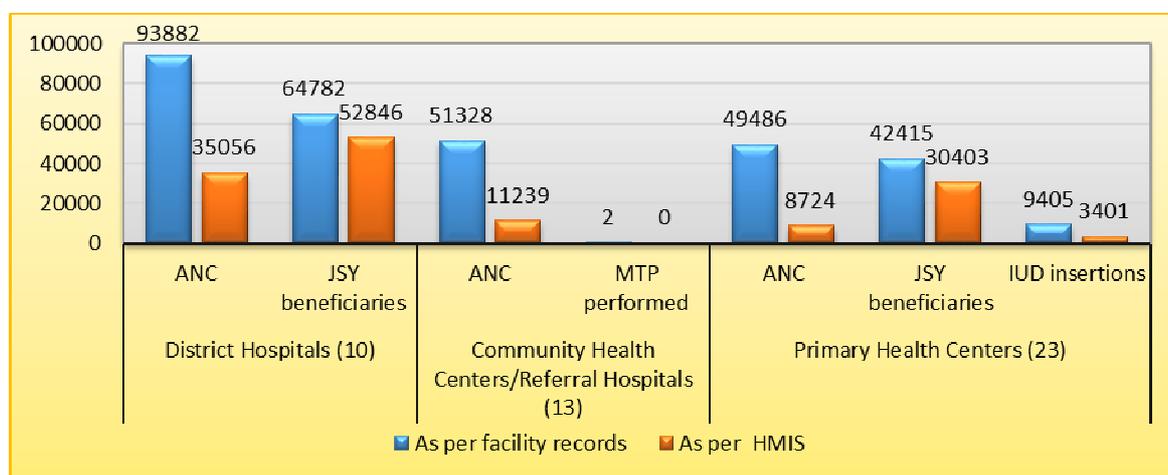
Chart- 8.1: Discrepancy between the data as per HMIS and records in DHs Assam, March 2016



(b) Bihar

Discrepancy in the data on services provided by the selected facilities is depicted in **Chart-8.2** below:

Chart-8.2: Discrepancy in data of services delivery in Bihar, during 2015-16



(MTP: Medical Termination of Pregnancy, IUD: Intra Uterine Device)

(c) Chhattisgarh

(i) The discrepancy in data in the selected SCs in four districts is detailed in **Table-8.5** below:

Table-8.5: Difference in the figures as per HMIS and records in Chhattisgarh, during 2015-16

| Sl. No. | District(Number of SCs) | Institutional Delivery | | | Home Delivery | | |
|---------|-------------------------|------------------------|-------------|------------------|---------------|-------------|------------------|
| | | As per Records | As per HMIS | Difference (+/-) | As per Record | As per HMIS | Difference (+/-) |
| 1. | Bilaspur(12) | 103 | 59 | (-) 44 | 254 | 334 | (+)80 |
| 2. | Jashpur(12) | 92 | 105 | (+)13 | 159 | 141 | (-)18 |
| 3. | Mahasamund(12) | 966 | 379 | (-)587 | 52 | 102 | (+)50 |
| 4. | Rajnandgaon(12) | 270 | 282 | (+)12 | 90 | 261 | (+)171 |

- (ii) As per the guidelines of HMIS, number of pregnant woman is to be reported when the number of Iron Folic Acid (IFA) tablets given to her exceeds 100. However, audit found that total available IFA tablets as per records was insufficient for the number of pregnant women shown to have been given such tablets. **Table-8.6** below illustrates the point:

Table-8.6: Details of Pregnant women registered and IFA tablets provided

| Sl. No. | Period | (State/ Block) | Number of pregnant women registered | Number of pregnant women shown given IFA tablets as per HMIS | Number of IFA tablets available | Number of pregnant women for whom the available IFA tablets were sufficient | Excess number of pregnant women shown in the data |
|---------|---------|----------------------|-------------------------------------|--|---------------------------------|---|---|
| 1 | 2013-16 | State (Chhattisgarh) | 20,18,614 | 17,86,063 | 5,45,40,000 | 5,45,400 | 12,40,663 |
| 2 | 2014-16 | Bagbahra | 9,547 | 9,250 | 2,10,600 | 2,106 | 7,144 |
| 3 | 2012-16 | Belha | 45,015 | 37,813 | 5,72,100 | 5,721 | 32,092 |
| 4 | 2011-16 | Ghumka | 23,473 | 15,708 | 1,96,700 | 1,967 | 13,741 |
| 5 | 2011-16 | Khairagarh | 22,107 | 13,731 | 12,49,672 | 12,497 | 1,234 |
| 6 | 2015-16 | Lodam | 1,649 | 1,406 | 1,06,800 | 1,068 | 338 |

- (iii) In 20 SCs, auxiliary nurse and mid-wife (ANMs) were not trained as skilled birth attendant (SBA) but HMIS data showed that delivery was conducted by SBA trained ANMs.
- (iv) Mismatch was observed in the data on retaining of women after delivery for 48 hours as per Delivery register and HMIS as detailed in **Table-8.7** below:

Table-8.7 Discrepancy in data as per HMIS and Records in CHC Khairagarh, Chattisgarh

| Sl. No. | Month | Total deliveries | Discharged within 48 hours | |
|---------|----------------|------------------|----------------------------|-------------|
| | | | As per Delivery register | As per HMIS |
| 1. | June 2015 | 62 | 34 | 21 |
| 2. | July 2015 | 62 | 40 | 23 |
| 3. | August 2015 | 66 | 36 | 26 |
| 4. | September 2015 | 78 | 52 | 17 |

| Sl. No. | Month | Total deliveries | Discharged within 48 hours | |
|---------|---------------|------------------|----------------------------|-------------|
| | | | As per Delivery register | As per HMIS |
| 5. | October 2015 | 91 | 56 | 27 |
| 6. | November 2015 | 81 | 62 | 22 |
| 7. | December 2015 | 93 | 55 | 20 |
| 8. | January 2016 | 61 | 44 | 19 |
| 9. | February 2016 | 54 | 31 | 9 |
| 10. | March 2016 | 61 | 39 | 31 |

(d) Himachal Pradesh

As per records, number of pregnant women registered in the State under JSY during 2011-12 and 2014-15 was 21,811 and 36,493 whereas the corresponding numbers reported in HMIS was 28,966 and 39,416 respectively. Similar variations were noticed in the selected districts as detailed in **Table-8.8** below:

Table-8.8: Details of difference in data, Himachal Pradesh

| Sl. No. | Year | Hamirpur | | Kullu | | Sirmour | |
|---------|---------|----------|-------|---------|--------------------|---------|-------|
| | | Records | HMIS | Records | HMIS | Records | HMIS |
| 1. | 2011-12 | 1,788 | 1,517 | 997 | Data not available | 873 | 1,818 |
| 2. | 2012-13 | 2,143 | 1,531 | 2,009 | 876 | 1,932 | 1,932 |
| 3. | 2013-14 | 2,061 | 1,325 | 2,537 | 1,629 | 2,902 | 2,902 |
| 4. | 2014-15 | 1,939 | 1,185 | 2,469 | 1,612 | 3,271 | 3,538 |
| 5. | 2015-16 | 2,065 | 1,231 | 2,611 | 1,477 | 3,219 | 3,219 |

The State Mission Director stated that the discrepancy in HMIS might be due to error in compilation. The Ministry stated that facility in charge was expected to look into the data regularly. Block MIS officer and district MIS officers were also expected to monitor the data quality on regular basis.

The reply was however silent on the corrective action to be taken to resolve the issues.

(e) Jharkhand

Discrepancy in the selected health facilities of five selected districts⁶ are given in the **Table-8.9** below:

⁶ Dumka, Giridih, Gumla, Jamtara and West Singhbhum.

Table-8.9: Difference in data as per HMIS and records in Jharkhand during 2015-16

| Sl. no. | Name of Service | DH | | CHC | | PHC | | SC | |
|---------|-------------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|
| | | As per records | As per HMIS |
| 1. | ANC Registration | 8,795 | 6,383 | 18,736 | 15,854 | 2,443 | 2,652 | 6,317 | 6,364 |
| 2. | Deliveries | 34,207 | 34,341 | 10,932 | 13,612 | 597 | 1,105 | 869 | 678 |
| 3. | JSY beneficiaries | 59,220 | 59,163 | 14,368 | 10,894 | 1,254 | 2,108 | 5,303 | 5,616 |
| 4. | Maternal Deaths | 43 | 0 | 113 | 23 | 1 | 0 | 113 | 14 |
| 5. | Infant Deaths | 69 | 18 | 40 | 8 | 2 | 0 | 127 | 4 |

(f) Maharashtra

Instances of discrepancy in respect of a few indicators are given in the **Table-8.10** below:

Table-8.10: Difference in data in HMIS and records in Maharashtra during 2015-16

| Sl. no | District | Institutional Delivery | | Number of live births | | Number of Pregnant women given IFA tablets | |
|--------|-----------|------------------------|---------|-----------------------|---------|--|---------|
| | | HMIS | Records | HMIS | Records | HMIS | Records |
| 1. | Bhandara | 16,826 | 19,967 | 19,599 | 19,617 | 8,939 | 8,943 |
| 2. | Buldhana | 19,203 | 42,491 | 29,882 | 42,246 | 37,776 | 40,055 |
| 3. | Nanded | 57,642 | 29,313 | 84,295 | 29,094 | 22,166 | 25,404 |
| 4. | Ratnagiri | 7,885 | 20,334 | 20,164 | 20,163 | 13,909 | 21,540 |
| 5. | Yavatmal | 24,168 | 44,977 | 32,098 | 44,333 | 30,555 | 32,781 |

Similar differences were noticed during 2011-15 (**Annexure-8.1**).

Inconsistent data in Rajasthan

For online tracking of pregnant women, infant and children, monitoring of immunization and institutional deliveries *etc*, Pregnancy, Child Tracking and Health Services Management System (PCTS) was implemented in Rajasthan from September 2009. Cross examination of data on activities as per PCTS and HMIS with records maintained at facilities revealed differences in selected districts as given in the **Table- 8.11** below:

Table-8.11: Discrepancy in data as per PCTS, HMIS and Records in Rajasthan

| Sl. no | Name of Service | 2013-14 | | | 2014-15 | | | 2015-16 | | |
|--------|-----------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | | Records | PCTS | HMIS | Records | PCTS | HMIS | Records | PCTS | HMIS |
| 1. | Pregnant women registered for ANC | 2,75,961 | 2,74,656 | 2,74,820 | 2,77,576 | 2,76,473 | 2,76,485 | 2,76,286 | 2,77,642 | 2,62,371 |
| 2. | Pregnant women received 3 ANCs | 2,10,574 | 2,09,663 | 2,09,771 | 2,09,308 | 2,07,891 | 2,07,892 | 1,91,096 | 1,90,321 | 1,84,101 |

| | | | | | | | | | | |
|----|--|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3. | Pregnant women given 100 IFA tablets | 2,07,954 | 2,06,085 | 2,49,598 | 2,13,651 | 2,11,913 | 2,63,390 | 2,03,474 | 2,01,524 | 2,53,955 |
| 4. | Institutional Deliveries | 2,25,529 | 2,31,893 | 2,33,542 | 2,19,768 | 2,22,549 | 2,23,337 | 2,23,532 | 2,23,703 | 2,17,853 |
| 5. | Women discharged within 48 hours of Delivery | 44,273 | 42,645 | 95,783 | 44,981 | 38,525 | 24,708 | 65,923 | 44,200 | 27,721 |
| 6. | Newborn having weight less than 2.5 kg | 62,632 | 74,367 | 74,402 | 58,737 | 58,390 | 58,491 | 33,271 | 30,797 | 59,137 |

(g) Tripura

Comparison of HMIS data with records maintained in the selected facilities revealed difference as given in **Table-8.12** below:

Table-8.12: Difference in data as per HMIS and records during 2011-16

| Sl. No. | Name of Service | SC | | PHC | | CHC | | DH | |
|---------|--|-------|---------|-------|---------|-------|---------|---------------|---------|
| | | HMIS | Records | HMIS | Records | HMIS | Records | HMIS | Records |
| 1. | Pregnant women registered for ANC | 8,194 | 6,951 | 4,597 | 5,562 | 1,601 | 21,491 | No difference | |
| 2. | Pregnant women registered under JSY | NA | NA | 2,764 | 3,185 | 173 | 5,980 | 806 | 2,017 |
| 3. | Pregnant women received 3 ANC's | 4,919 | 2,355 | 2,284 | 3,766 | 270 | 8,272 | No difference | |
| 4. | Pregnant women given 100 IFA tablets | 4,355 | 3,270 | 2,982 | 4,199 | 1,106 | 8,061 | No difference | |
| 5. | Pregnant women discharged under 48 hours of delivery | NA | NA | 983 | 714 | 2,798 | 1,926 | No difference | |

(h) Uttarakhand

Comparison of data on various activities in HMIS and the records revealed mismatches between the two as mentioned in **Table-8.13** below:

Table-8.13: Difference in data as per HMIS and records in Uttarakhand, during 2015-16

| Sl. No. | Data Item | HMIS | Records |
|---------|---|----------|----------|
| 1. | Pregnant women Registered for ANC | 2,21,686 | 2,20,273 |
| 2. | Pregnant women given 100 IFA tablets | 59,841 | 59,018 |
| 3. | Institutional deliveries | 95,812 | 95,664 |
| 4. | Home deliveries | 29,058 | 28,991 |
| 5. | Deliveries with obstetric complications | 9,419 | 9,346 |
| 6. | Live Birth Male | 77,547 | 77,454 |
| 7. | Live Birth Female | 70,264 | 70,184 |
| 8. | Administration of Vitamin A | 74,798 | 51,743 |
| 9. | Vasectomy | 1,143 | 1,176 |
| 10. | Third ANC | 1,77,171 | 1,76,213 |
| 11. | Maternal Death | 54 | 123 |

(i) **Discrepancy of data in a few other States****Table-8.14: Discrepancy of data in States**

| Sl. No. | State | Details of discrepancy |
|---------|----------------|--|
| 1. | Gujarat | <ul style="list-style-type: none"> ➤ Two maternal deaths took place at PHC, Hadiyol during 2015-16. However, HMIS showed no such data. ➤ Number of infant deaths during 2015-16 was 23, 1, 17 and 56 at PHC, Hadiyol, Jaswantgadh, Nava Revas and Nadiad respectively. HMIS showed no such data. |
| 2. | Madhya Pradesh | <ul style="list-style-type: none"> ➤ Number of First Referral Units (FRUs) in HMIS ranged from 979 in 2011-12 to 3,082 in 2015-16, whereas only 148 FRUs were functional in 2015-16. ➤ As per HMIS, number of functional 24x7 PHCs in 2015-16 was 4,778, while only sixty-eight 24x7 PHCs were functional. ➤ As per HMIS, number of functional Sick New Born Care units (SNCUs) was 2,566 in 2015-16, whereas only 54 SNCUs were functioning in the State. ➤ SHS stated (August 2016) that data entry in the HMIS portal was carried out at field level where some of the operators did not take action on the error after data entry, hence wrong data was exhibited in the HMIS reports. |
| 3. | Manipur | <ul style="list-style-type: none"> ➤ As per Delivery Register of DH, Ukhrul, 361 deliveries were conducted during 2015-16. However, as per HMIS, 314 deliveries were reported. ➤ 4 and 3 C-Section deliveries were conducted in June and July 2015 at DH, Ukhrul however, HMIS showed five C-Section deliveries in June 2015 and none during July 2015. |
| 4. | Meghalaya | <ul style="list-style-type: none"> ➤ There was discrepancy in data on various data elements <i>e.g.</i> Total number of pregnant woman registered for ANC, number of pregnant woman registered under Janani Suraksha Yojana (JSY), number of pregnant woman who received Tetanus Toxoid1 (TT1) <i>etc.</i> during 2015-16 (Annexure-8.2). |
| 5. | Odisha | <ul style="list-style-type: none"> ➤ Data Discrepancy was noticed under various services <i>viz.</i>, ANC/PNC, number of deliveries, maternal/infant deaths <i>etc.</i> as per HMIS and as per records of the facility during 2015-16 (Annexure-8.3). |

8.4 Validation checks

For maintaining data accuracy, various validation checks had been incorporated in HMIS so that the user is highlighted with probable cases of

data issues at the time of data entry itself. Some examples of validation⁷ issues are given in the **Table-8.15** below:

Table-8.15: Details of validation issues in HMIS

| Sl. No. | Year | State | District | Number of issues ⁸ |
|---------|---------|----------------|-----------------|-------------------------------|
| 1. | 2011-12 | Bihar | Aurangabad | 54 |
| 2. | 2012-13 | Chhattisgarh | Bastar | 32 |
| 3. | 2013-14 | Meghalaya | East Garo Hills | 11 |
| 4. | 2014-15 | Madhya Pradesh | Tikamgarh | 45 |
| 5. | 2015-16 | Uttar Pradesh | Allahabad | 49 |

However, these issues had not been resolved. The Ministry stated that Probable Outliers and Validation Reports identify the probable cases where there might be a data discrepancy. However, the cases which get highlighted in the report may not be an error and could be actual performance for that particular state/UT.

Audit however observed that the data in HMIS inconsistent with the prescribed validation checks remained unresolved. Some examples are given in **Annexure-8.4**.

Thus the data reported in HMIS did not tally entirely with the data available in the records of health facilities. This indicates that the data was not verified at appropriate level before being uploaded on HMIS portal. The variations and mismatch in two sets of data indicates the need for institutionalizing a mechanism for reliable data capture and reporting.

The Ministry stated that more than 1.96 lakh facilities across country upload monthly performance data and annual infrastructure data on HMIS portal. On the basis of a small sample drawn from few districts (that too on random basis, which may not be proper representative of the National scenario), the judgment on reliability or lack of integrity cannot be drawn. Such a huge system is bound to have some challenges related to monitoring but on the basis of some pitfalls the integrity of the system should not be doubted. Further, during exit conference, Ministry stated that data from different sources viz. registers and HMIS have variations as data entry is a cause of concern everywhere.

⁷ In HMIS, validation report discrepancy is highlighted on the basis of certain pre-defined rules and logic.

⁸ As per the standard report viz. "Outlier and Validation issues" on HMIS portal
[Performance Audit of Reproductive and Child Health under National Rural Health Mission](#)

The reply of the Ministry is not tenable as samples are selected on a scientific basis and inferences based on them, to a large extent, represent the entire population.

8.5 Computerisation and networking

NRHM envisaged accountability through computer based HMIS. A robust information system which could provide accurate, up to date and timely information was needed at every level. Accordingly, network facility was required at the ground level to transmit data. It was, however, observed that there was no adequate computerization, networking and human resources in the selected facilities. As a result, the facilities had to upload the reports on HMIS portal from the district headquarters or the nearest internet accessible area. This resulted in delayed availability or non-availability of data. State wise observations are given in **Annexure-8.5**.

These observations were also supported by the facility survey conducted in 134 DHs, 300 CHCs and 514 PHCs as detailed in **Table 8.16** below:

Table-8.16: DHs, CHCs and PHCs

| Sl. No. | Facility | Per cent of selected health facilities where the facility was not available | | |
|---------|---------------------|---|------|------|
| | | DHs | CHCs | PHCs |
| 1. | Computer | 2 | 8 | 54 |
| 2. | Internet connection | 13 | 12 | 64 |
| 3. | Data Entry Operator | 18 | 35 | 76 |

8.6 Non-maintenance of records

Proper maintenance of records at the health facility was necessary for assessing the health situation in the area. IPHS 2012 envisaged maintenance of 12 registers⁹ across all health facilities. These registers are primary records and help in taking corrective actions for improvement of the healthcare facilities. Hence, these records are required to be maintained and preserved.

⁹ Eligible Couple Register (including contraception), (2) Maternal and Child Health Register (a. Antenatal, intra-natal, postnatal b. Under-five register: i. Immunization ii. Growth monitoring c. Above Five Child immunization d. Number of HIV/STI screening and referral), (3) Births and Deaths Register, (4) Drug Register, (5) Equipment, Furniture and other Accessory Register, (6) Communicable diseases/Epidemic Register/Register for Syndromic Surveillance, (7) Passive Surveillance Register for malaria cases, (8) Register for records pertaining to Janani Suraksha Yojana, (9) Register for maintenance of accounts including untied funds, (10) Register for water quality and sanitation, (11) Minor Ailments Register, (12) Records/Registers as per various National Health Programme guidelines (National Leprosy Eradication Programme, Revised National TB Control Programme, National Vector Borne Disease Control Programme, etc.)

It was observed that the required registers/records were not maintained or were incomplete in the selected health facilities. This also calls into question the integrity of data reported by the facilities in the HMIS. State wise details on non-maintenance of registers/records are given in **Annexure-8.6**.

PART-B

Data analysis of HMIS database provided by the Ministry

8.7 HMIS data-dump

The Ministry furnished data-dump of HMIS for service delivery for 2012-16 in August 2016 and for 2011-12 in September 2016 with the certificate that ‘the data dump shared by the Ministry for 2011-12 to 2015-16 was complete and consistent across all the financial years’. However, Audit observed that the data for 2015-16 were not available for five States/UT (**Andaman and Nicobar Islands, Andhra Pradesh, Odisha, Puducherry and Telangana**), in the Table¹⁰ analysed. In addition, the data-dump on infrastructure was missing for the period 2011-12 to 2015-2016 which was subsequently provided in February 2017. Audit analysed HMIS database for the period 2011-2016 by using Computer Assisted Audit Techniques (CAATs). Audit also compared the data provided by the Ministry with the data of facility survey conducted during Audit.

8.8 Service delivery data

The Service delivery data contains, inter alia, data on various RCH interventions viz. ANC, immunization, administration of IFA tablets etc. Comparative analysis between the data derived from HMIS database¹⁰ and similar data collected during field audit revealed substantial variations (from -911 per cent to 100 per cent) for the 11 major/significant selected RCH indicators/parameters on either side (positive as well as negative) across the years (2011-2016) countrywide (**Annexure-8.7**). Only in a few cases did the figures for both the datasets matched.

Ministry replied (December 2016) that in the district consolidated table (which was used for data analysis by audit), information of all health facilities for a particular district may not be there, as some facilities might not have started reporting in that year or the “Compile” button was not pressed to incorporate the same in the district consolidated table. Hence, the Ministry’s reply implied that the data in the District Consolidated transaction table may be under-reported. The reply of the Ministry is not tenable as the comparison of the

¹⁰ District Consolidated Table (MISCONSOLIDATED_LIVE_TRN_RAW_DATA)
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data derived from the district level table in HMIS with the data collected by the States shows substantial number of instances of over-reporting also.

The Ministry also stated that the data dump provided to audit was raw data and a process/algorithm/program/application/software is run on this data dump to generate the reports which are used by the Ministry for decision making and for use by all the stakeholders. In response, audit requisitioned (December 2016) the data tables which were being used for preparation of standard reports/decision making. The Ministry provided (February 2017) a fresh data-dump with a disclaimer that “Standard Report may not match with the summary of data-dump provided because of ongoing essential activities in HMIS such as migration, upgradation of facilities, Blocks etc. as requested by States/UTs”. Thus, the data dump that was later provided by the Ministry could not be compared with the standards reports of the Ministry.

Analysis of the earlier data dump by Audit revealed instances of missing data, as mentioned earlier, even though the data dump was provided by the Ministry along with a certificate stating the said data dump was complete. The Ministry attributed this deficiency to “inadvertent error”.

8.8.1 Outliers: abnormal variations

In order to check internal data inconsistencies, common validation rules as envisaged in HMIS were referred to. Data analysis revealed that for some major RCH parameters, the achievement shown was more than hundred *per cent* in a number of instances, which was beyond normal range such as number of pregnant women who availed the benefit of ANC, immunisation, JSY etc. was more than the pregnant women registered etc., as detailed in (**Annexure-8.8**).

These instances relate to HMIS data for 2011-2016, the data for which had already been frozen by the Ministry except for 2015-16. It implies that the Ministry did not take any remedial steps to address the data discrepancies which may result in incorrect MIS reports being generated through the system.

8.8.2 Blank fields in data

Twelve test checked fields of District Consolidated Transaction Table (2011-2016), contained ‘Blank fields’ as given in **Table 8.17** below:

Table-8.17: Cases of blank fields in HMIS database

| Sl. No. | Indicators | Blank fields (Out of 37,850) |
|---------|--|------------------------------|
| 1. | Total number of pregnant women Registered for ANC | 54 |
| 2. | Number of pregnant women received 3 ANC check-ups during pregnancy | 59 |
| 3. | Deliveries conducted at Private Institutions (Including C-Sections) | 10,871 |
| 4. | Deliveries conducted at Public Institutions (Including C-Sections) | 164 |
| 5. | Number of ASHAs paid JSY Incentive for deliveries conducted at accredited Private Institutions | 16,164 |
| 6. | Number of ASHAs paid JSY Incentive for deliveries conducted at Public Institutions | 585 |
| 7. | Number of female live births | 137 |
| 8. | Number of male live births | 137 |
| 9. | Total number of male and female live births | 29 |
| 10. | Number of Pregnant women registered under JSY | 230 |
| 11. | Total number of pregnant women given 100 IFA tablets | 101 |

Presence of major 'Blank fields' in important fields viz. 'Deliveries conducted at Private Institutions' and 'Number of ASHAs paid JSY Incentive for deliveries conducted at accredited Private Institutions' of service deliveries renders the Ministry's key Management Information System unreliable.

8.9 Human and physical infrastructure

The database of Human and physical infrastructure contains data on availability of manpower and physical infrastructure viz. building, electricity, water, doctors, paramedical staff etc. at health facilities. Findings of data analysis on the same have been discussed below:-

8.9.1 Reporting status of health facilities

All the health facilities (DH, SDH, CHC, PHC and SC) have to report data inputs in the HMIS database. Audit noticed that 14 to 64 per cent of the health facilities were not reporting infrastructure data on HMIS for 2015-16 as given in **Table-8.18** below:

Table-8.18: Reporting status of health facilities

| Sl. No. | Name of facility | Total number of facilities | | | Facilities not Reporting | | | Facilities not reporting (per cent) | | |
|---------|------------------|----------------------------|--------------|-----------------|--------------------------|--------------|---------------|-------------------------------------|-----------|-----------|
| | | Public | Private | Total | Public | Private | Total | Public | Private | Overall |
| 1. | DH | 1,092 | 175 | 1,267 | 348 | 161 | 509 | 32 | 92 | 40 |
| 2. | SDH | 1,745 | 1,105 | 2,850 | 797 | 1,031 | 1,828 | 46 | 93 | 64 |
| 3. | CHC | 6,550 | 5,135 | 11,685 | 1,224 | 4,816 | 6,040 | 19 | 94 | 52 |
| 4. | PHC | 33,379 | 496 | 33,875 | 7,266 | 355 | 7,621 | 22 | 72 | 22 |
| 5. | SC | 1,75,816 | 280 | 1,76,096 | 24,492 | 195 | 24,687 | 14 | 70 | 14 |
| | Total | 2,18,582 | 7,191 | 2,25,773 | 34,127 | 6,558 | 40,685 | 16 | 91 | 18 |

Thus, due to non-reporting by substantial number of health facilities, the MIS reports failed to present a comprehensive picture.

8.9.2 Incomplete reporting

The details of count of total entries to be filled and count of blank fields during 2015-16 are given in **Table-8.19** below:-

Table-8.19: Details of blank fields

| Sl. No. | Details | DH | SDH | CHC | PHC | SC |
|---------|---|----------|----------|-----------|-----------|-------------|
| 1. | Total number of data field | 2,71,955 | 3,06,627 | 16,07,139 | 48,94,659 | 1,34,38,379 |
| 2. | Number of data field left blank | 32,545 | 32,204 | 1,84,939 | 4,53,915 | 11,15,211 |
| 3. | Percentage of number of blank field to total number of data field | 12 | 11 | 12 | 9 | 8 |

It is evident from the above table that 8 to 12 *per cent* of data field were not filled up by various health facilities making the data reporting under MIS reports unreliable.

8.9.3 Unrealistic data on men-in-position

(i) Community Health Centre

IPHS provides for deployment of one Obstetrician/Gynaecologist, Paediatrician, Physician and General Surgeon each at CHC. Audit noticed that the men-in-position was abnormally high in 462 cases in 370 CHCs during 2015-16, as given in **Table-8.20** below:

Table-8.20: Discrepancy in data of Personnel

| Sl. No. | Category of Personnel | Number of Personnel in position shown in database | | | |
|--------------------|--------------------------------|---|---------|--------------|------------|
| | | 2 to 4 | 5 to 10 | More than 10 | Total |
| 1. | General Surgeon | 84 | 11 | - | 95 |
| 2. | Obstetrician/ Gynaecologist | 130 | 5 | 1 | 136 |
| 3. | Paediatrician | 57 | - | - | 57 |
| 4. | Physician | 155 | 19 | - | 174 |
| Grand total | | | | | 462 |

Audit further analysed that out of these 370 CHCs, 16 cases in 15 CHCs pertained to sampled CHCs. The comparison of men-in-position of 16 test checked cases revealed that in only one case, HMIS data matched with the records of the health facilities.

(ii) Primary Health Centre

IPHS provides for deployment of one medical officer for type A and two for type B, one Laboratory Technician and one Pharmacist each for PHC. Audit noticed that the men-in-position was abnormally high in 2,732 cases in 2,038 PHCs, during 2015-16, as given in **Table-8.21** below:

Table-8.21: Discrepancy in data of Personnel

| Sl. No. | Category of Personnel | Number of Personnel in position shown in database | | | |
|--------------------|-----------------------|---|---------|--------------|--------------|
| | | 2 to 4 | 5 to 10 | More than 10 | Total |
| 1. | Medical Officer | 855 ¹¹ | 247 | 11 | 1,113 |
| 2. | Pharmacist | 990 | 37 | 6 | 1,033 |
| 3. | Laboratory Technician | 574 | 11 | 1 | 586 |
| Grand Total | | | | | 2,732 |

Audit further analysed that out of these 2,038 PHCs, 70 cases in 55 PHCs pertained to sampled PHCs. The comparison of men-in-position of 70 test checked cases revealed that only in 24 cases, HMIS data matched with the records of the health facilities.

(iii) Sub-Centre

IPHS provides for deployment of one female health worker for Type-A and two for Type-B, and one male health worker at each sub-Centre. Data analysis of HMIS revealed that 1,238 and 840 SCs respectively reported abnormally higher number of health worker (both female/male) in position against the provision during 2015-16 as given in **Table-8.22** and **Table-8.23** below:

Table-8.22: Discrepancy in data of female health workers

| Sl. No. | Number of Female Health workers in position shown in database | Number of SCs | State (Number of SCs) |
|---------|---|---------------|---|
| 1. | 3 to 10 | 1,123 | Assam (77), Haryana (174), Jharkhand(160), Madhya Pradesh (77), Rajasthan (89), Uttar Pradesh (160) and 26 other States (386). |
| 2. | 11 to 20 | 20 | Andhra Pradesh (3), Arunachal Pradesh (1), Bihar (1), Delhi (2), Haryana (1), Karnataka (2), Rajasthan (1), Tamil Nadu (2) and Uttar Pradesh (7). |
| 3. | 21-25 | 35 | Andhra Pradesh (1), Bihar (1), Chhattisgarh (1), Delhi (2), Madhya Pradesh (1), Puducherry (1), Punjab (2) and Uttar Pradesh (26). |
| 4. | 26 | 21 | Uttar Pradesh (21) |

¹¹ Since IPHS provide for at most two Medical Officers, the figure depicts number of PHCs having three to four Medical Officers.

| Sl. No. | Number of Female Health workers in position shown in database | Number of SCs | State (Number of SCs) |
|--------------|---|---------------|-----------------------------------|
| 5. | 38 | 1 | Nagaland (1) |
| 6. | 54 | 36 | Kerala (2) and Uttar Pradesh (34) |
| 7. | 222 | 1 | Jammu & Kashmir (1) |
| 8. | 259 | 1 | Uttar Pradesh (1) |
| Total | | 1,238 | |

Audit further analysed that out of these 1,238 PHCs, 13 SCs pertain to sampled SCs. The comparison of men-in-position of 13 test checked SCs revealed that only in three cases, HMIS data matched with the records of the health facilities.

Table-8.23: Discrepancy in data of male health workers

| Sl. No. | Number of Male Health workers in position shown in database | Number of SCs | State (Number of SCs) |
|--------------|---|---------------|---|
| 1. | 2 to 10 | 769 | Assam (63), Jammu and Kashmir (131), Meghalaya (32), Odisha (37), Tamil Nadu (34), Tripura (50), Uttar Pradesh (143), West Bengal (30) and 20 other States (249). |
| 2. | 11 to 14 | 29 | Gujarat (1), Jammu and Kashmir (1), Kerala (1), Maharashtra (3), Tamil Nadu (2) and Uttar Pradesh (21). |
| 3. | 54 | 3 | Andhra Pradesh (1), Kerala (1) and Telangana (1) |
| 4. | 100 | 34 | Uttar Pradesh (34) |
| 5. | 111 | 1 | Jammu & Kashmir (1) |
| 6. | 114 | 1 | Tripura (1) |
| 7. | 154 | 3 | Kerala (1) and Tamil Nadu(2) |
| Total | | 840 | |

Audit further analysed that out of these 840 SCs, 14 SCs pertain to sampled SCs. The comparison of men-in-position of 14 test checked SCs revealed that only in three cases, HMIS data matched with the records of the health facilities.

The unrealistic data on availability of human resources at different levels of health facilities reflected inadequate monitoring of data entry.

8.9.4 Comparison of HMIS data and survey sheet

Comparison of data for availability of various infrastructure facilities in CHCs, PHCs and SCs as per HMIS for 2015-16 and the data collected during the survey conducted by Audit revealed mismatch of figures, as given in **Table-8.24, Table-8.25 and Table-8.26** below:

Table-8.24: Community Health Centre

| Sl. No. | Type of Service | Total Number of CHCs | Number of CHCs where the service was not available as per | |
|---------|------------------------------------|----------------------|---|--------|
| | | | HMIS | Survey |
| 1. | Blood storage facility | 227 | 186 | 184 |
| 2. | New-born care | 227 | 25 | 29 |
| 3. | Personal computer | 222 | 21 | 14 |
| 4. | Referral transport service | 227 | 14 | 22 |
| 5. | Separate wards for male and female | 224 | 28 | 44 |
| 6. | X-ray facility | 224 | 82 | 76 |

Table-8.25: Primary Health Centre

| Sl. No. | Type of Service | Total Number of PHCs | Number of PHCs where the service was not available as per | |
|---------|------------------------------------|----------------------|---|--------|
| | | | HMIS | Survey |
| 1. | Ante natal care | 471 | 41 | 69 |
| 2. | New-born care | 471 | 153 | 220 |
| 3. | Operation theatre | 458 | 271 | 284 |
| 4. | Personal Computer | 457 | 199 | 196 |
| 5. | Separate wards for male and female | 458 | 236 | 292 |

Table-8.26: Sub-Centres

| Sl. No. | Type of Service | Total number of SCs | Number of SCs where the service was not available as per | |
|---------|-----------------------------------|---------------------|--|--------|
| | | | HMIS | Survey |
| 1. | Ante Natal Care | 1,371 | 50 | 61 |
| 2. | Child care including immunization | 1,371 | 51 | 52 |

It is evident from the above tables that the data of HMIS was not consistent with the results of the survey conducted by Audit.

The Ministry stated that strengthening of HMIS is an ongoing process due to inclusion of new data items as per requirement of NHM and other programmes of the Ministry. Moreover, it is the only portal which is having access to all public health facilities and provides facility wise information of about 1.96 lakh facilities. The system is bound to have some issues related to lack of registers, incomplete reporting etc. at some places. Further, lack of computerization or integrated MIS in the facilities leads to human/typographical/manual compilation errors.

Conclusion:

The primary objective of HMIS i.e., continuous flow of quality information on inputs, outputs and outcome indicators for monitoring of objectives of NRHM remained only partially fulfilled. Inconsistent data, incomplete reporting and unrealistic values in HMIS are likely to influence the decision making. Non-

maintenance of basic records/data in the prescribed manner and absence of data verification system resulted in misreporting and discrepant data in HMIS. Deficient computerization and networking compounded the problem preventing timely and smooth flow of data.

Recommendations:

- The Ministry should formulate a clearly documented organizational structure with identified positions for data management responsibilities.
- A documented and structured training programme for the personnel involved in data recording, reporting, aggregation, verification and feeding should be put in place.
- Improve the reliability of data in HMIS by providing for proper validation controls at all levels.
- Evolve and implement a mechanism for verification of data before uploading on the HMIS.

New Delhi
Dated: 17 June 2017


(MUKESH PRASAD SINGH)
Director General of Audit
Central Expenditure

Countersigned

New Delhi
Dated: 21 June 2017


(SHASHI KANT SHARMA)
Comptroller and Auditor General of India

