

Understanding Level of Maternal and Child Health Indicators used in Health Management Information System among Peripheral Level Health Functionaries in Two Districts of India

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Abstract. Millennium Development Goal indicators in context of maternal and child health can be met with a robust Health Management Information System (HMIS) in India. To achieve this the web based HMIS was started in 2008 to capture public health data from health institutions across the country. Standard formats were prepared, rationalized and e-enabled in HMIS web portal, a change from the manual reporting. Further, it is necessary that staff involved in data collection and management be aware of the interpretations of different indicators used in HMIS format for its effective use. The current study was conducted in one district each of two states, to assess understanding of the health functionaries in the field regarding data collection and use of health indicators. The observations indicate that some indicators for maternal and child health in format of monthly reports, are difficult to comprehend by system, no norms for analysis and use of data, and incomplete switchover from use of old to new formats leading to duplication. Efforts needed to address these for optimum functioning.

Keywords. Health Management Information System; health indicators; data management.

1. Introduction

Millennium Development Goals in context of maternal and child health need to be achieved. It is not possible to do so without an appropriate reporting system. One of the broader agenda of the Health Programmes in India is enhancing evidence-based decision making through strengthening of health care systems by enhancing the capacity of health system to "use information for local action.". One of the core strategies for achieving this goals has been to strengthen capacities for data collection, assessment and review towards evidence based planning, monitoring and supervision.

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The Health Management Information System (HMIS) web was launched in October 2008 to enable capturing of public health data from both public and private institutions in rural and urban areas across the country. The portal is envisaged as a “Single Window” for all public health data, for the Ministry of Health and Family Welfare (1). Before the launch of the web portal, the NRHM physical performance formats were made comprehensive and states were advised to replace the old formats for each level namely District Hospital, Sub Divisional Hospital, Community Health Centre, Primary Health Centers and Sub Centre, and their equivalent health institutions (both public and private). Trainings were started for the new system for optimum functioning. The staff involved in data collection and management must be aware of meaning of different indicators in the new formats so that correct data can be generated for its effective use. Towards this, efforts taken to maintain quality need to be assessed regularly so that observed deficiencies may be timely addressed. This study was conducted to ascertain the understanding level of the functionaries, regarding data collection, analysis and interpretation to be used for decision-making below district.

2. Methodology

2.1 Study Design and Study Area

This was an observational study to answer the research question “What is the understanding and use of data from HMIS by workers at the periphery?”

2.2 Sampling

Two states, near the capital city of New Delhi were taken up for the study keeping in view that the HMIS implementation was being uniformly implemented across the states.

The two states near New Delhi were selected for study sample purposely. Next one district and then one block from each state were selected randomly for the study.

2.3 Study Population

All officials and staff in the selected block until the sub-centre, who were involved in collecting, compiling, reporting and assessing the performance, were part of the study. At the district level, the study population consisted of the health functionaries involved in monitoring, supervision, collecting and compiling reports, and submitting them to higher authorities.

This study population included the health officials namely at district level, the Chief medical officer (CMO), Deputy CMO (immunization), and data managers. At the Community Health Centre and the Primary Health Centre, the senior medical officer, Medical officers-in-charge of PHCs, investigator-cum-computers (ICC) and data entry

operator were the key informants for the study. Additionally from the sub centre level the multipurpose worker (female) was part of study population.

2.4 Study Tools and Techniques

Table 1. Study population and technique used for data collection

Health Functionary	Study technique	Number
Chief Medical Officers/ Deputy CMO	in-depth interviews	6 (3 from each district)
Medical Officers	FGDs	4 (2 in each district)
Investigator-Cum-Computer/Data manager	in-depth interviews	10 (5 from each district)
ANMs	in-depth interviews	30 (15 from each district)

The tools were in-depth interview schedules partially structured with questions that were open ended. Voice recorder was used for focus group discussions, Records and reports were scrutinized to get details of problems encountered in data management.

At district level one Chief Medical Officer (CMO), and two deputy CMOs, (from each district) were interviewed to learn about their experiences on functioning of HMIS system in their districts. In-depth interview schedules were pretested in the field before final data collection. Two focus group discussions were conducted with Medical Officers posted at PHCs were done to understand the issues related to data flow, their perception on data use for programme planning and interpretation by the data handlers and field workers. The data manager/Investigator-Cum-Computer at district levels and Data Entry Operators at CHC level were interviewed to elicit information regarding data handling, transmission and time taken for all the formats In-depth interviews were conducted at sub centre level with 15 multipurpose workers (female) in each district regarding their socio-demographic status duration of service, method of maintaining data registers, understanding of maternal and health indicators and problems faced in generating data from field.

2.5 Ethical Clearance

The ethical committee of the National Institute of Health and Family Welfare New Delhi cleared the study proposal. During data collection, all respondents were explained the purpose of study and a written consent taken before the interviews. Confidentiality of records and data collected were maintained by the investigators.

2.6 Data Collection

The authorities in the states were informed about the study. Primary data was collected using in-depth interview schedules at various levels. In depth, interview schedules were pretested in the field before final data collection. Separate schedules were used for

Chief/Deputy Medical Officers and other medical officers, female workers, and data handlers. Besides four focus group discussions of medical officers were conducted (8-10 participants in each FGD). The focus group discussions were voice recorded with the prior consent of the study population. The understanding level of indicators related to maternal and child health were ascertained. The records and reports were scrutinised to assess the quality and completeness of data and number of formats used for data compilation.

2.7 Analysis of Data

The voice recorded from focus group discussions were transcribed and translated. Domain analysis of the data was done by sorting the data under broad themes. Manual analysis was done to identify main themes or concepts within the data. The in-depth interviews were analysed to assess the knowledge, understanding and problems faced in implementation. The indicators were taken from the current HMIS web-based system in the country.

3. Results

Flow of Health Information from Periphery to District Level

The normal flow of data in reporting formats is from periphery to district following the bottom up approach. The Sub-centre (SC/HSC) reports to PHC, from there to CHC and from the CHC to Chief Medical Officer at the district. The District headquarter collates the data and sends to the State headquarter. Beginning with the female worker, she collects the data manually in hard copies. Previous formats were being used till CHC level in one of the districts. At PHC, the data from all sub centres under its purview is compiled in manual formats and sent to next level that is CHC. There the data entry operator feeds it into the computer using the HMIS format; from there it is e-mailed to the district. Though there is provision for web based data entry from SC onwards but entry was not being done on the web, below district due to lack of training. Given below is the current system of data flow from sub centre to district

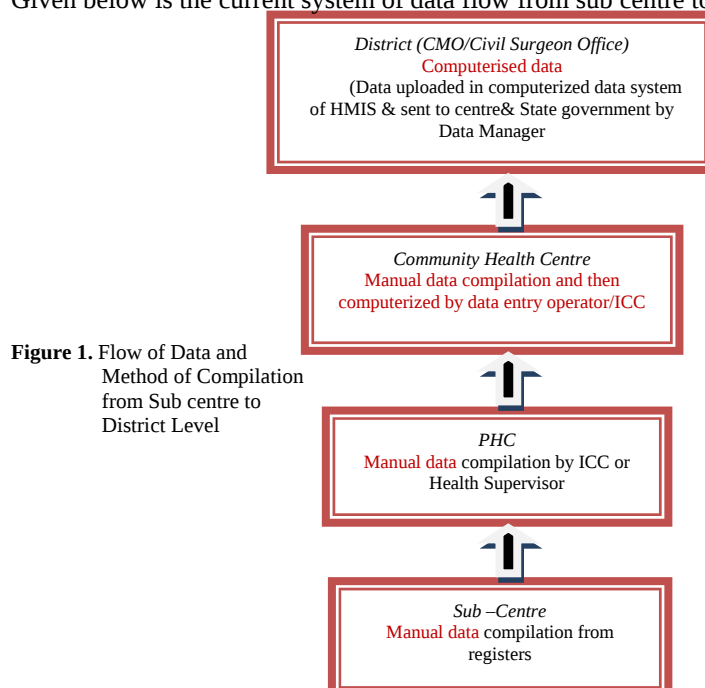


Figure 1. Flow of Data and Method of Compilation from Sub centre to District Level

3.1 Understanding of Material Health Indicators in HMIS

3.1.1 Antenatal care

A pregnant woman enters the health system when she gets herself registered for antenatal care (ANC). Registration in the first trimester gives an opportunity to the system to screen her for anemia, other health conditions and provide her the first dose of tetanus. It also increases the likelihood that the woman will choose to deliver in a hospital.. Registration of ANCs in the first trimester is also an indirect indicator of availability/access to services and awareness with health seeking behaviour of the pregnant women... Visits by the worker for antenatal care are an unique opportunity for early diagnosis and referral for treatment of problems like vaginal bleeding, pre-eclampsia/eclampsia, infection, abnormal fetal position after 36 weeks, abnormal fetal growth or movement, sexually transmitted infections malaria, and counseling the mother about nutrition and also for taking care of the baby in the postnatal period including birth weight and breastfeeding. Provision of iron folic acid tablets both for prophylaxis and as treatment of anemia are a part of antenatal care.

Given below are the indicators that are commonly misinterpreted by the workers:

- a) Indicator: ANC registration in first trimester (out of total ANCs registered.)

The original format for HMIS is in English. When the HMIS formats are filled in Hindi by the female workers after translation of the English HMIS format of Government of India. The meaning of the indicator changed to “pratham timahi me panjikaran”. The actual meaning of the indicator is ANC registration or number of pregnant women given antenatal care during 1st trimester. Different female workers understood it differently. . Some understood it as the number of antenatal mothers registered within first 3 months of the current year; others understood the indicator as the number of expectant women registered within 12 weeks of pregnancy.

- b) Indicator: Women who delivered in Hospital and paid JSY Incentive

The problem arose as the women delivered were counted in the month of delivery in the hospital records, but she was counted again; when the JSY incentive was paid latter, in another month resulting in double counting.

- c) Indicator--New women registered under Janani Surksha Yojna (JSY)

JSY is an incentive scheme for promoting institutional delivery. This varies from state to state in context of the “Inclusion criteria” for giving JSY incentive to the pregnant women. In one state that had weak demographic indicators and higher maternal and infant mortality rates (MMR and IMR), the indicator was to include all women coming for

delivery to the hospital. in the other state with better indicators for MMR and IMR it included women for JSY incentive amongst those who were below poverty line. (2).

- d) Indicator :Number of pregnant women given the booster dose of tetanus vaccine

There was variable understanding regarding information to be filled in HMIS formats for the booster dose of tetanus vaccine. The understanding by some that it can be given if the women came with next pregnancy within one year, while others gave it to women within 3 years of previous delivery.

- e) Indicator: Total number of pregnant women given 100 IFA Tablets.

As per the norm all pregnant women are to be given a minimum of 100 iron folic acid (IFA) tablets to prevent anemia. It should include total number of pregnant women who have received 100 days of IFA tablets @ one/day during the period of pregnancy. However, many a times the ANMs were reporting the total number of IFA tablets distributed instead of number of women receiving it, resulting in generation of wrong data.

- f) Indicator: Pregnant women with Hypertension

The worker should report number of new pregnant cases that have been detected with hypertension (i.e. Blood Pressure more than 140 systolic and more than 90 for diastolic) during the reporting month at the facility. However, this information was not reported from most of the sub-centres of the study area due to non-availability or none functioning of BP apparatus.

- g) Indicator: Pregnant women with Anemia

Number of ANC cases that have been tested and found with Hemoglobin (Hb%) less than 11 gm/dl during the reporting month at the facility should be filled as anemic.(2). However, there was confusion among female workers regarding the cut-off of hemoglobin for considering a pregnant woman anemic. Some female workers were taking less than 9 gmHb% as anemic leading to under-reporting of anemia cases.

3.1.2 Postnatal Care

- a) Indicator: Women receiving post natal care (PNC) within 48 hours after delivery

As per HMIS formats women receiving post partum check-up within 48 hours after delivery should include all those mothers given post natal care at home or hospital. But this was not been reported as such. Some were not reporting this at all because they were not using the standard format for reporting but older ones. Though the system was in place for

more than a year (until the time of data collection) still in one of the district older formats were still in use. The reason as explained by one of the data manager was that, “Since the older formats are discussed in all the meetings with senior officials, who prefer these older formats, we collect the data in older format only. The data from these formats is entered manually in the new HMIS web portal.”

3.2 Understanding of Child Health Indicators in HMIS

a) Indicator: Sex of the baby

The female workers were collecting the information in older reporting formats and submitting the same where there was no space for the sex of the baby. As a result this indicator about the sex of the baby was missed out in the final HMIS format, though it was an indicator there, Later during tracking the sex of the baby problem arose as the data was missing. .

b) Indicator: Birth Weight of Newborn Baby

Sometimes important parameters of child health such as the “birth weight” of the baby were not reported due to lack of understanding on the part of the female health worker regarding the importance of this parameter. So efforts were not made by her to procure a “weighing machine” if not available, or get a non-functioning equipment repaired, Hence this parameter was not filled in the form.

c) Indicator: Lack of understanding of guidelines on Stillbirth

There was lack of understanding of guidelines for reporting the stillbirth. Some female workers said that a fetus that died in uterus after 20 weeks would be reported as stillbirth, while others said that a fetus that died in uterus after 28 weeks should be reported as stillbirth, thereby leading to invalid data.

3.3 Other Problems Related to HMIS Reporting System

The understandings of the indicators were further compounded by certain other parameters such as those given below.

a) Confusion on cut-off date for reporting each Month

There was a fixed date of reporting at every level. However, there was no consensus among female workers regarding the cut-off date for reporting of data of a particular month. Some were taking it as the 25th of each month as told by the authorities as cut-off date. Others compiled all the data until the date of meeting on the 5th of next month.

b) Data not Reported due to Lack of Services

Sometimes data is not reported due to none functioning of certain equipments .e.g. BP apparatus for reporting BP of pregnant women, chemicals not available for Hb% estimation, weighing machine for taking weight of newborn baby. As a result, these important parameters regarding Mother and Child Health remained unreported in the HMIS format.

At times, however, due to non non-availability of Hemoglobin meter Hb estimation of pregnant woman was not done at sub centre level. Rather sometimes, cases identified by examination of eyes or nails were recorded, though it should not be done as per HMIS reporting instructions.

c) Lack of understanding of Technical terms.

Some female health workers and most of the data handlers at Primary Health Centres did not understand the technical terms used in HMIS formats properly. This led to wrong interpretation of data/information for example the terms “Eclampsia”- “Hypothermia” were misinterpreted many times by the workers and data entry operators.

d) HMIS format too lengthy

There was general opinion amongst the data managers, Investigator cum computer/data entry operators and Medical Officers that the HMIS format is too lengthy and difficult to fill especially by the female workers. During focus group discussion the medical officers said.

“HMIS Performa is too difficult for a 10th standard educated female worker posted at sub- centres to understand and fill the information correctly.”

e) Use of data

The CMO and Medical officers were of the opinion that the data was not of much use and they had lack of time to check it. One of the MO's remarked during FGD, *“We are already over-burdened and now do not ask us to verify the data filled by the workers or data entry operators.”*

4. Discussion

The Health Management Information System provides information to support planning, control functions of the managers, and help them in decision-making (3, 4). A study done in Haryana tells about over reporting of Reproductive and Child Health services coverage and operational problems in Health Management Information System at the Sub-Centre Level (5). The study findings are in concurrence with our study results that the health workers found the monthly HMIS report preparation, a difficult exercise and that the information collected is only used to prepare monthly reports as required by the system. Further as were observed in our study where the workers at the sub centre level found the format of monthly report too complex and difficult to be comprehend. They

also mentioned the whole process of data collection and reporting to be very time consuming.

The report of the second Common Review Mission pointed out that in most of the states the management of available data, its analysis validity and reliability of the data was wanting in quality (6). The two common reasons for this are as reported by them was; the system is not geared to analyze and display data at the peripheral level. The other reasons emphasized were frequent changes in recording formats and multiplicity in data reporting (6). The same findings were reflected in our study where the health workers at grass root level mentioned that they have to fill same information repeatedly in multiple reported formats due to system requirements.

The study on HMIS in Tanzania states about the poor implementation of MIS system (7). The findings given are that 95% respondents recommended training of health care providers in order to improve HMIS. Almost a quarter (23%) of respondents recommended for improved supervision and increased staffing levels at the facility level. Only 19% recommended for revision and simplification of the HMIS to be more user-friendly. The respondent from the district authority reported that the process of health data in the current HMIS was long and difficult, with many booklets and forms with some repeating information. Poor knowledge on HMIS among health workers was linked to lack of training on the system and workload pressure. In view of these gaps, the system was recommended for revision (8). Same findings were reported in our study. The impact of such poor compliance in this system is worrisome and suggests that vital public health decisions are made based on crude district data. .

Our study also shows that the complete switching to new HMIS has not taken place as older formats were still in use in one of the study district, though the new system was in place for more than a year. Discussion of data filled in older formats in various policies/programme level meeting was one of the prime reasons for their continued use. Similar finding of use of older formats along with new was observed in a study done in Zanzibar where some district officers wanted family planning reports separately in older formats from the periphery (9).

Another study from Tanzania and Mozambique show incompleteness and poor use of health data collected at a health facility. We agree with the reasons as poor knowledge on HMIS; inadequate financial, human and technological resource capacity; lack of user-friendly systems; lack of coordination and evaluation, as well as inadequate policies to manage the sustainability of the system (7,10. 11). An intervention study by All India Institute of Medical Sciences (12) involving PHC for computerization of record keeping, the Health workers acknowledged the usefulness of HMIS in data storage and generation of reports. The major advantage of computerization has been in saving of time of health workers in record keeping and report generation.

5. Conclusion and Recommendations

There are numerous operational problems that need to be addressed to be able to get good quality validated data, such as multiplicity of formats, manual entry, record

keeping, lack of skills of data handlers and lack understanding of indicators on part of workers. The key challenge in present Health Management Information System is that, the various stakeholders do not perceive the data and management information reports useful; rather, it is seen as just another reporting requirement and not as a tool for identifying areas for corrective action or for strengthening the programme.

Based on the study findings, the following suggestions are being made for strengthening the management information system so that it can support the Maternal and Child Health programme in the district in a more practical and user- friendly manner:

- I. The data collection and reporting formats should be standardized and universal to all health units in the districts and these should not be changed frequently, as is the practice now. The number of formats should be reduced by taking the Ministry of Health's format as the base and adding to it any additional data needed to avoid duplication. Redundant data should be dropped from the formats for collection.
- II. Use of computers for HMIS may be encouraged at PHC and the sub-centre level training in data entry can be given to female health workers.
- III. There is a strong need for sensitization of CMO to facilitate programmatic processes, MO's for action and training of data entry operators and female health workers for understanding of technical terms/indicators used in HMIS formats. Feedback to the grass-root level workers is needed for them to take appropriate action.
- IV. Provision and maintenance of equipments like weighing machine, instrument for Hb% estimation and BP apparatus at all the sub-centres/PHCs level, should be there to ensure that data is generated on important MCH parameters and also to motivate the workers who feel appreciated by the community when they provide the services. Non-functional instruments should not act as a deterrent.

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