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# The magnitude of prescribing medicines by brand names in a tertiary hospital, Mwanza, Tanzania

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## Abstract

**Background:** Globally, one of the most common causes of irrational use of medicines is brand-name prescribing. The consequence of prescribing medicines using brand names is an economic burden on patients and society. Thus, this study aimed to investigate the magnitude of prescribing medicines by brand names in a tertiary hospital in Mwanza, Tanzania.

**Methods:** A retrospective cross-sectional study was conducted between April 2020 and March 2021 at the Bugando Medical Centre. Data were collected from electronic prescriptions (outpatients) and medical files (inpatients). The data were analyzed using STATA version 14. A Chi-square test was conducted to examine the relationship between different categorical variables. *p*-Values of less than 0.05 were considered statistically significant.

**Results:** Of 851 prescriptions analyzed, 416 (48.9%) contained medicines prescribed using brand names. Compared to outpatient units, the proportion of prescriptions with medicines prescribed by brand names in inpatient units was significantly higher (58.5% vs 39.1%), $p < 0.001$. The most frequently prescribed medicines by brand names were Ampiclox (ampicillin + cloxacillin), 35.2%, Buscopan (hyoscine butylbromide), 8.7%, and Amoxyclav (amoxicillin + clavulanic acid), 7.7%.

**Conclusion:** Prescriptions written with brand names were found to be common, especially among fixed-dose combinations (FDCs), according to the current study. Governments, institutions, and other stakeholders should support and encourage the use of generic names in prescription writing because it saves money for patients and health care systems. This calls for Tanzania's government to prioritize the development and implementation of generic prescribing policies.

## Keywords

Medicines, prescription, brand name, generic name, Bugando

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## Introduction

The brand name of a medication is the name given by the manufacturer, while the generic name is the name of the active ingredient in the medicine that is decided by an expert committee and is understood internationally.[1] Generic medicines are copies of branded medicines that have precisely the same dosage, intended use, effects, side effects, route of administration, risks, safety, and strength as the original drug.[2] Since generic medicines are produced by multiple manufacturers after the patent of the branded medicines expires, most of them are less expensive,[3] whereby the cost incurred by patients is estimated to be 2.6–10 times more for originator brands than for their generic equivalent.[4]

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**Table 1.** Distribution of prescriptions with brand names based on inpatient and outpatient categories.

| Variable | Brand-name status, *N* (%) | | *p* value |
|---|---|---|---|
| Prescription category | Yes | No | |
| Outpatient | 166 (39.1) | 258 (60.9) | <0.001 |
| Inpatient | 250 (58.5) | 177 (41.5) | |

The World Health Organization (WHO) has designed standardized prescribing indicators to evaluate the trends in prescribing in health facilities.[5] One of the indicators is the percentage of medicines prescribed by brand name.[6] The standard accepted value for prescribing by generic name is 100%.[7] Globally, one of the most common causes of irrational use of medicines is brand-name prescribing. The consequence of prescribing medicines using brand names is an economic burden on patients and society.[8]

The use of generic medicines improves consumer access to drugs and provides significant savings in health care costs without affecting the quality or therapeutic outcome of the prescribed medicine.[9] However, there is concern among patients and prescribers that branded medicines may be clinically superior to generic ones.[10] Another factor that influences the decisions of prescribers in prescribing generic medicines is the pressure from representatives of pharmaceutical companies.[11]

Brand-name prescribing has become a common practice in Tanzania.[12] This trend, however, has not been thoroughly examined. Thus, the aim of this study was to investigate the magnitude of prescribing drugs by brand names in a tertiary hospital in Mwanza, Tanzania.

## Methods

### Study design and area

We retrospectively reviewed the prescriptions of patients who attended Bugando Medical Centre (BMC) between April 2020 and March 2021. BMC is a tertiary, teaching, consultancy, and zonal referral hospital with an estimated 1000-bed capacity, serving Lake Zone eight regions (Mwanza, Simiyu, Kagera, Shinyanga, Musoma, Tabora, Geita, and Kigoma) and a catchment population of 13 million people. This study included prescriptions from BMC inpatients in internal medicine units and outpatient pharmacy departments. We excluded prescriptions from health insurance fund clients. The sample size was estimated by using the Kish Leslie (1965) formula; $n = Z^2P\ (100P)/e^2$. We used a standard normal deviation ($Z = 1.96$), margin of error ($e = 3.1\%$), and prevalence ($p = 71.6\%$).[12] The minimum sample size calculated was 813 prescriptions. A systematic sampling technique was employed. By dividing 8130 prescriptions written within 12 months of the study period by 813, a sampling interval of 10th was calculated.

### Data collection

Data were collected from outpatient electronic prescriptions and inpatient medical files. Information about prescriptions written by brand and generic names was recorded using a structured checklist. The checklist included information to assess the number of generic name(s) per prescription, the number of brand name(s) per prescription, the brand name for medicine prescribed in brand name(s), the generic name(s) for generic medicines prescribed, and the pharmacological classification of medicines prescribed.

### Data analysis

Data for descriptive statistics were entered and cleaned in Microsoft Excel before being exported to STATA version 14 (Stata Corp, College Station, TX) for further analysis. In the statistical analysis, frequencies and percentages were calculated. The results are presented in frequency distribution tables and figures. A Chi-square test was conducted to examine the relationship between different categorical variables. *p*-Values of less than 0.05 were considered statistically significant.

### Ethical consideration

This study was approved by the Catholic University of Health and Allied Sciences (CUHAS) and BMC's Joint Ethics and Research Review Committee (UECC No. 1822/2021). Permission for data collection was granted by the BMC Director-General. There was no contact with the patients; only prescriptions were involved during data collection. Hence, the ethics committee waived the need for participant informed consent.

## Results

A total of 851 prescriptions (3299 medicines) were reviewed and analyzed in this study. The mean (standard deviation (SD)) number of medicines per prescription was 3.88 (2.39). Four hundred and sixteen prescriptions (48.9%) contained medicines prescribed by brand names.

The proportion of prescriptions containing medicines prescribed by brand names was significantly higher in inpatient units than in outpatient units (58.5% vs 39.1%), $p < 0.001$ (Table 1).

**Table 2.** Medicines prescribed using brand names.

| Variable | *N* (%) |
|---|---|
| Ampiclox | 299 (35.1) |
| Buscopan* | 74 (8.7) |
| Amoxyclav | 66 (7.7) |
| Brustan | 54 (6.3) |
| Fefo | 49 (5.7) |
| Nat B | 45 (5.3) |
| Lasix* | 38 (4.5) |
| Diclopar | 37 (4.3) |
| Others | Each < 2.0% |

*Medicines that are not in a fixed-dose combination.

**Table 3.** Pharmacological groups for medicines prescribed by brand names.

| Variable | *N* (%) |
|---|---|
| Antibiotics | 385 (45.2) |
| Supplements | 182 (21.4) |
| Analgesics | 111 (13.0) |
| Antispasmodic | 73 (8.6) |
| Diuretics | 47 (5.5) |
| Anti-acids | 26 (3.1) |
| Others | Each <2.0% |

### *The proportion of medicines prescribed using brand name*

The most frequently prescribed medicines by brand names were Ampiclox (ampicillin + cloxacillin), 35.2%, Buscopan (hyoscine butylbromide), 8.7%, and Amoxyclav (amoxicillin + clavulanic acid), 7.7% (Table 2).

### *Pharmacological groups for medicines prescribed by brand names*

Antibiotics (45.2%) and supplements (21.4%) were the most common pharmacological groups of medicines prescribed by brand names (Table 3).

## Discussion

Prescribing using generic names is recommended worldwide. In the current study, the use of generic names in prescribing was much lower than the WHO standard of 100%. It was observed that almost half (48.9%) of prescriptions contained brand names of various medicines. Higher proportions of brand-name prescribing have been reported in the previous studies conducted in Kenya (54.5%),[13] Muhimbili National Hospital-Tanzania (71.6%),[12] Nepal (83.1%),[14] and India (93.6%).[15] The relatively lower brand-name prescribing found in this study could be described by a relatively better level of compliance by prescribers in using the BMC hospital formulary, which recommends the use of full generic names of drugs.[16] In this study, the proportion of prescriptions containing medicines prescribed by brand names was significantly higher in inpatient units than in outpatient units. This might have been attributed to the fact that outpatient prescriptions were electronic prescriptions. Thus, prescribers do not need a lot of time and energy to write the full generic name of a medicine.

It has been reported that strategies to monitor and ensure drug prescribing from the standard treatment guidelines, essential medicine lists, and hospital formulary, which mostly involve generics, might mitigate trends in brand prescriptions.[17] Higher proportions of brand-name prescribing reported in previous studies may be linked to the incentives and promotions from pharmaceutical industries and suppliers, weak regulatory systems and inadequate regulation enforcement, undue influence of mentors' prescribing habits, respective inventory and dispensing computerized systems, availability of certain brands in the market and the price difference between various brands.[12,18,19]

In the current study, the majority of medicines prescribed by brand names were in the form of fixed-dose combinations (FDCs). This is a combination of two or more active ingredients in a fixed ratio of doses, so prescribers feel it is laborious and unnecessary to write more than one active ingredient of medicine in the prescription. The trend of prescribing FDCs is increasing in clinical practice. A previous study[20] of 620 prescriptions showed that 81.1% of the prescriptions contained at least one FDC and the majority were for vitamins and mineral supplements. Most of the FDCs (82.78%) in that study were prescribed by brand names. Another study conducted in a tertiary care hospital in India reported that almost 95% of all FDCs were prescribed by brand names and about 21% of the physicians were unaware of the active pharmacological ingredients available in these products.[21]

Generic prescriptions play a vital role in the determination of the rational use of antibiotics. Our finding that antibiotics, ampiclox in particular, were prescribed mostly by brand names is consistent with previous studies.[22,23] Ampiclox was a highly prescribed brand name. This may be due to the fact that the majority of physicians perceive it as an abbreviation of ampicillin + cloxacillin. However, the use of the abbreviation was restricted by the BMC hospital formulary.[16] Nevertheless, in previous studies, Amoxyclav was the most common antibiotic prescribed by brand name.[12,24] WHO recommends prescribing drugs by their generic names since it has been shown to be cost-effective and provides flexibility in the purchase of medicines from medicine dispensing outlets. One of the factors that contribute to the low proportion of generic prescriptions is the poor promotion of the use of generic medicines.[25] Generic prescriptions must be promoted because they have been proven to be a cost-effective

approach in low- and middle-income nations like Tanzania.[26] Future research should look at the factors that influence brand-name prescribing.

### *Limitations*

The data were collected at a tertiary hospital with medical specialists and an up-to-date hospital formulary, so their applicability to other hospitals in low-resource settings may be limited. This is a single-center study; therefore, it cannot be generalized to other health care settings across the country.

## Conclusion

Prescriptions written with brand names were found to be common, especially among FDCs, according to the current study. Governments, institutions, and other stakeholders should support and encourage the use of generic names in prescription writing because it saves money for patients and health care systems. This calls for Tanzania's government to prioritize the development and implementation of generic prescribing policies.

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### Author contribution(s)

**Stanley Mwita**: Conceptualization; Formal analysis; Writing—original draft; Writing—review & editing.
**Brigitte Mchau**: Conceptualization; Data curation; Methodology; Writing—original draft; Writing—review & editing.
**Winfrida Minja**: Methodology; Project administration; Writing—review & editing.
**Deogratias Katabalo**: Formal analysis; Validation; Writing—review & editing.
**Kayo Hamasaki**: Conceptualization; Supervision; Writing—review & editing.
**Karol Marwa**: Formal analysis; Supervision; Writing—review & editing.

### Availability of data and materials

The data set generated and/or analyzed during the current study is available from the corresponding author upon reasonable request.

### Declaration of conflicting interests

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### Supplemental material

Supplemental material for this article is available online.

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