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# Analysis of drug prescribing indicators in a family health strategy in the south of Mato Grosso State, Brazil

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**Abstract.** The aim of the present study was to analyze the WHO drug prescribing indicators in a Family Health Strategy (FHS) in the south of Mato Grosso State, Brazil. This was a retrospective cross-sectional survey of a quantitative approach. We analyzed all the requirements in a pharmacy of the FHS from Rondonópolis, MT, Brazil, in the period from January to February 2016. There were analyzed 1289 requirements, and the number of medication in the requirements was 2657. The average number of drugs per prescription was 2.06. The percentage of revenue on which they prescribe antibiotics was 33% and prescription with injectable drugs was 0.54%. Percentage of prescription drugs belonging to the National Ratio of Essential Medicines was 82% and prescription drugs by generic nomenclature was 90%. The most prevalent belongs to the classes of general use systemic anti-infective (16.56%) and nervous system (16.29%). Most of the requirements meet the Legislation. The study has contributed to recognize the profile of prescription drugs in a southern Mato Grosso FHS, contributing to the promotion of the rational use of medicines.

**Keywords:** Prescription Medicines; Family Health Strategy; Services Indicators

## Introduction

Drug consumption is essential for population recovery, contributing to physical and mental recovery. However, the indiscriminate use of this source can generate unpleasant risks such as discontinuation of treatment, risks of drug interactions, anaphylactic reactions and development of resistance against antibiotics (FRANCISCO et al., 2014). Therefore, it is essential that the prescription contains all information about both prescriber and patient, in addition to the information indispensable for an effective treatment. This would contribute to the promotion of the rational use of medicines (OLIVEIRA et al., 2015).

SOUZA and collaborators (2012) emphasized that prescribing indicators allow to know the current therapeutic practices, compare parameters among similar institutions, as well as describe the drug demand. Moreover, prescribing indicators serve to evaluate the services provided in health units. Thus, prescribing indicators represent an important aid tool in health management (BANDEIRA et al., 2015).

In the same sense, BANDEIRA and collaborators (2015) defend that prescription is a fundamental instrument, since it contains all the necessary information about the drug administration

and time of treatment that contribute to a correct maintenance of the drug therapy.

Sometimes the information presented in the prescriptions is insufficient and may expose the patient to risks or prevent him to properly enjoy all benefits of a successful therapy. The analysis of the drug prescriptions, hence, is justified in the identification of possible errors or difficulties that may occur, pointing out the changes necessary to improve the service (WEBER et al., 2012). Thus, the aim of the present study was to analyze the prescribing indicators in a pharmacy of a Family Health Strategy (FHS) in the south of Mato Grosso, Brazil.

## Methods

This work is a retrospective, cross-sectional and quantitative study. All the prescriptions dispensed at a pharmacy of the FHS of a municipality in the south of Mato Grosso, from January to February of 2016, were analyzed. For the data collection, a question form was applied from which information was obtained, including patient full name, as well as its identification and address, drug generic name, pharmaceutical form, route of administration, concentration, dosage, and duration of treatment, date of prescription, identification of the

issuer and its specialty. Prescriptions were also evaluated for readability. Prescription medications were classified in the first level of the Anatomical Therapeutic Chemical (ATC) system.

From the prescriptions generated by the service, we calculated the prescribing indicators recommended by the World Health Organization (WHO) (WHO, 1993), as described next.

Average number of drugs per consultation (determines the degree of polymedication to which the population is subject) was assumed to be equal to the total drugs prescribed per total number of visits in the period. As it was not possible to know the number of consultations during the period, the total of prescriptions collected during the period was used as denominator. Thus, an Average of Prescription Drugs was estimated. Percentage of prescribing antibiotics (determines the level of antibiotic use in therapy regimens) was equal to the amount of prescriptions (for which at least one antibiotic per total of prescriptions was prescribed), multiplying by 100.

Percentage of prescriptions injected (determines the degree of use of these treatment modalities) was assumed to be equal to the amount of prescriptions (for which at least one injectable per total prescribing was prescribed), multiplied by 100.

Percentage of prescribed drugs that belong to the National Relation of Essential Medicines (Relação Nacional de Medicamentos Essenciais - RENAME, which determines the adequacy of the service to the national medicine policy) was assumed to be equal to the total of prescribed drugs that appear in RENAME divided by the total of prescribed drugs, multiplied by 100.

Percentage of drugs prescribed by the generic name (determines the tendency of the prescriber to include generic names in the prescription) was assumed to be equal to the total of prescribed generic drugs divided by the total of prescribed drugs, multiplied by 100.

The data was collected and analyzed in the Microsoft® Office Excel 2007 program. Descriptive statistics were used to describe the results.

#### *Ethical Principles*

This work was submitted to the Research Ethics Committee of the Júlio Mueller Hospital under the protocol number of technical advice: 1,113,303 and was approved in accordance with ethical principles and current legislation.

## **Results and discussion**

During the study, 1289 prescriptions were analyzed and 2657 drugs were prescribed. All prescriptions presented the full name of the patients, 0.31% showed patient address, and 77% were readable. A percentage of 83.6% of the prescriptions contained the signature of the prescriber, 88.7% included the prescription date, 67.49% included the name of the prescriber, being the majority (51.8%) doctors. A frequency of 86% of the prescriptions included the pharmaceutical form, 69.43% the route of administration, 65% the drug concentration, 99% the dosage and 64% the treatment time. The prescribing indicators are described in Table 1.

Data of table 2 showed the type of prevalent drugs prescribed.

From 672 (52.13%) prescriptions presented the medical specialty, among them, the general practitioner (77%) and the pediatrician (15%) were the most frequent (Table 3).

Ambiguous, illegible or incomplete prescriptions, as well as lack of standardization of nomenclature of prescribed drugs, use of abbreviations and presence of erasures, are factors that may contribute to the occurrence of errors in drug therapy (JACOBSEN et., 2015). The prescriptions analyzed showed failures, mainly regarding readability (77%), prescriber name (67.49%), drug concentration (65%) and treatment time (64%). The professional must meet the criteria of safety, effectiveness and quality of drug therapy, which represents the last link between prescription and administration. Thus, it should actively participate in patient care, providing guidance on medications in use, assisting in adherence to treatment and preventing medication errors (SALDANHA et al., 2014).

The WHO recommended prescribing indicators make it possible to discuss situations of the daily practice of professionals, managers and users of the health system, as well as to safely evaluate the crucial aspects of pharmaceutical practice in primary care (LIMA et al., 2014). In the present study the average number of drugs per prescription was 2.06. A similar result was observed in the study (SANTOS & NITRINI, 2004) in which the prescribing indicators of different basic health units of the city of Ribeirão Preto, State of São Paulo, Brazil, were found to be 2.2.

Table 1: Analytical prescribing indicators analyzed in a pharmacy of an FHS from the south of Mato Grosso, 2016.

Prescribing indicator	Value
Average number of medications per prescription	2.06
Percentage of prescriptions in which antibiotics were prescribed	33.00
Percentage of prescriptions in which injectables were prescribed	0.54
Percentage of prescriptions that belong to RENAME	82.00
Percentage of prescriptions that include the drug generic name	90.00

RENAME: Relação Nacional de Medicamentos Essenciais/ National Relation of Essential Medicines.

Table 2: Classification at the first level of the ATC system of drugs prescribed during the study.

Therapeutic class	n	%
J – General anti-infectives for systemic use	440	16.56
C – Cardiovascular system	372	14.00
A – Digestive system and metabolism	358	13.40
G – Genitourinary system and sexual hormones	160	6.02
R – Respiratory system	246	9.25
D – Dermatological drugs	83	3.12
S – Sense organs and	6	0.22
H - Systemic hormonal preparations (except sex hormones and insulins)	37	1.40
P - Antiparasitic products, insecticides and repellents	116	4.36
B – Blood and hematopoietic organs	79	3.00
M – Skeletal muscle system	326	12.26
N – Nervous system	433	16.29
Others	1	0.33
Total	2657	100

The percentage of recipes prescribed for antibiotics was 33%. A study conducted in the Municipality of Ibiporã, PR, the percentage of prescriptions with antibiotics was 22%. Values between 20 and 30% are considered acceptable (GIROTTI & SILVA, 2006). However, a survey carried out in a health unit of a municipality in the western region of Paraná showed higher values for this indicator (71.50%). It is considered much higher than the value recommended by the WHO (DOURADO & RIZOTTO, 2015). According to SILVA and collaborators, 2014, the excessive and unnecessary use of antimicrobials leads to the development of multiresistant bacteria, which may make it difficult to treat new infections, besides increasing hospitalization costs and adverse drug reactions and contributing to hypersensitivity reactions. It is necessary to raise the awareness of the prescribing professionals in order to rationalize the use of this class of drugs, avoiding the occurrence of resistance by the microorganisms (SILVA et al., 2014).

Table 3: Medical specialties of the prescribers.

Medical specialty	n	%
General practitioner	517	77
Pediatrician	101	15
Gynecologist	11	1,6
Others	43	6,4

Regarding the injectables, we identified that 0.54% of the recipes presented this type of prescription, these values vary enormously according to the geographic location studied. Corroborating to the mentioned variation, it was found that injectables corresponded to 3.0% in a region of the municipality of Laguna, SC (SOUZA et al. 2014) in contrast to 8.1% in Blumenau, SC (COLOMBO et al., 2004) and 10% in Santarém, PA (SOUZA et al., 2016). There is no any evidence for the adoption of a prescription pattern, since it depends on characteristics of the health system and the population evaluated (COLOMBO et al., 2004).

RENAME is an important instrument to rationalize actions in the scope of pharmaceutical

assistance and an indispensable measure to promote the rational use of medicines as recommended for the Health Unic System (BRAZIL, 2017). Likewise, WHO recommends that 100% of prescribed drugs must be part of the essential drug listings (LIMA et al., 2014).

Regarding the indicator of prescription drugs that belong to RENAME, we obtained in our study a value of 82%. Similarly, from another recent work performed in the units of the Family Health Program of the Municipality of Imperatriz, MA, this indicator was 76% (SILVA et al., 2013). By contrast, in the Municipality of Lajeado, RS, 71% of the prescriptions contained RENAME drugs (LASTE et al., 2013). REMUNE is one of the milestones of the Municipal Pharmaceutical Assistance System, that includes actions from the selection of pharmaceutical products administrated to the Health Unic System users, serves as a basis to guide the acquisition of effective and safe products to prescription and dispensation. In addition, it constitutes to the best management for public resources that should be applied in an equitable way (WHO, 1993). In our study was not possible to evaluate the indicator related to the prescribing drugs that are included in REMUNE (Relação Municipal de Medicamentos Essenciais/Municipal Administration of Essential Medicines), since the municipality studied does not have available data. Our results suggest that a local RENAME must be created to improve the pharmaceutical assistance provided to FHS users

Law 9,787/99 regulates generic drugs in Brazil and indicates that all prescriptions dispensed by the Health Unic System professionals have to be written according to the Brazilian Common Denomination (OLIVEIRA & LIMA., 2016). The percentage of drugs prescribed by generic nomenclature was 90%, being this value lower to that required by the Law of Generics. A better adaptation to this orientation was observed from the results of other study, in which 98.7% of the drugs were prescribed with their generic names (SILVA et al., 2014). By contrast, only 54% of the drugs prescribed in Basic Health Units had the generic

name in Santarém, PA (SOUSA et. al, 2016), The authors postulate that this low percentage observed is result of a non-adoption policy of the List of Essential Medicines by the municipality studied.

The most prescribed classes of drugs were general anti-infective for systemic use (16.56%), and for nervous (16.29%) and cardiovascular (14%) systems. The analysis of the prescriptions dispensed at a basic health unit in the city of Ijuí, RS, showed that the most prevalent medications were those belonging to the cardiovascular (18.0%), nervous (16.3%) and muscle (16.3%) systems (BANDEIRA et al., 2015). The drugs prescribed at a Health Center in the city of Vitória da Conquista, BA, were mostly anti-inflammatory and antirheumatic (17.7%) and antibacterial classes (12.3%) (SILVA et al., 2014).

The higher prevalence of anti-infective drugs observed in the present study is probably due to the frequent antibiotic prescription. The rational use of this class of drugs will only be achieved if trained professionals prescribe and dispense appropriate medicines, with adequate dose and concentration. Moreover, they must indicate the duration and suitable pharmaceutical forms to the patient who is receiving drug therapy (OLIVEIRA & MUNARETO, 2010).

## Conclusion

From this work, we identified that prescribing indicators for antibiotics, medicines that belongs to RENAME, and drugs with generic names do not comply with WHO guidelines. Initiatives such as promotion of continuing education with the FHS team through lectures, courses, and trainings, alerting to the most frequent failures must be taken to minimize errors and contribute to a rational use of medications.

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