

## Original Research Article

# Influence of product selection on health commodity security among level four public health facilities in Nairobi County, Kenya

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## ABSTRACT

**Background:** Procurement of health products and technologies in Kenya faces challenges as seen by increased public complaints regarding erratic supplies of the essential drugs and other medical supplies in public health facilities. Often overlooked, is the need to build effective product selection systems which can ensure there is availability of health commodities.

**Methods:** The study adopted a cross sectional survey research design with descriptive approach involving 120 top management team, procurement officers, stores clerks, pharmaceutical officers and head of departments who were involved in procurement of health products and commodities from the 4 level four government health facilities in Nairobi County (Mbagathi Hospital, Pumwani Maternity Hospital, Mama Lucy Kibaki Hospital and Mutuini Hospital). The survey used questionnaires to collect data from the respondents. Consent was obtained from participants above the age of 18 years was included in to the study. Informed consent was taken prior to conduct of the study.

**Results:** Correlation analysis indicated that product selection and health commodity security were positively correlated ( $r=0.769$ ,  $p<0.05$ ) while regression analysis indicated that product selection influenced health commodity security in level four public health facilities in Nairobi City County, Kenya ( $\beta=0.457$ ;  $p=0.05$ ).

**Conclusions:** Product selection is important to ensure health commodity security. The management at the facilities should ensure product selection committees are available in the facilities, products selected are registered for use in the country and ensure that the user departments are involved in product selection.

**Keywords:** Product selection, Health system, Procurement, Health commodity security

## INTRODUCTION

A health system encompasses the organizations, people, and actions that promote, restore, and maintain communities' and individuals' health; its performance is determined by factors beyond those directly related to clinical services. The World Health Organization (WHO) categorizes these interrelated aspects of health system functioning into six building blocks: service delivery; health workforce; information; medical products, vaccines, and technologies; financing; and leadership and governance. In strong health systems, all six building

blocks work together to provide timely, affordable, high-quality services, where and when individuals need them.<sup>5</sup>

The pillar of focus in this research was medical products, vaccines and technologies which as a core function of a health system is intended to be available within the context of functioning health systems at all times, in adequate amounts, in the appropriate dosage, with assured quality, safety, and at a price that individuals and the community can afford<sup>5</sup>. Commodity security is described as the ability of clients or end users to obtain and use health commodities when and where they need them which requires adequate financing, logistics systems, program coordination, and

other factors that make up the enabling environment that supports access and use. In Kenya, frequent stock outs and erratic supplies in the public health facilities while linking it to poor and ineffective product selection practices. Additionally, procurement of health products and technologies in Kenya faces challenges as seen by increased public complaints regarding erratic supplies of the essential drugs and other medical supplies in public health facilities.<sup>1</sup>

Often overlooked, is the need to build effective product selection systems which can ensure there is availability of health commodities. Product selection is the process by which health programs as a whole identify, evaluate, and eventually buy the items that will be utilized and consumed in service delivery.<sup>4</sup>

Product selection is an important part of the logistics cycle since it determines what items are procured and used in the health system as well as the range of items that a consumer can obtain. Selection is an integral part of the application of the concept of value analysis.<sup>6</sup>

## **METHODS**

### ***Settings, population and study design***

This cross-sectional quantitative survey was conducted between January 2022 and May 2022 among employees from four level four government health facilities in Nairobi County. The study was carried out at Mbagathi Hospital, Pumwani Maternity Hospital, Mama Lucy Kibaki Hospital and Mutuini Hospital.

### ***Inclusion criteria***

Participants were included in the study if they were involved in procurement and storage of health commodities for the last six months and were eighteen years old or above.

### ***Exclusion criteria***

Participants were excluded if they had worked in the facilities under study for less than one year and were below eighteen years of age.

### ***Sample size***

A sample size of 92 was derived using sample size formula for a single population based on Krejcie and Morgan formula. The assumptions made were using a 95% confidence interval, 5% margin of error and 20.0% expected proportion of respondents adjusted with 10% for incomplete or spoilt questionnaires. The sample size was distributed equally among the respondents such that each of the facilities got a sample size of 23. Using stratified random sampling technique, participants were selected to participate in the study.

## ***Measurement***

Data was collected using a structured questionnaire with closed ended pre-coded questions and administered verbally to participants. The questionnaire was divided into three parts; socio- demographic characteristics, product selection and health commodity security. To determine the influence of product selection on health commodity security, the researcher developed 10 items.

## ***Data analysis***

The raw data in the questionnaires were checked for consistency, accuracy, and completeness before data entry and data was analyzed using statistical package for social science (SPSS) version 26. SPSS suite of survey commands was used to obtain estimates with 95% confidence intervals that took into account the survey design. The data was analyzed using percentages, frequencies, means, and standard deviation. The data was presented in table, and frequency table.

## ***Ethical issues***

Approval for this study was obtained from Kenya Methodist University review committee and national commission for science, technology and innovation (NACOSTI). Informed consent was sought from the study participants before being allowed to take part in the study. The identity of the study participants remained anonymous and data collected from them were kept confidential in a password secured computer.

## **RESULTS**

### ***Response rate of the participants***

A total of 91 questionnaires were distributed to the respondents at the four level 4 government health facilities in Nairobi County (Mbagathi Hospital, Pumwani Maternity Hospital, Mama Lucy Kibaki Hospital and Mutuini Hospital). A total of 82 out of the 91 expected respondents filled the questionnaires. All the questionnaires returned were valid for data analysis and therefore the response rate was 90.11%.

### ***Demographic characteristics of the respondents***

The study determined the demographic characteristics of the respondents as they were considered categorical variables which give some basic insight into the respondents. The findings on these are summarized in Table 1).

The findings in Table 1 shows that majority 46 (56.1%) of the respondents were female. Most of them were aged between 20-50 years 66 (80.5%), most of the respondents 44 (53.7%) had more than 10 years of work experience. The results also showed that 22 (26.8%) of the respondents occupied the position of a procurement officer, 17 (20.7%)

indicated management team and head of department each, 12 (14.6%) indicated pharmaceutical officer while 14 (17.1%) indicated stores clerk. The results indicate that there were few pharmacy personnel at the health facilities under study. There is need for recruitment of more pharmacy personnel because they are vital as they are involved in the efficient management of the supply chain either directly or indirectly.

**Table 1: Demographic characteristics of the respondents.**

Characteristics	Frequency	Percent
<b>Gender</b>		
Female	46	56.1
Male	36	43.9
Total	82	100.0
<b>Age</b>		
20-30	17	20.7
31-40	24	29.3
41-50	25	30.5
51-60	16	19.5
Total	82	100.0
<b>Position</b>		
Management team	17	20.7
Procurement	22	26.8
Stores clerk	14	17.1
Pharmaceutical officer	12	14.6
Head of department	17	20.7
Total	82	100.0
<b>Work experience (years)</b>		
Less than 5	16	19.5
Between 6-10	22	26.9
More than 10	44	53.7
Total	82	100.0

#### *Descriptive analysis results for product selection variable*

The findings are presented in Table 2.

In view of Table 2, 65 (79.3%) of the respondents agreed that product selection committee is available in the facilities, 69(84.1%) of the respondents agreed that user

departments are involved in product selection, 28 (34.1%) agreed that national essential medicine list (NEML) copy is always available and accessible in the facility, 47 (57.3%) agreed that product selection committee uses the EML to select products, 61 (74.4%) of the respondents agreed that products selected are all registered for use in the country.

A few 24 (29.3%) of the respondents agreed that products selected are not always available in the EML. Majority 72 (87.8%) of the respondents agreed that some commodities are sometimes selected based on stock availability in KEMSA. Majority of the respondents 67 (81.7%) agreed that most of the medical products, vaccines and technologies in the facility are selected and ordered from KEMSA and central medical stores. According to Munoz and Dunbar (2015) a national EML is a list of medicines that have been approved for usage across the country and that meet a population's top health-care needs. The core list of the WHO model list contains only around 300 effectives, safe and cost-effective active ingredients which cover the health care needs of the majority of the population. Countries frequently identify which levels of care in the health system each product will be used at as part of the establishment of national EMLs, based on illness patterns and consequences that are regularly treated at each level. Achieving access to essential medicines is also defined by the concept of commodity security, which is described as the ability of clients or end users to obtain and use health commodities when and where they need them.

Respondents 63 (76.8%) agreed that needs assessment is conducted to establish the products for local disease patterns, 49(59.8%) agreed that the NEML copy is always available and accessible in the facility, 47 (57.3%) of the respondents agreed that product selection committee uses the EML to select products, 72 (87.8%) agreed that some commodities are sometimes selected based on stock availability in KEMSA, 72 (87.8%) agreed that effectiveness, safety and cost are key consideration in product selection. Lastly, 67 (81.7%) agreed that most of the medical products, vaccines and technologies in the facility are selected and ordered from KEMSA and central medical stores.

**Table 2: Product selection.**

Parameters	Agree n (%)	Disagree n (%)
<b>Product selection committee is available in the facility</b>	65 (79.3)	17 (20.8)
<b>User departments are involved in product selection</b>	69 (84.1)	13 (15.8)
<b>The national essential medicine list (NEML) copy is always available and accessible in the facility</b>	28 (34.1)	54 (65.9)
<b>Product selection committee uses the EML to select products</b>	47 (57.3)	35 (42.7)
<b>Content of the EML is well mastered</b>	44 (53.7)	38 (46.3)
<b>Products selected are all registered for use in the country</b>	61 (74.4)	21 (25.6)
<b>Products selected are not always available in the EML</b>	24 (29.3)	58 (70.7)
<b>Some commodities are sometimes selected based on stock availability in KEMSA</b>	72 (87.8)	10 (12.2)

Continued.

Parameters	Agree n (%)	Disagree n (%)
<b>Effectiveness, safety and cost are key consideration in product selection</b>	72 (87.8)	10 (12.2)
<b>Most of the Medical products, vaccines and technologies in the facility are selected and ordered from KEMSA and central medical stores</b>	67 (81.7)	15 (18.3)
<b>A needs assessment is conducted to establish the products for local disease patterns</b>	11 (13.4)	71 (86.6)

### ***Inferential analysis results***

#### *Correlation analysis*

The correlation analysis results are presented in Table 3. The results in Table 3 indicated that product selection and health commodity security were positively correlated ( $r=0.769$ ;  $p<0.05$ ).

**Table 3: Correlation analysis results.**

Parameters	Health commodity security	Product selection
<b>Health commodity security</b>		
r	1.000	
Sig. (2-tailed)	.	
<b>Product selection</b>		
r	0.769**	1.000
Sig. (2-tailed)	0.000	.

\*\*Correlation is significant at the 0.01 level (2-tailed)

#### ***Logistic regression analysis results***

Logistic regression was performed to establish the effects of the product selections on the likelihood that they will guarantee health commodity security among level four public health facilities in Nairobi City County, Kenya.

**Table 4: Parameter estimates.**

Parameter estimates	B	Std. error	Sig.	Odds ratio
<b>No clear product selection (ref)</b>				
<b>Clear product selection</b>	0.792	0.403	0.049	2.208

Also, product selection was a significant predictor ( $\beta=0.792$ , S.E.=0.403,  $p$  value  $<0.05$ ) indicating that product selection was likely to improve health commodity security among level four public health facilities in Nairobi City County. The odds ratio of 2.208 indicates that for every unit increase on product selection, the odds of improving health commodity security among level four public health facilities in Nairobi City County changed by a factor of 2.208.

### **DISCUSSION**

Correlation analysis results indicated that there existed a positive and significant relationship between product

selection and health commodity security ( $r=0.769$ ,  $p<0.05$ ). The logistics regression analysis results indicated that product selection positively and a significantly influenced health commodity security among level four public health facilities in Nairobi City County, Kenya ( $\beta=0.792$ ;  $p<0.05$ ). The findings agree with Kariuki et al who established that product selection in public sector and health commodity products security are positively correlated.<sup>8</sup> The product selection process allows the management of health facilities to lay a sound basis for selecting commodities. It guides by giving the reasons and criteria that should be used for deciding which products to procure AMREF.<sup>9</sup> In any logistics system, products must be selected. In a health logistics system, product selection may be the responsibility of a national formulary and therapeutics committee, pharmaceutical board, board of physicians, or another government-appointed group. Most countries have developed essential drug lists patterned on the WHO model list.

Health commodities security affect mostly the essential medicines and hospital commodities funded by hospitals or the government itself. Special programs funded by donors, like HIV commodities, TB commodities, and malaria commodities are also subjects to shortages and stock outs but to a much lesser extent. The shortages at health facilities lead to shortages at peripherals levels of the supply chain, and the health facilities. The patients are the ultimate victims of this chain of problems.<sup>10</sup>

### **CONCLUSION**

The study concludes that at bivariate level product selection influence health commodity security among level four public health facilities in Nairobi City County, Kenya. In a combined set up with other variables including procurement, inventory management and quantification, product selection was found to have a positive influence on health commodity security.

#### ***Recommendations***

To improve health commodity security among level four public health facilities under study, this study recommends that the management at the facilities should consider improving a product selection team of expertise, ensure quantification of essential health products and technologies required in the facility is done on monthly basis in addition to the quarterly and annual basis, ensure the committee factors in the cost of commodities before and after procurement and ensure costs are compared with available funds. Records on consumption of medical

products should be kept at the facility level. It is also important to have vaccines and technologies regularly updated in the inventories for accountability, reporting and decision making.

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