

**Research Article****ASSESSMENT OF AVAILABILITY OF ESSENTIAL MEDICINES IN PUBLIC HEALTH FACILITIES IN SEKONDI-TAKORADI METROPOLIS**Alfred Osei-Assibey¹, Patricia Akweongo²¹ MPH, Ghana Health Service, Western Regional Health Directorate, Sekondi,² PhD, University of Ghana, School of Public Health, Legon-Accra.

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ABSTRACT

Essential medicines are selected to meet the priority health needs of majority of the population. The World Health Organization has set a benchmark of 80% availability of these essential medicines in health facilities. In Ghana, availability is low with only about 17% of essential medicines available in public health facilities where majority of Ghanaians seek healthcare. Factors that contribute to this low availability include availability of funds to procure these medicines, supply chain and procurement factors. The objective of the study was to assess the availability of essential medicines in the Sekondi-Takoradi Metropolis. A descriptive cross-sectional study design was employed using mainly quantitative methods complemented with qualitative methods to assess the availability and affordability of 50 essential medicines in public health facilities the Sekondi-Takoradi Metropolis. Fourteen public health facilities were selected to participate in the study. The World Health Organization and Health Action International Methodology, 2008 for medicines price, affordability and availability was applied in the study. The results showed a mean essential medicine availability of 64.5% for lowest-priced generic and 0.3% for originator brands. Median price ratios were 2.03 with 25th and 75th percentile price ratio of 1.43 and 3.17 respectively. Prices of essential medicines are two times higher than the international reference price published by Management Science for Health. The minimum wage earner requires 0.3 to 3 days' wage in order to buy essential medicines for the treatment of the common diseases in the Metropolis.

The procurement system was efficient with competitive procurement price similar to international prices published by the Management Science for Health. Prices of essential medicines remained high and strict adherence to medicine pricing policies is required to make medicines more affordable to low income earning Ghanaians.

INTRODUCTION:

World Health Organization (WHO) has advocated for the constant availability of a group of medicines classified as Essential Medicines (1). These are medicines that are selected to meet the priority healthcare needs that contribute to better health, better drug management, efficient use of financial resources and thereby improving access to care. They are selected with due regard to disease prevalence, evidence of efficacy and safety, and comparative cost-effectiveness. The WHO has a model list from which countries have developed their National Essential Medicines Lists and has set an 80% benchmark as acceptable limit

for essential medicines availability in member countries (2). In spite of the implementation of essential medicines policies since 1977, a third of the world's population lack access to essential medicines with about 50% of the Africans and Asians not having access (3). Ghana has developed this list with the first edition in 1988, and revised subsequently through 1993, 1996, 2000, 2004 to 2010 (4). About 55% of Ghanaians, obtain pharmaceutical services from public health facilities to take care of diseases such as malaria, upper respiratory tract infections, diarrhoeal diseases, skin infections and hypertension, among the top five diseases reported at health facilities' Out Patients Department (OPD) (5). Low availability

of essential medicines reduces the level of confidence the people have in the health system to deliver effective care and this could derail effort to attain universal coverage as agreed at Alma-Ata. Data required for estimation of essential medicine availability remains low and sometimes unavailable due to lack of monitoring(6). This lack of information may result in poor decision making resulting in a vicious cycle of unavailability of medicines, poor planning and bad decision making. The study will highlight the state of public health facilities' capacity to cater for the basic essential medicines needs of majority of the population in Sekondi Takoradi Metropolis. It will also provide information on how available and affordable essential medicines are in the metropolis and this may influence decision making in medicine stocking and utilization. Information gathered on the trend of availability of essential medicines will also inform health managers on the outcomes of measures put in place over the years to make essential medicines available.

The main objective of the study was to assess the availability of essential medicines in Public health facilities in Sekondi-Takoradi Metropolis. The specific objectives were to:

1. Assess the trends of availability of essential medicines in health facilities in Sekondi-Takoradi Metropolis from 2011 to 2015.
2. Assess affordability of essential medicines to patients of public health facilities in Sekondi-Takoradi Metropolis
3. To assess the effectiveness and efficiency of the procurement and supply chain system in public health facilities in Sekondi-Takoradi Metropolis

METHODS

The study was a descriptive cross-sectional study. The World Health Organization/ Health Action International (WHO/HAI) Methodology 2008 was used to assess availability and affordability of the essential medicines. Fifty medicines, comprising 14 Global Core, 16 Africa Regional Core and 20 supplementary list were selected from the Ghana National Essential Medicine List 2010 edition as described by WHO/HAI methodology. All medicines selected had Management Science for

Health (MSH). All public health facilities in the Sekondi-Takoradi Metropolis as captured by the District Health Information Systems (DHIMS) in 2015. Review of records of essential medicines was done retrospectively from 2011 to 2015. Stores ledgers and medicine stock cards were reviewed for availability of up to 50 essential medicines depending on the level of care of 14 health facilities. Physical stock of up to 50 essential medicines depending on the level of care was also assessed across 14 health facilities from 31st May, 2016 to 6th June, 2016. Quantitative and qualitative methods were used to assess stock levels and to assess facility level factors that affected essential medicines availability. The qualitative method complemented the findings of the quantitative methods. The study was conducted in the Sekondi-Takoradi Metropolis which lies on 04^o55'00"N and 01^o46'00"W at 30 feet above sea level with a population of 559,548 and a land area of 191.7km². It is one of the 22 districts of the Western Region of Ghana.

About 96.1% of households are in the urban area and 3.9% in rural area(7). It is the hub for the recently discovered oil and gas industry. Data were analyzed using the WHO/HAI Medicines Availability and Affordability workbook part 1 Version 1 released on 30th March 2011, a preprogrammed Microsoft Excel application and Microsoft Excel Version 2013. The two were used to enter the data and to summarize the results. Key informants interviews were conducted with the heads of health facilities to corroborate findings of the quantitative data.

RESULTS

Description of Study Facilities:

A total of 14 public health facilities were surveyed. These facilities make up 82% of public health facilities in the metropolis. The facilities are made up of 1 regional hospital, 3 district hospitals, 1 health center and 8 CHPS compounds and 1 Medical Store from where medicines are procured and distributed to the health facilities in the region.

Availability of Essential Medicines:

Table 1: Availability of essential medicines between 31st May, 2016 and 6th June, 2016 by level of care in Sekondi-Takoradi Metropolis

Indicator	Level of care					All
	CHPS compounds	Health Centers without doctor	District Hospitals	Regional Hospitals	Medical Stores	
Number of facilities surveyed	8	1	3	1	1	14
Number of Essential Medicines Surveyed	13	32	48	50	50	50
Mean Availability of essential medicines across facilities for Lowest Priced Generic Brand (SD)	42.90% (±34.60)	66.70% (±47.10%)	63.90% (±40.60%)	78% (±41.80%)	62.00% (±49.00%)	64.50% (±34.40%)
Mean Availability of essential medicines across facilities for Originator Brand	0%	0%	0%	4%	0%	0.3% (±1.40%)

The mean availability of essential medicines was 64.5% of the lowest-priced generic versions of medicines which were available across public health facilities in the metropolis with standard deviation of 34.4% across the 14 health facilities

while mean availability for originator brands stood at 0.3% and this was only found at the regional hospital level. Thirteen public health facilities out of 14 surveyed did not stock any originator brands (Table 1)

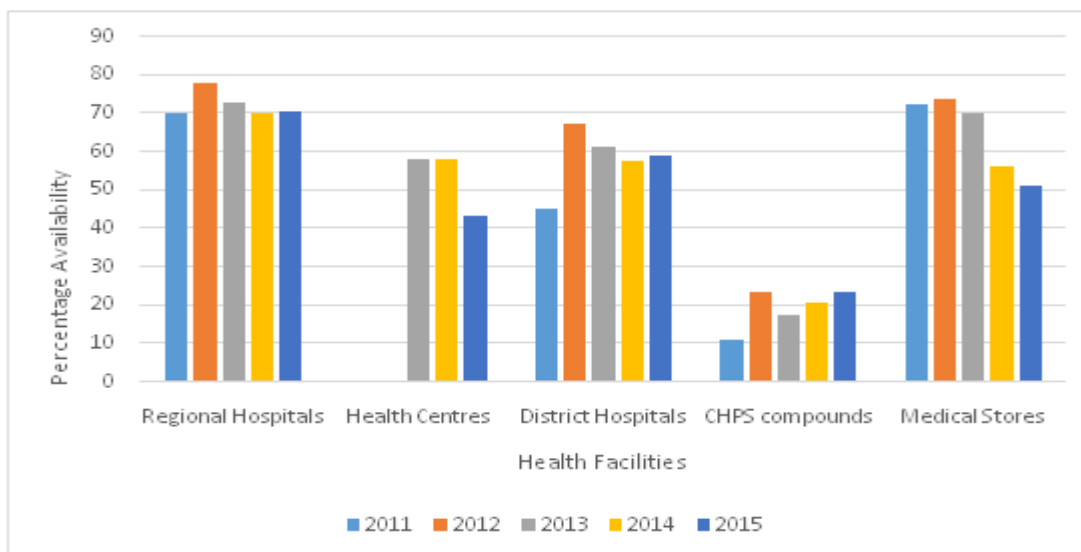


Figure 1: Trend of Mean Yearly Essential Medicines Availability from 2011 to 2015 across levels of care in Sekondi-Takoradi Metropolis.

The regional hospital recorded mean availability of 70.16% representing 35 essential medicines in 2011, 78.17% (39 medicines) in 2012, a decline to 73% (36 medicines) in 2013, and a further decline to 70.3% (35 medicines) in 2014 and 70.8% (35 medicines) in 2015. A similar declining trend was observed in the district hospitals, health centers and the regional medical stores (Figure 7). The

trends of medicines availability at the CHPS compound level was however seen to be increasing from 11.2% (1 medicine) in 2011 to 23.4% (3 medicines) in 2015, even though the CHPS compound level recorded the lowest mean essential medicines availability (Figure 1).

Affordability of Essential Medicines:

Table 2: Median price ratios of essential medicines by level of care in Sekondi-Takoradi Metropolis between 31st May, 2016 and 6th June, 2016

Indicator	Level of care					All
	CHPS Compounds	Health Centres without doctor	District Hospitals	Regional Hospitals	Medical Stores*	
Minimum MPR	0.26	0.31	0.27	0.26	0.13	0.27
25 th Percentile MPR	1.51	1.15	1.35	1.44	0.54	1.43
Median MPR	1.88	1.53	1.93	2.06	1.04	2.03
75 th Percentile MPR	7.97	2.27	2.33	3.10	1.39	3.17
Maximum MPR	15.26	20.99	15.83	15.83	8.17	18.47

The median of MPR in the Sekondi-Takoradi Metropolis at the time of this survey in public facilities was 2.03. Fifty percent of the price ratios however fell within the range of 1.43 and 3.17 (Table 2)

Table 3: Affordability of essential medicines for treatment of the top 10 diseases in Sekondi Takoradi by the Lowest Paid Government worker in 2016

Disease	Medicine for treatment according to STG 2010	Duration of Treatment (Days)	Cost of standard treatment with medicine (GH¢)	Minimum Number of Days of wage the lowest paid government worker requires to pay for Medicine
Uncomplicated Malaria	Artemether Lumefantrine tablet 20mg/120mg Adult full course	3	3.20	0.4
Uncomplicated Malaria in Pregnancy	Quinine Sulphate tablet 300mg	7	14.40	1.8
Acute Respiratory Tract Infection	Amoxicillin capsules 500mg	7	4.80	0.6
	Cefuroxime 250mg	7	22.40	2.8
	Erythromycin 250mg	7	12.00	1.5
Urinary Tract Infection	Ciprofloxacin 500mg	7	5.60	0.7
Hypertension*	Atenolol tablet 50mg	30	6.40	0.8
	Losartan tablet 50mg	30	24.00	3.0
	Nifedipine sustained release tablet 20mg	30	5.60	0.7
Pregnancy Induced Hypertension	Methyldopa tablet 250mg	30	20.80	2.6
Diarrhoeal Disease	Oral Rehydration Salts WHO formulation	3	2.40	0.3
	Ringers Lactate Infusion 500ml	3	16.00	2.0
Gastric/Duodenal Ulcer	Omeprazole capsule 20mg	28	16.80	2.1
Anaemia	Ferrous Sulphate + Folic Acid tablet	14	6.40	0.8.
Rheumatism and other joint pains	Paracetamol tablet 500mg	5	1.60	0.2
	Diclofenac tablet 50mg	5	3.20	0.4
Worm infestation	Albendazole 400mg	1	2.40	0.3

The daily minimum wage as announced by the Government of Ghana for the year 2016 was GH¢8.00(8). The forex rate for the United States Dollar was 3.8416 Cedis to a Dollar on 31st May, 2016(9). Thus the Dollar equivalent of the daily minimum wage is \$2.08

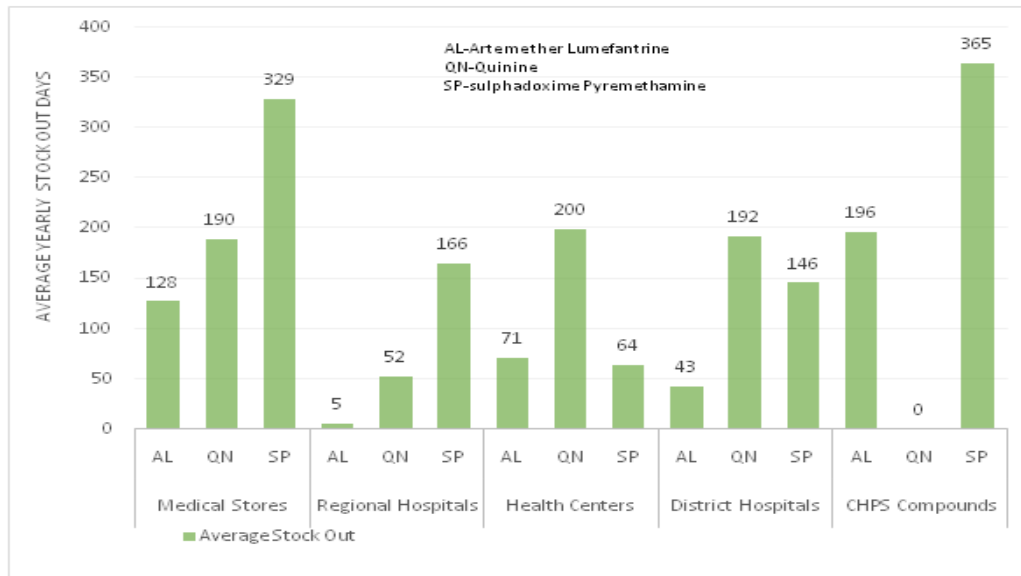


Figure 3: Average yearly stock out days of selected antimalarials across levels of care from 2011 to 2015 in Sekondi Takoradi Metropolis.

Figure 3 shows the average number of days in each year for which selected antimalarials were not available in the stores of the various facilities. The antimalarials assessed included Artemether Lumefantrine 20mg/120mg tablet adult regimen (AL), Quinine Sulphate 300mg tablet (QN) and Sulphadoxime Pyrimethamine tablet (SP). At the Medical Stores AL was not available for 128 days per year from 2011 to 2015. At the regional hospitals, however, AL was mostly available, with stock outs recorded for an average of 5 days annually throughout the five-year period.

Perception of Health Manager of Availability, Affordability and the procurement and Supply Chain System:

A total of eight (8) interviews were conducted with key informants from eight health facilities made up of the regional medical stores, two district hospitals, one health centre and four community-based health planning services compounds (CHPS). Below are some of the comments made by key informants.

Perception of Availability

“...We mostly stock what the hospitals request. ...if we see requisitions for a particular medicines more often and we don’t have, then we add it to our procurement list.....” KI001 Regional medical stores

Perception of Affordability

“...we put 10 to 15% markup on the products to cater for the running of the place.” KI002, District Hospital

“...we price the medicine such that when the facility also puts its markup they will not exceed the insurance price” KI001, Regional medical stores

“...we use the health insurance prices for everybody who comes here” KI007, CHPS

Perception of the Procurement and Supply Chain System

“...if there is a problem at one point in the cycle it is going to affect all the other areas and we know the problem is finance. If the insurance pay on time most of these problems will be solved” KI002, District Hospital

DISCUSSION

The availability of essential medicines in this study remained low in the Metropolis in all the public health facilities which serve majority of the population. A mean essential medicines availability of 64% at the time of the survey was below the WHO benchmark of 80%(2). Facility level availability, especially, at the CHPS level was lowest even though this level had fewer drugs to be assessed on the list. Only 42.9% of the 13 essential medicines were available. This raises concern about the capacity of these community level facilities to manage minor ailments that may in turn influence the referral of patients to higher levels of care. In a study conducted in Ghana, only

8.1% of patients referred were actually admitted, implying the rest of the patients could have been treated if the referring facility had the capacity to do so(10). Thus the availability of medicines could reduce congestion at higher levels of care. Interestingly, the five-year trend of essential medicines availability was also much lower at the community level with a yearly average of 19.1%. It is worth noting that first line antimalarial was available in all facilities at the time of the survey, reflecting the efforts being made to contain malaria in the metropolis and the country at large. At the time of the survey, the regional medical stores had only 58%(28 medicines) of the list of 50 essential medicines available and this would invariably affect public hospitals, clinics and CHPS compounds who rely mainly on the medical stores for their essential medicine needs. The essential medicine availability trend could be lower in more rural districts of the region, knowing that the Sekondi-Takoradi Metropolis had 96.1% urban households and the highest in the Western Region, as the availability trends has been observed in other studies(5)(7)(11).

The ability of clients to pay for health services, including medicines has been one of the main goals of the various health financing methods. The goal is to ensure that families and individuals do not suffer financial catastrophes as a results of paying for health services and medicines(12). The median of Median Price Ratio (MPR) for the medicines in this study was 2.03. This indicated that prices at which patients obtained medicines from public health facilities in the Sekondi-Takoradi Metropolis was twice the price of the same medicine as published by Management Science for Health (MSH). It must be emphasized that about 79% of patients who seek services at health facilities in the metropolis are insured under the NHIS(13), and may be protected from making out-of-pocket payment at the point of service. Thus, about 21% of patients at the point of services pay two times the price for medicines at the health facilities. 71% of these people who are not enrolled on the NHIS complain of their inability to afford premiums(14). This presupposes that poor people are not enrolled and thus may be suffering some financial catastrophe as they acquire medicines.

According to the World Health Organization (WHO) and Health Action International (HAI), procurement prices for the lowest-priced generically equivalent products should be fairly close to the MSH international supplier/buyer prices (that is, ratios up to 1.00). MPRs of 1.00 or less indicate that the procurement system is working efficiently, while MPRs above 1.00 raise questions about purchasing efficiency(2). The median MPR at the medical stores was 1.04, ranging from as low as 0.13 to a high of 8.17 and 50% of prices ranging from 0.54 to 1.39. The system according to this standard is fairly efficient and efforts should be made to make it more efficient. It is certainly important that this efficiency translates to the patient at the point of service delivery. The case is, however, different as medicines prices at public health facilities are mostly about two times the international reference price.

The number of stock out days is also used as a measure of the effectiveness of the supply chain system(15). Antimalarials are one major group of medicines that should be available at all times in the year due to the endemic nature of malaria in the country and the metropolis. For the first line antimalarial assessed in the study, Artemether Lumefantrine, it was out of stock for an average of 4 months in each year from 2011 to 2015, while the medicine for prophylaxis was almost not available for the whole period. Similar reasons of unavailability of funds were adduced for these shortages. However, other factors such as inaccuracies in estimation of required stock levels and low storage capacities may greatly affect all-year-round availability of a product. In line with Haszlinnaet al (2009), the high number of stock out days connotes an ineffective supply chain system.

The availability of essential medicines continues to be low in the Sekondi-Takoradi Metropolis at 64.5% in this Study. Prices of essential medicines are two times higher than the international reference price published by MSH. The lowest paid unskilled government worker requires between about 0.3 days (GH¢2.40) to 2.8 days (GH¢22.40) wage to pay for treatment with a course of an essential medicine for the most common disease conditions in the metropolis.

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