American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS)
ISSN (Print) 2313-4410, ISSN (Online) 2313-4402

http://asrjetsjournal.org/

Analysis of the Logistics System in the Management of Essential and Generic Drugs in Brazzaville

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The logistics system in the management of essential and generic medicines (MEGs) is the fundamental point to provide quality health care to the population, in order to ensure the sustainability of integrated health center (ISC) activities. The purpose of this work was to assess the performance of the ITC logistics system of Brazzaville by analyzing the different indicators. This study was a retrospective and observational study. The strategy consisted of conducting a survey among a sample of 17 CSIs in the seven districts of the city of Brazzaville. Data were collected over a three-month period following a one-on-one interview with Drug Management Officers, Document Operations, and Drug Availability Observation in CSI pharmacies. These data were recorded on a survey sheet, and an observation grid was established.

The analysis of logistic system variables revealed that: drug selection was fair in 76.5% of CSI and satisfactory in 23.5%. Quantification was good in 17.6% of cases, fair in 58.8%, and unsatisfactory in 23.5%. Storage conditions were fair in 41.2% and unsatisfactory in 29.4%. Distribution is unsatisfactory in the majority of CSIs. 76.46% of CSIs have unsatisfactory management tools. Drug use is fair at 47% with low availability of drugs.

The study found that the improvement of MEG availability is related to the organization of the management circuit and the logistics system.

Keywords: logistics system; management; generic essential drugs; Congo.

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1. Introduction

Medicines essential, constitutes a specific commercial element whose distribution is influenced by the level of the economy and development of the countries [1]. In Alma Ata in 1978, the World Health Organization (WHO) championed the concept of essential drugs as an integral part of national health policies [2,3] and made access to essential drugs the eighth component of Primary Health Care (PHC) [3]. For many countries, the arrival of the Bamako Initiative was an essential strategy to offer low-cost quality care and ensure the sustainability of activities at the level of Integrated Health Centers. (CSI) [4,5]. In Africa, this has translated into the field through the establishment of generic generic medicine (MEG) purchasing centers and drug depots in health facilities; this is the case in Congo where the main supply center, called the Congolaise of Essential and Generic Medicines (COMEG) was created in 2006 [6]. However, the management of essential drugs remains a problem. In Congo, the Ministry of Health has shown that the availability of drugs is 60% in public health facilities, 53.3% in the central supply [7]. The purpose of our work is to appreciate the performance logistics system by analyzing the different indicators.

2. Material and methods

It was a retrospective and observational study from March 20 to June 25, 2013, a period of 3 months. The study was carried out in the CSIs of the seven health and social districts (CSS) distributed in the seven districts of the city of Brazzaville: Makelekele (Diata, Jean Taty, Terynkio), Bacongo (Bissita, Madame), Poto-Poto (Q34, Martyrs, Q32), Moungali (Plateaux, Moukondo), Ouenzé (Jane Vialle, Q58, Ex-Adventist), Talangai (Congo River, Marien NGOUABI, Intendance) and M'Filou (Indzouli, Kibouende-M'Filou). The target population consisted of the managers responsible for the management of MEGs in the CSIs and all the pharmacies of the CSIs. Random sampling for both targets was performed. The sampling techniques consisted of the reasoned choice of agents responsible for MEG management and enumeration for pharmacies. The sample size was after counting and reasoned choice, with at least two CSIs per CSS. The data was collected after an individual interview with drug management officers, document processing and observation of drug disposition in pharmacies. Then, recorded in a personal interview guide, counting cards and an observation grid. These elements were initially tested in the field at CSI Intendance. After that, modifications were made following the difficulties encountered.

The variables studied were:

- General characteristics of CSI: type of minimum activity package of CSI (standard and expanded);
- General characteristics of the officers responsible for the management of MEGs: gender, qualification (which corresponds to academic training), seniority at the post, and training (skills passed on in the management of MEGs);
- Selection: availability and use of the national list of essential medicines, assessment of selection (satisfactory, fair, unsatisfactory);
- Quantification: availability and use of standard MEG control media, quantification assessment (satisfactory, fair, unsatisfactory);

- Transport acquisition: assessment of the transport acquisition (satisfactory, fair, unsatisfactory).
- Storage:
- Rack type: alphabetical, therapeutic group, without order;
- Cleaning the room and shelves;
- Storage conditions: visible identification labels, secure premises, existing cold chain, materials and arrangement of shelves, sufficient space, ventilation, ...
- Stock tools: stock card, purchase order / delivery;
- Assessment of storage (satisfactory, fair, unsatisfactory).
- Distribution: execution of a CSI command by the CSS.
- Use of MEGs: standard treatments, pricing of treatment and assessment of MEG use (satisfactory, fair, unsatisfactory).
- Maintenance of management tools: satisfactory, fair, unsatisfactory.
- Availability of MEGs: Main MEGs, Assessment of MEG availability (satisfactory, fair, unsatisfactory);
- Logistics system: elements of the system and appreciation.
- At the end of the data collection, the cards were manually scanned. Quantitative variables are expressed as mean and median. Excel 2013 software was used for statistical analysis.
- Operational definitions:
- Logistics system: physical circuit of the drug. Set of administrative procedures for the management of information, resources, means of transport, and storage facility premises set up to enable the client to obtain quality and sufficient quantity of drugs.
- Selection: choice of a drug at the time of expression of needs at the level of the health facility.
- Quantification: determination of the quantity of drugs to order.
- Acquisition-Transport: process including purchases, transportation and receipt of drugs at the sales depot. It starts from the placing of the order to the entry into stock of the drug.
- Distribution: transfer of drugs from a higher center to a lower level.
- Minimum Activity Package (MAP): curative (acute episode, chronic disease) and preventive (prenatal consultations, family planning, vaccination, preschool care) consultations.
  - Expanded LDCs: CSI performing deliveries
  - Standard PMA: no practice of childbirth

3. Results

3.1. General characteristics of CSIs and agents

In our study, fifteen CSIs had a minimum standard activity package of 88.2% and two expanded activity packages were 11.8%.

In CSI workers, women accounted for 58.8% and men were 41.2%. A female predominance with a sex ratio: 1.3.

Of the thirty-four CSI staff, 76.5% of MEG managers had received training related to their task while 23.5% of

officers had none.

- ***Qualification***

Table 1: Distribution of MEG Management Officers by Qualification

Qualification	Effectif	%
Technicien supérieur en pharmacie	16	47,05
Assistant sanitaire général	6	17,64
Infirmier diplômé d'état	8	23,52
Puéricultrice	4	11,76
Total	34	100

Several profiles were found during the study. However, the qualification of senior technicians in pharmacy was represented at 47% (Table I).

- ***Seniority***

Table 2: Distribution of MEG Management Officers by Seniority in Years

Seniority in Years	Effectif	%
0-5	18	52,94
5-10	4	11,76
10-1	6	17,64
15-20	2	5,88
20-25	4	11,76
Total	34	100

The most represented seniority bracket was 0-5 (Table II).

Selection

- ***Availability and Use of the National List of Essential and Generic Medicines (AUNME)***

Of the 17 CSIs, the LNME was only available in seven CSIs, ie 41.2%. Of these, it was only used in three CSIs, ie 42.85% of the 41.17% available. This method of selection was passable in 76.74% of cases, n = 13, and in 23.53% of cases it was unsatisfactory.

3.2. Quantification

- ***Availability and use of standard MEG command media***

Sixteen CSIs had standard MEG control media at 94.11%. However only three CSIs are 17.64% of the 16 used these media to place orders.

4. Storage

MEG rack type

The study reveals that in more than half of the cases (58.6%), shelving in all CSIs did not have a particular order of disposition. Therapy group shelving was done in 35.3% of CSIs while alphabetical shelving was used very little (5.9%).

Cleaning the room and shelves

In 88.2% that is fifteen CSI, the rate of cleaning of the storage room was daily and weekly in two CSI is 11.8%. Floor cleaning has not been done every day in any CSI. It was weekly in thirteen CSI (76.5%) and monthly in four (23.5%) CSI.

Storage conditions

Table 3: Distribution of CSIs according to storage conditions

Items	Yes	No
Products arranged in such a way that the identification labels are visible	7	10
The packaging is in good condition	14	3
Products stored in PPPS	16	1
Products protected from heat	9	8
Products protected from light	17	0
Products protected from water and moisture	17	0
Damaged and expired products separated from the vouchers	15	2
Insect and rodent free products	17	0
Secure premises	17	0
Existing cold chain	8	9
Material of adapted shelves	5	12
Sufficient space	6	11
Products stored at least 10 cm above the floor	13	4
Products at least 30 cm from walls and batteries	15	2
Products stored on a height of 2.5 m minimum	17	0
Accessible firefighting equipment	0	17
Products arranged separately from insecticides and other products	13	4
Existence of position card	7	10

• ***Stock tools***

In all the CSIs surveyed during the study, stock sheets and purchase orders were found. However only 29.4% of CSIs used stock cards and 41.1% purchase orders.

5. Distribution

CSS do not have a vehicle for the delivery of medicines. Centers that have placed orders are the only ones

responsible for transporting these drugs on delivery.

6. Logistics system

T**able 4:** Summary of logistic system components and their assessments

Components of the logistic system	Score	Appreciation
• Sélection	1	Fair in 13 CSIs are76.4% / satisfactory in 23.5% ie 4CSI
• Quantification	1	Fair in 10 CSIs are 58.83% / Satisfactory in 4 CSIs are 25.52% / Unsatisfactory in 3 CSIs are 17.6%
• .Acquisition / Transport	1	Average in 7 CSI is 41.17% / satisfactory in 10 CSI is 58.83%
• Stockage / Condition	0	Not satisfactory in 5 CSI is 29.41% / Passable in 7CSI is 41.17% / Satisfactory in 5 CSI is 29.41%
• Distribution	0	Unsatisfactory in the 17 CSIs
• Use	1	Average in 8CSI is 47.05% / Satisfactory in 7 CSI is 41.17% / Unsatisfactory in 2 CSI is 11.76%
• Holding management tools	0	Not satisfactory in 8CSI is 47.05% / satisfactory in 7 CSI is 41.17% / passable in 2 CSI or 11.74%
• Diponibility of MEG	1	Fair in 7 CSIs are 41.17% / Satisfactory in 4 CSIs are 23.52% / Unsatisfactory in 6 CSIs are 35.29%
• Logistics system	5	Unsatisfactory in the 17 CSIs

7. Discussion

Our study included the public and private non-profit health centers of the Brazzaville department as well as those responsible for the management of MEGs to guarantee representativeness. The investigation revealed that the staff was qualified. She highlighted several qualifications with senior pharmacy technicians who accounted for 47%. These results are better than those observed in the Comoros during the evaluation of the pharmaceutical sector in 2003 which had found 89% of sellers in pharmacies without qualification [8].

The selection variable obtained a score of 01 and according to our evaluation criteria, it is passable. The main problem is in the availability of the National Essential Medicines List (NEML) and its use. Of the 07 CSIs that had the LNME, only 03 CSI used it when ordering. In CSIs that did not have the LNME, MEG management agents reported referring to previous monthly consumption and epidemiological profile at the time of placing orders, which favors the selection of specialty drugs with a impact on the cost of care. These results are consistent with those of Nkogho in Gabon, who showed a high tendency for the prescription of specialties to the detriment of MEGs. This was partly due to the lack of dissemination of the LNME [9].

The quantification variable did not obtain a satisfactory score. In fact, 16 CSIs had standard MEG command supports that were not always complete. The heads of the center and the agents in charge of the inventory

management determined after the inventory the quantities of the monthly order. These orders are intended to cover the next month, but it was not uncommon to see emergency orders launched during the months. This is in line with WHO's 2004 findings, which states that it is still difficult for some populations to ensure a regular supply as needs are poorly estimated, leading to many ruptures and expiry [10]. Also, the multiple stockouts in all CSIs were not only caused by MEG shortages at the COMEG or SSC level, but also the consequence of poor quantification methods. Although 76.47% of MEG management staff were trained in MEG management, the application of formulas for determining quantities to order was almost non-existent. This is comparable to the results of Nkunzimana in 1996, which noted in its study on the availability of MEGs in the Atlantic this lack of control of procedures by stock managers [11]. The transport acquisition variable is passable because it has a score of 7. The problems at this level lie in the delivery times which vary from one week to one month, with quantities not always satisfactory. These results are similar to the evaluation carried out in Burkina Faso by the Ministry of Health, which reveals the non-respect of procurement deadlines [12]. The storage variable got a score of 28 for all CSIs and therefore unsatisfactory. In each CSI, there are two types of inventory: "large stock" managed by the center's drug management agents and another "retail store" managed by sales clerks. In the big stock, the drugs are arranged on the shelves. The material of the shelves is far from satisfactory to ensure good storage conditions. In 12 CSI MEGs are stored in cabinets, hermetically sealed. The drugs are poorly ventilated, because these cabinets do not offer enough space. These results are in agreement with those of Moore G. in Mali who noted the same shortcomings in the storage conditions [13]. Only 05 CSI hold acceptable conditions with good shelf material, preferably wooden shelves and the premises of the 17 CSI, are secured. Boussengar in Morocco, had noted acceptable storage conditions where the products are well ranked [14] .The measures that managers took to ensure the quality of MEG during storage are the expiry date, in which case they have claimed to store the MEGs according to First Ever Outdated (PPPS) justifying the absence of obsolete MEGs throughout the survey period, except drugs donated by the CSS. The distribution variable is unsatisfactory because it remains a problem for many African countries. The Ministry of Health in the Congo, says that there is no organized system of drug distribution [15]. Just as a study conducted in the Democratic Republic of Congo [16] has shown. There are no vehicles to ensure the distribution of MEGs, in contrast to the shortage of vehicles observed by Somda C. in Benin [17] and Boussengar in his study on the analysis of the management of medical devices [14]. The variable score using MEG is 12, so passable. However, 05 CSIs had satisfactory use of MEGs, 08 CSIs and then 04 others were respectively rated fair and unsatisfactory. Eleven CSIs had a flowchart. There are therefore standard schemes of treatment in these CSIs; but among the CSIs with standard treatments, only 03 CSIs placed their orders taking these into account. In the 06 CSIs where we did not find a flow chart, managers reported using their experience in treating certain diseases. Drugs delivered with or without a chart pose the problem of the rational use of MEGs, as Somda found in Benin in 2006 [17]. The management tools holding variable is unsatisfactory with a score of 03. The poor handling of the management media concerns the filling of the media and the archiving of the documents. The consultation of the supports shows that the filling during the storage operations was not regular. This is one of the elements that explain the poor quantitative evaluation and the multiple stockouts observed. And other aspects including the absence of delivery notes, despite the recommendations of the Ministry of Health [18]. Trap in Zimbabwe has observed the regression of these dysfunctions through the supervision of stock management and the use of standard treatments [19]. The MEG availability variable is passable. CSIs that manage to have a very good physical presence of MEGs are barely a

percentage of 11.76%. This rate is lower than those obtained by Nkunzimana in 1996 in Benin [11], Riddle in Burkina in 2005 [4] and Cheraghali in France. Iran in 2004 [20] with respective rates of 70%, 89% on the ten main MEG and 92%. These prolonged breaks are attributable on the one hand to the capacity of the agents in charge of the management of MEGs who fail to play correctly their role, on the other hand to the association CSS-COMEG insofar as orders placed are rarely satisfied. Only 02 CSIs had a good physical presence of MEGs. The MEG availability rate is 91% quarterly average. These results are similar to those of Niangaly in the region of Kolikoro (Mali) [21] and Somda C. with availability rates of 89% and 86% [17]. This low availability rate across all CSIs does not provide quality care, as found by Audibert M. [22]. Summarizing all the components of the logistic system variable and adding up each of their score, we obtained 05 as a score (unsatisfactory) for the logistic system variable. The flaws are related to the storage and holding of management tools. Indeed these two parameters have influenced the other elements of the circuit that are selection, quantification; because they are poorly judged, they have an impact on the availability of MEGs. Our results are comparable to those obtained by the Ministry of Health of Congo [7] and in the analysis of the logistic system by Somda in the commune of Kpomassé in Benin [17].

8. Conclusion

The management of generic essential medicines in Brazzaville, analyzed through the performance indicators and the evaluation criteria of the logistics system, is far from allowing the provision of quality care to the population, nor ensuring the sustainability of the activities of the integrated health centers. The main factors influencing the logistics system are not related to selection, quantification, acquisition, transport and availability, but rather the shortage of storage, distribution and maintenance of drug management tools. It is important to strengthen actions in the context of the implementation of the drug management policy, both at the intermediate and peripheral levels. Thus, training supervision, continuous training and evaluations should be carried out on a regular basis, in order to reinforce the quality and capacities of the agents in charge of drug management.

Reference

[1]. CEMAC. Common Pharmaceutical Policy. 2007,20p.

[2]. Declaration of Alma-Ata. International conference on Primary Health. Alma-Ata, USSSR. 1978,3p.

[3]. Monekosso G. L. Bamako Initiative. Some general principles. WHO / DRAO. Brazzaville 1989,10p.

[4]. Riddle V., Nitiema A. P., Dadjoari M. Improve accessibility of essential drug for the population of medical region in Burkina Faso. Santé2005; 15 (3): 172-82.

[5]. Ministry of Health Congo. Round table on the problem of drugs in Congo. Final report. 2008, 57p.

[6]. Convention Government of the Republic of Congo-COMEG, 10/07/2006 COMEG, Association Declaration Receipt N ° 352/05 / MATD / DGAT / DER / SAG.

[7]. Ministry of Health and Population, Pharmacy, Laboratory and Drug Branch. Evaluation of the Pharmaceutical Sector of Congo 2006, 76p.

[8]. WHO AFRO. WHO Strategy for Cooperation with the Union of Comoros 2005-2009. Moroni 2004, 33 p.

[9]. Nkhogho P, Gregoire JP, Moisan J, Gaudet M. The determinants of prescribing generic essential drugs

in primary health care (Gabon) 2006. <http://www.remed.org> accessed 9th September November 2010.

[10]. WHO. Regional strategy for better access to medicines. 2004-2007. Western Pacific Regional Office 2003.40p.

[11]. Nkunzimana C. Availability of essential drugs under generic names in public and private non-profit health facilities in the Atlantic Department (Benin). Cotonou 1996; Memory No. 108 / IRSP. Alfred Comlan Regional Institute of Public Health QUENUM Ouidah-Benin, 1996, 66 p.

[12]. Ministry of Health. Evaluation of the IST Drug Management Logistics System Ministry of Health, Burkina Faso, Ouagadougou 2003,46 p.

[13]. Moore G. Partnership Evaluation of the Family Planning Logistics Management Project in Mali. Bamako 1994,52 p.

[14]. Boussengar L. Analysis of the management of medical devices at the level of an emergency reception facility. Case of Ibn Sina Hospital in Rabat (Morocco) 2004, 109p.

[15]. Ministry of Health Congo. National Procurement Plan 2006, 15p.

[16]. Ministry of Public Health of the Democratic Republic of Congo. Essential Medicines Management in the community health sites of the Kasai CRS assisted health area: 2008 supervision report, 28p.

[17]. Somda C. Evaluation of the generic essential drugs management logistics system in Kpomassé commune, Benin. Memory No. 413 / IRSP / 2006. Master in Public Health, Regional Institute of Public Health Alfred Comlan QUENUM Ouidah -BENIN, 2006, 86p.

[18]. Ministry of Health, Social Affairs and Family, Congo. Drug Management Manual for Pharmacies in CSI 2006, 20p.

[19]. Trap B, Todd C H, Moore H., Laing R. The impact of monitoring and control of a drug. Health Policy and Planning 2001; 16 (3): 273-80.

[20]. Cheraghali M, Nikfar S, Bahrami A, Rahimi V, Asadi A, Tirdad F et al. Evaluation of availability, accessibility and prescribing pattern of medicines in the Islamic Republic of Iran. Eastern Mediterranean Health Journal 2004; 10 (3): 406-15.

[21]. Niangaly A, Kante N, SoumareN'diaye A. Quality of care in health centers in the Kolikoro region (Mali). Med Afr Black 2001; 48 (7): 300-4.

[22]. Audibert M, Roodenbeke E. Use of first level health services in Mali: situation analysis and perspectives. World Bank, Africa Region, April 2005,68p.