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## A Study of Antibiotic Use and Abuse in Ghana: a case study of the Cape Coast Metropolis

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### Abstract

Recent trends of antibiotic misuse with its attendant resistance development necessitated this study to determine patient's perspective and involvement in the use and abuse of antibiotics in the Cape Coast Metropolis of Ghana. A purposive sampling of 530 patients from 15 years and above patronizing 11 pharmacy shops in the Cape Coast Metropolis was undertaken by administering questionnaires and interviews. 59.9% of the interviewees were aware of the harmful potential of antibiotics abuse yet a significant number (71.5%) purchase antibiotics without prescriptions with 69.9% personally requesting specific drugs without seeking advice from the pharmacists ( $P < 0.01$ ). A significant amount of the antibiotics purchased was Amoxicillin (71.5%) whilst Cold/Running Nose (50.8%) and Cough/Chest pains (33.1%) were the highest reasons for antibiotic purchases respectively. About 25.4% of patients purchased the drug without any sign or symptom of illness whilst 18.5% of the patients confirmed the drug did not work when used for the illness for which they were purchasing the last time. However, 70.8% of the patients have at least secondary education. This research work exposes the abuse of antibiotics, the nature of the abuse and the drugs abused in the Cape Coast Municipality of Ghana.

### Introduction

In many African, Asian, and Latin American countries, antibiotics are readily available on demand from hospitals, pharmacies; patient medicine stalls (drugstores), roadside stalls, and hawkers<sup>1-4</sup>. Inappropriate prescribing of antibiotics has been attributed to a number of causes including people who insist on antibiotics, physicians who simply prescribe them as they feel they do not have time to explain why they are not necessary, physicians who do not know when to prescribe antibiotics or else are overly cautious for medico-legal reasons and those who just prescribe for economic reasons<sup>5-7</sup>. A 1998 study<sup>8</sup> in developing countries showed that the wealthiest 15% of the population consumes 48% of the medication dispensed from the country's pharmacies, whilst the 51% that earns US\$600 a month or less consumes only 16%. Observation has shown that the lack of effective monitoring and enforcement of controls on the sale and use of antibiotics is the main cause of growing resistance of the world's microbes to antimicrobial drugs<sup>9</sup>. The widespread use of antibiotics both inside and outside of medicine has been found to play a significant role in the emergence of resistant bacteria<sup>10</sup> whilst the volume of antibiotic prescribed is the major factor in increasing rates of bacterial resistance rather than compliance with antibiotics<sup>11</sup>.

A third of people for example believe that antibiotics are effective for the common cold<sup>12</sup> whilst 22% of patients on a course of antibiotics primarily do not finish due to that fact that they feel better (varying from 10% to 44% depending on the country)<sup>13</sup>. In one study the use of fluoroquinolones was clearly associated with *Clostridium difficile* infection, which is a leading cause of nosocomial diarrhea in the United States<sup>14</sup> and a major cause of death, worldwide<sup>15</sup>. A study on the influx of antibiotics into Ghana from both local and foreign manufacturers which leads to over-the-counter services without prescription points to antibiotics<sup>19</sup>. Thus this research seeks to appreciate patient involvement in antibiotic use and abuse in the Cape Coast Metropolis.

### Materials and Methods

**Subjects:** Subjects were selected by purposive sampling of all persons from 15 years and above

visiting all 11 pharmacy shops in the Cape Coast Metropolis of Ghana to purchase medication. A total of 530 medication purchasers responded to the questionnaires. The study was undertaken between October, 2009 and April, 2010.

**Instrument and Procedure:** A questionnaire was developed to answer questions on the educational background, knowledge of antibiotic abuse, hospital attendance, type of antibiotic purchase, whether antibiotic purchase was based on prescription, pharmacists advise or other, reasons for antibiotic purchase, presence or absence of any symptoms, adverse reactions to antibiotics etc. The questionnaire was completed by the subjects or for illiterates by the interviewer in the same study period.

## Statistical Analysis

Data analysis was carried out using SPSS 16.0 software. Microsoft Excel was used in obtaining descriptive statistics of the data, after which Statview Version 5.0 from SAS was used in Chi square analysis.

## Results

There were greater number of males purchasing antibiotics (59.2%) compared with females (40.8%). All the people sampled have bought and used antibiotics at one time or the other whilst majority (71.9%) does not attend the hospitals or clinics when sick. A significant number of the people sampled (71.5%) have purchased antibiotics without doctor's prescription and 69.9% of the lot also did not seek pharmacist's advice before purchase (Table: 1) ( $P < 0.01$ ). About 40% have some knowledge of antibiotic abuse although 30% still purchase antibiotics without any disease signs or symptoms. As much as 25.2% of the sample population indicated the antibiotic being purchased did not work when first used (Table: 1). There was a marked preference to the use of Amoxicillin (71.5%) which was significant ( $P < 0.001$ ), followed distantly by Ampicillin/Penicillin (13.1%), Flucloxacillin and Flagyl with (10.8%) each respectively (Table: 2). More than half of the sampled population (50.8%) buy antibiotics to treat cold or running nose, 33.1% to treat cough or chest pains and 16.9% stomach ache (Table: 3).

Questions	Frequency	Yes (%)	Frequency	No (%)
Do you often attend Hospital when ill?	127	23.9	403	76.1
Do you buy antibiotics?	530	100	0	0
Do you purchase antibiotics outside of the hospital?	363	66.9	167	33.1
Do you purchase with prescription?	151	28.5	379	71.5
If without prescription, do you seek advice from the pharmacists?	114	30.1	265	69.9
Do you purchase antibiotics based on signs and symptoms of any diseases?	359	70	134	30
Have you taken the antibiotic you are purchasing before?	432	82.3	98	17.7
If yes did the antibiotic work the first time you used it?	326	74.8	110	25.2
Do you know abuse of antibiotics can be harmful?	318	60	212	40
Have you experienced any adverse reactions to antibiotics?	200	62.7	330	37.3

Table 1: Frequency of Responses to Questions by Subjects

Type of Antibiotics Purchased?	Frequency	%
Tetracycline	24	4.6
Amoxicillin	379	71.5
Cloxacillin	57	10.8
Chloramphenicol	33	6.2
Ampicillin/Penicillin	69	13.1
Flucoxacin	57	10.8
Metronidazole/Flagyl	57	10.8
Fluconazole	8	1.5
Gentamicin	8	1.5
Ciprofloxacin	37	6.9
Cefuroxime	4	0.8
Amokosiclav	12	2.3
Erthromycin	8	1.5

Table 2: Frequency of Type of Antibiotic Purchased

Reasons	Frequency	%
Stomach ache	90	16.9
Headache	20	3.8
Cough and/ or Chest pains	175	33.1
Cold or Running nose	269	50.8
Typhoid	16	3.1
Diarhoea	16	3.1
Joints and general body pains	29	5.4
Wounds and foot rot	53	10
Skin infections (e.g. boils)	49	9.2
Candidiasis	24	4.6
Toothache	12	2.3
Eye or Ear infection	8	1.5

Table 3: Frequency of Reasons for Antibiotic Purchases

## Discussion

Several varying factors such as geographical region, social circumstances and existing health care systems influence antibiotic use and misuse in various parts of the world. Research has shown that many doctors prefer to prescribe broad-spectrum antibiotics for patients they assume cannot wait for a full diagnosis or are unlikely to return because of transportation cost or time<sup>17</sup>. The preference for broad-spectrum antibiotics was clearly confirmed in this work with 71.5% of the people sampled purchasing Amoxicillin. This confirms a survey by<sup>18</sup> who discovered that Amoxicillin is the most frequently used drug in Brazilian households. This preference was either likely to have resulted from medical advice from an earlier hospital visit by purchasers or more likely from non-medical advisers such as drug vendors<sup>19-20</sup> friends or colleagues. About (71.9%) of the people sampled did not attend

hospital or clinic when sick or ill resulting in as much as 66.9% purchasing antibiotics outside the hospital setting and 71.5% purchasing antibiotics without any form of prescription. This confirmed an earlier work in Bangladesh where 95% of drugs consumed was bought from the local pharmacy; only 8% was prescribed by a physician<sup>21</sup>. Some reasons assigned for lack of hospital attendance included lack of drugs at most public hospitals<sup>20</sup>, availability and accessibility of drug outlets compared with hospitals and clinics<sup>3</sup> and the opportunity to purchase smaller quantities than the required dose<sup>2</sup>.

About 72.3% of the people sampled have a minimum of High School Certificate which reflected in 60% of the patients being aware of the effects of antibiotic abuse. However, more than 50% of the people sampled purchase antibiotics for cold or running nose of which antibiotics have no effect. This confirms works by<sup>22</sup> who found out that half of all adults (49%) believe that antibiotics are at least somewhat effective in treating colds and flu although 79% knows that colds and flu's are caused by viruses, not bacteria, and most people (61%) know that antibiotics are not effective in treating viruses. <sup>12</sup> also found out that a third of people believe that antibiotics are effective for treating the common cold.

In Ghana there is an influx of antibiotics into the Ghanaian market from both foreign and local pharmaceutical companies, which has led to the considerable increase in the abuse of antibiotics as a result of the Over-The-Counter (OTC) services without prescription from qualified physicians<sup>16</sup>. This was confirmed in the study in that 66.9% of the people sampled purchase antibiotics in the open market without any prescription. The World Health Organization (WHO) concluded that the lack of effective monitoring and enforcement of controls on the sale and use of antibiotics is one of the main causes of growing resistance of the world's microbes to antimicrobial drugs<sup>9</sup>. The volumes of antibiotics prescribed are the major factor in increasing rates of bacterial resistance rather than compliance with antibiotic use<sup>11</sup>.

## Conclusion

This research points clearly to antibiotic abuse in the lack of hospital attendance for proper diagnoses, prescription for purchases and reliance on a single type of broad-spectrum antibiotic by the populace as well as misuse of antibiotics for treating common cold or flu. Although awareness levels were high, it is recommended that target oriented education on the use and abuse of antibiotics across the populace should be employed and pharmacists should be pressed upon to consider the long term effects of abuse rather than short term financial benefits.

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