RESEARCH ARTICLE

OPERATIONALIZING FIRST REFERRAL UNITS (FRUS) IN JHARKHAND, INDIA: EXPERIENCES FROM AN OPERATIONS RESEARCH

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ABSTRACT
Background: Till 2008, Jharkhand had only 12 designated first referral units (FRUs) at the district level and none of them were fully functional.
Aims & Objective: This paper focuses on the processes, experiences and health system challenges in operationalizing FRUs in Jharkhand.
Materials and Methods: In an operations research, a pre and post assessment of designated FRUs in the study area was undertaken using standardized tool during March 2009 and February 2011.
Results: There was 33 % (04) increase in availability of obstetricians, surgeons and pathologists across the facilities. The availability of pediatrician was improved in 26% (02) facilities, while there were only 14 % (01) of anaesthetists across all the seven facilities. There was significant improvement (P= 0.017) in availability of skilled human resource post intervention. This can be attributed to increased manpower recruitment and reallocation of specialists to designated FRUs post intervention. Only 29 % (02) of the facilities operated with a blood bank or blood storage unit. Magnesium-sulphate availability had improved by 29 % across the facilities. There was rise in availability of Misoprostol in four (57%) facilities and dip in availability of Nifedepine in six (86 %) and lignocaine-hydrochloride in one (14 %). About four (58 %) of the facilities did not have maternal-newborn care equipments. At the end of the project, only three out of seven designated FRUs achieved operational status.
Conclusion: This piece of work on small scale generated evidence from Jharkhand made to think strategically to scale-up operationalization of FRUs. Lack of leadership, management, skilled human resources, infrastructure and medical supplies impeded operationalization of FRUs in Jharkhand. Access to comprehensive emergency obstetric and new-born care services (CEmONC) is remaining as a major issue.
Key Words: First Referral Units (FRUs); Emergency Obstetric Care (EmOC); Operations Research; Jharkhand

Introduction

Since early 1990s Government of India, recognized to provide Emergency Obstetric Care (EmOC) services in three to four functional facilities in each district as a cost-effective strategy for reducing maternal deaths.[1-3] Till 2008, Jharkhand had only 12 first referral units (FRUs) at the district level and none at the sub-district or the block level.[4] However, none of them meeting the criteria of a functional FRU.[5]

In November 2008, the state health department, Jharkhand had collaborated with the Public Health Foundation of India (PHFI) to operationalize 12 designated FRUs to functional FRUs. There is hardly any literature available on how to bring a designated FRU to a functional level in the Indian context. Though there are guidelines or standards available for an ideal FRU but they are illustrative only. The key features of a fully functional FRU are summarized in table 1. This paper describes the key process and results of the operations research carried out to bring designated FRUs to functional FRUs level. Further, this paper discusses the practical issues that need to be addressed while operationalizing designated FRUs to functional or fully functional FRU. Here, functional FRU means designated FRUs which meet at least the first three criteria given in the table 1. This paper also highlights the lessons learnt and challenges faced while operationalizing FRUs in Jharkhand.

Table-1: Recommendations by the Government of India, the minimum services to be provided by fully functional FRUs, 2004

1.	24-hour delivery services, including normal and assisted deliveries
2.	Emergency obstetric care, including surgical interventions like caesarean sections and other medical interventions*
3.	Newborn care*
4.	Emergency care of sick children
5.	Full range of family planning services, including laparoscopic services
6.	Safe abortion services
7.	Treatment of STI /RTI
8.	Blood storage facility*
9.	Essential laboratory services
10.	Referral (transport) services

* The services are the critical determinants of functionality[13]

Materials and Methods

Study Setting: During 2007-09, compared to India, Jharkhand lags behind the national maternal mortality

ratio (212 versus 261 per 100,000 live births) and has lower infant mortality rate (47 versus 44).[6,7] The other health indicators for Jharkhand in the year 2009: birth rate = 25.6; death rate = 7.0[7]; the female literacy was 52%[8]; total fertility rate was 2.9[9].

Study Design: An operations research had been carried out with an objective of operationalizing FRUs in Jharkhand. The following are the steps followed in the operations research; planning phase, implementation phase and follow-through[10], refer table 2 for operations research framework adopted. In the implementation phase we have adopted the building blocks framework for EmONC, to bring the designated FRUs to fully functional level.[11,12]

In the implementation phase, a pre and post assessment of designated FRUs in the study area was undertaken using standardized tool during March 2009 and February 2011.

Table-2: Operations research framework adopted for the operationalization of the FRUs, Jharkhand, 2009-11

Planning
1. Organized research group and advisory committee with in PHFI.
2. Determined issues (critical determinants of functionality) to study and framed research question.
3. Developed research proposal to answer the research question.
4. Identified funding source and obtained funding to support the operations research.
5. Planned for capacity building and technical support.
Implementation
6. Monitored project implementation and maintained quality
7. Pre-tested all research tools
8. Established and maintained data management and quality control
9. Enabled FRU functionaries to develop action plans and identify critical monitoring indicators
10. Improved Functional Status of FRUs
11. Facilitated implementation of action plans
12. Monitored progress
13. Explored together with stakeholders interpretations and recommendations arising from the research findings
Follow-Through
14. Disseminated results and recommendations through policy briefs with health department, Government of Jharkhand and other stake holders in the state.

Study Population: The designated FRUs were selected based on the availability of blood bank or blood storage facilities; included district, sub-divisional or block level with geographical spread across Jharkhand; accessibility by road and their expected patient load. Based on the above criteria 12 designated FRUs were selected (Selected designated FRUs were at varied levels of functioning at the time of the study.). Of the 12 designated FRUs, six were district hospitals (Godda, Jamtara, Chatra, Chaibasa, Ramgarh and Khunti), and six block-level referral hospitals (Nagar Utari, Barwadih, Barhait, Jarmundi, Barhi, and Rajdhanwar).

After one year of the project implementation 5 out of 12 designated FRUs had been dropped because of the reasons; (a) The health department, Government of Jharkhand (GoJ) was not able to develop basic infrastructure of 5 facilities even after 1 year of project implementation. Also in consultation, we realised that it would be better to focus our energy to establish pilot role model in rest 7 facilities, which the health department could scale up later on; (b) The role of the research team was limited up to provision of technical assistance to the GoJ and all action with respect to FRU operationalization was supposed to be taken by the health department.

Study Instrument and Study Personnel: A tool was developed to provide a fair assessment of the current functionality of each facility by highlighting the operational level of specific areas within the facility.[13-15] We adapted the tool that was already validated and used for facility survey (The FRU assessment forms used in the Innovative family planning scheme technical assistance project (ITAP) survey to assess the functional status of FRUs in Jharkhand and feedback from both national and international maternal and child health experts.).[16] The assessment of facilities was conducted by four teams. Five day training organized for all field research assistants before the assessments.

Data was collected under the following sections: availability of basic infrastructure, availability of necessary equipment human resources, support staff, essential drugs, support services, waste management and infection control services, blood storage and transfusion services. All data collected was coded and entered into Epi Info™ 6.

We have had a number of consultations with all relevant stakeholders; refer table 2. Also in-person discussions and meetings conducted at the facility, district and state level, once in every month. However, we would like to clarify that we did not do any specific qualitative study under this study.

Ethical Statement: Institutional ethics approvals for this pre and post assessment were obtained from Indian Institute of Public Health - Delhi. Also approvals were obtained from Government authorities: National Rural Health Mission (NRHM) Mission Director, Jharkhand. Written informed consent was provided by the head of each facility.

Statistical Analysis: Simple descriptive analysis using ratios was undertaken for comparative analysis. The data

was analyzed by comparing the pre and the post interventions with critical indicators for FRUs functioning. All the data were analyzed anonymously by using SPSS 17©. Wilcoxon signed-rank test applied to see any significant improvement between pre and post intervention.

Results

The results are discussed under various sections such as availability of basic infrastructure for EmONC, health service delivery, health workforce, essential medical products and services for the seven designated FRUs.

Health Workforce

In pre assessment, there were three pediatricians, one obstetrician, one anesthetist and one pathologist available across the seven designated FRUs. There were no surgeons available in any of the seven designated FRUs. There were 37 medical officers and 31 nurses were in place across seven facilities assessed. Here, the obstetricians and anesthetists include the trained doctors on Emergency Obstetric Care (EmOC) and Life Saving Anesthetic Skills (LSAS) respectively.

In post assessment, there was an increase in number of specialists in all the seven facilities. There was an increase of four obstetricians, four surgeons, three pathologists and two pediatricians across seven designated FRUs. An increase of only one anesthetist observed, across the seven designated FRUs. The designated FRUs had recruited adequate number of medical officers, so there were surplus in number across the seven designated FRUs, please see Figure 1 for availability of specialists, medical officers and nurses. We found that there is a significant improvement (P= 0.017) in availability of skilled human resource post intervention. This can be attributed to increased manpower recruitment and reallocation of specialists to designated FRUs post intervention.

Essential Medicines, Equipment's and Support Services

See Table 3 for pre, post and change in percentage of essential medicines, equipment's and support services.

Post assessment, major changes observed in across facilities; increased availability of essential medicines to deal with emergency obstetric care like Magnesium Sulphate, Misoprostol, improved availability and utilization of necessary instruments to deal with emergency maternal and new born resuscitation.

Table-3: Pre and post assessment across the seven designated FRUs, Jharkhand, India, 2009-2011.

Parameters	Before (%)	After (%)	Change (%)
Availability of new-born care equipment			
Weighing Scale	71.4 (05)	100 (07)	28.6 (02)
Phototherapy unit	14.3 (01)	28.6 (02)	14.3 (01)
Mucus sucker	71.4 (05)	71.4 (05)	0.0 (00)
Endotracheal tube	14.3 (01)	42.9 (03)	28.6 (02)
Laryngoscope	0.0 (00)	14.3 (01)	14.3 (01)
Bag mask	14.3 (01)	28.6 (02)	14.3 (01)
Suction catheter	14.3 (01)	57.1 (04)	42.9 (03)
Availability of support services			
Blood Bank	0.0 (00)	28.6 (02)	28.6 (02)
Operating theatre	100.0 (07)	100.0 (07)	0.0 (00)
Lab services	100.0 (07)	100.0 (07)	0.0 (00)
Ambulance services	100.0 (07)	100.0 (07)	0.0 (00)
Water supply 24hr	71.4 (05)	85.7 (06)	14.3 (01)
Availability of essential drugs			
Gentamycin	71.4 (05)	85.7 (06)	14.3 (01)
Ampicillin	85.7 (06)	85.7 (06)	0.0 (00)
Oxytocin	57.1 (04)	57.1 (04)	0.0 (00)
Magnesium sulphate	28.6 (02)	57.1 (04)	28.5 (02)
Lignocaine hydrochloride	71.4 (05)	57.1 (04)	-14.3 (01)
Nifedepine	100 (07)	14.3 (01)	-85.7 (06)
Diazepam	28.6 (02)	57.1 (04)	28.5 (02)
Misoprostol	28.6 (02)	85.7 (06)	57.1 (04)
Availability of waste management and infection control			
Color coded bags	14.3 (01)	14.3 (01)	0.0 (00)
Discarded sharps invisible	57.1 (04)	57.1 (04)	0.0 (00)
Bleaching powder	85.7 (06)	100 (07)	14.3 (01)

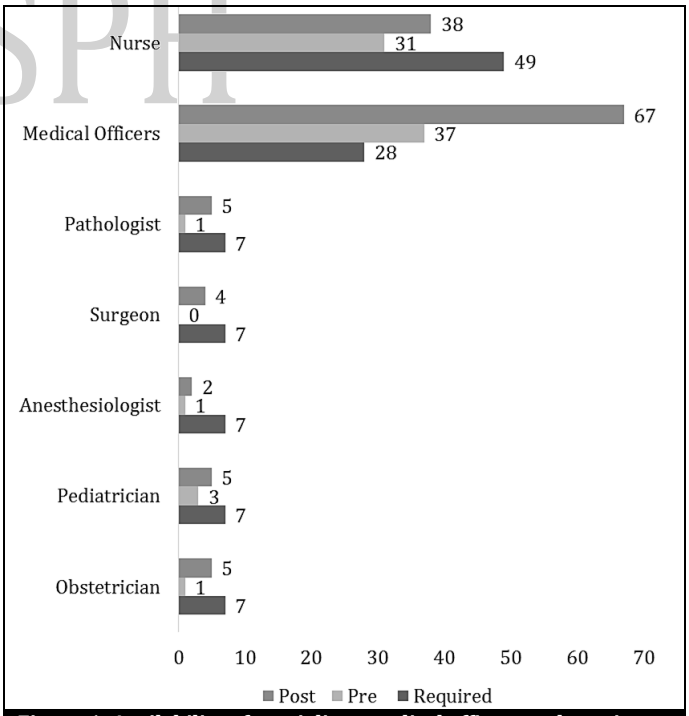

Figure-1: Availability of specialists, medical officers and nursing staff across seven designated FRUs, Jharkand, 2009-11

There was visible improvement in support services; all facilities had laboratory services, operation theatre and ambulance services. However, due to a lack of requisite reagents and skilled manpower, only one facility found conducting routine blood tests and five facilities

performed urine microscopy (data not shown in the figure).

Although all facilities had ambulance services for the patients, only two facilities reported having adequate funds available for operating the ambulances. Appropriate reagents and skilled human resource was still an issue to perform blood tests and urine microscopy in the facilities (data not shown in the figure). From pre and post assessment all the facilities had an operation theatre; laboratory and ambulance. Two of the health facilities had been linked to blood bank and another facility had functioning blood storage unit (BSU) so that blood is available for transfusion in emergency conditions. Waste management was largely inadequate across facilities with improper techniques employed for waste disposal as observed in pre and post assessment.

To summarize; by the end of the project, only three out of seven facilities could able to achieve functional FRU status by fulfilling the criteria 1,2,3 and 8 as mentioned in the table 1.

Discussion

Only three out of seven designated FRUs become functional and yet to achieve fully functional status meeting all criteria of a FRU, we have tried to throw light on the key issues which might have affected our results. They are; governance, health workforce, financing, information, medical products vaccines and technologies and service delivery.

Governance

The state Government oversees and guides the health system to protect public interest.[17] Frequent changes in the political leadership, as well as leadership within the health department had affected the desired outcomes in this project. At the facility level, the designated FRUs would not have improved at the end of this project without the leadership of the facility in-charge at the FRU level.

The state had no mechanism or process for evaluating or certifying a health facility as a fully functional FRU. Civil societies and community leaders should be taken on board at the FRU level to ensure demand-driven voices from the community to improve the quality of services being provided in the FRUs.[18] In Jharkhand, though members from civil society or communities were part of the Rogi Kalyan Samiti (RKS), they were neither active nor oriented towards their duties and responsibilities.[19]

Health Workforce

One of the most important bottlenecks to the functioning of EmOC, new-born care and availability of blood for transfusion within a facility, was absence of adequate and appropriate skilled human resources.[20] Given the present shortage of specialist staff within each facility, the state Government may have to consider reforming its transfer and deployment policy.[19] The example of the neighboring Odisha state was shared with the state health department.

Although an obstetrician was available in one of the designated FRUs, emergency obstetric complications could not be handled due to the absence of an anaesthetist, a paediatrician and lack of blood transfusion facilities. In Jharkhand, the doctors who were on contract were not preferred for long-term trainings, such as EmOC or LSAS. Doctors trained in EmOC or LSAS were not posted at designated FRUs. A policy change enabling contractual doctors to go in for these trainings could be explored.

After several consultations with the state NRHM Mission Director, senior directors in the health department and the Principal Secretary (Health), the department of health and family welfare took initiatives such as reallocation and redistribution of specialists and EmOC or LSAS trained doctors within or between districts. According to the NRHM and the Planning Commission data, the health infrastructure of the country is inadequate and is facing a huge human resource crunch.[4,19,21] However, the state has yet to make policy decisions related to human resource restructuring as a whole. Refresher courses and trainings need to be provided to the laboratory technicians to manage existing blood storage units and to carry out specific investigations.

The state health department and NRHM, Odisha, ensured that the trained workforce provides the needed services in the FRUs for at-least the next three years through a notification issued to all the districts by the Principal Secretary (Health). It was also ensured that the doctors were trained and posted in the facility or area of their preference. The state also had a proper strategy to scale up operationalization of FRUs as per the available trained health personnel for the FRUs. Inspired by the evidence from Odisha, the Mission Director, NRHM,

Jharkhand, issued directives to the chief district medical officers (civil surgeons) to ensure availability of trained MOs in the designated FRUs under their jurisdiction.

Financing

Procuring medicines and supplies is currently funded through state's health budgets. There are many limitations in funding mechanisms. When the designated FRUs do not have funds to purchase the essential supplies, patients and pregnant women are asked to purchase them, thus driving out-of-pocket expenses.[17] At the time of the project implementation, most of the RKS in the state were not registered as societies as per the NRHM guidelines. That was one of the major barriers in availability of funds for designated FRU. After continued engagement with the state health department and district administration, the RKS of the designated FRUs were registered and started receiving necessary funds from the state.

However, lack of clarity among the Medical Officers In-charge (MOIC), Civil Surgeons or Assistant Chief Medical Officers (ACMO), prevents proper utilization of these funds.[20-22] The health department should be more proactive in providing clarity on RKS fund by providing clear and comprehensive guidelines and training to FRU managers. In addition to the RKS fund, we advocated for an additional recurrent cost grant could be provided, especially for the designated FRUs for proper functioning. Towards the end of the project, the Government of Jharkhand sanctioned an additional rupees 50,000 (US$ 680) per annum for each designated FRU in the state.

Information

Facility-based information systems were missing in the designated FRUs. The lack of reliable morbidity data for conditions such as post-partum haemorrhage or eclampsia and inadequate pharmaceutical information in most facilities also affect the ability to track the inventory and use of the products. Through this project at least the designated FRUs have started using a comprehensive register that captures all maternal morbidity and complication data.

Essential Drugs

There are supply-chain management issues in all facilities assessed for antibiotics, magnesium sulphate and equipment. It was observed that continuous engagement with the health department at the district and state level as well yielded good results in improving the availability of oxytocin among designated FRUs.

Service Delivery

Infrastructure for hospital wards, space for blood storage units, labour rooms, laboratory and neonatal care units are inadequate in many of the designated FRUs in the state. The state needs to take care of basic amenities like safe drinking water, clean water supply to the labour room and electricity back-up at the facilities.[19] Strengthening coordination of the health department at the district or block level with multiple stakeholders like electricity, public works department and municipal bodies would help in solving issues related to electricity and water at the local level.

LIMITATIONS

Since this project was taken up as operations research, most field observations and experiences were gathered from seven designated FRUs only and there is lack of substantial quantitative data to measure the changes in a statistically robust manner. There was no striking pattern observed in the study finding because of very small sample size. A restricted time frame for the project was an obvious limitation in this project. The project relied on the contributions of multiple stakeholders associated with it in terms of both expertise and time.

Key Take Home Messages

Lack of an appropriate strategy by the state led to difficulty in sustaining the improvements achieved at selected facilities to be operationalized as FRUs. A realistic and practical approach should be adopted when deciding on the number of FRUs to be fully operationalized every year, in commensurate with the Indian Pubic Health Standards (IPHS) guidelines.[13,23]

Operationalize FRUs in phases; ensuring that they meet all requirements as per the IPHS guidelines and sustained provision of services would be a more pragmatic approach. The strategic road map should include both short-term and long-term objectives to ensure complete operationalization of the proposed FRUs as per the guidelines.[23] In case of Jharkhand, the state Government should first try to focus on all district hospitals (24 in number) and bring them to fully functional FRU level on priority and subsequently upgrade the services provided in sub District Hospitals

and block level to FRU level.

As short-term interventions; setting up of an FRU committee at the state level, reforming the HR policy and redistributing specialists to the selected FRUs can be taken up by the state. The long-term interventions, the state should consider: improving the infrastructure for FRUs and bringing in additional grants to be provided to FRUs in addition to RKS funds from RCH flexi pool or NRHM mission flexi pool.

Conclusion

This piece of work on a small scale generated evidence for the state to think strategically to scale up operationalization of FRUs. The present management system at the facility, district and state level needs strengthening. Generation of FRU specific information as per the IPHS standards, management of information systems and regular monitoring of all activities would ensure better reporting, management of administrative issues and availability of emergency obstetric services. These would also help addressing issues related to drug supply and demand, equipment procurement, maintenance and condemnation, referral and support services, and empower fund utilization at the local level.

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