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Evaluation of Pharmacy Logistic Performances and Barriers to Healthcare Access in Sarawak

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ABSTRACT

Introduction: In Malaysia, the healthcare services have developed structurally, transforming the country into one of the healthiest countries in the tropics. However, there is a gap to ensure continuous drug availability. Sarawak is one of the states in Malaysia, run a three-tier system of managing health commodities which are the suppliers, the central medical store and regional medical store that forms the supplying chain. At the moment, there is no measurement of efficiency of this supply chain; thus, this study assesses the practices of logistics management, the causes of inadequacy of logistics and the strengths and weaknesses in health service in Sarawak.

Methods: We collected data on logistic performance in 2015, which involves 227 facilities across Sarawak. The self-administered questionnaire assesses the possible impact of limitation in transportation on drug supply performance. We created a data extraction form to evaluate the delivery performances regarding the logistic issues.

Results: Questionnaire was distributed to 227 facilities yielding 36.56% response rate. We found that facilities that less workload and keep maximum 3-month stock will indent more. About 60-65% of the facilities received stock from the main store within the stipulated time.

Requestor also reported central store unable to deliver medicine; however, mostly due to transportation.

Conclusion: The function of the central store is essential and relevant; however, the gap for service delivery needs enhancement while the requestor also need to improve in ordering strategies.

Keywords: Store management, logistics, Sarawak

INTRODUCTION

The World Health Organization (WHO) defines essential medicines as “those that satisfy the priority health care needs of the population and 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 at a price the individual and community can afford (1).

Nations often faces bottlenecks in keeping essential medicines well-stocked at clinics in remote areas. Some cannot afford sufficient drugs and supplies, while others face distinctive medical issues to some degree not only because of their location but also due to their population numbers. Bad roads in rural areas and inadequate communications systems may stymied delivery of medication. Geographical location affects the health of those living in it because of the environmental differences that come from rural versus urban environments but also to the access to medical care. With the consistently evolving industry, it is imperative to recognise the various issues that emerge in different parts of the country.

Well-functioning supply chains to deliver medicines, vaccines and other health products are critical to the provision of health services. Supply chains that can guarantee consistency in the availability of affordable, high-quality medicines, vaccines and health products at all health service delivery points is a necessity in any good health systems (2). Disruptions to this supply undermine health outcomes as supply chains have an impact on the availability, cost, and quality of medicines for patients.

In Malaysia, the healthcare services have immensely improved the health of the population, transforming the country into one of the healthiest countries in the tropics (3). However, average availability of critical medicines in the public district drug stores was 89.2%; with an average stock-out duration of 32.4 days (4).

Sarawak is one of the states in Malaysia, run a three-tier system of managing health commodities which are the suppliers, the central medical store and regional medical store that forms the supplying chain. At the moment, there is no measurement of efficiency of this supply chain. The study assesses the practices of logistics management, the causes of inadequacy of logistics and the strengths and weaknesses in health service in Sarawak.

METHODS

We conducted a descriptive cross-sectional study. Pharmacy Service Division of Sarawak had collected data on logistic performance in 2015, which involves all facility across Sarawak (204 clinics and 23 Hospital) that have transactions with central medical store and regional medical store.

The self-administered questionnaire assesses the possible impact of limitation in transportation on drug supply performance to evaluate the delivery performances regarding the logistic issues. Questionnaire was distributed to 227 facilities yielding 36.56% response rate. We analysed delivery performances on open-ended questions regarding the logistic issues by using descriptive statistics while the comment of respondents reported narratively.

We conducted this study following the needs of improving pharmacy departments performances and approved by Pharmacy Service Division of Sarawak. This study did not use any probing questions or involve sensitive issues. The data will be kept confidential and can only be viewed by the higher authorities. We would destroy the data after report publication. The current study was registered with the National Medical Research Register (NMRR-19-2908-49449) and ethical approval for this study obtained from the Medical Research and Ethics Committee (MREC), Ministry of Health Malaysia.

RESULTS

Majority of the respondents are from Health Clinics, mostly handled by medical assistants (Table 1). About three-quarters of the respondents' facilities located far more than 50 km from the central medical store. Workload are majority less than 100 prescriptions a day.

Table 1. Demographic of respondents

Demographic Characteristics	n (%)
Facilities	
Hospital	10 (12)
Health Clinics	72 (82)
Occupation	
Doctor	1 (1.2)
Pharmacist	8 (9.6)
Pharmacist Assistant	3 (3.6)
Medical Assistant	67 (80.7)
Nurse	4 (4.8)
Age	
Below 30 years old	58 (69.9)
Above 30 years old	25 (30.1)
Distance from main store	
Less than 50 km	20 (24.1)
More than 50 km	63 (75.9)
Workload based on number of prescriptions	
<100 prescription a day	73 (88.0)
100> prescription > 300 a day	10 (12.0)

Most requestor complied to the rule of keeping the stock at least for three months by making stock order every quarter of the year (Table 2). They received ordering schedule and adhered to it. However, for some facilities, they required more supplementary indent at least once a month and urgent request for at least every quarter. We compared the facilities that indent more with their workload and stock-keeping; we found that facilities that have less workload and keep maximum 3-month stock required more indent (Table 3).

Table 2. Requestor performance

Performance	n (%)
Stock holding	
Up to three months	56 (67.5)
More than three months	27 (32.5)
Frequency of ordering	
Four times a year	66 (79.5)
More than four times a year	17 (20.5)
Frequency of supplementary order	
Once a month	13 (76.5)
More than once a month	4 (23.5)
Frequency of urgent request	
Once every quarter year	7 (46.7)
More than once every quarter year	8 (53.3)
Received schedule for ordering	83 (100%)
Follow ordering schedule every quarter year	
Yes	81 (97.6)
No	2 (2.4)

Table 3. Summary on workload, stock holding and the frequency of supplement and urgent orders

Orders	Workload		Stock holding		
	Less than 100 prescriptions a day, n (%)	More than 100 prescriptions a day, n (%)	Up to three months, n (%)	More than three months, n (%)	
Frequency of supplementary orders	Once a month	11 (84.6)	2 (15.4)	8 (61.5)	4 (38.5)
	More than once a month	3 (75.0)	1 (25.0)	3 (75.0)	1 (25.0)
Frequency of urgent orders	Every quarter year	7 (100)	0 (0)	5 (71.4)	2 (28.6)
	More than every quarter year	5 (62.5)	3 (37.5)	4 (50.0)	4 (50.0)

Table 4. Store performance

Performance	n (%)
Stock sent within 20 days from date of orderings	
Yes	54 (65.1)
No	29 (34.9)
Stock sent more than 20 days	
Within a month	23 (79.3)
More than a month	6 (20.7)
Urgent request sent within three days	
Yes	53(63.9)
No	30 (36.1)
Urgent request sent more than three days	
Within a week	22 (73.3)
More than a week	8 (26.7)
Requestor pick up their stock at the main store	
Yes	69 (83.1)
No	14 (16.9)
Frequency of end-user pick up their stock	
Once a month or less	34 (49.3)
Twice a month	21 (30.4)
Three times a month	14 (20.3)
Waiting time to pick up stock	
Lessor up to an hour	27 (39.1)
Two hours	13 (18.8)
Three hours	12 (17.4)
Four hours	7 (10.1)
More than five hours	10 (14.5)
Requestor complaint main store unable to deliver medicine	
Yes	34 (41.0)
No	49 (59.0)

About 60-65% of the facilities received stock from the main store within the stipulated time (Table 4). More than 70% of urgent request delivered within three days. Majority requestor did raise their concern that they have to pick up their stock. However, due to their request was so current and urgent; at the same time transportation was deployed to do scheduled delivery thus unavailable momentarily. Since the requestor location is near to the main store, they were asked to pick up their stock once it was ready. At the central store, requestor have to wait to get their stock. Most of them have to wait for more than an hour and sometimes more than five hours.

Requestor also reported central store unable to deliver medicine; however, more than half of the reason are concerning transportation (Table 5). The central store delivers many stocks to a vast territory. Most of the transports are on scheduled delivery which takes a few days to arrive. While there some area requires local transport via river thus depend solely on the availability of local services (Table 6).

Table 5. Reasons for unable to deliver the stock

Reasons	n (%)
Not enough driver	15 (44.1)
Distance is far, unable to send immediately	5 (14.7)
Location of requestor is near	3 (8.8)
Unable to feedback	5 (14.7)
No stock	3 (8.8)
River transportation unavailable at that moment	3 (8.8)

Table 6. Remedial measures from main store to supply undelivered request

Remedial measures	n (%)
Send stock immediately after transportation available	4 (11.8)
Inform requestor immediately upon stock ready prepared	3 (8.8)
Call requestor to pick up stock if nearby	18 (52.9)
Send stock together with the next quarter request due to the distance	2 (5.9)
Advise requestor to borrow stocks from nearby facilities	3 (8.8)
River transportation unavailable at that moment	3 (8.8)

DISCUSSION

Stock management does not only rely on the main store; however, at the micro-level, the requestor at their store must play a significant role in ensuring continuous supply of stock (5). Strategic stock-keeping may avoid too many supplementary and urgent indent to the main store. As a storekeeper, it is crucial to be sensitive with the trend and enquire their user on the preferred choice of drug. By recognising stable usage pattern, this may help to reduce the frequency of ordering, ensure sufficient stock in hand and avoid unnecessary loss of resources such as time and finance.

The apparent lack is inability to supply more than 90% of the requestor needs within a certain grace period. It is admirable for the traditional store setting to be able to cover 227 facilities that have geographical challenges and distance; however, such effort has stretched the resources too thin. Therefore, the central store require reinforcement either on resources and technology. In order to hasten the supply process, we need to invest in human resources, studies on lean management and enhancement in software (2).

Transportation and delivery service were the most highlighted by the requestor. However, the problem caused by fully optimised facility stretch too thin. In Sarawak, trucks with medicines can travel up to 450 km on bad roads, which can take up to 2 days to deliver drugs. Not many clinics located on main roads, some road get flooded in the rainy season. Meanwhile, some clinics are accessible only by a small bridge, and when that bridge is washed away during the rainy season, it means having to get a boat and then from there, continuing the journey by trucks. These are not ideal conditions for transporting drugs. Due to distance and geographical situation, available transportation need time to deliver and return to the base. Even though the transportation support improved gradually, perhaps ordering from requestor could be augmented with new formula and strategies in order to reduce frequency of delivery, supplementary order and urgent request (2).

CONCLUSION

Central store is useful to reduce the burden of doing the lengthy bureaucratic procurement procedure (2), thus help many facilities to focus on their clinical work. The augmented procurement by central store help to reduce stock prices, thus allow saving the budget we can divert and consolidate for other means. The function of the central store is essential and relevant; however, the gap for service delivery need enhancement while the requestor also need to improve in ordering strategies.

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