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PUBLIC PRIVATE PARTNERSHIP (PPP) APPROACH IN STRENGTHENING HEALTH SERVICES IN BIHAR THROUGH HEALTH MANAGEMENT INFORMATION SYSTEM (HMIS)

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Abstract. PPP is a relationship between Government and private sector agency for the purpose of completing a project that serves the public at large. It can be used to finance, build and operate. Now the PPP model has been adopted in almost all the sectors including public health. PPP model in HMIS has been experimented in the state of Bihar. Efficient HMIS is an integral component to effective and responsive Public Health System. Realizing its importance, State Health Society, Govt. of Bihar has launched HMIS in 2008. Later UNFPA has also agreed to provide support to SHSB through IIHMR, Jaipur. The project was initially launched for two years which was further extended for more than two years. IIHMR has to provide support in improving the completeness and quality of HMIS data mainly through capacity building of the concerned health staffs, providing feedback on the data generated through HMIS and constant handholding of field staffs for standard HMIS practices. The role of the government was to provide the leadership, funding to training and facilitation in smooth conduct of training. The role of UNFPA is to provide technical support and fund the project team including salary, field movement and setting-up the offices at state and nine divisions. As a result of the intervention, the completeness of reporting format increased from 36 to 90 percent for the period of Jan, 2010 to Mar 2014. Error in data also decreased significantly. It also encouraged conducting the review and monitoring of the health programs at all the levels i.e., state, division, district and block PHCs. The present PPP model was successfully implemented and the overall goal of the project was also achieved. The strengthening of HMIS directly and indirectly helped in improving the health services in Bihar.

Keywords: Public Private Partnership (PPP), Health Management Information System (HMIS), Public Health, Data Quality.

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1. Introduction

Public Private Partnership (PPP) involves a contract between a public sector authority and a private party, in which the private party provides a public service and assumes substantial financial, technical and operational risk in the project. In some types of PPP, the cost of using the service is borne exclusively by the users and not by the taxpayers. In other types, capital investment is made by the private sector on the basis of a contract with government to provide services and the cost of providing the service is borne wholly or in part by the government. Government contributions to a PPP may also be in kind. In projects that are aimed at creating public goods like infrastructure, the government may provide a capital subsidy in the form of a one-time grant, so as to make it more attractive to the private investors. PPP usually enables the public sector to harness the expertise of the private sector and also the public sector body seeking to make a capital investment does not incur any borrowing.

National PPP Policy 2011, Govt. of India has defined PPP as: an arrangement between a government/statutory entity/government owned entity on one side and a private sector entity on the other, for the provision of public assets and/or public services, through investments being made and/or management being undertaken by the private sector entity, for a specified period of time, where there is a well-defined allocation of risk between the private sector and the public entity and the private entity receives performance linked payments that conform to specified and pre-determined performance standards, measurable by the public entity or its representative. Public services are those services that the State is obligated to provide to its citizens.

Thus, PPPs provide governments with alternative methods of financing, infrastructure development and/or service delivery. Now the Government has been undertaking PPP in almost all the sectors including health sector. Several such PPP models of health care have been achieved successfully. Various definitions have been framed for PPP in health depending on the desired relationship and the characteristics of the respective sectors. In healthcare, the PPP approach can be applied to a wide range of healthcare system needs such as construction of facilities, provision of medical equipment or supplies or delivery of healthcare services across the spectrum of health care, monitoring of health programs and providing technical inputs, etc. (http://globalhealthsciences.ucsf.edu/global-health-group/private-sector-healthcare-initiative).

Government has a fundamental responsibility to set the rules of engagement. It should provide private sectors with overall policy direction, define clear roles for government and private sectors, and help develop a predictable and transparent environment within which

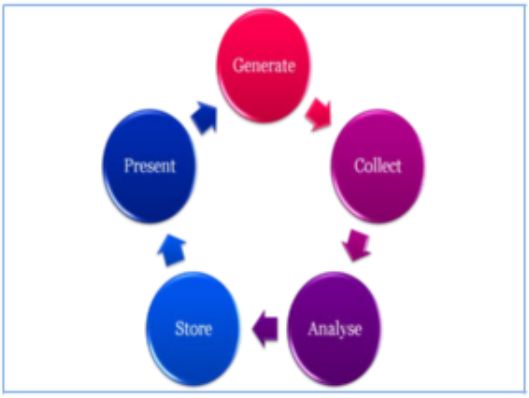
private sector actors can operate. Separating operational and management responsibility from policymaking and regulation is important for better accountability. Private sector participation help consolidate this separation by reducing the influence of government in day-to-day operations (Patel, et.al, 2007). Governments in many developing countries acknowledge facing difficulties in their attempt to meet the basic health needs. They rely on contracting out to NGOs and for-profit organizations as a strategy to meet the needs of underserved populations. The issue of PPP in health is really one of institutional design. As such, it goes beyond details of contract parameters, or specific inputs or expertise that are contributed by different parties (Singh, 2011).

A successful model of PPP is illustrated in Singapore Health Care which has attained high standards in health care provision while successfully transferring a substantial portion of health care burden to the private sector. Governments around the world are realizing that while publicly financed, universal health care is undoubtedly humane, it can be an enormous drain on national resources and extremely difficult to sustain in the long run. At the same time, no government has been reckless enough to abandon health care entirely to free market forces. Invariably, therefore, a public-private mix of funding mechanisms exists in most countries (Lim, 2004). Private sector alone cannot effectively fulfill certain roles in health care services. In particular, large scale public health issues, or any aspects of health care that involve significant externalities and ethical concerns of public intervention. The evidence suggests that access and quality concerns can be met by effective public sector regulation and incentive provision with private sector delivery (http:pppinharyana.gov.in/ppp/sector/health/report-healthcare.pdf).

Present study is descriptive in nature and based on primary data taken from reports of HMIS project of IIHMR. This paper is also substantiated through secondary sources such as documents and reports from National Rural Health Mission (NRHM), MoHFW, State Health Society Bihar, NHSRC, data from the DHIS-2 web portal. The aim of the paper is to illustrate the PPP model in strengthening HMIS in Bihar which is being successfully implemented by all the three project partners i.e., SHSB (Govt. of Bihar), UNFPA and IIHMR, Jaipur (Pvt.). The specific objectives of this paper are: to elucidate the PPP model in strengthening HMIS in Bihar with special emphasis on the processes; and to see the impact of project on the completeness and quality of data and related aspects.

2. **HMIS in Bihar**

HMIS is not a new concept but an improved and user-friendly programme geared towards use of health information for planning and action. It is a process of collection, compilation, reporting, analysis and finally use of information for the purpose of management and



problem solving of healthcare services. Proper HMIS thus can contribute significantly to improve the health programs performance. It helps in bringing various data elements of a program together and manages them better. The health data and information are valuable only if they are used to inform the decision-making processes. Interventions that increase the local demand for information and facilitate its use enhances evidence-based decision making and helps to make the health system more effective. The role of HMIS is very important not only for the program monitoring and evaluation but also for the policy formulation and program planning. Thus, HMIS has been envisaged to not only help the administrators to have better monitoring and control of the functioning of hospitals across the state using decision support indicators but also assist the doctors and medical staffs to improve health services with readily reference patient data, and parameterized alarms and triggers during patient treatment course. It enables monitoring pre-defined health indicators and the embedded exception reporting facilitates decision making by the hospital management and state level administrators for policy and strategic decisions (Kandhar and Singh, 2008).

MoHFW, Govt. of India has launched NRHM to ensure necessary architectural corrections in the basic health care delivery system. The plan of action includes: increasing public expenditure on health, reducing regional imbalances, optimization of health manpower, community participation and ownership of assets, etc. These interventions have increased the demand for data on health for use in both micro-level planning and program implementation. At the same time, understanding the synergy between availability of services, expenditure and pattern of utilization among various sections of population, are important aspects that influence decision making. A continuous flow of good quality information on inputs, outputs and outcome indicators facilitates monitoring the objectives of NRHM. For reasons such as these efficient HMIS is required (HMIS Service Manual, 2011).

HMIS was formally launched in Bihar in Oct, 2008 by the Government of Bihar to receive un-interrupted health related information from different facilities to the state mainly to monitor the implementation of health programs, use of HMIS data in planning the state and district annual plans and assessment. The following figure illustrates the flow of information under HMIS.

It may be seen from Fig.1 that the basic unit of public health facility is Health Sub-Center (HSC) where basic mother and child health services are being provided by the health workers (mainly ANMs). The services provided at HSC level is recorded in different registers, including Mother and Child Health Register or MCH Tracking Register. The information is transferred in NRHM Monthly Reporting Format and submitted to Primary Health Center (PHC) by 3rd day of following month. At PHC level, there is a HMIS cell which is responsible for collecting all the HSC, APHC and PHC service data and after checking, the report is uploaded on SHSB official web portal of DHIS-2 (District Health Information System-2) by 3rd day of the following month. The next level facility is District Program Management Unit at district where the data of all the facilities including PHCs, SDH and DH are compiled and checked for the outliers and uploaded on the DHIS-2 website by 10th day of the following month.

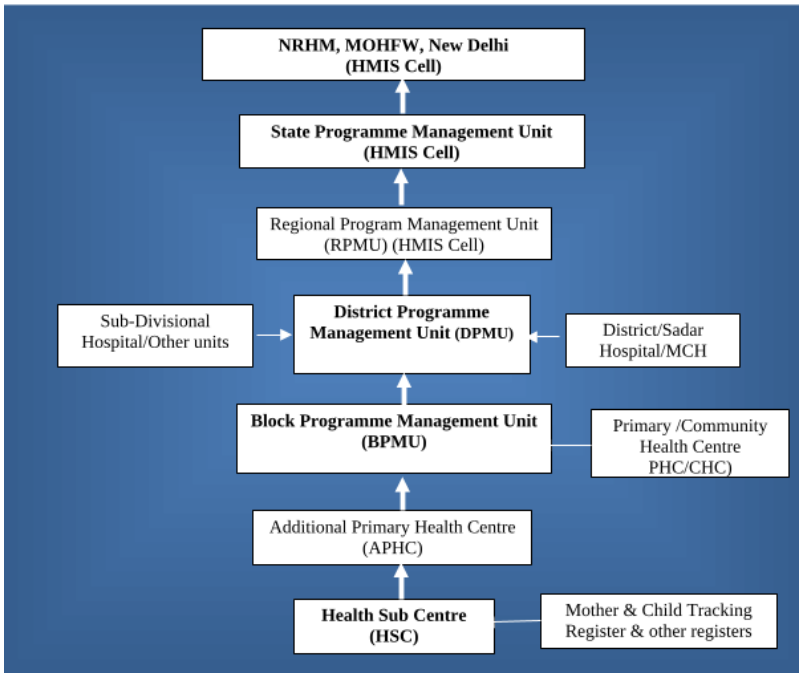


Figure 1. Flow of information under HMIS in the State (Source: State Health Society Bihar)

3. Parameters of HMIS

There are three important parameters for an efficient and robust HMIS i.e., timeliness, completeness and correctness of data. For better use of HMIS data, all these three components are important. Timeliness is the first essential parameter as timely reporting is crucial for making any valid decision. Table-1 shows different types of NRHM reporting formats, their level of use and timeline for submitting the reports in the state.

S.N.	Types of NRHM Reporting Format	Name of NRHM Reporting Format	Level of Use	Timeline of Reporting
1.	NRHM/HSC/3/M	For HSC and equivalent facilities	HSC	Monthly (3rd day of following month)
2.	NRHM/PHC/3/M	For PHC and equivalent facilities	PHC/ APHC	Monthly (3rd day of following month)
3.	NRHM/CHC/3/M	For CHC and equivalent facilities	CHC	Monthly (3rd day of following month)
4.	NRHM/SDH/3/M	For Sub-Divisional Hospital (SDH) or equivalent hospitals	SDH	Monthly (5th day of following month)
5.	NRHM/DH/3/M	For DH and equivalent hospitals	DH	Monthly (5th day of following month)
6.	NRHM/DHQ/3/M	For District	DHQ	Monthly (10th day of following month)

Table 1. NRHM Reporting Format for different level of facilities and their timeline

Data completeness is assessed as number of services reported in the monthly reporting format against total services available at the health facility. Reports are reflection of service provision and their utilization. Thus, an incomplete report will either indicate partial service delivery by the facilities or under utilization of services by the community and vice versa. It gives an idea of services provided to the beneficiaries and helpful in strengthening the health services at the concerned health facility. Correctness of data refers to the recording and reporting of valid data.

4. PPP Approach in Strengthening HMIS in Bihar

State Health Society Bihar (SHSB) is mainly responsible for implementing HMIS in the state under the overall guidance of the MoHFW, GoI. It has been realized after the launch of HMIS that flow of information from the field to the district and sate is regular and monthly uploading on web-based MIS portal is also being done by most of the facilities. However, completeness and quality of data remain a major challenge. Health staffs also lacked analytical skills to provide feedback on data and make proper use of it. For this,

UNFPA has proposed to provide support through Institute of Health Management Research (IIHMR). The main concern of UNFPA and IIHMR is to ensure the quality of data generated in the field and upgrade the skill of staffs on HMIS so that data may be used for improved service provision at the Government health facilities. In this backdrop, the project "strengthening of HMIS in Bihar" was launched initially for two years in 2009, which was further extended for more than two years in phased manner. The objectives were to train health functionaries at different levels of facilities (HSC, PHC, District, and State) so that they can oversee the quality of data generated at different levels, to facilitate use of data in planning, monitoring, and decision making and to establish a system of feedback.

This project is divided strategically into three main stages: *inception phase*- includes training need assessment, review of existing data, recording registers, and reporting formats, preparation of training plan, development of training materials, etc. The second stage was of *implementation*, which included training of health staffs, continuous follow-up and supportive supervision, start and facilitate monthly review meetings on HMIS at block and district levels, regular visits to facilities for periodic review meetings with concerned staffs for providing feedback on HMIS. The last stage was *project documentation and dissemination phase* to illustrate the detailed processes of the project, best practices and achievement of the project.

5. Stakeholders and their Roles and Responsibilities

A clear term of reference was charted out and the overall roles and responsibilities of all three parties i.e., SHSB (Govt), IIHMR (Pvt.) and UNFPA were fixed. The stakeholders carried out their responsibilities till the end of the project and the implementing partners withdrawn their support gradually only after establishing required set of procedures.

5.1. **Role of SHSB.** The main role of SHSB, Govt. of Bihar was to take the ownership and provide leadership and overall guidance to the project. It has funded the trainings and facilitated smooth conduct of trainings at all levels of health facilities. SHSB identified nodal officers at different levels for interface with the project team. It has also provided timely feedback on training plan and published training materials. It has ensured availability of selected trainers and trainees as per the schedule of training and provided for the traveling and daily allowances to the trainees. It has ensured all the training modules, registers and reporting formats at all the concerned health facilities. Later it has also supported in organizing regular review meetings and asses the project progress.

5.2. **Role of UNFPA.** The main role of UNFPA was designing the project activities with the Govt. of Bihar and implementing partner- IIHMR. It has also funded the cost of the

project team including their salary, field movement, establishing offices (state and regional level offices) and recurring cost. Beside this, UNFPA's country office has been guiding the project team periodically and providing continuous technical support to the project team and reviewing the progress of the project.

5.3. **Role of IIHMR.** IIHMR is the main implementing partner and responsible for the roll out of HMIS project in the entire state. Initially it has established project offices at the state and all nine divisional headquarters and recruited the project staffs. As implementing partner, IIHMR has to review the existing status and need of HMIS and to undertake the activities to strengthen the HMIS in the state through training and capacity building of the concerned health staffs, providing regular feedback on the data quality to the concerned officials, organizing regular review meetings based on HMIS data, etc.

6. Processes and Activities under the Project

Improving HMIS data quality is quite a difficult task and substantial improvement could not be achieved over a short period of time, for it is not only due to the lack of technical knowledge among health staffs and logistical mishandling, but it also concerns with the poor routine practices and the attitude towards the data management. People do not understand the importance of data. For this, special emphasis was placed on due processes and establishing standard procedures, sensitizing the health staffs on use of data, etc. A number of processes adopted and standard practices of data review, giving feedback to below staffs, capacity building, etc., have been introduced. Thus, it is pertinent here to mention some of the important processes and activities. All the major activities have been carried out primarily by IIHMR with the proper coordination and active support from SHSB and UNFPA.

6.1. **Project Team and Training.** At the outset, a core team was constituted by IIHMR to coordinate with different stakeholders. It has to oversee the activities, provide technical support and guidance to the project team placed at the state and divisions. A number of capacity building activities were organized. First, the team was oriented on HMIS at the UNFPA office and later by HMIS division of NRHM and the HMIS cell of SHSB. The main purpose was to introduce the team with existing structure of HMIS in the state as well as use of NRHM and DHIS-2 web portals.

6.2. **Snap-Gap Study.** A pilot study was undertaken with objectives to find out existing HMIS needs in Bihar and to understand the gaps in existing HMIS system. This was conducted in two districts namely Saran and Supaul. Both districts were poor performing and backward with regards to the HMIS but Saran district was slightly better. It has been found that the information capturing was week at the facility level. Sometimes the same

information was sought from them in different formats. It was found that ANMs were still using old formats due to unavailability of revised formats. Out of 20 registers on which the information recorded by ANMs, only 13 registers were maintained, but their updating and supervisory checks were not done regularly. Health staffs especially at the sub-center and PHC levels including ANMs, data entry operators and health managers had major confusion on data elements and lacked clarity on reporting format.

6.3. **Training Need Assessment.** In-depth review of existing documents and reports and subsequent snap-gap analysis indicated the needs for capacity building of health staffs on HMIS. Therefore, a separate survey on training needs of health personnel at various levels (HSC, PHC and district) regarding knowledge, attitude and practices towards HMIS was undertaken. A total of 27 blocks were selected from 9 divisional headquarter districts of Bihar (3 blocks from each district) with total sample size of 135 ANMs, 54 LHVs and four districts level officials in one district. It was found that ANMs, LHVs, supervisors at the block and below has difficulty in recording and preparing reports. Most of them, especially ANMs did not get training on HMIS. ANMs were not clear about the source of data of various data elements in the monthly reporting format. The inputs from the block and district level officials also show the need of training, which needs to be supported by ensuring availability of the logistics like printed registers and reporting formats.

6.4. **HMIS Training Modules.** After assessing the needs of capacity building, two basic modules in Hindi (for trainers and trainees) were developed for the frontline workers. Initially HMIS training module was developed in English and also piloted in different PHCs of Patna. The modules were developed by a team constituted by the SHSB, representing different stakeholders, i.e., IIHMR, UNFPA and NHSRC. The cost of printing was borne by SHSB and transportation of these modules up to block PHCs were carried out jointly by SHSB and IIHMR. Another module in English was developed for the district, division and state level use.

6.5. **Standard Training Materials.** In order to maintain the uniformity in training across the 534 block PHCs and 38 districts of the state, other resource materials, such as training calendar, power point presentations, chart papers, etc., were also prepared. The presentations were self-contained and at the same time it had a specific frame, color codes, etc. with examples, games and other activities. These resource materials were developed as some kinds of permanent resources which may be used even after the completion of training for facilitation and handholding of staffs.

6.6. **Constituting State HMIS Resource Pool.** Training of frontline health workers and block level health staffs in all 533 block PHCs of Bihar was a huge task. To conduct

this in a smooth fashion, a state level resource pool was formed. The main responsibility of this Pool was to conduct quality trainings on HMIS using the govt local resources. They also played an important role in district level training and helped in monitoring the quality of training programs through well-designed monitoring formats. A total of 100 candidates were short listed for the state resource pool and three days residential training in two batches were also organized for them by the SHSB with the support of IIHMR and NHSRC. They were trained on health system, data flow and status of HMIS in Bihar, HSC monthly reporting formats and data elements, data quality, internal consistency of data, etc. A separate orientation for district monitoring evaluation officers and state resource pool members was organized at the state for better coordination among them and the districts have to organize the training for blocks.

6.7. **District Level Training.** Cascade model of training was adopted. Cascade model of training is important particularly for the in-service training and where duration is for longer period and involves a large number of trainees. The training material is designed to provide systematic direction of the training process; training at different levels– the unfolding of the actual training by facilitators; follow-up trainings (More, 2004; Dichaba and Mokhele, 2012). The district level HMIS training was organized for the district and block level health staffs in all 38 districts of Bihar. The main contents of training were to oversee the quality of data generated at different levels, to facilitate use of data in planning, monitoring, evaluation and decision making; and to establish a system of feedback and suggest measures for improvement at different levels. The resource persons for this orientation were District ME Officers and zonal officers of IIHMR and other state officials.

6.8. **Resource Pool Allocation and Monitoring of Training.** State resource pool members were deputed as trainers to all the districts on the basis of number of PHCs in the respective districts (two trainers to a district up to 10 PHCs, three to district with 10-15 blocks and four trainers to district with more than 15 PHCs). Training calendar and all the arrangements were made by the concerned districts. Since it was a continuous and exhaustive process, a monitoring cell was also formed at the SHSB to monitor and coordinate the training activities. Regular visits to the training venues at PHCs were undertaken by IIHMR zonal officers, district M&E officers and state officials in order to monitor and facilitate the training sessions.

6.9. **Block Level Training.** Last stage of first round of HMIS training was conducted at block PHCs for health workers (ANMs/LHVs and DEOs). It was planned in such a way that it could be implemented soon after the completion of district level one day orientation. This training was focused on explaining different data elements in the monthly reporting format, filling the recording register, compilation of data and transfer it into reporting

format, use of data in routine work, such as indenting of medicines, planning, etc. Continuous fieldwork and handholding support to the health staffs are integral components of the project and hence during the entire project period, IIHMR team members have undertaken regular field visits for attending periodic review meetings (weekly, monthly), collecting data/formats for analyzing the monthly reporting formats from PHC and HSC. The purpose was to establish the practice of review meetings and capacity building of the regional, district and block level officials to use the HMIS data.

7. **Outcome of the Project**

The need of HMIS strengthening in the state has been clearly evident particularly on the completeness and correctness of data in HMIS formats. It has been realized that the health staffs lack basic skills in HMIS and they need training, but one time training is not sufficient and hence need sometime so that they may be supervised and guided. This had helped them in utilizing the newly acquired skills. The immediate outcome could be observed in terms of the number and type of training programmes conducted at different levels and also number of health personnel trained by the project partners under PPP scheme, resource materials produced, the standard practices established and instilled in the system, etc.

7.1. **Training Batches Planned and Organized.** HMIS trainings have been conducted at all the three levels (state, district and block). The entire project team was oriented on HMIS including the website of NRHM, MOHFW and state level DHIS-2. Another state level three-day residential training was conducted for the state resource pool (SRP) members. Third training at the state level was for district M&E officer along with SRP. A total of 459 batches were planned at different levels and all these batches were also organized. At the state level, three batches of trainings were planned and organized. At the district level, 38 trainings and at the block level, 419 batches were planned and organized (Table 2). Although, there are 534 PHCs in the state, but some of the smaller PHCs were clubbed together.

S.N.	**Level**	**No. of Training Batches Planned and Organized**		
		Trainings Planned	**Trainings Held**	**Percent Held**
1.	State	3	3	100
2.	District	38	38	100
3.	Block	419	419	100
	Round 2			
	State	2	2	100
Total		459	459	100

Table 2. HMIS Training batches planned and organized at different levels

7.2. **Health Personnel Trained.** It may be seen from Table 3 that overall 93 percent health staffs and resource persons were trained at all the levels (17943 out of 19282 planned). At the state level, 87.3 percent participants were trained (131/150). Of this, 100 percent project staffs and district ME officers were trained and 81 percent SRP members trained. At the district, both district officials such as CS-cum-CMO, Assistant Chief Medical Officer (ACMO), District Immunization Officer (DIO), and DPM and PHC officials including MOIC, Health Manager and Accounts Manager were trained. At the district level there were 38 units and at the PHC level there were 534 units but only 519 PHCs have functional status where MoICs and other staffs were posted. A total of 1341 participants were trained out of 1671 planned (80.3 percent). Percentage trained was maximum in the category of DPM and Block Accounts Manager/Health Educator (84.2 percent) and minimum for ACMO/DIO (60.5 percent). Comparatively low attendance in some category of staffs was due to vacant positions. Overall, the turnout of participants for the training was very high.

Level	Category of Participants	No. Planned	No. Trained	% Trained
State	Project Team Members	12	12	100.0
	State Resource Pool	100	81	81.0
	District M & E Officers	38	38	100.0
	State Total	**150**	**131**	**87.3**
District	CS-cum-CMO	38	24	63.2
	ACMO/DIO	38	23	60.5
	DPM	38	32	84.2
	MOIC	519	415	80.0
	BHM	519	410	79.0
	BAM/BHE or Both	519	437	84.2
	District Total	1671	1341	80.3
Block PHC	ANM	16474	15646	95.0
	LHV	480	327	68.1
	DEO/Computer or both	519	510	98.3
	Block Total	**17473**	**16483**	**94.3**
Total		**19282**	**17943**	**93.1**

Table 3. Level and Category wise planned and trained health staffs on HMIS

Maximum training load was at the block PHC level where 17473 frontline health workers including ANMs, LHVs and DEOs are trained. This category of staffs is most crucial as most of the HMIS data originate from HSC level. Of this, 16483 staffs (94.3 percent) were trained. High turnout of the participants is due to proper communication and planning by

the project team and Government and its constant follow-up with the districts. The break-up of the trained staffs is– ANM both contractual and regular (95 percent), LHV (68.1 percent) and Data Entry Operator (98.3 percent).

8. **Impact of the Project on HMIS**

The present study highlights the PPP model of HMIS project in the state, processes adopted under the project, activities undertaken and results achieved during this period. Although, it is quite difficult to see the precise and direct impact of the project on overall HMIS of the state as the study period is very short and area and scope of the study is too large. Also, the stakeholders involved in HMIS are too many such as the Government at different levels (state, division and districts), implementing partner, funding agency and other stakeholders. The project has been able to complete all the planned batches of trainings at all levels and trained 93 percent staffs. It has helped the state to put HMIS system in place and supported in developing the resource materials for the present training as well as future reference, ensuring the availability of recording registers and new reporting formats and promote their use as well. The skills of health staffs on HMIS have improved considerably and they are more sensible towards the data now, which is also reflected in the timely reporting of health service data.

Improvement in all the three standard parameters i.e., timeliness, completeness and correctness have been observed during the project period. Of these, completeness and correctness of the monthly reports are directly concerned with the data quality of HMIS. Timely submission of the reports to the next upper level of facilities and subsequent uploading of these reports on state HMIS web portal (DHIS-2) was not a much challenging task. However, the real challenge was to improve the quality of data by ensuring the completeness and correctness and thus, making HMIS data more reliable.

8.1. **Impact on Timeliness of HMIS Reports.** At the time of launch of the project, a few health facilities particularly HSCs and PHCs were not submitting and uploading the reports as these facilities were not mapped on the DHIS-2 web portal of the state. Also a few of them were uploading these reports irregularly and very late due to some technical and managerial problems such as low speed of internet, lacking the knowledge of reports, absence of concerned health staffs etc. Working together, SHSB has ensured the timely submission and upload of the reports. All the functional health facilities (100 percent) have started submitting and uploading the monthly reports on time.

8.2. **Impact on Completeness of HMIS Reports.** It refers to number of data elements filled against the total number of data elements available in the reporting format. It reflects

the availability and provision of health services to the patients at the health facility. Earlier before the HMIS training, the health workers used to leave most of the columns of reporting format bank. Figure-2 shows the month wise percentage of completeness of monthly reporting format from Jan to May, 2010 and during the same period in 2011. Further, this increase in not gradual and consistent over time but there are some minor fluctuations in between the months.

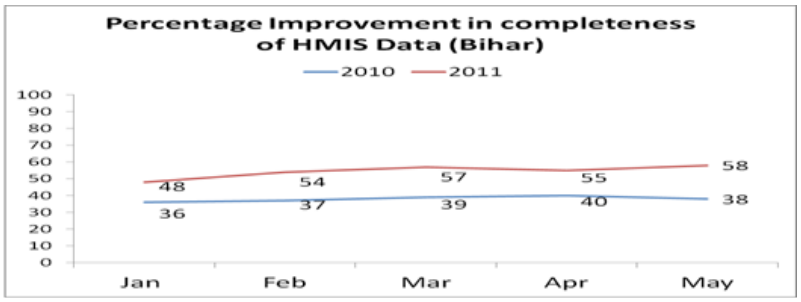


Figure 2. Flow of information under HMIS in the State (Source: State Health Society Bihar)

8.3. **Impact on Accuracy and Correctness of HMIS Report.** The correctness of data is a major problem in HMIS of the state. There may be various reasons of this - unavailability of uniform printed registers and reporting formats and its poor understanding among the concerned health staffs, poor knowledge of data compilation and preparation of reports, wrong entry into the computer, etc. According to one of the studies of health workers, prominent reasons of incorrect data are low understanding of the data elements among the health workers (19%), followed by no record in MCH register (14%), counting error (10%) (Khandade, Kumar and Chattopadhyay, 2013). Data quality also depends upon its use as more use of data resulting in more feedback to the system and providing more scope for the improvement in data quality. Correctness of data means recording and reporting of accurate and valid data- what is actually found in the field, the same to be recorded and reported. To check the data correctness in HMIS, there is an inbuilt mechanism of validation check in the DHIS-2 system. If the data is logically valid and consistent, it passes the validation rules.

8.4. **Institutionalization of HMIS Review Meeting.** Monthly review of health programs based on HMIS data has recorded increase at each level of facility during the project period. It has increased from 11 percent to 100 percent at the RPMU level; from 39 percent to 92 percent at district level and from 53 percent to 85 percent at PHC level. A majority of these meetings are characterized by recording of minutes and sharing formal feedback with staff/units.

8.5. **Indicator Analysis of Key Programs.** Indicator calculation for the important program indicators was started by the project team, which were later adopted by all the regional and district MEOs. However, the Govt. officials have also been undertaking the analysis for the monthly review meeting. This activity was carried out by project staffs at the regional level and shared with the regional and district ME Officers. The project has also established the concept of ongoing capacity building through field visits, and organizing need-based specific capacity building sessions.

9. Conclusion

The successful implementation of this PPP model project and organization of trainings was made possible only through the proper understanding and coordination among all three project partners namely SHSB (Govt. agency), UNFPA (funding and technical support agency), and IIHMR (implementing agency). SHSB has provided the leadership and also borne cost of trainings; while technical inputs and funding the team was made by UNFPA and implementation by IIHMR team in the field. Overall, the turnout of participants for the training was very high at all the three levels. The present PPP model has been successfully implemented and the objectives of the project achieved in terms of development of training and resource materials, trainings of health staffs on HMIS at different levels. It also succeeded in instilling the procedures, such as use of HMIS data in review meetings and planning the annual PIP, etc. The strengthening of HMIS directly and indirectly helped in improving the health services in Bihar.

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