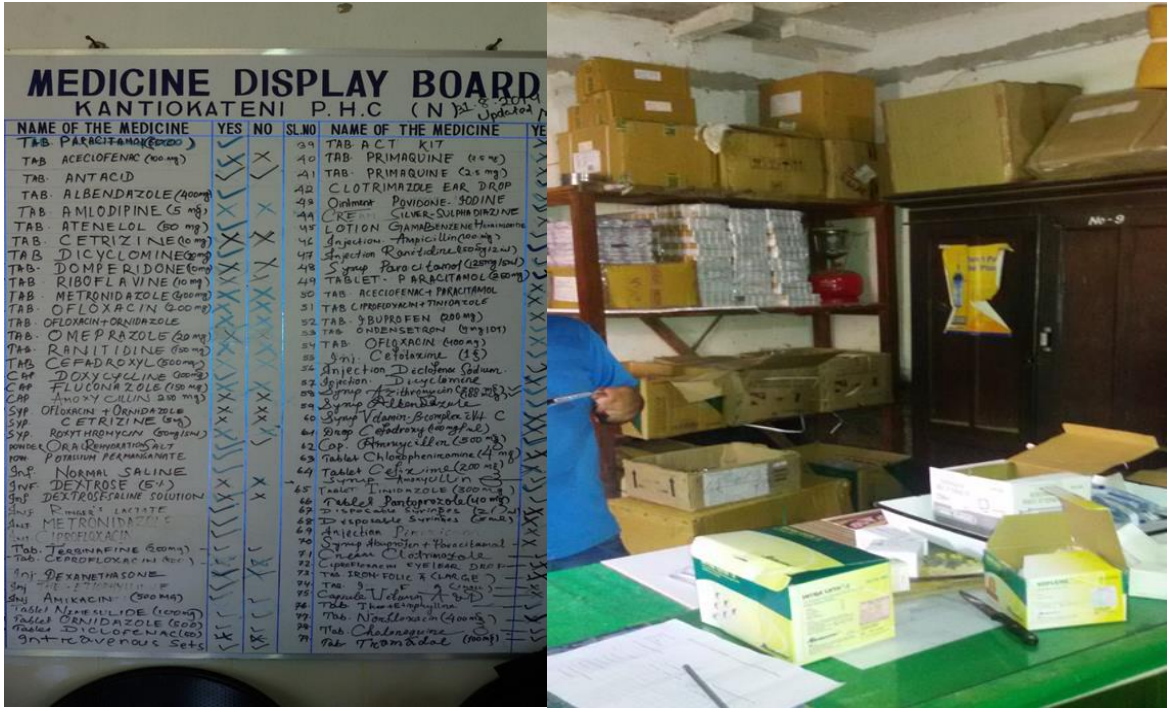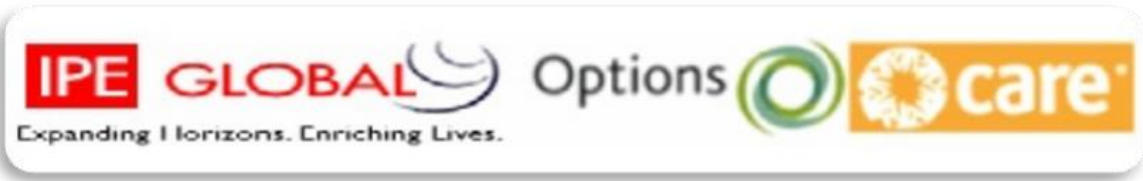# DEPARTMENT OF HEALTH & FAMILY WELFARE GOVERNMENT OF ODISHA

Draft Drug Stock Out Assessment, including recommendations for the procurement system, identification of issues arising and mitigation plan, agreed with DHFW

COVER NOTE

Government of Odisha has the mandate to improve access to quality healthcare including medicine and diagnostics for the entire population of the state. The declaration of "***Free Medicine Distribution Scheme***" by the government is one such step taken in that direction. The aim of the scheme is to ensure availability of essential medicines, within the context of functioning health facilities, at all times, in adequate quantity, in the appropriate dosage, with assured quality, available adequate information and at free of cost.

Department of Health and Family Welfare, Government of Odisha, has taken various measures to ensure successful implementation of the ***Scheme***. The need for an appropriate reform strategy based on empirical evidence was felt necessary to bring about order in the system and to ensure sustainable improvement in accessibility of medicines at government health facilities. The need for an in depth assessment of the issues and challenges relating to accessibility to essential drugs was of paramount importance; more so when almost 68% of the people in India have limited or no access to essential medicines[1].

In view of above facts, Indian Institute of Public Health(IIPH) at Bhubaneswar, was commissioned through the Technical Management and Support Team (TMST) under DFID supported Odisha Health Sector and Nutrition Plan (OHSNP) to carry out a rapid assessment of availability of drugs at government health facilities. It has the following objectives:

a) Assess the extent of availability and stock out of essential medicines and other medical supplies at the health facilities;
b) Analyse consumption patterns at different levels of health facilities to facilitate rational drug budgeting and better procurement planning; and
c) Identify the factors that drive both availability and consumption of essential drugs at health facilities.

IIPH started field assessment process during Sept'14 with concurrence of the department. The assessment tools, methodology and the approach were finalised in consultation with the government counterparts. The first draft report was submitted by IIPH in the 1st week of Dec'14. The meeting on sharing the assessment findings with department officials was held on 22nd Dec'14. The findings and recommendations were deliberated upon in detail and an action plan agreed. It was also agreed that the new procurement and inventory management system, which is under implementation

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[1] WHO report on the world's medicines situation

through Odisha State Medical Corporation Limited[2] shall address the majority of the issues identified. The report on the rapid assessment clearly depicts the survey findings and provides appropriate analysis. The survey findings are detailed out within the report and have been summarized under separate heads. In line with the study findings the report also recommends both short term and long term measures for improving drug availability at the facilities.

The minutes of the meeting held with the department on sharing first hand findings of the rapid assessment study, along with the recommended action plan as agreed, is enclosed herewith for reference and the records of the department.

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[2] Odisha State Medical Corporation Limited is the newly established corporation by the government, who shall act as a nodal agency of the department for procurement, quality assurance, storage and distribution of the medicines, equipment and medical supplies for the department.

Mission Directorate

National Health Mission, Odisha
Department of Health & Family Welfare,
Government of Odisha.

Letter No. __1565l__   Date : __11.9.14__

From   __415/10 (PL-1)__

        Smt. RoopaMishra,IAS
        Mission Director
        NHM, Odisha

To

        The CDMO,
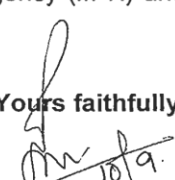   Nayagarh / Jharsuguda / Kalahandi / Dhenkanal.

Sub: **Rapid Assessment of Drug Availability at Government Health Facilities**

Sir,

    This is to inform you that Indian Institute of Public Health (IIPH), Bhubaneswar has been engaged through TMST (under OHSNP) to conduct a rapid assessment of availability of drugs at government health facilities. The study findings will be primarily helpful in assessing the annual drugs requirement accurately including general consumption pattern and prescription practices.

    In the course of this assessment they would be visiting selected health facilities of the district and interact with different stake holders including staff and beneficiaries. In this regard you are advised to provide necessary support to the Agency (IIPH) and their representatives to carry out the assignment successfully.
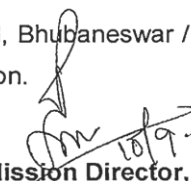
                                    Yours faithfully,

                                    Mission Director
                                    NHM, Odisha

Memo No. __15652__   Date __11.9.14__

    Copy to Dr. Nayan Chakravarty, Associate Professor & P.I, IIPH, Bhubaneswar / Team Leader, TMST, Bhubaneswar for information and necessary action.

                                    Mission Director,
                                    NHM, Odisha.

Mission Directorate, NHM,
SIHFW Building, Nayapalli, Bhubaneswar, Odisha.
Phone/Fax: 0674- 2392479/80, E-mail: oshfws@orissahealth.org.Web: www.orissahealth.org

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Mission Directorate
National Health Mission, Odisha
Department of Health & Family Welfare,
Government of Odisha

ଜାତୀୟ ସ୍ୱାସ୍ଥ୍ୟ ମିଶନ୍

Letter No. __17367__ OSH&FWS/   Date : __25.10.14__

From :
Ms.Roopa Mishra, IAS
Mission Director,
NHM, Odisha

To

The Principal SCB Medical College, Cuttack

The Director, Capital Hospital, Bhubaneswar

The Director AHRCC, Cuttack

Sub: Rapid Assessment of Drug Availability at Government Health Facilities

Sir,

The Indian Institute of Public Health (IIPH), Bhubaneswar has been engaged through TMST (under OHSNP) to conduct a rapid assessment of availability and dispensing practices of drugs at different level of government health facilities. The study findings shall be particularly useful to improve procurement planning and supply chain system to improve availability and dispensing of drugs at government health facilities.

As your institution has been covered under this study, IIPH representatives shall visit your institution for collection of necessary information including interaction with officials and staff members.

In this regard, it is requested to provide necessary support to the Agency (IIPH)to carry out the assignment successfully.

Yours faithfully,

Mission Director
NHM, Odisha

Memo No. 17368 /OSH&FWS/ Dt. 25.10.14

Copy forwarded to the Special Secretary (Scheme), H & F.W Dept. for information.

Mission Director,
NHM, Odisha

Memo No. 17369 /OSH&FWS/ Dt. 25.10.14

Copy forwarded to the Additional Secretary, (Medical Education & Trg.) for information.

Mission Director
NHM, Odisha

Memo No. 17370 /OSH&FWS/ Dt. 25.10.14

Copy forwarded to the Director Medical Education & Training (O), Bhubaneswar for information

Mission Director,
NHM, Odisha

SIH&FW Annex Building, Nayapalli, Bhubaneswar-751012
Phone : 0674-2392480/88/Fax-2392479/E-mail : missiondirector@nic.in/Web: www.nrhmorissa.gov.in

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Letter No. No. _503_____ /OSH&FWS   Dated 15·01·15
415/2010(Pt – 1)

From
Ms. Roopa Mishra, IAS
Mission Director,
NHM, Odisha

To

The General Manager,
(HR & Admin.),OSMCL
Bhubaneswar

Joint Director,
State Drug Management Unit (SDMU)
Bhubaneswar

Team Leader,
Technical Management Support Team (T&MST)
Bhubaneswar

Sub : **Minutes of the meeting on findings of the rapid assessment carried out by IIPH, BBSR on "Drug availability & stock out at Government Health Facilities" held on 22nd December,2014 at 3.30 PM.**

Sir,

Please find enclosed herewith minutes of the meeting on findings of the rapid assessment carried out by IIPH, BBSR on "Drug availability & stock out at Government Health Facilities" held on 22nd December,2014 at 3.30 PM in Mini Conference Hall of NHM.

This is for your information & necessary action.

Yours faithfully,

Mission Director
NHM,Odisha

SIH&FW Annex Building, Nayapalli, Bhubaneswar-751012
Phone : 0674-2392480/88/Fax-2392479/E-mail : missiondirector@nic.in/Web: www.nrhmorissa.gov.in

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MINUTES OF THE MEETING HELD ON 22ND DECEMBER 2014 AT 3.30 PM IN THE MINI CONFERENCE HALL OF NHM, BHUBANESWARTO DISCUSS ON THE FINDINGS OF THE RAPID ASSESSMENT CARRIED OUT BY IIPH, BHUBANESWAR ON " DRUG AVAILABILITY AND STOCK OUT AT GOVERNMENT HEALTH FACILITIES":

The meeting was convened under the chairpersonship of Ms. Roopa Mishara, Mission Director, NHM and following officials were present in the meeting.

1.	DrDinabandhuSahoo	JD, Technical, NHM, Odisha
2	DrRabi Chandra Garnaik	JD, SDMU, Odisha
3	DrB.K. Swain	General Manager-Logistics
4	Dr. K.C. Sahoo	General Manager-Procurement, OSMCL
5	MrS.K.Nayak	Manager – QA, OSMCL
6	DrR.K. Paty	JD, MCH (In-charge Procurement, SDMU)
7	MrP.Das	Sr Consultant Procurement, NHM
8	ProfNayanChakrabarty	Principal Investigator IIPH, BBSR
9	Ms. SonaliMohapatra	Principal Investigator, IIPH, BBSR
10	Mr. HemantaKumanrNayak	Procurement Specialist, TMST (OHSNP)
11	Mr. Nihar Mishra	Consultant Demography- TMST (OHSNP)
12	Mr. Neel KanthaBhoi	Consultant Procurement, TMST (OHSNP)

The representatives of IIPH, Bhubaneswar made the presentation of the key findings of the assessment and suggested the areas that required immediate attention.

The members present discussed on possible solutions to overcome the deficiencies and gaps in the system both in terms of the infrastructure, policies and practices to improve the availability and consumptions of medicines at the facilities.

The chair based on the discussion and suggestion of the member present summarized following key action points.

1. Classification of EDL based on its criticality and cost (VED & ABC Analysis)
2. Expansion and up gradation of storage facility
3. Computerization of drug store at facility
4. Implementation of standard protocols, forms and formats
5. Training and capacity Building

The Chair advised TMST representatives to develop a detailed action plan based on the discussion.

The meeting ended with a vote of thanks to the Chair.

Mission Director, NHM
Bhubaneswar

Key action points agreed at the meeting to share the findings of the rapid assessment with the department officials held on 22nd Dec'2014.

1. Classification of Essential Drug Lists (EDL):

The EDL (2014) enlists 359 drugs including kits, which indicates the drugs that should be available in each category of health facilities i.e. PHC, CHC, DHH, Medical College Hospital and Major Health Institutions.

However, classification of drugs items, separately for each category of health facilities based on their criticality (Vital, Essential and Desirable-VED) or cost burden (Always, Better and Control-ABC), is important for effective supply-chain management and budgetary control respectively. Classification of drugs, preferably based on their critical value (i.e. shortage cost) or cost implications, would help in focusing more on items having relative higher clinical importance by separating critical medicines from the more trivial in the EDL, and ensuring their availability, without failure to improve service delivery.

Explanation:

ABC analysis *helps in identifying the items that require the greater attention for control. In this, 10% items consume about 70% of the budget (Group A). The next 20% inventory items take away 20% of the financial resources (Group B) and the remaining 70% items account for just 10% of the budget (Group C).*

VED analysis *is based on critical values and shortage cost of the item. Based on their criticality, the items could be classified into three categories: Vital, Essential and Desirable, i.e., VED.*

A combination of ABC and VED analysis (ABC-VED matrix) *can be gainfully employed to develop meaningful control over the material supplies. Category I includes all V and E items (AV, BV, CV, AE, AD). Category II includes the remaining items of the E and B groups (BE, CE, BD). Category III includes the desirable and cheaper group of items (CD).*

Similarly, the classification of these medicines on the basis of their consumption pattern (Slow, Medium and Fast) is equally important for better supply-chain management.

2. Expansion and Up-gradation of Storage Facility:

Warehousing is another area of relevance, which requires immediate attention for renovation and up-gradation. The medicines need to be stored as per the scientific

parameters specific to them, to maintain its efficacy and integrity. Separate temperature zone and moisture, rodent and seepage free environment is essential to ensure quality of the medicine throughout its usable life. A detailed GAP analysis is highly recommended at this point to assess the infrastructural and process level gaps requiring necessary remedial action, keeping following points in mind.

a) The central warehouses, which shall be managed by the OSMCL, shall have adequate space to carry at least 5 months stock (1month for quarantine stock + 4 months consumption) to handle the peak load. The warehouses shall have separate earmarked space for (a) stock under quarantine (b) damaged and expired drugs (c) toxic substances (d) high volume items to have better physical control.

b) Each facility shall have storage space for minimum two months consumption. In addition the store shall have separate space for cold-chain items, damaged and expired drugs, high volume items and other toxic substances.

c) The warehouses and facility level stores shall have adequate racking system and handling equipment for better handling and easy access.

d) Detailed training need assessment has to be made to ensure that the protocols and guidelines with respect to warehouses/stores management are understood and implemented uniformly.

3.   Computerization of Drug Stores at Facilities:

Computerization of drug stores at the facility shall be done to integrate entire supply-chain system from DDCs till the point of origin (supplier) to ensure smooth flow of supplies. This needs detailed assessment of both hardware and software requirement. In addition, a detail training and manpower need assessment shall also be helpful.

The reordering level shall be fixed both at warehouses and facility level and there shall be a system of auto indenting once the reordering level is reached. The inventory management system shall also facilitate indenting as per actual demand by revising the procurement plan as per consumption. The inventory management system shall also facilitate inter-faculty transfer, if required, to improve availability of medicines across the facilities.

4. Protocols, Forms and Formats

There shall be standard procedural guidelines, forms and formats, which shall be followed uniformly at all level. The guidelines/protocols which need to be developed immediately are as given below:

S.No.	Area	Purpose	Key Benefit
1	Guidelines on rational procurement planning and management (Drugs and Equipment).	Timely finalization of "Annual Procurement Plan" by collecting, compiling and rationalizing the facility-wise indent at different stages.	• Accurate annual demand estimation. • Involvement of practitioner/ doctors in the process of indenting. • Information on quantity. helps in scheduling of procurement. • Expiry management.
2	Guidelines on disposal of damaged and expired medicines and consumables.	Timely and proper disposal of expired and damaged medicines conforming to environment and other norms.	• Better space management. • Prevention of contamination. • Conforming to environmental and other statutory norms.
3	Guidelines on Quality Assurance.	Timely collection of samples, coding, packaging, transporting of samples to empaneled labs and analysis of test report.	• Less time and space for quarantine. • Proper sampling and documentation. • 100% batch sample testing.
4	Protocol on Storage and Warehouse Management.	Adherence to storage norms specific to each medicine. Segregation of the medicines based on scientific norms.	• Easy access and physical control. • Waste and damage management. • Space Management.
5	Procurement Guidelines (Goods and Services)	Define process and methods to be adopted. Standard tender terms and conditions with respect to eligibility, quality, etc.	• Competition due to clarity and transparency. • Economy and process efficiency.

5.   Training and Capacity Building

Workshop Training on following areas shall be required in following areas and target group.

S. No.	Training Subject	Target Group	Purpose
1	E-tendering module of NIC.	Officials in the corporate office from procurement, finance, quality assurance and IT.	To understand the entire process of e-tendering and how is it different from manual system, including invitation of tender, receipt of tender, evaluation and selection.
2	Inventory Management System (e-Aushadhi)	Officials from logistic department and central warehouses staff.	To get acquainted with the new software and all its modules.
3	Warehouse Management.	Staff of the central warehouse and drug store (facility).	To understand the storage protocols for its successful implementation including receipt, quarantine, inspection, racking, labeling, segregation, cold-chain, waste, etc.
4	Quality Assurance and Sampling.	QC department and Pharmacists of central warehouse.	To understand and implement QC protocol including sampling, coding, packaging, lab report analysis, disposal, etc.
5	Logistic and supply-chain management.	Logistic department and Central Warehouse staff.	To understand and implement logistic and supply-chain protocols suitable for the operation.

RAPID ASSESSMENT OF DRUG AVAILABILITY AND STOCK-OUTS AT GOVERNMENT HEALTH FACILITIES OF ODISHA

Report 2014

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Abbreviations

ADMO	**Additional District Medical Officer**
AHRCC	Acharya Harihar Regional Cancer Center
ANM	Auxiliary Nurse Midwife
CDMO	Chief District Medical Officer
CHC	Community Health Centre
DHH	District Headquarter Hospital
EDL	Essential Drug List
EML	Essential Medicine List
FEFO	First Expiry First Out
GoI	Government of India
GoO	Government of Odisha
MO	Medical Officer
MOI/C	Medical Officer In- Charge
NLEM	National List of Essential Medicine
NSQ	Not up to Standard Quality
OOP	Out of Pocket
PHC	Primary Health Centre
PHC-N	Primary Health Centre- New
SCs	Sub- Centres
SCB MCH	Sriram Chandra Bhanja Medical College and Hospital
SDMU	State Drug Management Unit
SMO	State Medical Officer
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organization

EXECUTIVE SUMMARY

Introduction

Medicines are integral part of the health care and limited access to medicines undermines health systems' objectives of equity, efficiency and health development. Essential medicines are defined as those that satisfy the health care needs of the majority of a population. India is one among global leaders in manufacturing generic medicines, however, majority in India have limited or no access to essential medicines. The Government of Odisha has been implementing systemic reforms in drug management. Scant literature is found on availability and stock out of essential drugs in Odisha public health system. This study assessed the extent of availability of essential drugs at all levels of public health facilities in Odisha.

Methods

A rapid assessment using cross-sectional study design was conducted in selected health care institutions of Odisha during August-December 2014. Methods used were interviews with stakeholders, review of secondary data and observation techniques. Health facilities were selected from all the tiers of health system. At state level, 3 tertiary care facilities were purposively selected for the study. The 30 districts of Odisha were categorized into 3 groups based on performance on health indicators and 3 districts were randomly selected for the study. In selected districts, all the district hospitals (DHH) and central warehouses were included in the study. At Sub district level, 2 blocks were randomly selected and from the sampled blocks, all CHCs and PHCs, and from each PHCs two SCs were selected randomly for the study. The study subjects were Store Medical Officers, Additional District Medical Officer (medical), Pharmacists, Medical Officers, ANMs and Patients. Both quantitative and qualitative data was collected using semi-structured questionnaires and checklists. Quantitative data was analyzed using MS Excel and SPSS 20.0; Qualitative data was analyzed using framework approach.

Results

The vital and essential drugs required for various health facilities were of short supply and chronic stock-outs of essential drugs were observed. Annual drug requirements were not calculated scientifically, hence quantity of required drugs supplied was not adequate. Incongruity between quantity of drugs indented and supplied was noticed in most of the health facilities. The storage and transportation facilities of drugs were found to be poor. Some of the health facilities were understaffed and untrained pharmacists manage drug stores. Automation was in place for drug management, but there was limited utilization of the same, due to reasons such as inadequacies in infrastructure, lack of IT skills among the staff and incomplete implementation of software. Despite all the issues, the patient satisfaction survey shows that majority of the patients are satisfied on different quality parameters.

Conclusion

The forecasting / estimation, indenting, storage, supply and management of drugs are weak in Odisha, adversely affecting the availability of drugs at health facilities. Development and strict implementation of Standard Operating Procedures (SOPs) for all key activities through appropriate training and handholding are recommended, in order to strengthen the existing system of procurement and supply chain management.

INTRODUCTION

Medicines are integral part of the health care and limited access to medicines undermines health systems' objectives of equity, efficiency and health development[i]. Medicines not only save lives and promote health, but prevent diseases and epidemics too. Availability and accessibility of essential medicines were reaffirmed as key components of primary health care during the Alma Ata declaration in 1978[ii]. Essential medicines are defined as those that satisfy the health care needs of the majority of a population. This concept was defined in 1975 by the World Health Organization (WHO), and is based on the premise that a limited list of carefully selected medicines will improve quality of health care and provide cost-effective health care and better management of medicines[iii]. The first WHO essential medicines list (EML) was published in 1977 and thereafter revised every two years. As of now, 134 countries in the world have their own EMLs[iv]. The Government of India, recognizing the importance of the EML, prepared and published its first National Essential Drugs List in 1996, which was revised in 2003 as the National List of Essential Medicines[v]. The National List of Essential Medicines of India (NLEMI 2011) was revised recently[vi] by the Ministry of Health and Family Welfare (MOH and FW), Government of India (GOI), in June 2011, nearly eight years after the previous list, on the directions of the Supreme Court of India[vii].

India is reckoned among the global leaders in manufacturing generic medicines. However, according to a report by WHO on the world's medicines situation, almost 68% of the people in India have limited or no access to essential medicines[viii]. Implementation of NEML in procurement of good quality medicines, regular supply as well as price regulation, strengthening indigenous manufacturing capacity is therefore emphasized. Essential medicines are intended to be available within the context of functioning health systems at all times in adequate amounts, in the appropriate dosage forms, with assured quality and adequate information, and at a price an individual and the community can afford[ix]. Inequities in access to medicines is perceived as a symptom of weak health-care system and represents a failure on the part of national governments to fulfill their obligations towards right to health[x].

The Government of Odisha has been implementing a series of systemic changes and reforms in management of drugs. The Department for International Development

(DFID), UK, is one of the key players in assisting the Government of Odisha in enhancing capacity to improve the supply of essential drugs. Since 1997, Odisha has implemented a rational drug policy by introducing an Essential Drug List (EDL), centralized purchasing of drugs and transparency through an open tender system and quality assurance. State Drug Management policy 2003, is a mixed procurement system whereby 80% (centralized) of the state budget on drugs is to be procured centrally at state level and the balance of 20% (decentralized) locally, directly by the district to meet emergency needs. The drugs can only be procured in generic name from the Essential Drug List (EDL) that is revised every two years[xi].

Estimates from the 55th expenditure survey reveal that consumption of drugs account for a substantial part of household expenditure. In Odisha, 90.64% of the total out of pocket expenditure (OOP) is spent on drugs in both rural as well as in urban areas. In this context, it is important to discuss out-of-pocket expenditure and whether the state government is able to protect Odisha's large number of poor families from health shocks.

Another initiative by Department of Health and Family Welfare, Odisha, is setting up of a Medical Corporation to look into the procurement and distribution of drugs and supplies to all the government health institutions across the state. Also, a proposal to establish adequate number of IT enabled Drug Dispensing Counters across public health facilities in the state is another initiative to increase access to free medicines, that is under process.

To ensure smooth and successful implementation of these schemes, a comprehensive drug management system is prerequisite. The drug management system should have scientifically developed and clearly spelled out guidelines on procurement planning and management, including demand assessment, sourcing, quality assurance, storage, waste management and dispensing, in order to ensure availability of essential drugs at all level of health facilities.

Studies, which look into the availability and stock out of essential drugs in all the tiers of the public health care delivery system in Odisha, are scarce. Therefore, our study aims to assess the extent of availability of essential drugs at health facilities and explore the possible factors contributing to availability and consumption.

Study Rationale

Several initiatives have been taken up by Government of Odisha, such as increased budget allocation for procurement of drugs, centralized drug procurement system through SDMU, online drug inventory management, and the forthcoming "Free Medicine Distribution Scheme" at government health facilities. The primary objective behind all these initiatives is to ensure that essential drugs are available at government health facilities, in required quantities, and that all patients can avail prescribed drugs at the point of treatment.

Establishment of the Odisha State Medical Corporation Limited (OSMCL) as the nodal procurement agency for the department and the setting up of drug distribution counters at facilities for dispensing of medicines and on-line capturing of prescriptions are designed to facilitate implementation of the "Free Medicine Distribution Scheme". There will be changes in policies and practices both at strategic and operational level once the OSMCL is operational. In view of the above, the proposed assessment will provide important inputs to policy formulation and designing a system for drug management.

Conducting an assessment of drug availability and stock-out at health facilities will assist GoO to understand the present situation and plan for future course of action to strengthen the overall design of the procurement, indenting system, infrastructure building, human resource and supply-chain system.

OVERALL OBJECTIVE

The overall objective of the project was to know the availability of drugs at different levels of health facilities and to explore factors contributing to the same in order to analyze consumption pattern and facilitate rational drug budgeting and better procurement planning.

SPECIFIC OBJECTIVES

There were three specific objectives that the project was designed to achieve. They were as following:

1. Assess the extent of availability and stock out of essential medicines at different level of health facilities.
2. Identify the factors that drive both availability and consumption of essential drugs at health facilities.
3. Analyze consumption pattern at health facilities to facilitate rational drug budgeting and better procurement planning.

METHODOLOGY

Study design

This is cross-sectional study using both qualitative and quantitative study techniques. The duration of the study was from 1st August 2014 to 31st December 2014.

Study setting

The study was carried out in Odisha, across all levels of health care institutions starting from sub-centers to the tertiary care facilities, including a Medical College Hospital (MCH).

Selection of tertiary care facilities (at state level)

Among the three government MCHs, SCB Medical College and Hospital was selected based on the patient load as criteria. In addition to MCHs, two other tertiary care facilities, Capital Hospital and Acharya Harihar Regional Cancer Centre (AHRCC), located at the state head quarters, were also included in the study.

Selection of districts

Three districts were selected on the basis of indicators related to health services utilization at government health facilities: Annual Health Survey (AHS) 2011-12, fact sheet, Odisha. All thirty districts of Odisha were ranked in an ascending order in terms of utilization of government health services. The districts were then scored based on the services and categorized into lowest, moderate and high scoring districts. One district was selected randomly from each category. Jharsuguda was one among the list of low scoring districts, Dhenkanal was among the moderate scoring districts and Kalahandi was one among the high scoring districts.

Table 1 Number of health facilities included in study in each district

Districts	DHH	CHC		PHC		Sub centers	
		Existing	Sampled	Existing	Sampled	Existing	Sampled
Jharsuguda	01	6	02	15	07	66	11
Dhenkanal	01	10	02	33	05	167	10
Kalahandi	01	16	02	43	04	241	8

Selection of primary and secondary care facilities (at district level)

At the district level, all the three District Headquarter Hospitals (DHH) and central warehouses of the selected districts were included in the study. In each district, two blocks were randomly selected; from the sample blocks, all CHCs and PHCs were included, and under each selected PHCs, two SCs were randomly selected for the study.

Sampling

The given below figure illustrates the sampling frame used in the study.

Figure 1 Sampling frame
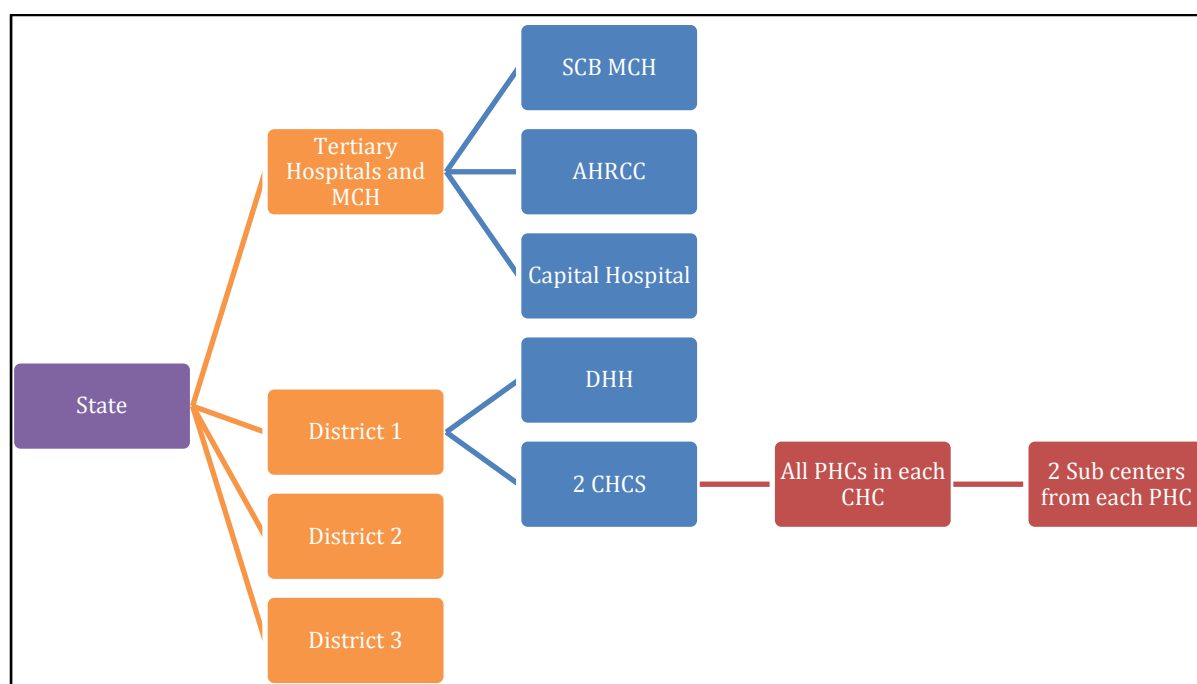
Table 2 Total health facilities covered in the study

Category of Health Facility	Coverage	Study Participants
Medical College Hospital	1	Store Medical Officer, Store Pharmacist, Outdoor patients
Capital Hospital	1	Store Medical Officer, Store pharmacist, Outdoor patients
AHRCC	1	Store Medical Officer, Technical Store Keeper
Central Warehouses	3	Store In Charge
District Headquarter Hospital	3	ADMO (M), Store Medical Officer (Central warehouse), District Pharmacist/Store in Charge Outdoor patients

Community Health Centres (CHCs)	6	MOIC/ Specialist, Block Pharmacist, Outdoor patients
Primary Health Centres (PHCs)	16	MOIC, Pharmacist, Outdoor patients
Sub-Centres (SCs)	29	ANMs

Table 3 List of selected health facilities in sample districts

Kalahandi	Dhenkanal	Jharsuguda
1. DHH-Kalahandi	1. DHH-Dhenkanal	1. DHH- Jharsuguda
2. Block CHC		
2.1 Narla CHC	2.1 Aanlabereni CHC	2.1 Kirimira CHC
2.2 Pastikudi CJC	2.2 Birasala CHC	2.2 Kolabira CHC
3. PHC		
3.1 Rupra PHC	3.1 Guneibili PHC	3.1Adra PHC
3.2 Rupra Road PHC	3.2 Kantiokateni PHC	3.2Bagdehi PHC
3.3 Ulikupa PHC	3.3 Sirimula PHC	3.3Bhadimal PHC
3.4 Palam PHC	3.4 Pangatira PHC	3.4Pokhorasal PHC
3.5 Utkela PHC	3.5 Kantapala PHC	
3.6 Kandel PHC		
3.7 Belkhandi PHC		
4. SC		
4.1 Kandel SC	4.1 Kantapala SC	4.1 Arda SC
4.2 Amath SC	4.2 Tumursinga SC	4.2 Bagdehi SC
4.3 Tungla SC	4.3 Guneibil SC	4.3 Bhimjore SC
4.4 Dhoben SC	4.4 Ichchabatipur SC	4.4 Chandarpur SC
4.5 Ghantamal SC	4.5 Kantio- puta sahi SC	4.5 Pokhorasal SC
4.6 Rupra SC	4.6 Kantio kateni SC	4.6 Parmanpur SC
4.7 Nishanpur SC	4.7 Pangatira SC	4.7 Raghunathpalli SC
4.8 Rupraroad SC	4.8 Kantapala SC	4.8 Belmunda SC
4.9 Sargiguda SC	4.9 Kankadahada SC	
4.10 Palam SC	4.10 Ghagramunda SC	
4.11 Gigina SC		

Study Population

The study population includes various stakeholders involved in drug procurement, supply and inventory management processes. The study participants were the Store Medical Officer of central warehouse, Pharmacists of central store and patients attending out door at Capital Hospital, SCB MCH and Acharya Harihar Regional Cancer Center.

The participants at the district level were ADMOs (medical), Store in-Charges of central warehouses and pharmacists of district headquarter hospital. Information was collected from the MO I/Cs and pharmacists at CHCs, PHCs; and ANMs at sub centers. In-addition, 10-20% of outdoor-patients attending the sampled facilities on the day of survey were randomly selected for interview.

Sample Size

The total sample size selected for the study was 243. The table 4 presents participants interviewed during the study, by category.

Table 4 Category wise respondents in sample districts

Respondents	No of Respondents
Store Medical Officer	4
ADMO (Med)	3
MO I/C	24
Pharmacist/Storekeeper	26
ANM	29
Patients	158 (145 district level + 13 tertiary Care hospitals)
Total	**244**

Tools for Data Collection

Different study instruments were developed to collect data from for interviewing different stakeholders including checklists for observation. Following study instruments were used to collect data from the sample population:

- Interviews using semi-structured interview schedule with store Medical Officer of Capital Hospital, SCB MCH, Store in Charge of central warehouses in the district level.
- Interviews using semi-structured schedule for interview with MOICs, Pharmacists, ANMs and out-door patients.
- Exit interviews using structured interview schedule with patients at sampled facilities.

- Review of stock availability and stock outs using checklist of drugs as per WHO recommended 'list of key drugs' for all levels of health institutions.
- Observation with checklists for all the facility level pharmacies, central warehouses, storage facilities, dispensing units and OPD conditions.

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

The primary data was collected from the study participants through interviews and observation checklist. The secondary data was collected from various records and documents from various facilities visited during the study. Following are the details of study instruments and sources of data.

Primary Source

- In-depth interview with Store Medical Officer of Capital Hospital, SCB MCH, Store in Charge of central warehouses in the district level.
- Checklist of drugs as per WHO recommended 'List of key Drugs' for all levels of health institutions.
- Semi-structured schedule for interview with various stakeholders like MOICs, Pharmacists and ANMs of all the facilities.
- Exit interview of out-door patients visiting the same facilities
- Structured Observation schedule for direct observation of the storage facility, dispensing unit and OPD working situation.

Note: The checklist of drugs for district level facilities also contains five more drugs suggested by the ADMOs (med) as per the demography and morbidity pattern of the respective districts.

Secondary Source

Review of stock register in order to know the stock position on the day of survey and referred previous year stock registers to in order to know indented and actual received quantity of drugs for the past 6 months.

Data Collection

A detailed data collection plan was prepared in consultation with district authorities and research team. The research involved three field teams, each comprising of three members (2 Investigators and 1 Supervisor). A three-day training was conducted with all the field staff to familiarize them with the concepts, data collection tools and techniques. For each district, the data collection spanned seven days. The data collected from field were checked and corrected every evening by the supervisor before leaving the field.

Data Analysis

The quantitative data collected through interviews were first coded and entered into MS Excel and exported to SPSS 20.0 and descriptive statistics were computed. The qualitative data from in-depth interviews were transcribed and translated into English for analysis. Qualitative data analyzed manually using thematic framework[xii] approach.

Ethical Consideration

The study has obtained ethical clearance from institutional ethical committee of Public Health Foundation of India-Indian Institute of Public Health (PHFI), Bhubaneswar. Prior to data collection, necessary permissions from concerned officials, including CDMOs, were acquired.

Written informed consent was taken from all study participants that allowed them to terminate their participation in the study at any stage if they desired. All interviews were conducted at places convenient for study participants to maintain privacy. To ensure anonymity throughout the process of data management and analysis, the identity of study participants were kept confidential using a unique code for each participant.

RESULTS and ANALYSIS

The results of the study have been summarized as per the objectives of the study:

I.   **Assess the extent of availability and stock out of essential medicines at different level of health facilities**

Figure 2 Drug Stock-outs on the day of survey
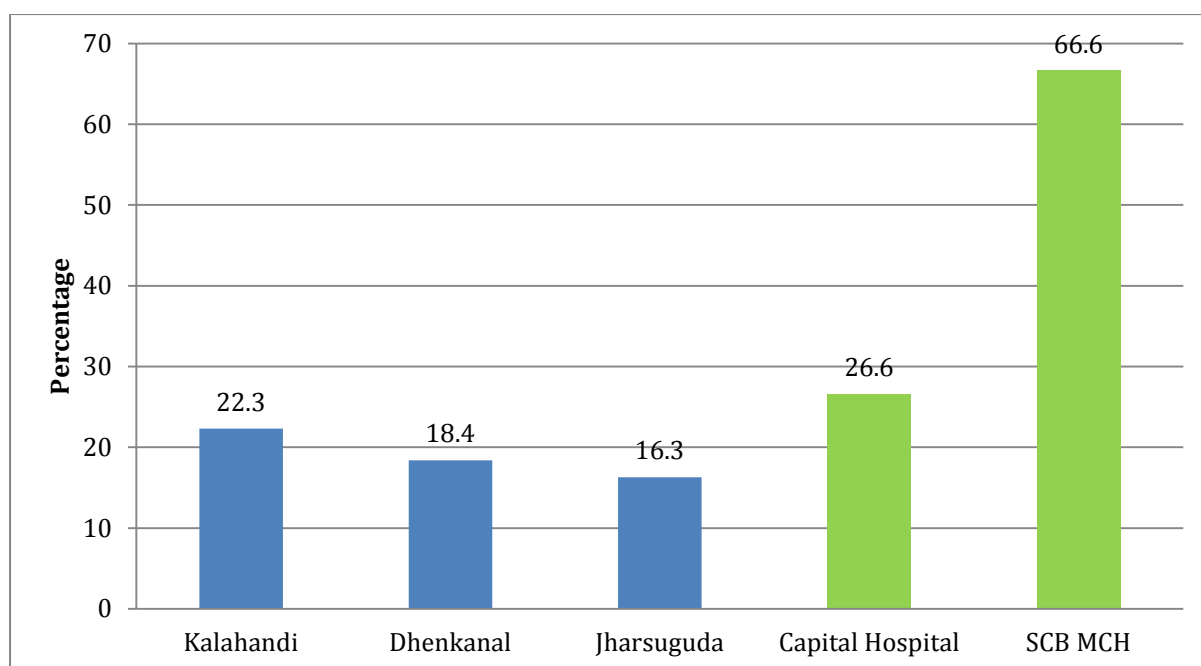
Graph 1 shows the drug stock out reported during the study in respective district facilities. Out of selected 210 drugs (21 for each facility) in Kalahandi, it was found that 22.3% (47) of drugs were not available on the day of survey (Refer Table-1 in Annexure). In Dhenkanal, out of selected 184 drugs (23 for each facility) 18.4% (34) of drugs were not available (Refer Table-2 in Annexure). And Out of selected drugs 147 (21 for each facility) for the study across institutions of Jharsuguda district it was found that 16.3% (24) of drugs were not available on the day of survey (Refer Table-3 in Annexure).

In Capital Hospital, from the selected 15 drugs, 26.6% (4) (Refer Table-4 in Annexure) and in SCB MCH, 66.6% (18) out of 27 (Refer Table-5 in Annexure) selected drugs were not available on the day of survey.

Figure 3 Average months stock-out in the last 6 months
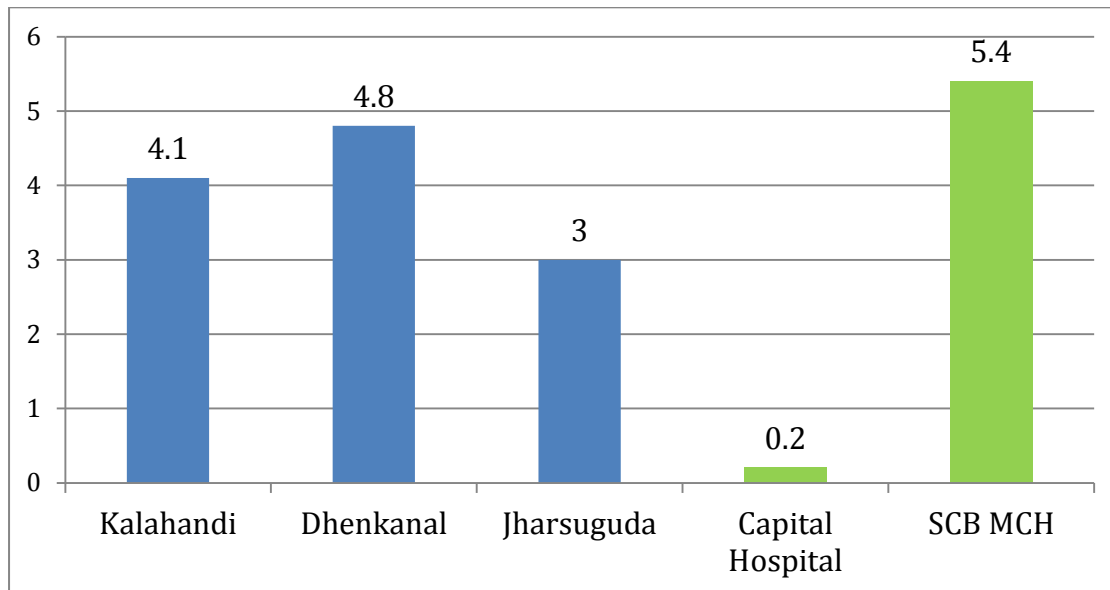
Graph-2 shows the average duration of drug stock out in the facilities at the respective districts during 6 months prior to the study duration.

In last six months, 35.2% (74) of drugs were out of stock in Kalahandi and the average months stock out was found 4.1 months (Refer Table-1 in Annexure). In Dhenkanal, 22.8% (42) drugs were out of stock in last six months and average month's stock out was found 4.8 months (Refer Table-2 in Annexure). In Jharsuguda, 22.4% (33) drugs were out of stock in last six months and average month's stock out was found to be 3 months (Refer Table-3 in Annexure). The average month's stock out was found 0.2 months for capital hospital. (Refer Table-4 in Annexure).

In SCB MCH, 77.7% (21) drugs were out of stock in last six months and average month's stock out was found to be 5.4 months (Refer Table-5 in Annexure).

II. Factors affecting both availability and consumption of essential drugs at health facilities

A. Perspectives of ANMs

Table 5 Indenting system at Sub-Centres

Name of the Unit	No, of respondent	1	2				3			
		Indenting system at facility	Process of indenting				Frequency of indenting			
		a	a	B	c	d	a	b	c	D
		Yes	Indent Form	Words of mouth	Chit of paper	None of the above	Bi-Monthly	Monthly	Quarterly	As required
Kalahandi (%)	11(100.0)	11(100.0)	0(0.0)	1(9.1)	9(81.8)	1(9.1)	0(0.0)	0(0.0)	1(19.1)	9(90.9)
Dhenkanal (%)	10(100.0)	10(100.0)	0(0.0)	3(30.0)	7(70.0)	0(0.0)	1(10.0)	4(40.0)	1(10.0)	4(40.0)
Jharsuguda (%)	8(100.0)	4(50.0)	3(37.5)	0(0.0)	1(12.5)	4(50.0)	0(0.0)	0(0.0)	2(25.0)	6(75.0)
Total (%)	29(100.0)	29(100.0)	3(10.3)	4(13.7)	17(58.6)	5(17.2)	1(3.4)	4(13.7)	4(13.7)	19(65.5)

Table 5 shows the indenting system in the study districts. At Dhenkanal and Kalahandi, all the SCs (100%) reported that there is an indenting system where as at Jharsuguda, 50% of SCs reported not having an indenting system. However, 58.6% ANMs (Kalahandi-81.8%, Dhenkanal-70% and Jharsuguda-12.5%) reported as using chit of paper for indenting drugs. But at Jharsuguda 37.5% ANMs used indent forms for indenting drugs. At 65.5% facilities (Kalahandi-90.9%, Dhenkanal-40.0% and Jharsuguda-75.0%), indent for drugs was based on "as on requirement" basis.

Table 6 Supply of Drugs to SCs

Name of the Unit	No. of respondents	1	2		
		Supply of drugs based on indenting	Quantity of supplied drugs		
		a	A	b	C
		Yes	Exact amount Indented	Less than Indent	More than Indent
Kalahandi (%)	11(100.0)	8(72.7)	5(45.5)	3(27.3)	3(27.3)
Dhenkanal (%)	10(100.0)	4(40.0)	4(40.0)	6(60.0)	0(0.0)
Jharsuguda (%)	8(100.0)	5(62.5)	4(50.0)	2(25.0)	2(25.0)
Total (%)	29(100.0)	17(58.6)	13(44.8)	11(37.9)	5(17.2)

Table 5 shows the discrepancy between quantities of drugs indented versus quantity supplied. 58.6% ANMs (Kalahandi-82.7%, Dhenkanal-40.0% and Jharsuguda-62.5%) reported that the supplied drugs were based on their indent. In Dhenkanal 60.0% ANMs received less than the indented drugs whereas in Kalahandi (45.5%) and Jharsuguda (50.0%) ANMs received the exact amount of drugs as they indented.

In Dhenkanal, ANMs told that the drugs should be supplied on the same day in required quantity. In Kalahandi, ANMs told that short expiry drugs should not be supplied.

Table 7 Annual Requirement Estimation at SCs

Name of the district		1				2		
		Forecasting the quantity of drugs for a year				Source of information		
		a	b	C	d	a	b	c
		Based on previous year consumption	Standard calculation	Based on experience	Centrally Assigned	Training	Handholding/ Mentoring	Other secondary sources
Kalahandi (%)	11(100.0)	10(90.9)	0(0.0)	1(9.1)	0(0.0)	0(0.0)	0(0.0)	10(90.9)
Dhenkanal (%)	10(100.0)	0(0.0)	10(100.0)	0(0.0)	0(0.0)	7(70.0)	3(30.0)	0(0.0)
Jharsuguda (%)	8(100.0)	1(12.5)	0(0.0)	3(37.5)	4(50.0)	0(0.0)	3(37.5)	5(62.5)
Total (%)	29(100.0)	11(37.9)	10(34.4)	4(13.7)	4(13.7)	7(24.1)	6(20.6)	15(51.7)

Table 7 shows the methods of annual forecasting drugs at SCs level and source of information for the same among ANMs. At Kalahandi, 90.9% of ANMs forecast drugs for a year based on previous year consumption whereas standard calculation was done to forecast drugs at Dhenkanal (100%). At Jharsuguda mixed response (based on previous year consumption-12.5%, on experience-37.5% and centrally assigned-50.0%) was reported for estimation of annual drug requirement.

At Dhenkanal, the source of information for standard calculation was training (70.0%) and handholding/ mentoring by seniors (30.0%).

Table 8 Transportation and Storage at SCs

Name of the Unit	No. of respondents	1			2			
		Transportation			Storage			
		Transportation of drugs			Storage facility at SC		Sufficiency of storage space	
		a	b	c	a	b	a	B
		Private Vehicle	Own Vehicle	Others	YES	NO	YES	NO
Kalahandi (%)	11(100.0)	5(45.5)	6(54.5)	0(0.0)	6(54.5)	5(45.5)	6(54.5)	0(0.0)
Dhenkanal (%)	10(100.0)	4(40.0)	0(0.0)	6(60.0)	7(70.0)	3(30.0)	2(20.0)	5(50.0)
Jharsuguda (%)	8(100.0)	4(50.0)	0(0.0)	4(50.0)	8(100.0)	0(0.0)	6(75.0)	2(25.0)
Total (%)	29(100.0)	13(44.8)	6(20.6)	10(34.4)	21(72.4)	8(27.5)	14(48.2)	7(24.1)

Table 8 shows transport and storage facility for drugs at SCs. 44.8% of SCs (Kalahandi-45.5%, Dhenkanal-40.0% and Jharsuguda-50.0%) hired private vehicle for transportation of drugs and 34.4% (Dhenkanal-60.0%, Jharsuguda-50.0%) used other means of transportation for drugs. Only at Kalahandi (54.5%) ANMs used their own vehicle for transportation drugs from CHCs.

At 72.4% of SCs (Kalahandi-54.5%, Dhenkanal-70.0% and Jharsuguda-100%), ANMs reported having storage facility but the storage space was reported to be insufficient at Dhenkanal (50.0%) and Jharsuguda (25.0%). Whereas, the ANMs at the SCs in Kalahandi, found the storage facility to be insufficient. In Kalahandi and Dhenkanal, few ANMs suggested for supply of infrastructure such as racks, shelves etc. for drug storage and not to supply short expiry drugs.

B. Perspective Of MOs

Table 9 Indenting System

Name of the Unit	No. of respondents	1 Indenting system at facility	2 Comfortable with present system of indenting	3 Process of indenting		4 Frequency of indenting				5 Person responsible for indenting	
		a	a	a	b	a	B	c	d	a	B
		YES	YES	Indent form	Chit of Paper	Bi-Monthly	Monthly	Quarterly	As required	Pharmacist	MO
Kalahandi (%)	9(100)	9(100)	9(100)	9(100)	0(0.0)	0(0.0)	2(22.2)	5(55.6)	2(22.2)	9(100)	0(0.0)
Dhenkanal (%)	8(100)	8(100)	6(75.0)	2(25.0)	6(75.0)	1(12.5)	3(37.5)	0(0.0)	4(50.0)	7(87.5)	1(12.5)
Jharsuguda (%)	7(100)	7(100)	7(100)	5(71.4)	2(28.6)	0(0.0)	0(0.0)	4(57.1)	3(42.9)	7(100)	0(0.0)
Total (%)	24(100)	24(100)	22(91.6)	16(66.6)	8(33.3)	1(4.1)	5(20.8)	9(37.5)	9(37.5)	23(95.8)	1(4.1)

The above table shows the indenting system at all the facilities included in the study. The results showed that all the facilities of the study districts had an indenting system. It was found that 25% of doctors in Dhenkanal reported not being comfortable with the existing system of indenting. For indenting of drugs, 66.6% of doctors used indent forms (Kalahandi-100.0%, Dhenkanal-25.0%, Jharsuguda-71.4%) and 33.3% used chit of paper (Kalahandi-0, Dhenkanal-75.0%, Jharsuguda-28.6%).

A total of 37.5% of doctors (Kalahandi-55.6%, Dhenkanal-0, Jharsuguda-57.1%) did the indenting on a quarterly basis whereas 37.5% doctors followed "as on requirement"

method for indenting of drugs. At all the facilities pharmacists are the key person responsible for indenting.

Table 10   Annual Requirement Estimation

Name of the Unit	No. of respondents	1 Forecasting the quantity of drugs for a year				2 Source of information			
		a	b	c	D	a	b	c	D
		Based on previous year consumption	Standard calculation	Based on experience	Any other	Training	Handholding/ Mentoring	Guidelines of Govt.	Other secondary sources
Kalahandi (%)	9(100)	8(88.8)	0(0.0)	1(11.1)	0(0.0)	1(12.5)	0(0.0)	1(12.5)	6(75.0)
Dhenkanal (%)	8(100)	7(87.5)	0(0.0)	1(12.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	7(100.0)
Jharsuguda (%)	7(100)	7(100.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	6(85.7)	0(0.0)	1(14.3)
Total (%)	24(100)	22(91.6)	0(0.0)	2(8.3)	0(0.0)	1(4.5)	6(27.2)	1(4.5)	14(63.6)

Table 10 shows methods used for annual requirement estimation and the source of information. 91.6% of doctors (Kalahandi-88.8%, Dhenkanal-87.5%, Jharsuguda-100.0%) told that they do annual forecasting of drugs based on previous year consumption and the source of information was reported as other/secondary sources for Kalahandi (75.0%) and Dhenkanal (100.0%). In Jharsuguda, handholding/mentoring from senior officers (85.7%) was the source of information.

Table 11   Inventory Management

Name of the Unit	No. of respondents	1 FEFO followed	2 Knowledge on Batch recall mechanism	3 Requesting new stock of drugs	4 Management of sudden variation in demand of drugs			5 Local procurement in emergency situation	6 Source of fund		
		a	a	a	a	b	c	a	a	B	c

	YES	YES	Buffer level touched	Buffer stock	Additional fund	Fresh Indent	YES	20% of the budget	RKS	NRHM fund
Kalahandi (%)	9(100)	9(100)	4(44.4)	9(100)	8(88.9)	1(11.1)	0(0.0)	2(22.2)	0(0.0)	2(100)	0(0.0)
Dhenkanal (%)	8(100)	8(100)	6(75.0)	8(100)	5(62.5)	0(0.0)	3(37.5)	3(37.5)	1(33.3)	1(33.3)	1(33.3)
Jharsuguda (%)	7(100)	7(100)	2(28.6)	7(100)	1(14.3)	1(14.3)	5(71.4)	1(14.3)	1(100)	0(0.0)	0(0.0)
Total (%)	24(100)	24(100)	12(50.0)	24(100)	14(58.3)	2(8.3)	8(33.3)	6(25.0)	2(33.3)	3(50.0)	1(16.6)

Table 11 shows the inventory management practices of doctors. In all three districts, FEFO (First Expiry First Out) method was used for disposing expired drugs and batch recall mechanism was known to 50.0% of doctors (Kalahandi-44.4%, Dhenkanal-75.0% and Jharsuguda- 28.6%). At all the facilities (100%), request for new stock of drugs is placed once the buffer level is reached.

When there are sudden variations in demand of drugs, 58.3% of medical officers (Kalahandi-88.9%, Dhenkanal-62.5% and Jharsuguda- 14.3%) used buffer stocks and 33.3% (Kalahandi-0, Dhenkanal-37.5% and Jharsuguda- 71.4%) did fresh indenting of drugs to manage such situation.

In emergency situations, local procurement of drugs was done in 25.0% of facilities (Kalahandi-22.2%, Dhenkanal-37.5% and Jharsuguda- 14.3%). For local procurement of drugs, 100.0% of Kalahandi district doctors use RKS fund, 33.3% of Dhenkanal doctors use RKS fund and fund available in drug budget. In Jharsuguda, 33.3% of doctors (DHH) use 20% of the fund available in drug budget to locally procure drugs.

At DHH Kalahandi and Dhenkanal ADMO (medical) suggested that for better inventory management a computer was needed, with trained personnel to operate it.

Table 12   Transport and Storage Facility Available for Drugs

Name of the Unit	No. of respondents	Transport facility					2	
							Storage Facility	
		Transportation of drugs			Delay in transportation		Storage Facility	Sufficiency of storage space
		a	B	c	a	b	a	a
		Private vehicle	Govt. vehicle	Others	YES	NO	YES	YES
Kalahandi (%)	9(100)	0(0.0)	9(100.0)	0(0.0)	0(0.0)	9(100.0)	6(66.7)	6(100.0)
Dhenkanal (%)	8(100)	5(62.5)	1(12.5)	2(25.0)	0(0.0)	8(100.0)	8(100.0)	1(12.5)
Jharsuguda (%)	7(100)	1(14.3)	6(85.7)	0(0.0)	1(14.3)	6(85.7)	7(100.0)	4(57.1)
Total (%)	24(100)	6(25.0)	16(66.6)	2(8.3)	1(4.1)	23(95.8)	21(87.5)	11(52.3)

Table 12 shows transportation and storage facility for drugs in the health institutions. At Kalahandi, all the facilities used government vehicle for transportation of drugs. Whereas, in Dhenkanal only 12.5% and in Jharsuguda 85.7% used government vehicle for drug transport. At Dhenkanal 62.5% facilities hired private vehicles to transport drugs. Almost all the doctors (95.8%) did not faced delay in transportation. Only at Jharsuguda delay in transportation of drugs was reported (14.3%).

Table 13   Available Human Resources and Training Needs

Name of the Unit	No. of respondent	1 Regular pharmacist at facility		2 Pharmacist trained on drug management		3 Pharmacist needs Further training	
		a	b	a	b	a	b
		Yes	No	Yes	No	Yes	No
Kalahandi (%)	9(100)	9(100.0)	0(0.0)	8(88.8)	1(11.1)	1(11.1)	8(88.8)
Dhenkanal (%)	8(100)	6(75.0)	2(25.0)	3(37.5)	5(62.5)	6(75.0)	2(25.0)
Jharsuguda (%)	7(100)	7(100.0)	0(0.0)	5(71.4)	2(28.6)	4(57.1)	3(42.9)
Total (%)	24(100)	22(91.6)	2(8.3)	16(66.6)	8(33.3)	11(45.8)	13(54.1)

Table 13 shows available human resources to manage drugs at pharmacies and the training needs of Pharmacists. At 91.6% of facilities (Kalahandi- 100.0%, Dhenkanal-75.0% and Jharsuguda-100.0%) doctors told that a regular Pharmacist is posted in their facility. 66.6% of Pharmacists (Kalahandi-88.8%, Dhenkanal-37.5% and Jharsuguda-71.4%) were trained on drug management, however, 45.8% of doctors (Kalahandi-11.1%, Dhenkanal-75.0% and Jharsuguda-57.1%) felt the need for training of Pharmacists.

Table 14   Supply of Drugs

Name of the Unit	No. of respondents	1 Supply of drugs based on indenting		2 Quantity of supplied drugs			3 Supply of Never indented drugs
		a	b	a	b	c	a
		Yes	No	Exact amount Indented	Less than Indent	More than Indent	Yes
Kalahandi (%)	9(100.0)	4(44.4)	5(55.6)	1(11.1)	5(55.6)	3(33.3)	7(77.8)
Dhenkanal (%)	8(100.0)	0(0.0)	8(100.0)	0(0.0)	8(100.0)	0(0.0)	5(62.5)
Jharsuguda (%)	7(100.0)	0(0.0)	7(100.0)	0(0.0)	5(71.4)	2(28.6)	7(100.0)
Total (%)	24(100.0)	4(16.6)	20(83.3)	1(4.1)	18(75.0)	5(20.8)	19(79.1)

Table 14 shows the discrepancy between quantities of actual drugs indented versus supplied. At 83.3% of facilities (Kalahandi- 55.6%, Dhenkanal-100.0% and Jharsuguda-

100.0%), the drug supply was not based on actual indenting. At 75.0% facilities (Kalahandi- 55.6%, Dhenkanal-100.0% and Jharsuguda-100.0%) received less than the actual indented quantity.

At 79.1% facilities (Kalahandi- 77.8%, Dhenkanal-62.5% and Jharsuguda-100.0%), the Medical Officers told that they received drugs that they had never indented.

Table 15 : Awareness, Attitude and Practice of EDL by Medical Officer

Name of the Unit	No. of respondents	1 Availability of EDL in facility	2 Aware of EDL	3 EDL is useful	4 Which way EDL is useful			5 Drugs listed in EDL are adequate		6 Adequacy of drugs listed in EDL		7 Inadequacy of drugs in EDL
		a	a	a	a	b	c	a	b	a	b	a
		YES	YES	YES	Helps in product selection	Prescribing drugs	Deciding category of drugs	Adequate	Inadequate	Can treat most of diseases	Meets minimum requirement of drug	Cannot treat some diseases
Kalahandi (%)	9(100)	1(11.1)	2(22.2)	2(100)	1(50.0)	0(0.0)	1(50.0)	1(50.0)	1(50.0)	0(0.0)	1(100.0)	1(100)
Dhenkanal (%)	8(100)	1(12.5)	1(12.5)	1(100)	1(100)	0(0.0)	0(0.0)	0(0.0)	1(100)	0(0.0)	0(0.0)	1(100)
Jharsuguda (%)	7(100)	6(85.7)	6(85.7)	4(66.6)	0(0.0)	4(100)	0(0.0)	2(33.3)	3(50.0)	2(100.0)	0(0.0)	3(100)
Total (%)	24(100)	8(33.3)	9(37.5)	7(77.7)	2(28.5)	4(57.1)	1(14.2)	3(33.3)	5(55.5)	2(66.6)	1(33.3)	5(100)

Table 15 shows the awareness, attitude and practice of EDL of medical officers in districts. The availability of EDL at health facilities was 33.3%. Awareness on EDL among doctors was 37.5% (Kalahandi-22.2%, Dhenkanal-12.5%, Jharsuguda-85.7%). Out of those who are aware of EDL, 77.7% (Kalahandi-100.0%, Dhenkanal-100.0%, Jharsuguda-66.6%) doctors felt it useful. Of those who found EDL useful, 50.0% said it helps in product selection for indenting and 50.0% said for deciding category of drugs. In Dhenkanal, all the interviewed doctors said it is helpful in product selection for indenting and in Jharsuguda, all the doctors reported as helpful in prescribing drugs.

Out of the doctors who are aware of EDL, 50.0% and 33.3% at Kalahandi and Jharsuguda respectively felt that the drugs listed in EDL were adequate. At both Kalahandi and Jharsuguda 50.0% doctors felt drugs listed in EDL as inadequate. Whereas at Dhenkanal 100.0% doctors felt inadequacy of drugs listed in EDL. The doctors who felt drugs listed in EDL were adequate believed so as it meets their minimum requirements to treat most of the diseases in their area. Since the drugs in the EDL were insufficient to treat some of the diseases prevalent in their respective areas, 55% of doctors reported EDL to be inadequate.

The doctors, who felt EDL to be inadequate to treat some of diseases / conditions, perceive that the patients are comfortable taking combination drugs and that EDL does not have combination drugs. They felt that if they prescribe from EDL, they need to give higher numbers of drugs, which patients may find difficult to consume.

C. Perspective of Pharmacists:

Figure 4 Process of drug indenting
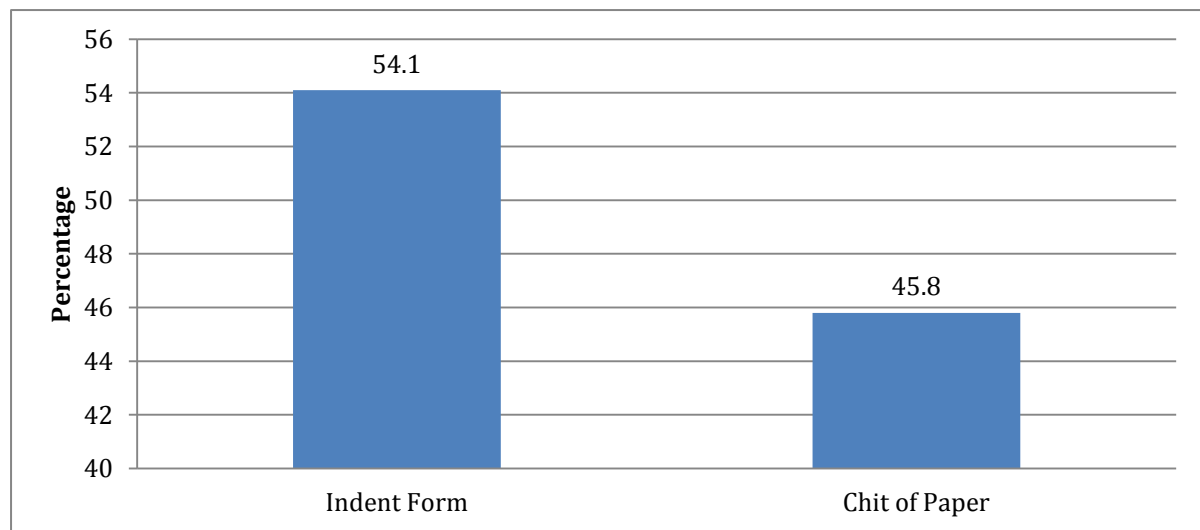
The graph (figure 4) shows the existing indenting process in districts. All the health institutions (100.0%) in three districts had indenting system. For indenting drugs, 54.1% of pharmacists used indent forms (Kalahandi-60.0%, Dhenkanal-14.3%, Jharsuguda-85.7%) and 46% used a chit of paper (Kalahandi 40.0%, Dhenkanal 85.7% and Jharsuguda 14.3%). (Refer Table-7 in Annexure).
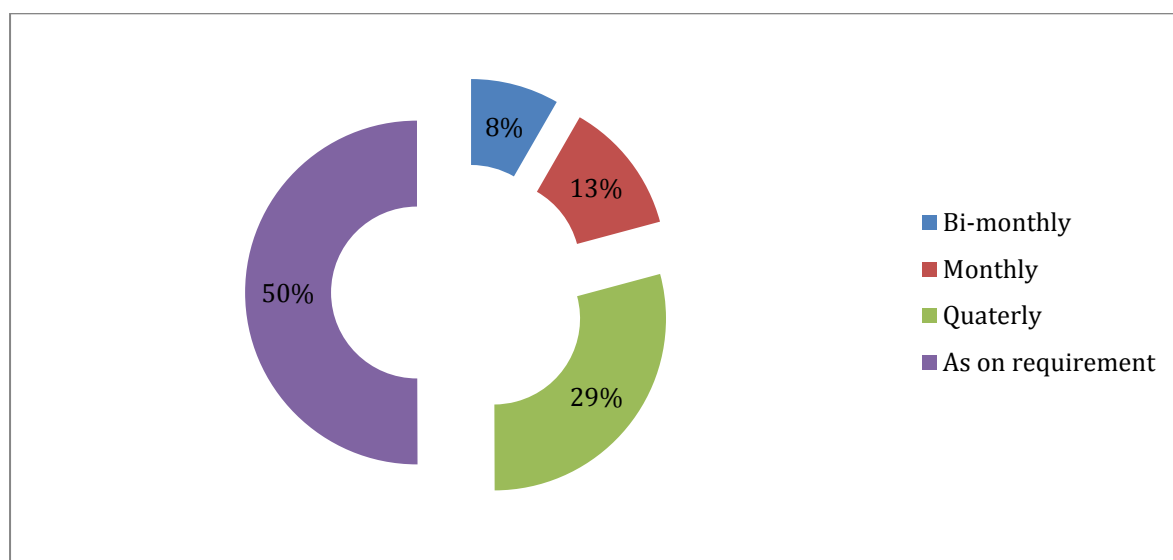
Indenting of drugs was undertken 'as on requirement' basis by 50.0% of pharmacists (Kalahandi-40.0%, Dhenkanal-42.9%, Jharsuguda-71.4%) and quarterly by 29.1% of pharmacist (Kalahandi-50.0%, Dhenkanal-0, Jharsuguda-28.6%).

At 29.1% of facilities (Kalahandi-60.0%, Dhenkanal-0, Jharsuguda-14.3%), pharmacist received drugs based on indenting. At Dhenkanal all the pharmacists (100.0%) did not receive drugs as per indenting. (Refer to Table-6 in Annexure)

Table 16   Annual Requirement Estimation

Name of the Unit	No. of respondents	1 Forecasting the quantity of drugs for a year		2 Source of information			
		a	b	a	b	c	d
		Based on previous year consumption	Standard calculation	Training	Handholding/ Mentoring	Other secondary sources	Own experience
Kalahandi (%)	10(100.0)	10(100.0)	0(0.0)	1(10.0)	2(20.0)	1(10.0)	6(60.0)
Dhenkanal (%)	7(100.0)	7(100.0)	0(0.0)	0(0.0)	5(71.4)	2(28.6)	0(0.0)
Jharsuguda (%)	7(100.0)	7(100.0)	0(0.0)	1(14.3)	4(57.1)	0(0.0)	2(28.6)
Total (%)	24(100)	24(100.0)	0(0.0)	1(4.1)	11(45.8)	3(12.5)	8(33.3)

The above table shows methods used for annual requirement estimation and the source of information of the method. All the pharmacists (100.0%), reported the annual

requirement estimation to be done on the basis of the previous year's consumption. The source of information was training (Kalahandi-10.0%, Dhenkanal-0, Jharsuguda-14.3%), handholding/mentoring (Kalahandi-20.0%, Dhenkanal-71.4%, Jharsuguda-57.1%) and from other secondary sources (Kalahandi-10.0%, Dhenkanal-71.4%, Jharsuguda-57.1%). Almost 33.3% of Pharmacists (Kalahandi-60.0%, Dhenkanal--0, Jharsuguda-28.6%) reported estimating the drug requirement on the basis of their experience.

Table 17 Inventory Management

Name of the Unit	No. of respondents	1	2		3		4			
		FEFO followed	Knowledge on Batch recall mechanism		Requesting new stock of drugs		Management of sudden variation in demand of drugs			
		A	A	b	a	b	a	b	c	d
		Yes	Yes	No	Buffer level touched	Randomly	Buffer stock	Additional fund	Fresh Indent	Advice patient to buy outside
Kalahandi (%)	10(100)	10(100)	3(30.0)	7(70.0)	9(90.0)	1(10.0)	7(20.0)	0(0.0)	3(30.0)	0(0.0)
Dhenkanal (%)	7(100)	7(100)	4(57.1)	3(42.9)	7(100)	0(0.0)	2(28.6)	2(28.6)	3(42.9)	0(0.0)
Jharsuguda (%)	7(100)	7(100)	0(0.0)	7(100.0)	7(100)	0(0.0)	0(0.0)	1(14.3)	5(71.4)	1(14.3)
Total (%)	24(100)	24(100)	7(29.2)	17(70.8)	23(95.8)	1(4.1)	9(37.5)	3(12.5)	11(45.8)	1(4.1)

Table 17 shows inventory management practices of Pharmacists. The first expiry first out (FEFO) method was used for disposing expired drugs at all facilities in all the three districts. Batch recall mechanism was known to 29.1% of pharmacists (Kalahandi-30.0%, Dhenkanal-57.1% and Jharsuguda-0).

It was reported that, 95.8% of Pharmacists (Kalahandi-90.0%, Dhenkanal-100.0% and Jharsuguda-100.0%) request new stock of drugs, when the buffer level was reached. For managing sudden variation in demand of drugs, 37.5% of Pharmacists (Kalahandi-

70.0%, Dhenkanal-28.6% and Jharsuguda-0) used buffer stock and 45.8% (Kalahandi-30.0%, Dhenkanal-42.9% and Jharsuguda- 71.4%) did fresh indent.

Table 18   Use of Software for Indenting

(At present, only the DHHs and CHCs have software for drug management)

Name of the unit	No. of respondents	1 Use of software for indenting		2 Reason for not using software			3 Have you attended training		4 Need of further training	
		A	b	a	B	c	a	b	a	b
		YES	NO	Computer is not available	Software is not functional	Any other	YES	NO	YES	NO
Kalahandi (%)	3(100.0)	0(0.0)	3(100)	3(100)	0(0.0)	0(0.0)	0(0.0)	3(100)	_	_
Dhenkanal (%)	3(100.0)	0(0.0)	3(100)	3(100)	0(0.0)	0(0.0)	0(0.0)	3(100)	_	_
Jharsuguda (%)	3(100.0)	0(0.0)	3(100)	2(66.6)	1(33.3)	0(0.0)	1(33.3)	2(66.6)	1(100)	_
Total (%)	9(100.0)	9(100)	9(100)	8(88.8)	0(0.0)	0(0.0)	1(11.1)	8(88.8)	1(11.1)	_

Table 18 shows that the use of software for drug indenting is not in practice in all the districts. The reason stated for not using software is non-availability of a computer at Kalahandi and Dhenkanal districts, whereas the software was not functional in Jharsuguda. Only at Jharsuguda, was the store Pharmacist trained and he felt the need for further training in order to use the software.

D. Perception of Pharmacists Tertiary Care Hospitals (Capital Hospital and SCB MCH):

Indenting System:

For drug indenting, the Pharmacists at both the facilities (i.e. Capital Hospital and SCB MCH) use indent forms and the frequency of indenting was "on requirement basis". It was reported by the pharmacists that they get drugs as per their indents.

Annual Requirement Estimation:

Based on previous year consumption, pharmacists estimate the annual requirement for the facilities. The source of information was training for pharmacist at Capital Hospital and other sources for SCB MCH.

Inventory Management:

FEFO was followed while issuing different drugs. Pharmacists requested for new stock of drugs when the buffer level was reached and also they use buffer stock for managing sudden variation in demand of drugs.

Use of Software for Indenting:

Pharmacists do not use software for indenting. The reason reported was that the software was not functional. They have attended training on using software and do not need further training.

E. Perception of Patients:

Table 19 Demographic and Socioeconomic status of patients in study districts

Districts		Kalahandi (%)	Dhenkanal (%)	Jharsuguda (%)	Total (%)
No. Of respondents (%)		56(100)	50(100)	39(100)	145(100.0)
Sex	Male	33(58.9)	30(60.0)	23(59.0)	86(59.3)
	Female	23(41.1)	20(40.0)	16(41.0)	59(40.6)
Age group (In yrs.)	1-10	4(7.1)	14(28.0)	7(17.9)	25(17.2)
	11-20	5(8.9)	5(10.0)	4(10.2)	14(9.6)
	21-30	4(7.1)	6(12.0)	6(15.3)	16(11.1)
	31-40	7(12.5)	6(12.0)	6(15.3)	19(13.1)
	41-50	17(30.3)	7(14.0)	5(12.8)	29(20.0)
	51-60	11(19.6)	3(6.0)	6(15.3)	20(13.7)
	61-70	3(5.3)	7(14.0)	3(7.6)	13(8.9)
	71-80	5(8.9)	2(4.0)	2(5.1)	9(6.2)
Religion	Hindu	56(100)	50(100)	38(97.4)	144(99.3)
	Muslim	0(0)	0(0)	0(0)	0(0.0)
	Sikh	0(0)	0(0)	1(2.6)	1(0.7)
Caste	ST	19(33.9)	3(6.0)	2(23.1)	24(16.5)
	SC	19(33.9)	19(38.0)	13(33.3)	51(35.1)
	OBC	16(28.6)	20(40.0)	8(20.5)	44(30.3)
	General	2(3.6)	8(16.0)	16(41.0)	26(17.9)
Occupation	Agriculture	22(39.3)	8(16.0)	11(28.2)	41(28.2)
	Non agriculture	5(8.9)	0(0)	1(2.6)	6(4.1)
	Regular wage/salary	1(1.8)	2(4.0)	2(5.1)	5(3.4)
	Labour in agriculture	7(12.5)	2(4.0)	1(2.6)	10(6.8)
	Labour in non-agriculture	6(10.7)	0(0)	1(2.6)	7(4.8)
	Others	15(26.8)	38(76.0)	23(59.0)	76(52.4)

At Capital Hospital most of the patients (83.3%) were very satisfied with the quantity of drugs received from the facility. And 42.8% of patients were very satisfied with the quantity at SCB MCH.

For the waiting time to visit Doctor and receiving drugs 66.7% of patients were satisfied at Capital Hospital; 71.4% of patients were somewhat satisfied with the waiting time for visiting Doctor and 28.5% of patients were satisfied with waiting time for receiving drugs.

All the patients at both of the facilities were very satisfied with the Doctors' and Pharmacists' behaviour.

Table 20 Doctor and Pharmacist behaviour and time spent during consultation and drug distribution in districts

Districts		Kalahandi (%)	Dhenkanal (%)	Jharsuguda (%)	Total (%)
No. of respondents		56(100.0)	50(100.0)	39(100.0)	145(%)
Doctor Explained disease condition		51(91.1)	44(88.0)	37(94.9)	132(91.0)
Doctor spent time with patient	<1 minute	9(16.1)	8(16.0)	16(41.0)	33(22.7)
	1-3 minute	31(55.4)	21(42.0)	18(46.2)	70(48.2)
	3-5 minute	13(23.2)	11(22.0)	4(10.3)	28(19.3)
	>5 minute	3(5.4)	10(20.0)	1(2.6)	14(9.6)
Pharmacist Explained drug dozes		55(98.2)	41(82.0)	34(87.2)	130(89.6)
Pharmacist spent time with patient	<1 minute	3(5.4)	10(20.0)	22(56.4)	35(24.1)
	1-3 minute	45(80.4)	17(34.0)	13(33.3)	75(51.7)
	3-5 minute	8(14.3)	16(32.0)	4(10.3)	28(19.3)
	>5 minute	0(0)	7(14.0)	0(0)	7(4.8)

Table 20 shows according to 91.0% patients, Doctors (Kalahandi-91.1%, Dhenkanal-88.0% and Jharsuguda-94.9%) explained about their disease condition to them. On time spent during consultation, 22.7% of patients (Kalahandi-16.1%, Dhenkanal-16.0% and Jharsuguda-41.0%) told that the Doctors spent less than one minute; 48.2% patients (Kalahandi-55.4%, Dhenkanal-42.0% and Jharsuguda-46.2%) told that the Doctors spent 1-3 minutes; and 19.3% of patients (Kalahandi-23.2% Dhenkanal-22.0% and Jharsuguda-10.3%) reported that Doctors spent 3-5 minutes with them.

89.6% patients (Kalahandi-98.2%, Dhenkanal-82.0% and Jharsuguda-87.2%) reported that Pharmacist explained drug dosage to them. About drug dispensing, 24.1% of patients (Kalahandi-5.4, Dhenkanal-20.0% and Jharsuguda-56.4%) told that less than 1 minute and 51.7% of patients (Kalahandi-80.4%, Dhenkanal-34.0% and Jharsuguda-33.3%) told 1-3 minutes was spent by the pharmacists.

Table 21 Perceived satisfaction of patients for received health services in study districts

Factors	Satisfaction scale	Kalahandi (%)	Dhenkanal (%)	Jharsuguda (%)	Total (%)
	Total respondents	56(100)	50(100)	39(100)	145(100.0)
Quantity of drugs received from facility	Very dissatisfied	1(1.8)	9(18.0)	0(0)	10(6.8)
	Somewhat dissatisfied	2(3.6)	7(14.0)	0(0)	9(6.2)
	Somewhat satisfied	4(7.1)	12(24.0)	4(10.3)	20(13.7)
	Satisfied	24(42.9)	8(16.0)	8(20.5)	40(27.5)
	Very satisfied	25(44.6)	14(28.0)	27(69.2)	66(45.5)
Waiting time for visiting Doctor	Very dissatisfied	1(1.8)	5(10.0)	1(2.6)	7(4.8)
	Somewhat dissatisfied	2(3.6)	2(4.0)	1(2.6)	5(3.4)
	Somewhat satisfied	7(12.5)	15(30.0)	3(7.7)	25(17.2)
	Satisfied	31(55.4)	22(44.0)	17(43.6)	70(48.2)
	Very satisfied	15(26.8)	6(12.0)	17(43.6)	38(26.2)
Waiting time for receiving drugs	Very dissatisfied	1(1.8)	5(10.0)	1(2.6)	7(4.8)
	Somewhat dissatisfied	1(1.8)	2(4.0)	1(2.6)	4(2.7)
	Somewhat satisfied	2(3.6)	11(22.0)	5(12.8)	18(12.4)
	Satisfied	35(62.5)	21(42.0)	16(41.0)	72(49.6)
	Very satisfied	17(30.4)	11(22.0)	16(41.0)	44(33.3)
Choice of medicines	Very dissatisfied	4(7.1)	5(10.0)	1(2.6)	10(6.9)
	Somewhat dissatisfied	8(14.3)	1(2.0)	1(2.6)	10(6.9)
	Somewhat satisfied	12(21.4)	10(20.0)	2(5.1)	24(16.5)
	Satisfied	20(35.7)	24(48.0)	9(23.1)	53(36.5)
	Very satisfied	12(21.4)	10(20.0)	26(66.7)	48(33.1)
Doctor's behavior	Very dissatisfied	0(0)	4(8.0)	0(0.0)	4(2.7)
	Somewhat dissatisfied	2(3.6)	0(0.0)	1(2.6)	3(2.1)
	Somewhat satisfied	1(1.8)	3(6.0)	0(0.0)	4(2.7)
	Satisfied	9(16.1)	14(28.0)	10(25.6)	33(22.7)
	Very satisfied	44(78.6)	29(58.0)	28(71.8)	101(69.6)
Pharmacist's behavior	Very dissatisfied	0(0.0)	5(10.0)	0(0.0)	5(3.4)
	Somewhat dissatisfied	1(1.8)	0(0.0)	2(5.1)	3(2.1)
	Somewhat satisfied	0(0.0)	5(10.0)	3(7.7)	8(5.5)
	Satisfied	2(3.6)	11(22.0)	4(10.3)	17(11.7)
	Very satisfied	53(94.6)	29(58.0)	30(76.9)	112(77.2)

Table 21 shows the perceived satisfaction of patients after receiving health care services. For the quantity of drugs received from facility, 45.5% of patients (Kalahandi-44.6%, Dhenkanal-28.0% and Jharsuguda-69.2%) reported to be very satisfied and 27.5% of them (Kalahandi-42.9%, Dhenkanal-16.0% and Jharsuguda-20.5%) were satisfied.

For waiting time at facility, 48.2% of patients (Kalahandi-55.4%, Dhenkanal-44.0% and Jharsuguda-43.6%) were satisfied with waiting time for Doctor and 49.6% (Kalahandi-62.5%, Dhenkanal-42.0% and Jharsuguda-41.0%) were satisfied with the waiting time for receiving drugs at dispensing unit.

And 69.6% of patients (Kalahandi-78.6, Dhenkanal-58.0% and Jharsuguda-71.8%) were very satisfied with Doctors' behaviour and 77.2% (Kalahandi-94.6 Dhenkanal-58.0% and Jharsuguda-76.9%) were very satisfied with Pharmacists' behaviour.

Table 22 Doctor and Pharmacist behaviour and time spent during consultation and drug distribution at tertiary care facilities

Name of the Facility	Capital Hospital	SCB MCH
No. of respondents (%)	6(100.0)	7(100.0)
Doctor Explained disease condition	6(100.0)	7(100.0)
Doctor spent time with patient		
<1 minute	0(0.0)	0(0.0)
1-3 minute	2(33.3)	2(28.5)
3-5 minute	4(66.7)	5(71.4)
>5 minute	0(0.0)	0(0.0)
Pharmacist Explained drug dozes	6(100.0)	7(100.0)
Pharmacist spent time with patient		
<1 minute	1(16.6)	0(0.0)
1-3 minute	4(66.7)	3(42.8)
3-5 minute	1(16.6)	4(57.2)
>5 minute	0(0.0)	0(0.0)

Table 22 shows at both the facilities all the Doctors and Pharmacists explained disease condition and drug dosage information to the patients. At Capital Hospital, 66.7% patients reported that Doctor spent 3-5 minutes during consultation and Pharmacist spent 1-3 minutes during dispensing drugs. At SCB MCH, 71.4% of patients told that

Doctor spent 3-5 minutes and 57.2 % of patients told Pharmacist spent 3-5 minutes with them.

Table 23 Perceived satisfaction of patients for received health services in tertiary care facilities

Name of the Facility		Capital Hospital	SCB MCH
No .of respondents (%)		6(100.0)	7(100.0)
Quantity of drugs received from facility	Very dissatisfied	0(0.0)	0(0.0)
	Somewhat dissatisfied	0(0.0)	0(0.0)
	Somewhat satisfied	0(0.0)	3(42.8)
	Satisfied	1(16.6)	1(14.2)
	Very satisfied	5(83.3)	3(42.8)
Waiting time for visiting Doctor	Very dissatisfied	0(0.0)	0(0.0)
	Somewhat dissatisfied	0(0.0)	2(28.5)
	Somewhat satisfied	2(33.3)	5(71.4)
	Satisfied	4(66.7)	0(0.0)
	Very satisfied	0(0.0)	0(0.0)
Waiting time for receiving drugs	Very dissatisfied	0(0.0)	0(0.0)
	Somewhat dissatisfied	0(0.0)	1(14.2)
	Somewhat satisfied	2(33.3)	4(57.1)
	Satisfied	4(66.7)	2(28.5)
	Very satisfied	0(0.0)	0(0.0)
Choice of medicines	Very dissatisfied	0(0.0)	0(0.0)
	Somewhat dissatisfied	0(0.0)	0(0.0)
	Somewhat satisfied	1(16.6)	0(0.0)
	Satisfied	0(0.0)	3(42.8)
	Very satisfied	5(83.3)	4(57.1)
Doctor's behaviour	Very dissatisfied	0(0.0)	0(0.0)
	Somewhat dissatisfied	0(0.0)	0(0.0)
	Somewhat satisfied	0(0.0)	0(0.0)
	Satisfied	0(0.0)	0(0.0)
	Very satisfied	6(100.0)	7(100.0)
Pharmacist's behaviour	Very dissatisfied	0(0.0)	0(0.0)
	Somewhat dissatisfied	0(0.0)	0(0.0)
	Somewhat satisfied	0(0.0)	0(0.0)
	Satisfied	0(0.0)	1(14.3)
	Very satisfied	6(100.0)	6(85.7)

Table 23 shows the perceived satisfaction of patients after receiving health care services from facilities. Most of the patients (83.3%) at Capital Hospital and 42.3% of the patients at SCB MCH were very satisfied with the quantity of drugs received from the facilities.

For the waiting time to visit doctor, 66.7% of patients at Capital Hospital were satisfied whereas 71.4% of patients were somewhat satisfied at SCB MCH. About the waiting time for receiving drugs, 66.7% of the patients were satisfied at Capital Hospital and 57.1% were somewhat satisfied at SCB MCH.

All patients at both the facilities were very satisfied with the Doctors' and Pharmacists' behaviour.

III. Other Factors affecting availability and consumption pattern of drugs at health facilities

A. Storage conditions

Table 24 Storage conditions of pharmacy at all level of health facilities in districts

Indicators	Kalahandi (%)	Dhenkanal (%)	Jharsuguda (%)	Total (%)
No. of Facilities	10(100)	8(100)	7(100)	25(100.0)
Use of racks to keep medicine	8(80.0)	8(100)	6(85.7)	22(88.0)
Drug in the shelves are arranged with identification labels	8(80.0)	2(25.0)	4(57.1)	14(56.0)
Manufacturing dates and expiry dates are clearly visible	9(90.0)	7(87.5)	2(28.6)	18(72.0)
Separate compartment of expire drugs	0(0)	3(37.5)	2(28.6)	5(20.0)
Segregation of drugs from toxic, non-toxic, injectable etc.	7(70.0)	3(37.5)	3(42.9)	14(56.0)
Outer cartons are in good condition (not crushed, perforated, stained, or otherwise visibly damaged).	10(100)	4(50.0)	4(57.1)	18(72.0)
Cartons and products are protected from direct sunlight.	8(80.0)	7(87.5)	6(85.7)	21(84.0)
There is evidence of rodents or insects in the storage area.	3(30.0)	4(50.0)	4(57.1)	11(44.0)
Storage area is secured with a lock and key but is accessible during normal working hours; access is limited to authorized personnel.	9(90.0)	7(87.5)	7(100)	23(92.0)
Storeroom is clean, with all trash removed, no evidence of food and drinks, products stored on sturdy shelves/bins, and boxes organized neatly.	4(40.0)	4(50.0)	3(42.9)	11(44.0)
Water leakage in drug store	5(50.0)	4(50.0)	4(57.1)	13(52.0)
Disposal of expiry drugs	6(60.0)	5(62.5)	2(28.6)	13(52.0)

Ventilation/Air circulation	6(60.0)	5(62.5)	4(57.1)	15(60.0)
Temperature Control	6(60.0)	0(0)	5(71.4)	11(44.0)

Table 24 shows the storage conditions in the pharmacies at all level of health care facilities in the selected districts. At 88.0% of Pharmacies (Kalahandi-80.0%, Dhenkanal- 100%, Jharsuguda-85.7%), usage of racks was observed, to store drugs. However, only in 56.0% of facilities (Kalahandi-80.0%, Dhenkanal- 25.0% and Jharsuguda-57.1%) were drugs on the shelves arranged with identification labels. Even at DHH Dhenkanal and Jharsuguda, drugs on the shelves were not arranged with identification labels. At 62% pharmacies (Kalahandi-90.0%, Dhenkanal- 87.5% and Jharsuguda-28.6%) manufacturing dates and expiry dates were clearly visible in drug cartons. Only 20% of pharmacies (Kalahandi-0, Dhenkanal- 37.5%, and Jharsuguda-28.6%) had separate sections for expired drugs. Segregation of drugs from toxic and injectables was done at 52.0% of pharmacies (Kalahandi-70.0%, Dhenkanal-37.5% and Jharsuguda-42.9%). Drug cartons were protected from sun light at 84.0% of pharmacies (Kalahandi-80.0%, Dhenkanal-87.5% and Jharsuguda-85.7%). Rodents were seen at 44.0% of pharmacies (Kalahandi-80.0%, Dhenkanal-87.5% and Jharsuguda-85.7%). At 92.0% of facilities (Kalahandi-90.0%, Dhenkanal-87.5% and Jharsuguda-100.0%) storage area was secured with a lock but was accessible during normal working hours (access is limited to authorized personnel). Proper disposal of expired drugs was done at 44.8% of facilities (Kalahandi-60.0%, Dhenkanal-62.5% and Jharsuguda-28.6%). Temperature control was totally absent across Dhenkanal district. Use of the computer at the pharmacy was not seen at any of the DHH and CHC of Kalahandi and Dhenkanal districts. Only at Jharsuguda DHH, the pharmacy computer was in use.

Table 25 Storage conditions of pharmacy at Capital Hospital, Bhubaneswar

Indicators	Yes	No	Partial
Use of Racks to keep medicine			✓
Drug in the shelves are arranged with identification labels			✓
Manufacturing dates and expiry dates are clearly visible	✓		
Separate compartment of expire drugs		✓	
Segregation of drugs from toxic, non-toxic, injectable etc.	✓		
Outer cartons are in good condition (not crushed, perforated, stained, or otherwise visibly damaged).	✓		

	Yes	No	Partial
Cartons and products are protected from direct sunlight.	✓		
There is evidence of rodents or insects in the storage area.		✓	
Storage area is secured with a lock and key but is accessible during normal working hours; access is limited to authorized personnel.	✓		
Storeroom is clean, with all trash removed, no evidence of food and drinks, products stored on sturdy shelves/bins, and boxes organized neatly.	✓		
Water seepage/damp		✓	
Disposal of expiry drugs	✓		
Ventilation/Air circulation	✓		
Temperature Control	✓		
Use of computer in pharmacy	✓		

Table 25 shows the drug storage conditions of Capital Hospital pharmacy. Use of racks and shelves was there to keep drugs, however there was insufficient space to keep all the drugs. The manufacturing and expiry dates were clearly visible in drug cartons.

Drugs and other consumables were separated from toxic, non-toxic and injectables. All the drugs and products were protected from direct sunlight. Air conditioning facility and refrigerators are there for controlling the temperature. The storage area was secured with lock and accessible during work hours. The expired drugs are disposed of, as per the government guidelines.

Table 26 Storage condition of Pharmacy at SCB MCH

| Indicators	Yes	No	Partial
Use of Racks to keep medicine		✓	
Drug in the shelves are arranged with identification labels			✓
Manufacturing dates and expiry dates are clearly visible	✓		
Separate compartment of expire drugs		✓	
Segregation of drugs from toxic, non-toxic, injectable etc.	✓		
Outer cartons are in good condition (not crushed, perforated, stained, or otherwise visibly damaged).		✓	
Cartons and products are protected from direct sunlight.	✓		
There is evidence of rodents or insects in the storage area.	✓		
Storage area is secured with a lock and key but is accessible during normal working hours; access is limited to authorized personnel.	✓		

Storeroom is clean, with all trash removed, no evidence of food and drinks, products stored on sturdy shelves/bins, and boxes organized neatly.	✓		
Water seepage/damp		✓	
Disposal of expiry drugs	✓		
Ventilation/Air circulation	✓		
Temperature Control			✓
Use of computer in pharmacy	✓		

Table 26 shows the storage conditions of SCB MCH Pharmacy (Central Store). No use of racks and shelves to store drugs were reported, due to space constraints. Manufacturing and expiry dates were not clearly visible for all the drug cartons. There was no separate compartment for expired drugs.

All the drugs were protected from direct sunlight. Air conditioning facilities and refrigerators are available for controlling the temperature but not in adequate quantity. The storage area was secured with a lock and accessible during work hours. The expired drugs are disposed of, as per the government guidelines.
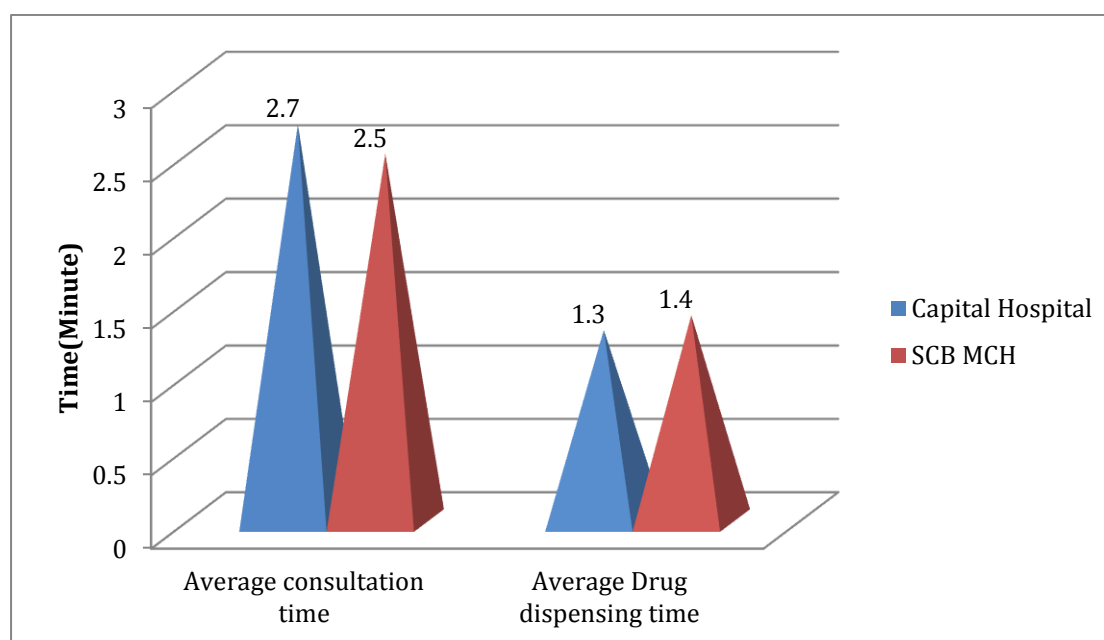
B. Average consultation and dispensing time at health facilities

Figure 6 Average consultation and drug dispensing time in study districts
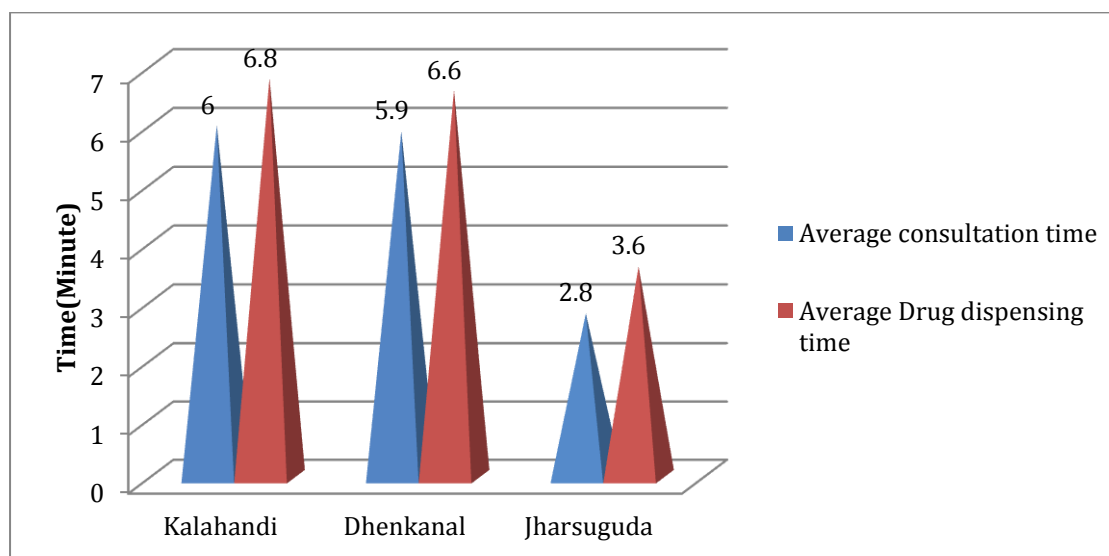
In Kalahandi, Dhenkanal and Jharsuguda districts, the average time for doctor consultation was 6, 5.9 and 2.8 minutes respectively. The average time for dispensing drugs was 6.8, 6.6, 3.6 minute in Kalahandi, Dhenkanal and Jharsuguda districts respectively (Refer to Table-8 in Annexure).

Figure 7 Average consultation & drug dispensing time in tertiary care hospitals

Average consultation time was 2.7 and 2.5 minutes at Capital Hospital and SCB MCH respectively. Whereas, average drug dispensing time at Capita Hospital and SCB MCH was 1.3 and 1.4 minutes respectively (Refer to Table-9 in Annexure).

C. Attitude & practice of doctors and pharmacists at health facilities

Table 27 Attitude and practice of doctors and pharmacists during consultation and drug distribution in study districts

Districts	Kalahandi (%)	Dhenkanal (%)	Jharsuguda (%)	Total (%)
No. of facilities	8(100)	8(100)	7(100)	23(100.0)
Doctor used Standard prescription	5(62.5)	4(50)	5(71.4)	14(60.8)
Doctor used Carbonated slip	1(12.5)	2(25.0)	1(14.3)	4(17.3)
Doctor explained disease condition	8(100)	8(100)	6(85.7)	22(95.6)
Pharmacist explained drug dozes	8(100)	7(87.5)	6(85.7)	21(91.3)

Standardized prescription was used by Doctors at 60.8% of facilities (Kalahandi-62.5%, Dhenkanal-50.0%, Jharsuguda-71.4%). But the use of carbon copy for prescription was only in 17.3% (Kalahadi-12.5%, Dhenkanal-25.0% and Jharsuguda-14.3%).

In Kalahandi and Dhenkanal, Doctors at all health facilities explain about the disease/condition to the patients whereas in Jharsuguda, doctors in 85.7% of facilities discuss about the disease/condition with patients. At 91.3% of facilities (Kalahadi-100.0%, Dhenkanal-87.5% and Jharsuguda-85.7%), Pharmacists explain the drug dosage information to the patients.

Table 28 Attitude and practice of doctors and pharmacists during consultation and drug distribution at tertiary care hospitals

Name of the facility	Capital Hospital	SCB MCH
Doctor used Standard prescription	✓	✓
Doctor used Carbonated slip	✓	✓
Doctor explained disease condition	✓	✓
Pharmacist explained drug doses	✓	✓

The Doctors at Capital Hospital and SCB MCH used standard prescription with carbon copy slips and explain disease / condition to the patients. The Pharmacists explain drug dosage information to the patients at the time of dispensing drugs at both the facilities.

D. Consumption pattern of drugs at health facilities

Table 29 Consumption pattern of drugs at district level

Districts	No. of Respondents	Average drugs prescribed	Average drugs dispensed
Kalahandi	56	3.7	2.6
Dhenkanal	50	2.8	1.7
Jharsuguda	39	2.3	2.2

The average number of drugs prescribed at is 3.7, 2.8 and 2.3 whereas the actual number of drugs dispensed is 2.6, 1.7 and 2.2 for Kalahandi, Dhenkanal and Jharsuguda districts, respectively. The drugs dispensed are less than prescribed in all the facilities. The variation between drug prescribed and dispensed was found to be 0.1 in Jharsuguda and 1.1 in both Kalahandi and Dhenkanal.

Table 30 Consumption pattern of drugs at tertiary care level

Facility	No. of Respondents	Average drugs prescribed	Average drugs dispensed
Capital Hospital	6	3.1	3.1
SCB MCH	7	3.7	2.4

Each of the interviewed patients at both the facilities was prescribed an average of about three drugs and the prescribed quantity of drugs were dispensed at the pharmacy to all patients.

IV.   Findings from the Qualitative Interviews and Observation

This section summarizes the findings of the in-depth interviews conducted with various stakeholders with regard to Store Medical Officer, Store in-Charge and Technical Store in-Charge during the study. Data were collected on the infrastructure, availability of drugs, system of indenting, use of indenting software, storage and transportation of drugs.

a. Central Warehouse (Districts)

The central drug warehouses at district level collects annual drug requirements from all block CHCs (CHCs from PHCs and SCs) and after compilation, it is submitted to the SDMU. Once the annual requirement is submitted, the districts indent for drugs as per the need.

Kalahandi

The central warehouse is situated within the campus of the DHH in Kalahandi. A separate building was allotted to run the central warehouse. All the drug cartons were arranged with identification labels. Storage area was secured with a lock and only authorized personnel have access. The warehouse is well ventilated with provision for air circulation.

Usually the Kalahandi district submits the indent 4 times a year and they receive drugs as per the indent submitted. It is reported that the usual time gap is 3 to 4 days between indenting and receiving of drugs. The warehouse uses software for recording information on drugs received and issued. The store in-charge is also trained on software and a data entry operator is placed to assist him. But currently, the software is found to be non-functional.

Dhenkanal

There is no separate building allotted for the central warehouse. About 4 to 5 rooms were allocated within the DHH campus to function as warehouse. The limited space provided for warehouse is insufficient for proper arrangement of drugs, ILR and refrigerator.

On an average, Dhenkanal warehouse does indenting 7 to 8 times a year and receive almost all the drugs as per indent. The usual time gap is 1 to 2 days between indenting and receiving of drugs.

NSQ drugs were found to be occupying a huge space at the store. The Store in-Charge, was unaware of the procedure for management of NSQ drugs.

Jharsuguda:

The central warehouse is situated within the campus of district head quarter hospital in Jharsuguda. The district hospital pharmacy as well as the warehouse are located in the same building.

All the indented drugs were supplied from SDMU on time and they are not facing any delay in supplies. However, the warehouse could not store/arrange the supplied drugs and other consumables properly due to limited shelves and racks.

The software is used only to enter the drugs received and other functions of the software, such as recording drugs issued, monitoring drug position, consumption patterns, drug requirement calculation etc. are not being used.

b. Central Warehouse : SCB MCH

The central warehouse is located within the campus of SCB MCH. There is no dedicated building for the warehouse but about seven to eight rooms were allotted within the hospital. Currently, the warehouse manages drugs for SCB MCH, AHRCC and Sisu Bhaban. The space provided for the warehouse is inadequate and it was noticed that the drugs cartons were scattered all over the rooms.

The SMO said that funds should be provided for employing daily wage labourers and rickshaw/ trolley equipment for transporting drugs within the hospital. Also, deploying one more Pharmacist at the store would help in better inventory management. Providing additional personnel would reduce the burden on the existing pharmacist and thereby he would have time and opportunity to operate the inventory efficiently.

c. Central Warehouse/Central Store: Capital Hospital

At Capital Hospital, the central store itself is functioning as the pharmacy of the hospital. It distributes drugs to dispensing unit of Capital Hospital and other zonal dispensaries in Bhubaneswar. The drugs/ consumables were well arranged in shelves but not all could be accommodated due to limited space. Additional racks are required for the store in order to better manage the available space.

The SMO suggested that there should be provision to indent program related drugs (e.g. IFA tablets) for all the tertiary care hospitals (3 MCHs, Capital Hospital, RGH). The data

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management system was found to be largely manual, with limited usage of the software, which makes the entire process cumbersome.

d. AHRCC

AHRCC, is a state autonomous body and its drug policy differs from other health facilities in the state. The SDMU does not supply drugs to AHRCC. There was no warehouse, no dispensing unit and no indenting system followed in the facility. The economically vulnerable patients purchase medicines free of cost, under different government schemes (RSBY, BKKY, NCPDCS, OSTF, etc.) from the empanelled medicine stores (two) that are 500 meters away from the hospital. The general patients (non BPL category) purchase medicines at 57% discounted price from a medicine store located within the hospital campus. The patients purchase saline bottles, gauze, cottons etc. from local pharmacies and they directly purchase narcotic drugs from the manufacturer.

The drug store was found to be small in size without majority of required drugs that should be available. The SMO was insistent that the AHRCC should also come under the Drug Corporation.

DISCUSSION

The study revealed many important findings on the drug availability, management, storage and perception of key stakeholders at various health facilities across the selected study districts. The study findings highlight the fact that there is non-availability of essential medicines, drug stock outs, poor indenting practices, discrepancy between the requirement and supply of drugs, inadequate infrastructure both material and human across health care facilities. It was observed that the availability of drugs varied across various levels of health care facilities; DHHs and CHCs have better availability compared to medical college hospitals and PHCs; there are also inter-district variations in terms of availability of essential drugs.

Availability and stock out of essential drugs

Access to drugs is critical to the provision of equitable and affordable health care in low and middle-income countries (LMICs). According to WHO, the mean availability of essential drugs in LMICs is 35% in public sector facilities[xiii]. Limited studies are available from India, which demonstrate significant variations in essential drugs availability and stock-out. For example, a recent survey in Tamil Nadu and Bihar showed that the mean availability of selected medicines for Bihar was about 43% as compared with 88% for Tamil Nadu[xiv]. In another study it was observed that the median availability of critical medicines in the public health system was about 30% in Chennai, 10% in Haryana, 12.5% in Karnataka, 3.3% in Maharashtra (12 districts) and 0% in West Bengal[xv]. A study on health-care facilities managed by either the State Government or the Municipal Corporation of Delhi showed the mean availability of essential medicines was 41.3% and 23.2%, respectively; in tertiary care facilities operated under the federal government, the availability was about 50%[xvi]. A study assessing availability of children's medicines from Odisha also pointed out availability concerns[xvii]. The present study also found wide variations in availability of essential drugs across the health care facilities. For instance, the stock out on the day of the visit varied from on an average 19% in various hospitals in a district to 66% at a tertiary care facility. It is also observed that some of the essential drugs were not available on an average for four months in the district hospital whereas this was for five months in tertiary care facility during the past six months.

Indenting practices

In order to improve availability of drugs, it is essential to strengthen the indenting, supply chain and inventory management systems along with other components such as provision of adequate infrastructure including space, equipment, transportation facility and human resources. The study examined the above factors and found that there is lack of scientific forecasting and indenting systems. A qualitative comparison of the different procurement models in India concluded that scientific demand estimation and forecasting as one of the key factors for ensuring drug availability[xviii]. Similar findings were observed in another study conducted in Bihar[xix]. Although the institutions in Odisha reported having an indenting system in place, a standard procedure is not adopted across the health care institutions. Some of the institutions are also using chit of papers for indenting of drugs, which was observed from the interactions with ANMs, Medical Officers and Pharmacists. The inter-district variations are stark at the sub-centre level. Regarding the frequency of indenting, at sub-center level the indenting is largely 'as on requirement basis' whereas at PHC, CHC and DHH level a combination of 'periodic indenting' and 'as on requirement basis' is practiced.

Supply of drugs and other consumables

Discrepancy between quantity of actual indented and supplied drugs was seen in all the districts included in the study. Almost half of the ANMs reported the quantity of supplied drugs was not according to the indent. More than 80.0% doctors and pharmacists also reported that they do not receive drugs based on indents. A clear gap between the demand and supply of drugs was observed in most of the facilities. It was reported that the practice of following any logical procedure is limited in drug supply and sometimes the facilities do receive drug, which were not indented. An unreliable distribution system causes chronic shortage and acute stock-outs of essential medicines[xx]. Our study findings are in congruence with a study assessed availability of common drugs with respect to disease load, regarding three common childhood diseases, acute respiratory infection (ARI), diarrhea and malaria; the study which was conducted in Odisha concluded that, the drug supply was not only inadequate but also uneven and erratic, having weak correlation with the pattern of disease morbidity[xxi]. Absence of a standard operating procedures or weak implementation of the same could

be one of the key reasons for this; and evidence generated through this study, for instance, the practice of pushing the unutilized drugs to the lower level hospitals with short expiry period, further substantiates the problem.

Infrastructure: space, equipment and storage conditions

Though there are drug storage facilities across the health institutions, inadequacies in space, equipment and store conditions are key concerns reported. In a tertiary care hospital (SCB MCH), which is considered the best medical college hospital, space provided for warehouse is reported to be inadequate. Similar challenges are faced at the district hospitals. Limited space and storage conditions may influence the availability of drugs at various levels; if a facility has less space to store drugs, the indenting quantity would be less than required and more frequent indenting; whereas the storage conditions affect the quality of medicines and result in wastage, thereby affecting the availability. For instance, in one of the study districts (Dhenkanal), the district warehouse does indenting more than 7 times a year, which might be because of the limited storage space.

Inventory management systems

At all levels both the Doctors and Pharmacists are aware of FEFO but only less than one third of the Pharmacist, 50% of the doctors are aware of the batch recall mechanism, which is an important component of the inventory management and can have serious implications for patient safety. Though training is an important component for capacity enhancement, only two-thirds of Pharmacists are trained on drug management as indicated by the study.

Drug management

In order to improve efficiency in drug management system, the role of automation is critical. Evidence suggests that use of software in supply chain management improves efficiency especially in indenting, monitoring drug stock position, supply and accountability. The present study shows that the use of software is completely absent at district as well as state level tertiary care facilities. The reasons stated for non-use of IT was, absence of computers, non-functional software and lack of trained manpower.

CONCLUSION AND RECOMMENDATIONS

This rapid assessment of availability of essential drugs in Odisha brings to fore many important findings for policy level considerations. The study underlines the stock out of some of the essential drugs for a period of five months in tertiary care settings and for a period of four months at the district level. Crucial factors that could influence the drug availability as observed from the study are lack of scientific forecasting / estimation of drug requirements, poor indenting practices, limited storage facilities, irrational drug supply and staff skills gaps. It is recommended that these issues are addressed in order to improve the availability of essential drugs in health care institutions.

The findings suggest that the there is a mismatch between demand and supply of drugs and many times institutions receive drugs which they did not indent. This can be mainly attributed, amid other reasons, to an unreliable drug procurement and distribution system. It was evident that standard operating procedures (SOPs) are not available for all major activates, even if there are SOPs for selected operations, they are seldom practiced. Therefore, an urgent need for development (or further strengthening) and strict implementation of the SOPs for all major activities relating to procurement (planning and management), storage, quality assurance and distribution is required. Inefficiency in any of these areas may lead to sub-optimal performance of the system, resulting in frequent stock-outs.

Specific recommendations

- o On a priority, implement standard procedures for estimation of drug requirement, introduce standard formats for indenting (discourage chit of papers) and supply drugs as per indents (avoid irrational supply of drugs).
- o Provide on the job trainings to pharmacists and store keepers on basic store and drug management. This should include drug requirement calculations, usage of indent forms and inventory management including segregation of expired drugs.
- o To improve efficiency and accountability, design and implement IT enabled supply chain management system across health care institutions in a phased manner, which is currently not found any of the selected health institutions.

Way forward *(long term interventions)*

In order to achieve the objective of providing quality drugs and medical consumables in all government health institutions, which is mentioned in Odisha Drug Policy, a series of systemic changes need to be introduced.

- o Develop detailed Standard Operating Procedures (SOPs) for overall supply chain management systems. Set up a working group to design evidence based procedures for drug procurement and distribution.
- o Invest in infrastructure which includes providing adequate space, necessary storage equipment and temperature control machinery for all levels of health institutions, to bring sustainable improvements in access to drugs, one of the key premises for achieving universal health coverage (UHC).
- o Deploy adequate human resources and management, including capacity building, to support strengthening drug procurement and supply systems.

The Government Odisha initiatives, such as formation of a nodal agency for drug management, the Odisha State Medical Corporation Limited (OSMCL), and forthcoming free medicines distribution scheme at all government health facilities, are important systemic reforms which have potential to address some of the issues highlighted by the study, if well implemented.

Annexure I - Tables

Table 1: Drugs Availability in Kalahandi

Facility	No. of drugs selected	No. of stock outs on the day of survey (%)	No. of stock outs in last six months (%)	Average months stock out
DHH	21	4 (19.0)	5(23.8)	4
CHC-1	21	2 (9.5)	5 (23.8)	4
CHC-2	21	5 (23.8)	5 (23.8)	3.4
PHC-1	21	5 (23.8)	9 (42.8)	4
PHC-2	21	6 (28.5)	5 (23.8)	6
PHC-3	21	4 (19.0)	13 (61.9)	3.9
PHC-4	21	6 (28.5)	7 (33.3)	4.8
PHC-5	21	3 (14.2)	17 (80.9)	2.2
PHC-6	21	6 (28.5)	7 (33.3)	3.8
PHC-7	21	6 (28.5)	6 (28.5)	4.8
Total	210	47(22.3)	79(37.6)	4.1

Table 2: Drugs Availability in Dhenkanal

Facility	No. of drugs selected	No. of stock outs on the day of survey (%)	No. of stock outs in last six months (%)	Average months stock out
DHH	23	3 (13.1)	5 (21.7)	5.6
CHC-1	23	0 (0.0)	0 (0.0)	0
CHC-2	23	0 (0.0)	0 (0.0)	0
PHC-1	23	8 (34.8)	11 (47.8)	4.2
PHC-2	23	6 (26.1)	6 (26.0)	4.1
PHC-3	23	8 (34.8)	8 (34.8)	5
PHC-4	23	4 (17.4)	3 (13.1)	6
PHC-5	23	5 (21.7)	9 (39.1)	4.2
Total	184	34(18.4)	42(22.8)	4.8

Table 3: Drugs Availability in Jharsuguda

Facility	No. of drugs selected	No. of stock outs on the day of survey (%)	No. of stock outs in last six months (%)	Average months stock out
DHH	21	0(0.0)	0(0.0)	0
CHC-1	21	1(4.7)	1(4.7)	6
CHC-2	21	1(4.7)	1(4.7)	6
PHC-1	21	2(9.5)	2(9.5)	1
PHC-2	21	13(61.9)	13(61.9)	2.8
PHC-3	21	4(19.0)	6(28.6)	3.5
PHC-4	21	3(14.3)	10(47.6)	2.3
Total	147	24(16.3)	33(22.4)	3.0

Table 4: Drugs Availability at Capital Hospital

No. of drugs selected	No. of stock outs on the day of survey (%)	No. of stock outs in last six months (%)	Average months stock out
15	4 (26.6)	0 (0.0)	0.2

Table 5: Drugs Availability at SCB MCH

No. of drugs selected	No. of stock outs on the day of survey (%)	No. of stock outs in last six months (%)	Average months stock out
27	18 (66.6)	21(77.7)	5.4

Table-6: List of Stock out Drugs in SCB MCH

Sl no.	Name of drugs not available
1	Paracetamol(s)
2	Albendazole(T)
3	Albendazole(S)
4	Fluconazole(T)
5	Miconazole(Ointment)
6	Chloroquine Phosphate(T)
7	Chloroquine Phosphate(Syr)
8	Amoxicillin(Caps)
9	Ciprofloxacin(Eye/ear drop)
10	Sulfadoxine + Pyrimethamine(Tab)
11	Gama Benzene Hexachloride (lotion)
12	Amlodipine(Tab)
13	Atenolol(Tab)
14	Metlormin(Tab)
15	Antacid Tablets
16	Cough Expectorant
17	IFA Tablet
18	Contraceptive (Oral/IUCD)

Table-7: Indenting system

Name of the Unit	No. of respondents	1 Indenting system at facility	2 Process of indenting		3 Frequency of indenting				4 Received Drugs based on Indenting	
		A	a	c	a	B	c	d	a	b
		YES	Indent Form	Chit of paper	Bi-Monthly	Monthly	Quarterly	As required	YES	NO
Kalahandi (%)	10(100)	10(100)	6(60.0)	4(40.0)	0(0.0)	1(10.0)	5(50.0)	4(40.0)	6(60.0)	4(40.0)
Dhenkanal (%)	7(100)	7(100)	1(14.3)	6(85.7)	2(28.6)	2(28.6)	0(0.0)	3(42.9)	0(0.0)	7(100)
Jharsuguda (%)	7(100)	7(100)	6(85.7)	1(14.3)	0(0.0)	0(0.0)	2(28.6)	5(71.4)	1(14.3)	6(85.7)
Total (%)	24(100)	24(100)	13(54.1)	11(45.8)	2(8.3)	3(12.5)	7(29.1)	12(50)	7(29.1)	17(70.8)

Table 8: Average consultation and dispensing time in study districts

Districts	Kalahandi	Dhenkanal	Jharsuguda
No. of facilities	8	8	7
Average consultation time (Minute)	6	5.9	2.8
Average Drug Dispensing time (Minute)	6.8	6.6	3.6

Table-9: Average consultation and dispensing time in Tertiary care Hospitals

Name of the Facility	Capital Hospital	SCB MCH
Average consultation time (Minute)	2.7	2.5
Average Drug Dispensing time (Minute)	1.3	1.4

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