

**A STUDY ON THE LOGISTICS AND SUPPLY MANAGEMENT SYSTEM OF
DRUGS AT DIFFERENT LEVELS IN DARBHANGA DISTRICT OF BIHAR**

Sponsored by



NIHFW, New Delhi



**Conducted by
Department of Community Medicine
Darbhanga Medical College
Laheriasarai, Darbhanga (Bihar)**

**A Study on the Logistics and Supply Management System of Drugs
at Different Levels in District Darbhanga of Bihar**

**Chief Investigator
Prof Deoki Nandan
Director
National Institute of Health and Family Welfare**

**Study Team
Darbhanga Medical College**

**Dr. Chittaranjan Roy
Dr. Hem Kant Jha**

National Institute of Health and Family Welfare

**Prof. J.K. Das
Mrs. Vandana Bhattacharya
Mr.J.P Shivdasani**

Contents

Preface

Acknowledgements

Abbreviations

Dharbhanga at a Glance

Executive Summary

Chapter 1 Introduction

Chapter 2 Methodology

Chapter 3 Findings and Discussions

Chapter 4 Conclusion and Recommendations

References

PREFACE

The National Rural Health Mission (NRHM) was launched by the Government of India on 12th April 2005 to carry out necessary architectural correction in the basic health care delivery system, with a plan of action that includes a commitment to increase public expenditure on health. The Mission envisages an additionality of 30% over existing annual budgetary outlays every year to fulfil the mandate to raise the outlays for public health from 0.9% of GDP to 2-3% of GDP. Under the Mission, multifarious activities have been initiated to strengthen the rural health care delivery system for the improvement of health of the rural population.

NRHM implementation framework does not envisage significant engagement of medical colleges in delivery of Mission interventions. The role of the medical colleges in RCH-II is largely limited to conduction of clinical skill based trainings. In the absence of any systematic engagement of medical colleges, faculty members of departments are clueless about the evidence-based technical strategies being pursued in the implementation of various National Health Programmes. There is a huge potential available in medical colleges of the country for undertaking innovations, facilitating programme interventions and conducting health systems research, which largely remains untapped.

The Rapid Assessment of Health Interventions (RAHI), a collaborative activity with the United Nations Population Fund (UNFPA), is a unique initiative taken under the wider umbrella of the Public Health Education and Research Consortium (PHERC) of the National Institute of Health and Family Welfare (NIHFW) for developing partnerships with different organisations working in the field of health and family welfare. The objective of the project is to accelerate NRHM delivery in identified states by organising timely, quality and appropriate inputs through rapid assessments/reviews to address priority implementation problems. During the first phase of the RAHI project, the UNFPA supported 12 health systems research projects in five low-performing states viz. Madhya Pradesh, Jharkhand, Chhattisgarh, Uttar Pradesh, and Orissa. During the second phase, another 12 health system research projects from 6 low performing states viz. Uttar Pradesh, Uttarakhand, Madhya Pradesh, Jharkhand, Bihar and Rajasthan were taken up.

The rationale for supporting such rapid assessments stems from the discussions during the periodic Joint Review Missions and Common Review Missions. An impressive number of innovations have been supported by the states to improve access and enhance service quality. Many innovations are currently underway in the states and districts to deliver health care services in an effective manner. The state and district programme managers wish to know how well these innovations are performing so that in case of gaps corrective measures can be taken to achieve the stated objectives. There has been an increasing recognition for incremental improvements in the programme delivery by undertaking quick and rapid health systems research and engineering the feedback into the processes. As an institutional response to such demand an attempt has been made to develop a network of institutions and strengthen their capacities on rapid appraisal methodologies for generating programme - relevant information at local and regional levels.

The rapid appraisal of some of the interventions taken up in the second phase of RAHI-project covered the issues of contribution of indigenous systems of medicine in operationalisation of 24x7 services, interface of ASHAs with the community and service providers, logistics and supply management system of drugs at different levels, functioning

of mobile medical units, birth preparedness and complication readiness as a tools to reduce MMR, quality assessment of institutional deliveries, performance-based incentives to ASHA Sahyogini, referral transport systems, functioning of programme management units, functioning of RKS, utilisation of untied funds at various levels and utilisation and client satisfaction of RCH service. The present study report entitled “**A Study on The Logistics and Supply Management System Drugs Different Levels in Darbhanga District of Bihar**” by the Department of Community Medicine Darbhanga Medical College, Darbhanga (Bihar), was finalized by NIHFw in consultation with UNFPA.

The findings and recommendations of these studies will trigger of a series of follow-up measures by programme managers in the state. We strongly feel availability of such a resource to the programme managers will provide necessary evidence based inputs enabling them to make any mid-course corrections and also scaling up. An added benefit will be incorporation of information about newer programmatic interventions in the medical curriculum

Dr. Dinesh Agarwal
National Programme Officer, UNFPA

Prof. Deoki Nandan
Director, NIHFw



ACKNOWLEDGEMENTS

I extend my sincere thanks to Prof. (Dr.) Deoki Nandan, Director, National Institute of Health and Family Welfare, for assigning the study entitled "The Logistics And Supply Management System of Drugs at Different Levels in Darbhanga District Of Bihar" to the Department of Community Medicine, Darbhanga Medical College, Laheriasarai.

We appreciate the efforts of the Principal, Darbhanga Medical College, Dr. S.N. Sinha for being supportive, and co-operative in the pursuit of research studies undertaken by the department. We convey our gratitude and regards for his relentless work and constant guidance for the study.

Prof. (Dr.) J.K. Das, Professor and Head, Epidemiology and Medical Care and Hospital Administration, NIHFW deserves special thanks for his technical guidance, support and co-operation at every stage of this study. His inputs have enriched the quality and overall content of this study. We would also like to thank the members of the Central Team Mrs. Vandana Bhattacharya and Mr. G. S. Karol for their kind co-operation at various levels. We shall be failing in our duty if we do not thank Dr. V.K. Tiwari and Dr. K.S. Nair of NIHFW for their kind support at various stages in completion of this work.

My heartfelt thanks to Dr. Hem Kant Jha (Assistant Professor and Co-Principal Investigator) for his support, enthusiasm and active involvement right from the initiation of the study, to report writing and dissemination.

The CMO-cum-Civil Surgeon, MO I/C of PHC, APHC and store keepers-cum-clerks and ANM of the study centres deserves special thanks for providing their support and co-operation in providing relevant information and their opinion during the field study.

We are thankful to field supervisors and research workers for their keen interest, hard work and team spirit during field data collection.

The Junior Residents of the Department of Community Medicine, Dr. Lakshman Kumar, Dr. Kasif Sahanawaz, Dr. Ashutosh Kumar and Dr. Sanjay Kumar deserves special thanks who have been actively involved in the planning of the study, data collection and report writing.

We extend our sincere thanks to Dr. (Mrs) Veena Roy for her support during the data analysis and report writing. We extend our thanks to Mr. A.N. Jha for his constant support while writing the report.

We also sincerely extend our thanks to all community members for their generous participation in the FGDs for providing valuable information for the study.

Prof. (Dr.) Chittaranjan Roy

ABBREVIATIONS

ANM	-	Auxiliary Nurse Midwife
APHC	-	Additional Primary Health Centre
ASHA	-	Accredited Social Health Activist
CMO	-	Chief Medical Officer
CHC	-	Community Health Centre
DHO	-	District Health Officer
DMS	-	District Medical Store
ED	-	Essential Drugs
FIFO	-	First in First Out
FEFO	-	First Expiry First Out
IFA	-	Iron Folic Acid
IPHS	-	Indian Public Health Standard
LMIS	-	Logistics Management Information System
MO	-	Medical Officer
MO I/C	-	Medical Officer In-charge
NRHM	-	National Rural Health Mission
PHC	-	Primary Health Centre
RKS	-	Rogi Kalyan Samiti
SK	-	Storekeeper
VED	-	Vital, Essential and Desirable
UNFPA	-	United Nations Fund for Population Activities

EXECUTIVE SUMMARY

State Health Society Bihar is implementing the National Rural Health Mission (NRHM) to carry out necessary correction in the basic health care delivery system. The goal of the Mission is to improve the availability of and access to quality health care by people, especially for those residing in rural areas. As part of its overall mandate of ensuring accessibility to good quality health care and to meet the overall demand of good quality drugs in the government health institutions, the SHSB is aiming towards rational drug management and its procurement, so as to ensure availability of good quality drugs in the government health institution.

General Objective

To know the logistics and supply management system of drugs at different levels district health care delivery system in Darbhanga district of Bihar in order to suggest measures to improve availability of essential drugs to the masses.

Specific Objectives

- To study the procurement process (i.e, bidding, tendering, evaluating tenders and quality control) of drugs at the district health system,
- To explore the methods of transportation of drugs, their storage, stock keeping records and distribution in whole of the district area,
- To assess availability and quantity of drugs as per the state essential drug list,
- To study inventory control management of drug items, and
- To identify the gaps in the procurement, supply system and inventory control management and suggest measures for further improvement.

METHODOLOGY

Study Area

The study area is Darbhanga district of Bihar.

Study Design

This was an exploratory -retrospective and cross-sectional research. As to get the representation of the sample, the district was divided into 3 regions depending on the distance. The study was specially designed with a mix of both qualitative (Observation and FGDs) and quantitative techniques. (In-depth interview and record analysis) . The data attained from these techniques were then triangulated to get good analysis.

Study Subjects

District level: CMO-cum-Civil Surgeon, and Storekeeper/Pharmacist;
PHC level : MO I/C of PHC and Store keeper /Pharmacist
APHC level : MO I/C of PHC and Store keeper /Pharmacist

At sub-centre level : ANM and beneficiaries from the community. A total sample of the 20 respondents were contacted (in-depth interviews) during the entire duration of the study. The comments from the community were recorded through FGDs at PHC, APHC and sub-centre levels separately.

Sampling

The selection criteria of the PHCs and APHCs was random. Whereas purposive sampling was used for the selection of the sub-centres. Three PHCs (one nearest < 10 kms. from the district headquarter), one farther (10-20 kms. from the district headquarter) and another (20 kms. from the district headquarter) farthest were identified. From each PHC one additional PHC was randomly selected. Two sub-centres were selected from each PHC, one nearer and another farthest. Thus total numbers of selected sub-centres were six.

Total sample size in the district:

CMO-cum-Civil Surgeon	01
Pharmacist/Store keeper/clerk in the CMO-cum Civil Surgeon office	01
MO I/C of 3 PHC and 3 APHC	06
Pharmacist/Store keeper/clerks in 3PHC and 3 APHC	06
ANM in 6 sub-centres	06
FGD with community members at different levels viz. PHC, APHC and sub-centres (alternate)	09

SALIENT FINDINGS

- Procurement of drug items in the district is done through both push and pull system. Budget allocation for the district for purchase of drugs is Rs. 36 lacs out of which 10% can be purchased locally.
- Drugs in the district are pushed from state health society and were also purchased by district health society through rate contracting of essential drugs. The contract monitoring and quality control system was not very effective.
- For a PHC Rs. 15 thousand is sanctioned for purchase of emergency drugs through Rogi Kalyan Samiti but this was hardly done.
- No fund for drug purchase was provided to APHC. APHC Adila was non-functioning. None of the sub-centre was functioning satisfactorily. Drug kits with all the essential drugs were not available in PHC and APHC were supplied through indent from District Medical Store.
- The state have computerized system and same was available at district level. At the APHC and PHC level there is no computerization of the system. All the work was done manually.
- Drug list did not match with the state's essential drug list. The quantity of each item was not tallying with the need/demand of the population. It was neither based on population covered nor on the equity.

- The method of assessing drug requirements (drug formulary according to the health facility) and making indents at any/every level in the district health system were not appropriate. The demand estimations were not following criteria's like trends in consumption pattern during last 2 years. Objective of the hospital, morbidity pattern of the health unit, the clientele, cyclic changes in epidemiological occurrences of diseases, and the resource constraints.
- The essential drugs required by various health centres were either always in very short supply or altogether missing from medical store. No explanation or reason for this kind of short supply had been given.
- Health centres were found to be understaffed and because of the shortage of pharmacy assistants, no single person could be given exclusive responsibility for the drug stores, logistics and supply chain activities at the health centres.
- There was no essential drug list for the various health centres under the study and usually there was no demand estimation done hence drugs supplied were not in accordance with community needs.
- Due to shortage of dedicated trained staff and lack of tools to forecast and manage drug supply at the health centre levels, the drug logistics system rely exclusively on higher level of the health care delivery system that do not have adequate visibility down to the health centre level.
- The task of managing drug stores often depends on the already overburdened nurses and medical assistants. These workers were primarily responsible for providing health care to large population. It was difficult, for them to spend the time required to adequately store, record keeping and maintain the drug items in the stores and to most efficiently and effectively manage supply and dispense drugs.
- Medical officer-in-charge of PHC/APHC were unaware of budget allocation/allotment of their centres. Hence the budget utilization rests with the higher authorities leading to discrepancies between demand and supply.
- Due to poor inventory control and with concept of indent and supply as and when required type, there was frequent stock out.
- Overall store management was very poor.
- No scientific technique of inventory control i.e. ABC, VED classifications were applied for managing availability of drugs.
- Re-order level and buffer stocks were hardly maintained.
- It was revealed that due to hitherto increase supply of drugs in PHC and APHC, number of patients attending these centres have enormously increased and thereby the demand of drugs leading to mismatching.
- Sub-centres were not supplied with the drugs against people's expectation as revealed in FGD.
- Essential RCH drugs were not fully supplied. They were not according to essential drug list. Drugs like Misoprostol and Magsulf were not available at the PHC or APHC.
- Transportation of drugs at various levels was done either by hired vehicle or by private owned vehicle. No separate vehicle for transportation of drugs was available at any level.

- There was no proper arrangement of storage of drugs at all levels. They lack adequate space, racks/almirah, ventilation and sanitation. At APHC there was no separate space for storage of drugs and at some centres drugs were found scattered around the table in the so-called store room. No where there was any systemic arrangement to keep the drugs
- Drugs under national programme like RNTCP were not available in APHC. Drugs for malaria, kala-azar was available in the PHC.
- None of the sub-centres were satisfactorily functional and drugs were not available. The ANM comes on the centre only on the day of immunization. Village health sanitation committee was not set-up in any of the village. FGD among community members revealed unawareness about NRHM and they lack confidence in government hospital. They were also not satisfied with the availability of drugs at various centres. They were unaware of District Health Society and Rogi Kalyan Samiti.

During FGD it was noted that the community members were not satisfied with the availability of drugs. It was revealed from the study that logistics and supply management system of drugs in Darbhanga district is very weak.

KEY RECOMMENDATIONS

- Provide adequate funds as per demand for drug procurement and drug logistics. Make it fully decentralized. Proper monitoring system and quality control should be strengthened.
- Rogi Kalyan Samiti should be made operational and functional and make sub-centres functional and also APHC Adila.
- Ensure availability of all vital and essential drugs at all levels health care delivery system.
- Provide proper storage space (drug store) with racks, almirahs, ventilation, light and sanitation at all levels.
- Introduce and encourage the staff members to be more organized and to use of stock cards (Bin Cards) for the drug store along with maintenance of and update stock register and other records. Use appropriate method for quantifying the requirements based on actual need i.e., on past consumption, morbidity or combination of all these.
- Introduce indent proforma scientifically prepared.
- A control system that allows decision on 'when to re-order' and 'how much to order' should be introduced. The re-order level calculation should be efficient.
- Use of inventory control techniques i.e. classification system such as ABC, VED to be encouraged.
- Use of buffer and safety stock for maintaining a desired service level to deal with emergency situations.
- Provide on the job training for storekeepers and pharmacists in basic stores and drug management. Appoint qualified pharmacist to maintain stocks.
- Introduce the computerized tracking system.
- Provide separate warehouse at the district headquarter.
- Provide separate vehicle for transportation of drugs at different levels.

- Village health sanitation committee should be formed immediately and make it functional.
- District health manager should assess the functioning of reverse cold chain and actions they take based on feedback report of vaccine quality. This could be very sensitive indicator of functioning of cold chain system logistics.
- Provide safety of drugs from theft and fire. Also provide tablet -counting machine to DMS.
- Include logistic training in other training packages for all health related cadres.

CHAPTER 1

INTRODUCTION AND BACKGROUND INFORMATION

During the Alma-Ata conference sponsored by UNICEF and WHO in September 1978, the availability and accessibility of essential drugs were reaffirmed as basic components of primary health care. The conference recommended that governments to formulate and implement national drug policies in order to improve their national pharmaceutical sectors. A year later, the 32nd World Health Assembly requested the Director General to establish a special programme on essential drugs that would assist Member States to develop and implement national drug policies. This request led to the creation of the drug action programme now called the Essential Drugs and Medicine Policies.

Launched on 12th April 2005, the NRHM is an ambitious, equity-oriented initiative of Government of India with an ambitious coverage of over 750 million people. It attempts to strengthen the public health care system and address specific health determinants such as water, sanitation, nutrition and medicare including availability of drugs as per IPHS. It has a strong component of community involvement.

Specific mechanisms have been established for community participation in health decision-making and action through village health sanitation committees support for community action for health including community monitoring and planning from village level upwards and Rogi Kalyan Samiti/patient welfare societies/hospital development committee at all health care facilities. Thus there is an attempt to strengthen public health institutions at all levels (health sub-centre, PHC, CHC, Block and district hospitals) with the Indian Public Health Standard as the reference point.

The procurement of drugs involves various steps including quantification, sourcing, pricing and ensuring timely delivery to the central store. The management of inventory depends on information system that provides method feedback for: 'Tracking the storage and movement of goods at every level within the supply system and storage to stocks ready for use in health facilities'. 'Ensuring proper stock rotation and medicine with dates so that items of earliest expiry dates are used first'.

Enabling managers to know the total amounts of commodities that are within the supply and where they are located thus allowing the possibility of redistribution on emergency permitted for use within the programme in question. Inventory records should be regularly put in order to confirm that items are being used correctly and not diverted and misused thus inventory good control are essential as a source of data for review and decision about future procurement'. Hence it is clear that delivery and distribution of drugs at various levels are not possible without effective drug procurement and inventory control. The consolidated reports by the Ministry of Health and Family Welfare claims to have substantial improvement in terms of

number of patients attending OPD. In Bihar alone number of patients visiting PHC every month has gone up from 39 in January, 2006 to 3018 in August, 2006 (J.V. Programme associate, GFP, CBCI, Health Commission, New Delhi). States have put in place effective system of procurement of drugs. NRHM has advocated decentralized procurement in line with successful Tamil Nadu Medical Supplies Corporation. Funds for procurement under NRHM are released to states. However available drugs need to be well managed in order to meet public health needs.

- Even in Bihar where logistics and supply management system of drugs were ineffective, is trying to put in place a very efficient and effective drug logistics and supply management system for drugs on essential drug lists. The drug management cycle (i.e. selection, procurement, distribution, use) contributes significantly to getting maximum output of limited resource available for essential drugs.
- Despite availability of numerous tools for the management of drugs, none of these specifically targets the health centre level, particularly the health worker who had no formal training in drug logistics and supply management system.
- After launch of NRHM several logistic issues were identified to have hampered programme success in ensuring that NRHM drugs are available for distribution, including: poor quality of drug and inadequate need assessment at district and facility level. In addition, decentralization of health services has resulted in inadequate capacity for inventory and information management in the district and service delivery point, thus affecting the overall performance of NRHM drug logistics system.
- In this backdrop, the logistics and supply management process of drugs at different levels bears greater significance since it is the most important part of health care delivery and study in this regard is not available.

It is therefore, proposed to study the logistics and supply management system of drugs at different levels in Darbhanga (Bihar) in order to fulfil the goal of NRHM and peoples high expectation.

Operationalization in Bihar

Bihar is trying to put an efficient and effective drug logistics and supply management system for drugs on essential drug lists. The drug management cycle (i.e. selection, procurement, distribution, use) contributes significantly to getting maximum output of limited resource available for essential drugs. Despite availability of numerous tools for the management of drugs, none of these specifically targets the health centre level, particularly the health worker who had no formal training in drug logistics and supply management system.

After the launch of NRHM several Logistic issues were identified to have hampered programme success in ensuring that essential drugs are available for distribution, including: poor quality of drug and inadequate need assessment at District and facility level. In addition, decentralization of health services has resulted in inadequate capacity for inventory and information management in the district and

service delivery point, thus affecting the overall performance of essential drug logistics system.

District_Darbhanga at a Glance

The study of logistic and supply management of drugs was carried out in the District Darbhanga, Bihar State. The district Darbhanga was selected for the following reasons :

- (1) It is easily approachable from project headquarter i.e. Darbhanga Medical College, Laheriasarai, Darbhanga.
- (2) It is a big size district in the planes of North Bihar surrounded by rivers and therefore more representatives in demographic, socio-economic and other parameters as compared to any other district in the region.

It has got no district hospital. One medical college Hospital is there which has not been included in the study.

Darbhanga is a big size district having population 36,85,472 and are of the district 2504 sq.km. There is one medical college hospital and 2 CHC, 18 PHC (5 upgraded) and 36 APHC and 261 sub-centres. The brief description of the district is given below:

S.No.	Particulars	Description
1.	Geological Profile	North-Madhubani, South-Samastipur, East-Saharsa, West-Muzaffarpur
2.	High from sea level	49 meter
3.	Population	36,85,472
4.	Male	19,25,637
5.	Female	17,59,835
6.	Child (0-6 years)	6,27,897
7.	Male (0-6 years+)	3,33,061
8.	Female (0-6 years)	2,94,836
9.	Sex Ratio	1,00,914 (According to 2001)
10.	Medical college hospital	1
11.	Referral hospital (CHC)	2 (Jale, Manigachhi)
12.	Total No. of PHC	18 (5 upgraded PHC)
13.	Total No. of sub-division	3 (Darbhanga sadar, Benipur and Biraul)
14.	Total No. of a PHC	36
15.	Total No. of sub-centres	261
16.	Area of district	250 sq.km
17.	Total No. of panchayat	339
18.	Total No. of literate	11,77,743
19.	Total male literate	7,91,068
20.	Total female literate	3,86,675
21.	Percentage of literacy	44.32%
22.	Percentage of male literate	57.18%
23.	Percentage of female literate	30.35%

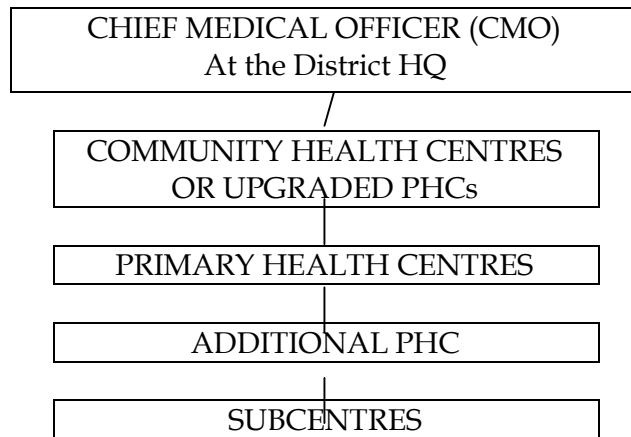
24.	Railway line	92 km
25.	Blocks linked with rail	Jale, Kamtaul, Manigachhi, Biraul, Hayaghat and Bahadurpur
26.	Total no. of villages	1322
27.	Populated villages	1058
28.	Geographical area	24 lacs 443 hectares
29.	Ponds (Talab and Pokhara)	>11, 600
30.	Agricultural land	1,98 lacs hectares
31.	Rivers	Kosi, Kamala, Jibachh, Kareh, Bagmati, and Adhwara Samuh
32.	Total area (Rakwa)	2 lacs 47 thousand 580 acres
33.	Main grains	Dhan (Rice), Wheat, Maize, Tishi, Ganna Sugarcain, Potato
34.	Main export	Makhana, Mango, Fish and Lichi
35.	Tourist places	Ahilya Asthan, Kusheshwar Asthan, Shyama Kali Mandir, Malekch Mardini Mandir, Manokamna Mandir, Raj Kila (Fort), Maharaja Dhiran Lakchmeshwar Singh Museum, Main Museum.
36.	Birth ratio	32.0 (According to 2004): 1000
37.	Death ratio	8.0 (According to 2004): 1000
38.	Growth ratio	21.21 (According to 1991): 1000
39.	RMR	09.04
40.	TFR	05.1%
41.	MMR	0.4-0.5%
42.	Population density	1442
43.	% Decadal growth rate (1991-01)	30.85
44.	Girls marrying below 18 (%)	51.3
45.	Percentage of births of order 3 and above	59.7
46.	CPR	27.1
47.	% of pregnant women with ANC	26.7
48.	% of safe delivery	14.7
49.	% of child with complete immunization	22.2
50.	IMR	77
51.	CBR	35.3
52.	Special	Two tower, two university, two main post office, two jama masjid.

General Profile of the District

The state of Bihar is big size state in Eastern India. The district Darbhanga is one of the developing districts of the state. The relevant demographic data along with other particulars are as follows:

The overall health care delivery system at the health centres are through a network of ancillary health units. The linkages of various health units are shown in Figure 1.

Figure - 1

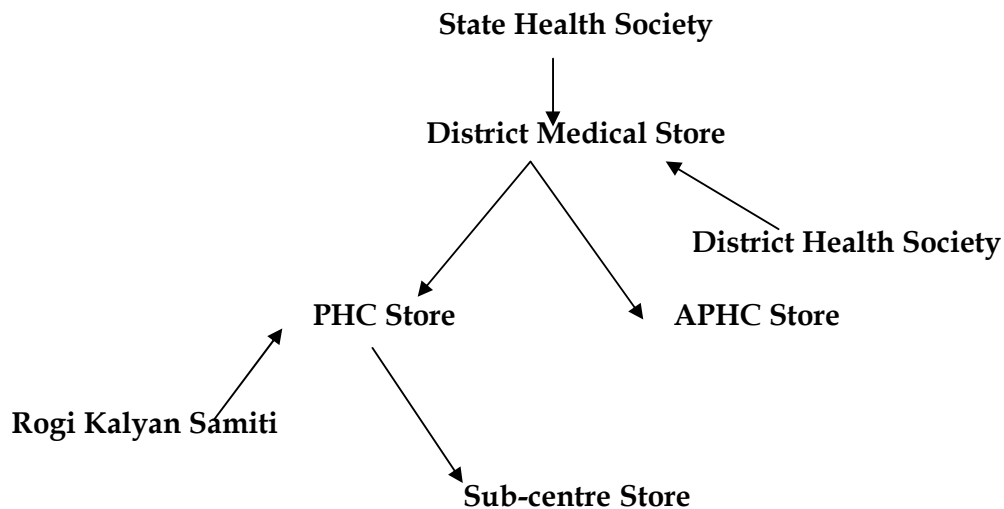


The present study of logistic and supply management of drugs is an in-depth study of the government health set-ups within the district after launching of NRHM. The topographic map of Darbhanga district is given at Figure 2.

Figure - 2



Flow Chart Depicting Drug Supply in the District



OBJECTIVES OF THE STUDY

1.1: General Objective

To know the logistics and supply management system of drugs of different levels district health care delivery system in Darbhanga district of Bihar in order to suggest measures to improve availability of essential drugs to the masses.

1.2: Specific Objectives

- To study the procurement (bidding, tendering, evaluating tenders, and quality control) process of drugs at the district health system.
- To explore the methods of transportation of drugs, their storage, stock keeping records and distribution in the whole of the district area.
- To assess availability and quantity of drugs as per the state essential drug list.
- To study inventory control management of drug items.
- To identify the gaps in the procurement, supply system and inventory control management and suggest measures for further improvement.

CHAPTER 2

METHODOLOGY

2.1 Study Area

Darbhanga district, Bihar.

2.2 Study Design :

An exploratory research- Retrospective and cross-sectional.

2.3 Study Population

The research population refers to various stakeholders of drug procurement process and inventory control, PHC (covers more than 1 lakh population in Bihar), APHC (30 thousand population) and sub-centres (more than 5 thousand population). viz Medical Officer in-charge store, Chairman or members of RKS, CMO -cum-Civil Surgeon, Storekeepers, ANM, Drug Suppliers and Community Members.

2.4 Inclusion/Exclusion Criteria

Those who have given consent were included and those who refused were excluded. Bihar has 38 districts. The proposed study was undertaken in Darbhanga district. The total population of the district is 36,85,472. There are 18 Block PHC s, 36 Additional PHCs and 261 sub-centres in the district. The district was divided into 3 regions - (1) < 10 kms, (2) 10-20 kms, (3) > 20 kms from district headquarter. One PHC was selected from each of the three regions by random sampling using lots method. One APHC was selected from each selected PHC by random sampling. From each selected PHC, 2 sub-centres were selected based on the distance from the APHC (nearest and farthest).

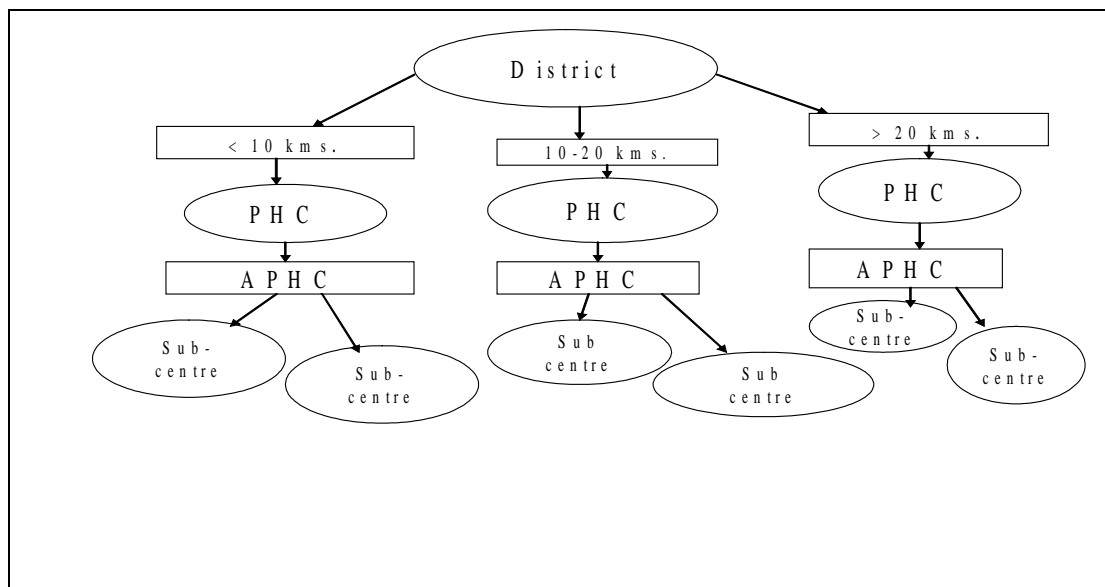


Table 1 : Showing Criteria of Selection of PHC, APHC and Sub-Centres

Random	Three PHC (one from each region)
Random	Three APHC (one from each selected PHC)
Purposive	Six sub-centres (two from each APHC one nearer and one farthest)

Table 2 : List of Selected PHC, APHC and Sub-centres.

PHC	APHC	Sub-centres
PHC distance from Headquarter in km Bahadurpur 5 kms.	Bazar Samiti, Shivdhara	Ojhaul Barhetta
Keoti 18 kms.	Raiyam	Khirma and Karjipatti
Hanuman Nagar 22 kms.	Adaila	Bishanpur, Dilahi

Table 3 : Total Sample Size of the Respondents in the District

CMO-cum-Civil surgeon	01
Pharmacist/Storekeeper/clerk in the CMO -cum Civil Surgeon office	01
MO I/C of 3 PHC and 3 APHC	06
Pharmacist/Storekeeper/clerks in 3PHC and 3 APHC	06
ANM in 6 sub-centres	06
FGD with community members at different levels viz. PHC, APHC and sub-centres (alternate)	09

The following tools were used to collect data for the sample:

- Semi-structured interview schedule.
- Guideline for FGD (through thematic guidelines)
- Checklist of NRHM drugs as per IPHS for PHC, APHC and sub-centres.
- Check-list for inventory/store control.
- Check-list for review of secondary data.

Pre-testing of Tools

The tools were pre-tested before use. Pre-testing was undertaken in a small sample in a non-study district.

Data Collection

Primary Source

- Semi-structured schedule for interview with various stakeholders viz. pharmacist/storekeeper, suppliers, pharmacist and ANM.
- In-depth interview with Civil Surgeon-cum-CMO, MO I/C of PHC and APHC.
- FGD with Community Members at different facility levels viz:- PHC, APHC and sub-centre levels (alternate).

Secondary Source

Desk research (Data collection from secondary sources)

Information Collected

Files

To know drug management cycle i.e. drug selection process, estimation of drug requirement its type, quantity, processes of tender and final award of contract and placement of orders.

Records

Delivery/lead time, order level, EOQ, ABC, VED, HML, SDE and FSNO analysis, requisition and issue records, dispensed to user record at service delivery points.

Stock Register

Stock position, buffer stock: quality, maintenance, daily use record, RI (request indicator) quantity requested and filled column like in, Out and balance.

Indent

Number of copies filled, how are they filled, signature required on it? What is the basis of request?

Receipt of Drug at Dispensary

Copies of indent comes with consignment, filled, consumption record, discrepancy in receipt if any

Variables

- (1) Variables related to drug procurement: Stakeholders job responsibilities, process of procurement. Availability of funds, policy and guidelines for tender and bids.
- (2) Variables related to inventory control: like availability of drug stores and storage condition etc.

Data Collection Methods

On receiving the assignment a detailed schedule was prepared to collect data from Darbhanga district (3 PHCs, 3 APHCs (Additional PHC) and 6 sub-centres). Three teams of 3 people each were designated (investigators - 02, supervisor -01). All the three teams simultaneously collected data from each PHC and each team moved to one PHC- 2 APHC and 6 sub-centres. There were total number of 6 investigators and 3 supervisors for collection of information and required 15 days for collection of data from PHC, APHC and sub-centre. Another 10 days required for scrutiny by the same team.

Focus Group Discussion (FGD)

Invited members of the community from different strata and status consisting of 5 -6 males and 5-6 females attended FGD. The purpose of the FGD was to know the study objective - availability of drugs at different levels and also to know about procurement, as community members are involved as a representative in District Health Society or Rogi Kalyan Samiti.

Duration

Data collection were done in October 2008 - November 2008 and data analysis and report writing completed in December 2008.

Tools Used for Different Category of Respondents

*Semi-structured schedule for interview with various stakeholders' viz. Pharmacist/storekeeper, suppliers, pharmacist and ANM.

* In-depth interview with Civil surgeon-cum-CMO, MO I/C of PHC and APHC.

*FGD with Community Members at different facility level viz: - PHC, APHC and sub-centre level (alternate).

Data Collection Methods

On receiving the assignment a detailed schedule was prepared to collect data from Darbhanga district (3 PHCs, 3 APHCs (Additional PHC) and 6 sub-centres). Three teams of 3 persons (investigator - 02, Supervisor -01). All the three teams were simultaneously collect data from each PHC and each team moved to one PHC- 2 APHC and 6 sub-centres. There were total number of 6 investigators and 3 supervisors for collection of information and it required 15 days for collection of data from PHC, APHC and sub-centre. Another 10 days required for scrutiny by the same team. Data collection were done in October 2008 - November 2008 and data analysis and report writing were done in December 2008.

- The data collected from field were checked and corrected every evening by the supervisor before leaving the field. The data collection were completed in all respects. The tools already discussed were used in respective situation. These three teams spent around 25 days in collection of data.
- In order to ensure quality of FGDs, PI/Co-PI conducted FGDs and district level in-depth interviews depending upon availability of time - 9 FGDs and 7 in-depth interviews was divided between PI and Co-PI. This was taken in and around 8 to 10 days. The participants in FGD were around 10 to 12 members. A tape recorder was used along with that of a note taken. The content analysis was done on the same day as far as possible.

Data Processing and Analysis

Analysis of the data collected through structured questionnaire were done through computer using packages, information collected through FGDs was analyzed using content analysis (qualitative data analysis) methods for social sciences.

Safety Considerations

Investigators–Budgetary provision was done to take care of accidents/illness in field interviewing. They were assured that the investigation was not meant for finding fault rather was necessary to correct the gaps if any. So that the community get the maximum benefit.

Follow-up

This is a one-time, fact-finding study. Based on the findings of the study recommendation was offered for action taken at appropriate level.

Data Management and Statistical Analysis

Data collected from the field were verified, cross-checked the same day, before being dispatched to the headquarters. Data were entered into the computer on bi-weekly basis and were checked for discrepancies, which were dispatched to the field for clarification and correction. Once clean data were ready, it were processed and tabulated and used for writing report.

Expected Outcomes of the Study

The expected outcomes of the study were :-

- Details appraisal of drug procurement process and inventory control system.
- Recommendation for improving the functioning of drug procurement process and inventory control so that essential drugs availability was ensured to the people.

Dissemination of Results and Publication Policy

- Workshop was organized for dissemination of results. Findings were forwarded to the policy makers for utilization at appropriate level. The lead publication was by the researcher. Acknowledgement was done to the funding agency, the investigators, the community members, other stakeholders etc.

CHAPTER 3

FINDINGS AND DISCUSSION

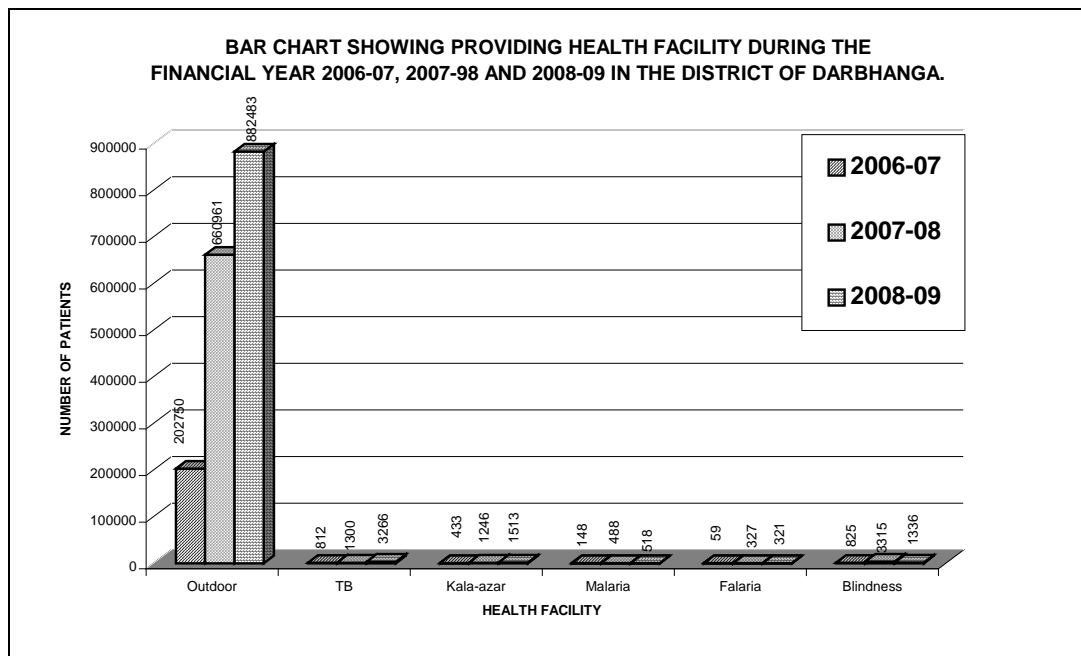
The present study of logistic and supply management of drugs is an in -depth study of the government health set-up within the district after launching of NRHM.

General Morbidity Pattern

After the launching of NRHM patients visiting the health care facilities in the districts are increasing every year simply due to availability of drugs. Before launching of NRHM availability of drugs at government run health centre was a far cry.

Table Showing Morbidity Pattern from 2006 to 2009

	2006-07	2007-08	2008-09
Outdoor	202750	660961	882483
TB	812	1300	3266
Kala-azar	433	1246	1513
Malaria	148	488	518
Falaria	59	327	321
Blindness	825	3315	1336



Number of Beneficiaries Visiting the Study Area

After launching of NRHM the number of patients visiting primary health centres are increasing every year. In the short span of 9 months of this year i.e. from April 2008 to December 08, the number of patients visiting Bahadurpur, Keoti and Hanuman Nagar are as follows:

Bahadurpur	24276
Keoti	38274
Hanuman Nagar	24868

3.1 Experience of Officers and Staffs Involved in Drug Logistic Management

Though there is no computerized system in PHC and APHC, but most of the MO I/C and storekeeper/clerk-cum-store keeper/ANM have got experience of more than 2-3 years in drug logistics management, Their experience can be utilized if they are trained in logistics management information system.

Table : Showing Experience of CMO, MO I/c, and Staff in Drug Logistics Management

PHC/APHC/Sub-centres	M.O. In-charge	Store keeper/Clerk-cum-store keeper/LDC-cum-store keeper/store keeper-cum-Dresser/ANM
CMO, Darbhanga		>3 years
Bahadurpur PHC	>3 years	<1 yr.
Keoti PHC	<1 year	>4 yr
Hanuman Nagar PHC	>4 year	<1 yr
Bazar Samiti APHC	>1 year <2 year (1-2 year)	>4 yr
Raiyam APHC	>3 year	>4 yr
Adaila APHC	<1 year	>4 years
Ojhaul sub-centre	-	<1 year
Barhetta sub-centre	-	>3 years
Khirma sub-centre	-	>3 years
Karzapatti sub-centre	-	>3 years
Bishanpur sub-centre	-	>3 years
Dihlahi sub-centre	-	>3 years

3.2 Procurement

3.2.1. At State level

State Health Society Bihar is implementing the National Rural Health Mission (NRHM) to carry out necessary correction in the basic health care delivery system. The Goal of the Mission is to improve the availability of and access to quality health care by people, especially for those residing in rural areas. As part of its overall mandate of ensuring accessibility to good quality health care and to meet the overall demand of good quality drugs in the government health institutions, the SHSB is aiming towards rational drug of management and procurement, so as to ensure availability of good quality drugs in the government health institution.

3.2.2 At District level

Procurement was done mostly through push system from State Health Society but some drugs were also purchased through district health society. There was a purchase committee headed by CS-cum-CMO, Darbhanga. The purchase committee decides the drugs to be purchased. There was no computerized system at any of PHC/APHC. None of the medical or paramedical staff have been trained in LMIS.

The FGD conducted with the community members revealed that they do not know either about NRHM or district health society or Rogi Kalyan Samiti. They said "Nai nai hamra sab ke e sub nam nahi sunal achi" (No we have not heard these names).

3.3 Procurement Order Interval, Receipt and Allotment

At district medical stores with provision of annual allotment of approximately 36 lacs, drugs were ordered at the interval of 3 months and it is received within a month or two. The DMS shows non-availability of drugs from main store of more than 25% of drugs. There was allotment of Rs 15,000/- for PHC for purchase through RKS.

3.4 The Budget for Procurement

The budgetary allocation of drug for the whole district was Rs 36,00,000 but out of annual budget only 10% of drug can be purchased locally. For regular purchase there was a purchase committee. Local Purchase: 10% of the drugs can be purchased locally out of annual budget. Below Rs 50,000 purchase was made through approval of the District Magistrate and above Rs. 50,000 through tender bids by CS-cum-CMO, Darbhanga.

3.4.1 At PHC level: Through indent from district main store by MO I/C. Rs. 15,000/- was allotted to every PHC for purchase through Rogi Kalyan Samiti but this was hardly done.

3.4.2 At APHC level: Through indent from district main store by MO I/C.

3.4.3 Sub-centre: Only very few drugs at few centres were sometimes pushed from MO I/C to the sub-centre.

Essential Drug List

In none of the health centres including district medical store there was a essential drug list available.

3.5 Drug Indent

Standard Proforma and fixity of amount for indent: Though there is no standard Proforma for submitting indent in any of the facility level but indents are made containing the name of the centre, drugs and its amount is finally signed by MO I/C of the PHC/APHC. The balance stock is shown against items asked for supply in the indent. Drugs are usually not supplied by the headquarter without indent.

3.6 Demand of Drugs

Five independent drugs were chosen at random. They are Paracetamol, Albendazole, ORS, Ampicillin and Diclofenac Sodium and their demand were compared with last year's demand from indent register. It was noticed that in almost all the centres except Adaila which is not functioning, there was increase of 10 -20%. This is all due to launching of NRHM in Bihar in July 06, the patients attending these centres have enormously increased and so has the demand.

Table No. 1 : Showing Independent Items of Indent at Random and their Comparison For Last Years Demand.

Health centres	Drugs Indent				
	Paracetamol	Albendazole	ORS	Ampicillin	Diclofenac Sodium
Bahadurpur	>15 - 20%	>15 - 20%	>15 - 20%	>15 - 20%	>15 - 20%
Bazar Samiti	>10 - 15%	>10 - 15%	>10 - 15%	>10 - 15%	>10 - 15%
Keoti	>20%	>20%	>20%	>15 - 20%	>15 - 20%
Raiyam	>15-20%	>20%	>20%	>20%	>15 - 20%
Hanuman Nagar	>20%	>20%	>20%	>20%	>20%
Adaila	-	-	-	-	-

3.7 Periodicity of Submitting Indents

There is no fixed periodicity of submitting the indents. Contrary to NRHM objective - drugs were not available at sub-centres and no indent from sub-centres were submitted. A few drugs were sometimes pushed to these centres. Due to poor logistic and drug management, drugs were indented 'as when required basis' at all facility level.

Reminder for Indent, Selection of Drugs for Indent and Estimation of Annual Demands of Drugs

Reminder for drugs indented were usually given after 2 weeks of no supply from the main source at all health functioning. The criteria for selection of drugs to be indented in DMS, Raiyam APHC, Hanuman Nagar PHC was based on last year consumption but in Bahadurpur it was as and when required and at Keoti PHC it was morbidity profile. Usually a criterion for estimation of annual demand of drugs was last year consumption. Reminders for indents were made after two weeks and selection of drugs were also according to last year's consumption.

3.8 Lead Time

Lead time was time between indent and supply. The district medical store supply the drug was made whenever indented and in most of the circumstances the time gap between indent and supply was minimum.

3.9 Re-order and Buffer Stock Level

No re-order and buffer stock level was maintained at any of the PHC and additional PHC. The DMS claims to maintain uniform buffer stock of 10% for all drug items.

3.10 Supply of Drugs to Health Centres

In supply of drugs as per any code number and/or sequence were not maintained at any health centres as per indent. Supply were retained and issued on the indent form itself in all centres. There was no stock card/Bin card at any of the facilities but stock registers was maintained for all items.

3.11 Facilities for Checking the Supply of Drugs

Standard check-list was not available at any of the health centres but items supplied were almost the same that was indented. But the amount supplied was mostly less than indented. Usually the drugs were not supplied which were not asked for. Vaccines temperature is maintained in most of the health care settings. The frequencies of non-availability from DMS are reported sometimes to all health facilities level. The person who checks the supply is designated as storekeeper.

3.12 Stock Position of Drugs

The stock registers were updated frequently and code/serial number and sequence were not the same as in indent. Supply was retained and issued on the indent form and stock register was maintained for all drugs.

3.13 Columns in Stock Register

Stock register showed the following columns – Stock in hand, supply received. The amount of items issued and present stock balance. But there is no re-order level column.

3.14 Drug Logistics and Human Resource

Though most of the administrative officer viz. CMO and MO incharge have more than 3 years of experience on the post but there was acute shortage of Pharmacist/store keeper. The clerks/ANM/dressers work as pharmacist, who have no formal training of drug logistics and supply management system.

3.15 Inventory Control

Except at the district level there was no computer at any facility level. Almost all the facilities had an inadequate inventory control and management. No scientific technique viz. ABC, VED technique of inventory control is applied for maintaining availability of drugs. There is no Bin card system. Stock registers are poorly maintained. The staff maintaining these registers were subject to frequently changed and they do not feel responsible for up-keeping the registers hence they are not kept up-to-date. There is a lack of basic reordering skills at all levels for example – not knowing how to calculate monthly stock available and to calculate orders on maximum and minimum quantities.

3.16 Logistics Management Information System (LMIS)

Logistic management information system is yet to develop.

3.17 Drug Stores

No doubt the district had a dedicated storage facility but that was not a proper store. Some spaces were utilized for storage down to the APHC level. They were inadequate in terms of space and storage conditions. Some had supplies scattered all over the floor, were untidy and poorly ventilated. Others lacked shelves, and thus the systematic placement of drugs was not possible. In appraising quality of storage the team rated the storage facilities even of the district store as poor. At PHC and APHC level there was no separate store and some space available within any other room used for some other purposes were utilized for storing the drugs and vaccines. At sub-centres question of drug store does not arise as mostly there only one room and almost no drugs available. FEFO system was not maintained in any of the store.

3.18 Transportation and Distribution

The supply of drugs to the various facilities suffers due to non-availability of vehicle for transportation and distribution of drugs. There was acute shortage of vehicles at

the district level and there was no vehicle earmarked for transportation of drugs. There was no provision for outsourced vehicle. Transportation of drugs was mainly done on adhoc arrangement by private vehicles. There was no separate vehicles for transportation of drugs from the central store at state headquarter to district medical store and again from district medical store to PHC and APHC.

3.19 Expired Drugs

Some stock of expired drugs was found in most of the facility level. No written guidelines on handling the expired drugs were found. But on most instances they were segregated from viable stock.

3.20 Forecasting and Need Assessment

There was no practice of forecasting and need assessment whatsoever at any level.

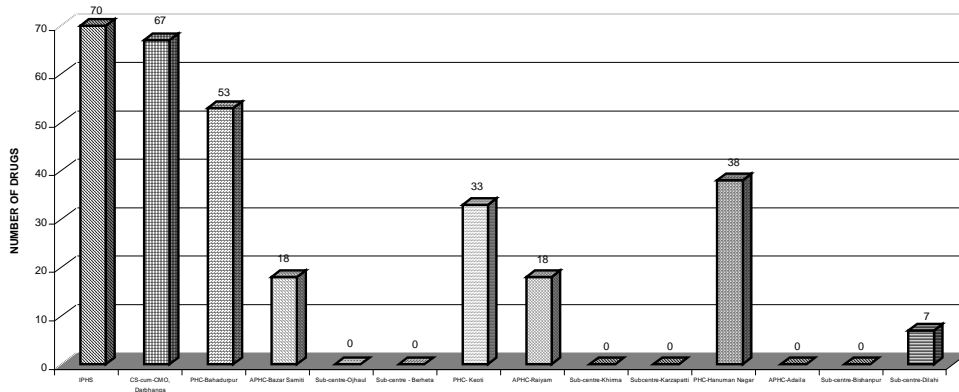
3.21 Availability of Drug Supplies

During FGD it was revealed that community members were unsatisfied with the facilities available in the government hospital. In one of the FGD they told, *Pura dabai ke ta prasana nahi achhi, kakhano du din ke kakhano tin din ke dabai bheta -ayi-ya* (sometimes of two days or sometime of three days medicine are provided). Drugs were not available as per essential drug list for PHC and sub-centres. In essential drug list there were 70 drugs should be available at PHC and sub-centres but even the DMS have only 67 drugs. Number of drugs available per centre were as following:

Table Showing Availability of Drugs as Compared to Essential Drug List

Essential drug list	70
CS-cum-CMO, Darbhanga	67
PHC-Bahadurpur	53
APHC-Bazar Samiti	18
Sub-centre-Ojhaul	0
Sub-centre - Berheta	0
PHC- Keoti	33
APHC-Raiyam	18
Sub-centre-Khirma	0
Sub-centre-Karzapatti	0
PHC-Hanuman Nagar	38
APHC-Adaila	0
Sub-centre-Bishanpur	0
Sub-centre-Dilahi	7

BAR CHART SHOWING NUMBER OF DRUGS REQUIRED TO BE AVAILABLE AT VARIOUS PHC, APHC, AND SUB-CENTRES AND ACTUAL POSITION OF AVAILABILITY IN THE SELECTED PHC, APHC AND SUB-CENTRES.



During FGD community members revealed that they have got no idea regarding essential drug list. When asked about the theft of drugs they asserted at various levels “doctor sub sabta dabai ta bachiye laye” (all the medicine are sold by doctors).

The drugs were not available at the sub-centres not even iron and folic acid tablets. It was strange to note that through one MO of PHC Hanuman Nagar looks after Adaila APHC, but due to overburden hardly gets time to visit the centre and the centre is going without drugs and MO since so many months. The community members are unsatisfied regarding the availability of drugs at various facility level as revealed in FGD.

CHAPTER 4

CONCLUSION AND RECOMMENDATIONS

1. Provide adequate funds for drug procurement, transportation and storage. Resources allocated to the provision of essential drugs are limited. Increase minimum stock levels for these essential drugs.
2. Introduce scientific method of drug indent.
3. Introduce, encourage, facilitate and organize use of stock/bin cards and proper maintenance of stock registers for all drugs. This is the basic tool for the drug needs quantification process and, more generally, for effective stock management. Store managers need to improve record keeping: preparing stock cards for all products in the store or the facility, keeping those stock cards upto date with accurate information, setting re-order levels, and checking stock status on a regular basis.
4. Provide on-the-job training for storekeepers and pharmacists in basic stores and drug management.
5. Improving drug use and maintaining proper records will require on-going supervision and technical support from district and Directorate. As logistic functions are distributed among various categories of staff, which may not have had the required training, closure supervision and on sight support can ensure that these basic functions are achieved efficiently.
6. Introduce the computerized tracking system. If the quantification process is to become a routine planning activity at health unit level, in charges and all staff handling drugs, need to acquire the corresponding skills. In the next few years, when conducting the quantification exercise, district Health Teams need to plan and notify health units well in advance, so that in charges can be fully participating in the process. Overtime, the responsibility of data collection can shift to the Health Unit. The District Health Team will later on co-ordinate a meeting to compile analyzed information. Managers at districts and PHC levels will also need computer skills to expedite the compilation work.
7. Promote and facilitate quantification of annual drug needs. Promote and develop drug quantification manual as a reference and guiding tool.
8. Provide separate stores for drugs and improve their physical conditions. The improvement should include installation of basic shelving and floor pallets, repair of major environmental defects (leaks, ventilation and security).
9. Train and support a district drug logistic core team and pharmacists/store keeper in logistic management, store management, procedures and job aids so that they can transfer drug logistic skills to other staff during on the job training.
10. Promote and co-ordinate with relevant authorities the collection and removal of expired stock and damaged materials from health facilities and district level storage areas. This will help free more space in the already congested stores for storage of the valid drugs.
11. Include logistic training in other training packages for all health related cadres in order to better promote logistic management among health workers. MOH

GOI should launch District Drug Management Programme (DDMP) to improve decentralized management of drug logistics.

12. Develop in-built monitoring system to ensure availability of adequate quantity of drugs.
13. Provide adequate vehicles for transportation of drugs.

REFERENCES

- (1) www.who.int
- (2) On Day National Concentration on Access to Medicine in India: International Centre, New Delhi, May 27, 2008.
- (3) World Medicine Situation Report, 2004 of WHO.
- (4) West Bengal Government Drug Procurement and Inventory Control Policy 2004.
- (5) Yusuff KB, Tayo F : Drug Supply Strategies, Constraints and Prospects in Nigeria. *African Journal of Medical Sciences*, 2004 Dec. 33(4): 389-94.
- (6) Lt. Col. R. Gupta; Col. K.K. Gupta (Retd.); Brig. BR Jain (Retd; and Maj. Gen. R.K. Garg : ABC and VED Analysis in Medical Stores and Inventory Control. *MJAFI* 2007; 63 : 325-327.
- (7) Kotwani A, Ewen M, Dey D, Iyer S and others : Prices and Availability of Common Medicines at Six Sites in India Using a Standard Methodology. October 2004 - January 2005.
- (8) N. Lalitha Access to Medicine Initiative in Policy Making and Delivery of Drugs - A Case Study of Tamil Nadu (May 2004; IESE and the World Bank) Conference Delhi 17/18 June 2004.
- (9) Anand, T.R.; Agrwal, A.K.; and Mitra, P. Logistic and Supply Management System of Drugs in Rural Areas of Madhya Pradesh (1986).
- (10) Agarwal A. K., Gupta Y.P., and Das J. K. Study of Logistics and Supply Management Systems of Drugs, Vaccines and Contraceptive in a District Health System.