

Availability and Stock Outs of Paediatric Essential Medicines Across Different Levels of Care in One District

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ABSTRACT

Objective: To assess the availability and stock out periods of key paediatric essential medicines across different levels of care in one district of Jammu and Kashmir state. **Methods:** A cross-sectional survey at public health facilities and private retail outlets in their vicinity across primary, secondary and tertiary levels of care. **Results:** Overall public paediatric medicine availability was low (30.46%) in comparison to the private retail outlet availability of 71.83%. In public sector, primary level of care showed highest availability of 36.27% followed by tertiary care (28.57%) whereas secondary care recorded least availability of 25%. Private retail outlets recorded highest availability at primary level (78.13%) followed by secondary level (76.25%) and tertiary level (54.78%). Among public health facilities and private retail outlets Children's hospital recorded highest availability of 56.16% and 68.85% respectively whereas District Hospital and Primary Health Centre had lowest availability of 8.64% and 69.76% respectively. Mean stock out period was more in public sector (66.29 days) as compared to private retail outlets (34.78 days). At primary level of care mean stock out period was 88 days in public facilities as compared to 41.25 days in private retail outlets. At secondary level mean stock out period were 43.75 days in public and 34.87 days in private facilities. Tertiary level recorded mean stock out period of 22.6 days and 22.1 days at public and private facilities respectively. **Conclusion:** Overall availability of key essential medicines for children was low with frequent stock-outs in public hospitals which deprive the children who attend these public hospitals from adequate access to essential medicines.

Key words: Paediatric, Essential Medicines, Availability, Stock-outs, Access, Tertiary care.

INTRODUCTION

It has been estimated that one third of the world's population does not have regular access to essential medicines.¹ Access to essential medicines for children is globally accepted now as an important contributing factor for good childhood health outcome and in this direction World Health Assembly Resolution WHA60.20 (2007) encourages its member states, to promote access to essential medicines for children.² The access to essential medicines for children has not been studied widely. However few surveys in developing world on availability of key essential medicines for children have exposed the severe lack of medicines at both public and private level.³⁻⁶ A snapshot national survey carried out in India in the year 2010

reported limited and poor availability of five key paediatric essential medicines in Jammu and Kashmir State as compared to other states of the country thus making it the only availability specific study carried out in this state till date.⁷ In absence of detailed information about the availability of essential medicines it becomes difficult to devise and recommend appropriate interventions to improve their access and availability. An important and vital step towards improving medicines access for children is to measure the availability of essential medicines and to identify the key barriers in its access. Given the paucity of published data on paediatric drug availability in J&K state this study examined the physical access (availability) to

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Table 1: Details of public health facilities and private retail outlets surveyed

Health Facility	Children's Hospital (CH)	Medical College (MC)	District Hospital (DH)	Sub-District Hospital (SDH)	Primary Health Centre (PHC)	Total
Public	1	1	1	1	1	05
Private Retail Outlets (PRO)	1	1	1	1	1	05

Table 2: Yearly OPD-IPD patient loads at public health facilities

Health facility	OPD Loads (lac)			Average	IPD Loads (lac)		Average
	2011-12	2012-13			2011-12	2012-13	
CH	2.44	2.97	2.70	0.21	0.22	0.215	
MC	6.98	7.54	7.26	0.51	0.56	0.536	
DH	2.70	2.45	2.58	0.09	0.07	0.830	
SDH	1.44	1.13	1.29	0.03	0.02	0.262	
PHC	0.17	0.21	0.19	NA	NA	NA	

NA=Not applicable.

key essential medicines for common childhood diseases and their stock-out periods in public hospitals and private retail outlets in their vicinity across different levels of care.

MATERIAL AND METHODS

Duration and design of study

This study was carried out over a period of 8 months i.e. January 2014 to August 2014. Selection of public health facilities and private retail outlets was done in a manner to ensure that the findings are representative of the entire district. One super speciality children's tertiary care hospital (CH), one Govt. Medical College (MC), one district hospital (DH), one Sub-District Hospitals (SDH), one Primary Health Centre (PHC) and one private retail outlet (PRO) in the vicinity of each public health facility was chosen for this study (Table 1). CH, MC, DH and SDH chosen were the only health facilities available in the selected district, whereas private retail outlets and primary health centres were selected randomly on the basis of their proximity with the public health facility. Thus a total of 05 public hospitals and 05 private retail outlets were included in the study.

A list of drugs featuring both in National List of Essential Medicines (NLEM), 2011 and WHO List of Essential Medicines for Children, 2015 was prepared and used in the survey. In this list drugs were selected and categorised into primary, secondary and tertiary lists based on different therapeutic categories and their frequency of use in children across different levels of care.

Secondary data sets regarding annual patient load, budgetary allocations for drugs and key steps involved in supply chain management were also obtained from

public health facilities.

Data collection and analysis

Data was collected using pre-validated data collection forms designed for the study and analysed using MS-Access. Statistical analysis of the data was conducted using computer software SPSS version 20.0

RESULTS

Yearly patient loads showed that there is a heavy inflow of both OPD and IPD patients attending these facilities (Table 2). Public health facilities recorded overall mean availability of 30.46% with CH showing highest availability of 56.16% and DH showing lowest availability of 8.64%. Private retail outlets recorded comparatively higher availability of 71.83% with highest availability of 78.02% recorded in the vicinity of SDH and lowest availability of 68.85% recorded in the vicinity of CH (Table 3 and Figure 1, 2). Across different levels of care, primary level public health facilities showed highest mean availability of 36.27% (CH=53.48% and DH 20.93%) however Private retail outlets recorded comparatively better overall availability of 78.13%, (CH-86.04% & PHC-69.76%)(Figure 3). Secondary level public health facilities recorded least availability of 25% (CH-65% and DH-5%) whereas private retail outlets recorded comparatively higher mean availability of 76.25% (MC-80% and SDH-70%). Tertiary care public health facilities recorded a mean availability of 28.57% (CH-50% & DH-0) as compared to private retail outlets where mean availability (54.78%) was better (CH 57.14% & DH 50%).

Table 3: Medicines availability across different levels of care among public health facilities and Private Retail Outlets (PROs) of District Srinagar

Health facility	Public				Private			
	Primary (%) N=43	Secondary (%) N=20	Tertiary (%) N=14	Mean	Primary (%) N=43	Secondary (%) N=20	Tertiary (%) N=14	Mean
CH	53.48	65	50	56.16	74.4	75	57.14	68.85
MC	41.86	20	35.71	32.52	81.39	80	57.14	72.84
DH	20.93	05	0	8.64	79.06	80	50	69.68
SDH	30.23	10	NA	20.11	86.04	70	NA	78.02
PHC	34.88	NA	NA	34.88	69.76	NA	NA	69.76
Mean	36.27	25	28.57	30.46	78.13	76.25%	54.78	71.83
SEM	5.48	13.69	14.86	-	2.81	2.39	2.38	-

N=Total no. of drugs; NA=Not Applicable.

Table 4: Medicines stock out in days among public health facilities and Private Retail Outlets

Facility Name	Public health facility				Private Retail Outlet			
	Primary N=43	Secondary N=20	Tertiary N=14	Mean	Primary N=43	Secondary N=20	Tertiary N=14	Mean
CH	10	0	0	10	15	22	10	15.6
MC	105	60	68	77.6	50	10	10 23.3	72.84
DH	112	90	0	67.3	51.25	67.5	46.3	55.01
SDH	98	25	NA	61.5	60	40	NA	50
PHC	115	NA	NA	115	30	NA	NA	30
Mean	88	43.75	22.6	-	41.25	34.87	22.1	-
SEM	19.72	19.72	22.66	-	8.19	12.50	12.10	-

N=Total no. of drugs; NA=Not Applicable.

Mean stock out period was found to be more among public health facilities (66.29 days) as compared to private retail outlets (34.78 days). Across different levels of care, primary level in public health facilities had mean stock out of 88 days (CH-10 and DH-112 days), whereas among private retail outlets mean stock out was found to be 34.78 days (CH 15.6 and DH 55.01) (Table 4 and Figure 4, 5).

At secondary level of care in public health facilities mean stock out in days was found to be 43.75 (CH no stock out and DH 90 days) whereas among private retail outlets mean stock out was recorded at 34.87 days (MC-10 and DH-67.5) At tertiary level of care in public health facilities mean stock out was found to be 22.6 days (CH no stock out and MC 68). Similarly in private retail outlets mean stock out was found to be 22.1 days (MC 10 & DH 46.3 Figure 6).

DISCUSSION

State of Jammu and Kashmir selects and procures medicines for public health facilities by collecting requisitions/indents annually from all levels of care at the peripheries. These requisitions are consolidated first

at the district level and then forwarded to the Controller of Provincial Medical Stores (PMS) for further short listing, quantification and consolidation on the basis of monthly work done reports of various health facilities that reflect their morbidity patterns and drug needs. Quantification at the level of Controller, PMS is done on the basis of availability of budgetary allocations for medicines. Consolidated drug lists prepared by Controller, PSM thereby along with quantities required are forwarded to the Directorate of Health Services of the respective province wherefrom they are sent to the concerned Central Purchase Committee (CPC) for floating the tenders. Tenders are then floated annually by the respective CPC by competitive bidding process using double envelope system.

Yearly IPD and OPD patient loads revealed that local hospitals are overburdened and there is a heavy patient load at all levels of care making it a very challenging job for all health care professionals to provide continued care. Results of this study revealed poor mean public paediatric drug availability of only 28.09%. However mean availability at private retail outlets was far better to the tune of 73.08%. In a similar study carried out in

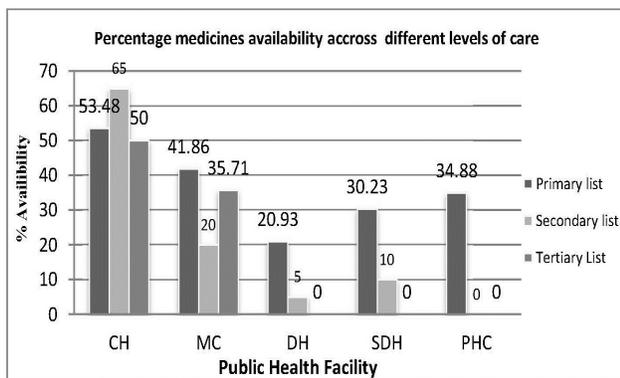


Figure 1: Percentage medicines availability among public health facilities across different level of care

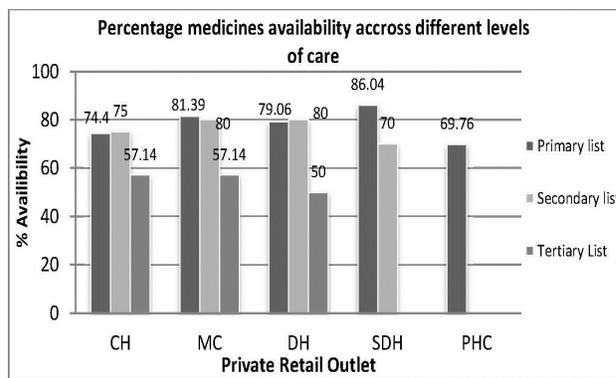


Figure 2: Percentage medicines availability among Private Retail Outlets across different level of care

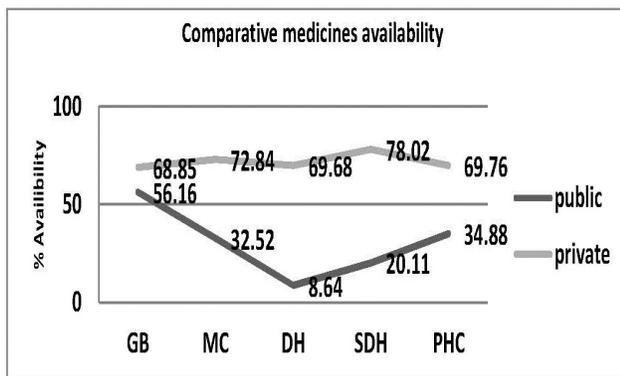


Figure 3: Comparative Percentage medicine availability between public health facilities and private retail outlets

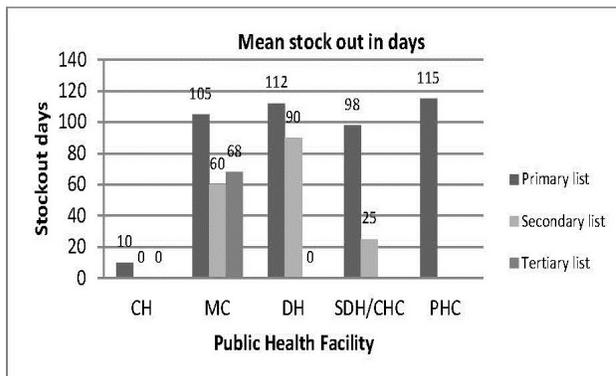


Figure 4: Mean stock out in days at public health facility level

China it was estimated that children account for 20% of the total population but paediatric medicines accounted for only 2% of the total medicines available.⁸ Another study recorded median availability of 19% to 69% in public facilities.⁹ Availability was higher in private or retail pharmacies in all countries that reported data on private sector outlets.³

In public sector, primary level of care witnessed highest availability of 36.27% followed by tertiary care (28%) whereas in case of secondary level of care i.e. at DH and SDH availability was found to be as low as 20%. In comparison to the public facilities private retail outlets recorded highest availability at primary level (80.75%) followed by secondary level (78.5%) and tertiary level (60%).

A study carried out in Srilanka showed overall mean per cent availability of 52% (Tertiary Hospital – 62%, District Hospital–54%, PU–49%, CD–45%).¹⁰ In this study, highest availability of 55.84% at public health facility level was seen at CH and DH showed lowest availability of 12.98% whereas private retail outlets in the vicinity of CH had highest availability of 84% & and those in

the vicinity of PHC had lowest availability of 71.06%. A survey that assessed the availability of essential medicines for children in 14 central African countries reported poor availability of essential medicines for children. The results showed that the availability of surveyed medicines was 15-75% in the central medical stores, 15-70% in the teaching hospitals, 10-80% in the district hospitals, 18-48% in primary health care clinics and 38-62% in the retail or private pharmacies.³ Our findings are also consistent with a number of pricing and availability surveys that have been conducted for adult medicines for both acute and chronic diseases.¹¹⁻¹³

Various possible reasons that could be attributed to the poor public sector availability are lack of adherence to the EML, limited budgetary allocations, irregular and scattered disbursement of funds for medicines and poor medicines management infrastructure. Yearly decrease and curtailment in budgetary allocations for medicines as evident from may be one of the important reasons for poor medicine availability in the state.

Stock-outs were more frequent in the public sector hospitals than in private retail outlets. Mean stock out

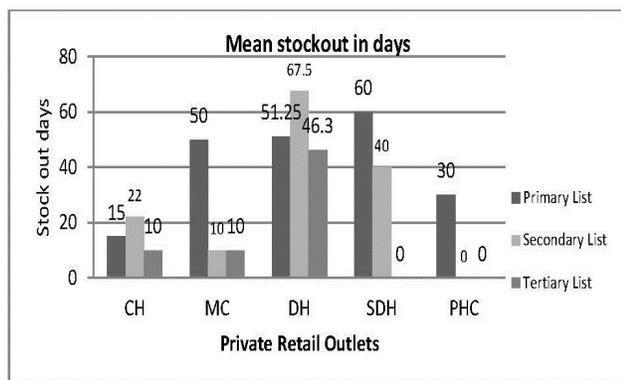


Figure 5: Mean stock out in days at private retail outlets

period was more in public sector (66.1 days) as compared to private retail outlets (34.78 days Figure 6). At primary level of care mean stock out was found to be 88 days in public health facilities and 38.25 days in private retail outlets. At secondary level mean stock out was 43 days in public health facilities and 34.87 days in private retail outlets. At tertiary level of care, mean stock out was found to be 22.6 days in public health facilities and 22.1 days in private retail outlets. Similar results of stock outs of key drugs in healthcare facilities were reported by several other studies.^{14,15} Inefficient demand forecasting and distribution systems, financial constraints, inappropriate drug management were found to be common reasons responsible for drug stock-outs.

CONCLUSION

The availability of key essential medicines for children was low in public health hospitals. This deprives the children who attend the public hospitals from adequate access to essential medicines.

Appropriate measures need to be taken particularly for proper selection, forecasting, procurement and distribution of medicines to make the supply chain more efficient and robust. Moreover disbursement of funds should also be sufficient and timely to cater to the needs of individual hospitals across all levels of care. Scattered and sparse budgetary allocations for medicines available with individual hospitals need to be pooled

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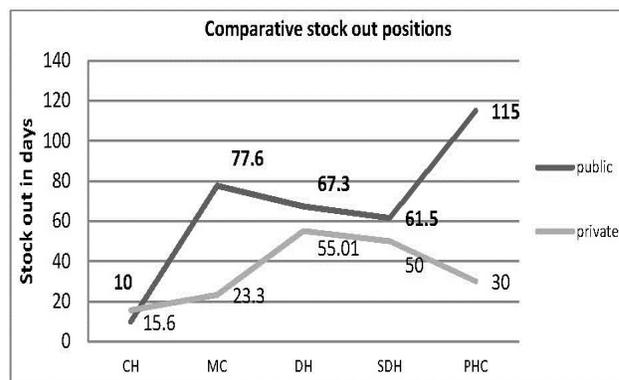


Figure 6: Comparative stock out positions between public health facilities and private retail outlets

at the central level for optimal utilization of available resources resulting into more efficient procurement since centralized procurement and decentralized distribution has been found to improve access to medicines in all settings.

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CONFLICT OF INTREST

The author declare no conflict of interest.

ABBREVIATION USED

PRO:	Private Retail Outlets
CH:	Childrens Hospital
MC:	Medical College
DH:	District Hospital
SDH:	Sub District Hospital
PHC:	Primary Health Centre

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