

**MEDICINES PRESCRIBING PATTERNS FOR THE TREATMENT OF COMMON DISEASES AT COMMUNITY HEALTH CENTRES IN 3 DISTRICTS OF TIMOR-LESTE**Stanley Chindove^{1*}, Antonio Ximenes¹, Nelson Martins²¹Department of Pharmacy, Ministry of Health, Timor-Leste²Department of Central Services, Ministry of Health, Timor-Leste***Corresponding author e-mail:** stanchindove@yahoo.com**ABSTRACT**

Problems with inappropriate use of medicines leading to antimicrobial resistance and increased healthcare costs are a major global concern. In Timor-Leste, concerns of inappropriate use of medicines at public health facilities are current among stakeholders in the health community. Therefore this descriptive, cross-sectional and retrospective study investigated the pattern of medicine use at community health centres in 3 districts of Timor-Leste. 100 case records of outpatients with acute respiratory infections, diarrhoea and malaria during a one year period (July 2010 to July 2011) were randomly sampled at 8 community health centres. Our findings show that the average number of medicines per encounter was slightly higher compared to a previous study at community health centres in Timor-Leste. However, extremely low usage of injections for outpatients was observed. Use of antibiotics among patients with upper respiratory infections and diarrhoea was considerably high. Antibiotics, analgesics, vitamins and antihistamines were commonly prescribed medicine categories. There was moderate availability of key medicines.

Keywords: medicines, rational use, community health centers**INTRODUCTION**

Essential medicines are integral to effective disease management^[1]. However, problems with inappropriate use of medicines have been reported. The World Health Organisation (WHO) estimates that 50% of medicines are inappropriately prescribed, dispensed or sold and only 50% of patients take their medicines correctly^[2]. In addition, less than 40% of primary care patients in public sector are treated in accordance with standard treatment guidelines^[3] in developing and transitional countries^[3].

Rational use of medicine refers to prescribing of the correct medicine for the correct indication in the appropriate dosage and dosing frequency for the correct duration^[4]. Irrational use of medicines can lead to shortage of essential medicines at health facilities. Chronic shortage of essential medicines will severely affect provision of quality medical treatment and care^[5]. Availability of medicines has

been identified as an important determinant for patients to seek treatment at health facilities^[6,7].

Inappropriate use of medicines can lead to waste of resources and increased antimicrobial resistance^[4]. Medicines are costly and constitute a large proportion of health budget but inadequate financing is a common challenge facing developing countries^[8]. Emergency of antimicrobial resistance will result in longer hospital stays and the need for newer and expensive antibiotics. This will ultimately result in increased health costs to the patient and the healthcare system.

Investigating patterns of medicine use through review of prescriptions is part of medical audit that seeks to monitor and evaluate medicine use. WHO and International Network for Rational Use of Drugs (INRUD) developed a set of 12 core indicators to describe medicine use in various settings^[9]. These include prescribing indicators (5), patient care indicators (5) and facility indicators (2). Several

studies have been published that use these indicators to describe the pattern of medicine use in several countries. The indicators provide a means to measure optimal use of medicines and help identify areas for improvement that could support efforts in reducing medicine expenditure and improve quality of patient care^[10].

An investigation of medicine use focusing on adherence to standard treatment guidelines at rural community health centres (CHC) in Timor-Leste was carried out in 2006 and concluded that medicine use was generally found to be acceptable^[11]. However, in recent years, increasing numbers of health professionals from different training backgrounds have become available at public health facilities in Timor-Leste. New standard treatment guidelines were published in June 2010 but there have been concerns over their use at health facilities. In addition, problems of excessive use of antibiotics have been reported.

The aim of the study was to investigate pattern of medicine use at community health centres, in Timor-Leste using the WHO/INRUD indicators.

MATERIALS AND METHODS

The study was a cross-sectional, retrospective review of outpatients' records which was carried out from September 2011 to November 2011. The study focused on acute respiratory tract infections (ARI), diarrhoea and malaria cases. These diseases were targeted because they are commonly diagnosed among outpatients at the health facilities in Timor-Leste. In addition, a 2006 study at CHCs in Timor-Leste focused on these 3 diseases and we selected similar diseases to observe differences in treatment practices from that time. The sampling consisted of 2 stages. The first stage was random sampling of the CHCs in 3 purposively selected districts, namely Baucau, Covalima and Dili. Ten community health centres were included in the study. For the second stage, 100 retrospective cases were randomly sampled from outpatient registration books for a one year period (July 2010 to July 2011) at each selected CHC. 24 key medicines were selected in consultation with a panel of health personnel in the Ministry of Health and development partners working in the health sector (Table 1).

On each case record, data was collected on: the date of visit; patient's age; patient's sex; diagnosis and name of medicines prescribed. Sampled case records were hand-copied by the data collectors onto the prescription indicator form.

The data analysis was based on the WHO/INRUD core indicators for medicine use^[9]. The study centred on the following core indicators on prescribing and facility indicators:

- Average number of medicines per encounter (95% confidence interval (CI))
- Percentage of patients prescribed antibiotics
- Percentage of encounters prescribed an injection
- Percentage of medicines prescribed by generic name
- Percentage availability of key medicines

The Statistical Package for Social Science program (SPSS version 19.0, SPSS, USA) was used to analyse the data. A p-value<0.05 was considered statistically significant. The study was approved by the Cabinet of Health Research and Development, Ministry of Health in Timor-Leste (Ref MS/GPDS/VII/11/58).

RESULTS

Out of the 800 outpatient prescriptions obtained from 8 of the 10 CHCs included in the study, a total of 686 prescriptions with complete information were analysed. At CHC Bairo Pite and CHC Comoro, relevant prescriptions/records could not be accessed because most of the old prescriptions from July 2010 up to a month of the visit had been discarded or diagnosis was not recorded on the prescriptions that were available.

Out of the total prescribing encounters collected, 309 (45%) of the case records were written for males and 377 (55%) were for females. The median age of the patients analysed was 11 years (range: 1 month to 80 years).

Diagnosis:

68% of the patients were diagnosed with an ARI and 16% each were diagnosed with diarrhoea and malaria. Out of the ARI cases (n=468), 86% (n=404) were upper respiratory infections (non-pneumonia/bronchitis) and 14% (n=64) were lower respiratory infections (pneumonia/bronchitis). Only 2 cases of diarrhoeas analysed specified dysentery as the diagnosis.

Prescribing Indicators:

The patterns of the prescribing indicators in the 3 districts and by diagnosis are presented in Table 2. The overall average number of medicines prescribed per encounter was 3.3 (95% CI: 3.2 to 3.4). The average number of medicines prescribed per encounter between the districts was significantly

different ($p=0.041$), testing at 5% level using the ANOVA technique. 77% of the patients were prescribed an antibiotic. Baucau district had the highest number of patients prescribed an antibiotic (82%) and Dili district had the lowest number of patients prescribed an antibiotic (70%). All pneumonia and bronchitis cases were treated with an antibiotic. 28% of malaria cases and 94% of diarrhoea cases were prescribed an antibiotic. Generic prescribing was generally good across the 3 districts. 92% of all medicines were prescribed by generic name. In Baucau, 95% of the medicines were prescribed by generic name compared to 91% and 90% in Covalima and Dili respectively. Only one case was prescribed an injection out of all the outpatient prescriptions analysed.

Medicines Prescribed

In total, 2269 medicines were prescribed and 77% of the medicines can be categorised into any of nine groups set by WHO/INRUD¹ [9]. We adapted these classifications and grouped the medicines prescribed into 12 groups. Figure 1 shows the categories of medicines prescribed. 27% of the medicines were analgesics (612/2269), 22% were antibiotics (510/2269) and 11% were vitamins (247/2269). A tenth of the medicines prescribed were antihistamines (232/2269) and 5% of medicines prescribed were iron and folic acid supplements (104/2269). 3% of the medicines prescribed were cough preparations. Thus, 12% of ARI cases were prescribed with a cough preparation.

Availability of key medicines

The average availability of 24 selected medicines was 60.4% (95% CI: 54.3% to 66.6%). CHC Tilomar (Covalima) had the lowest availability of 50% and the highest availability of 70.8% was recorded at CHC Bagaia (Baucau). Table 3 shows the results of the inventory assessment at the community health centres on the date of visit.

DISCUSSION

A high number of cases of acute respiratory tract infections were diagnosed on the case records sampled. This is consistent with statistics from the health management information system in Timor-Leste. Upper respiratory tract infections and pneumonia are among the top five causes of morbidity and they accounted for almost 40% of total

¹The medicine classifications are analgesics, anti-malarials, antibiotics, vitamins, oral rehydration salts (ORS), anti-helminthics, topical medicines, ferrous and metronidazole

consultations during the period from January-June 2011 [12]. Malaria and all diarrhoeas accounted for 3.8% and 4.4% respectively.

The average number of medicines per encounter for the CHCs studied was 3.30. This is slightly higher than the average of 2.4 medicines per encounter recorded by Higuchi (2008) using a similar set of diseases and facility type [11].

However, our sample size of 8 CHCs is smaller than the 20 CHCs which were used for the cross sectional survey across all districts in the 2006 study. A study in 2009 on health seeking behaviour in Timor-Leste revealed that users of health services expect to be prescribed medicines and receive different medicines for different symptoms [13]. These factors could have contributed to the increased average number of medicines prescribed as patient may demand particularly medicines to be prescribed.

Table 4 shows comparison of prescribing indicators from our findings against findings from South-East Asia reported by WHO in 2009 [14]. Our findings on prescribing by generic name and patients with an injection prescribed are favourable compared to the regional indicators. However, more patients in this study were prescribed antibiotics (77% compared to 46%) and slightly more medicines per encounter (3.3 compared to 2.5).

The extremely low use of injections in this study was similar to findings by Higuchi (2008) [11], where only 0.4% of patients were prescribed an injection from an analysis of similar diseases and facility type. The high percentage of medicines prescribed by generic name indicates that health personnel at the health facilities are conforming well to the standard practice of generic prescribing. Prescribing using brand name at these health facilities is related to the prescriber's habit and not the procurement of brand medicines by the health facilities. This is because all CHCs obtain their medicines from the central medical stores and these are mostly generics.

Prescribing of antibiotics among patients diagnosed with an upper respiratory infection was high. 82% of patients with upper respiratory infections were treated with antibiotics. In South-East Asia, half of upper respiratory cases were reported to be treated with antibiotics [14]. Most upper respiratory tract infections are known to be commonly caused by viruses and treatment with antibiotics is considered unnecessary [15]. A recent study reported that use of antibiotics for upper respiratory tract infections was not associated with an improved recovery [16].

A significantly high proportion of diarrhoea cases were treated with antibiotics. 94% of diarrhoea cases from our study were treated with antibiotics compared to 54% from studies in South-East Asia [14]. High use of antibiotics when they are not indicated is a waste of resources that can lead to stock-outs and will contribute to antimicrobial resistance development and increased pharmaceutical expenditure.

Antibiotics, analgesics, vitamins and antihistamines were the commonly prescribed medicine categories, accounting for 70% of all medicines prescribed. In the 2006 study, antibiotics, analgesics and vitamins accounted for 58% of all medicines prescribed. Other medicines, which include antihistamines, represented 9% of medicines prescribed. This means there was more use of antihistamines in our survey and this together with use of cough preparations and antacids could partly account for the increase in average number of medicines prescribed.

At the time of assessment, the availability of 24 key medicines at the community health centres was moderate. However the average availability of the same basket of medicines at the central medical stores during the study period was 83%. Delays in delivery of supplies from the central medical stores, poor inventory control systems and poor drug management skills have been cited among other problems in management of pharmaceuticals in Timor-Leste [17]. These factors could partly explain the reason for the low stock availability at the community health centres compared to the central medical stores at the time of assessment. Prescribing

and dispensing records are essential for audit or evaluation of drug utilisation. We observed that on a number of prescriptions, complete information on dose, frequency and duration of treatment was not provided. This can result in under- or over-dispensing of medicines, thus contributing to irrational use of medicines.

CONCLUSION

Our findings show that the average number of medicines per encounter was slightly higher compared to a previous study at CHCs in Timor-Leste. However, extremely low usage of injections among outpatients was observed. Use of antibiotics among patients with upper respiratory tract infections and diarrhoea was considerably high. Antibiotics, analgesics, vitamins and antihistamines were commonly prescribed medicine categories. Availability of key medicines was moderate.

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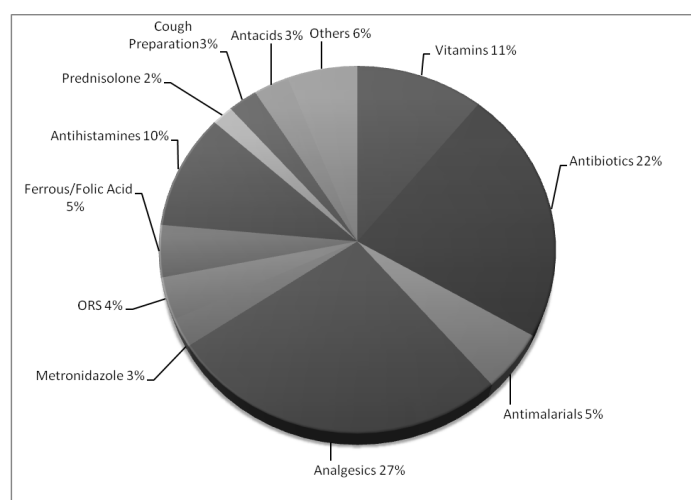


Figure 1: Category of medicines prescribed

Table 1: List of 24 medicines surveyed at community health centres

No	Medicine name
1	Amoxicillin 500mg capsule/tablet
2	Amoxicillin 125mg/5ml suspension
3	Ampicillin 1g injection
4	Artesunate 50mg tablet
5	Artesunate injection
6	Calcium Gluconate 10% injection
7	Ceftriaxone injection 1g injection
8	Ciprofloxacin 250mg tablet
9	Coartem 5-14kg (4mth-5yr) [child] tablet
10	Coartem >34kg (>14yr) [adult] tablet
11	Dexamethasone 4 mg/ml injection
12	Gentamicin injection 80mg/2ml injection
13	Magnesium Sulphate 50% injection
14	Metronidazole 500mg injection
15	Misoprostol 200mg tablet
16	Nifedipine 10mg capsule/tablet
17	Oral Rehydration Salts 1 litre packet
18	Oxytocin 10 units/1ml injection
19	Procaine Penicillin 3g injection
20	Ringer Lactate Solution
21	Salbutamol Inhaler
22	Vitamin A 100,000 IU capsule
23	Vitamin K 1mg/ml injection
24	Zinc 20mg tablet

Table 2: Pattern of prescribing indicators

	No of prescriptions	Ave no. of medicines per encounter (95% CI)	% Patients prescribed antibiotics	% medicines prescribed by generic name	% Prescriptions with an injection
District					
Covalima	288	3.3 (3.2 to 3.4) [¥]	77%	91%	0%
Baucau	212	3.2 (3.1 to 3.3) [¥]	82%	95%	0.5%
Dili	186	3.4 (3.3 to 3.6) [¥]	70%	90%	0%
Diagnosis					
ARI: non-pneumonia/bronchitis	404	3.2 (3.1 to 3.3) ^β	82%	95%	0.25%
ARI: pneumonia/bronchitis	64	3.5 (3.3 to 3.7) ^β	100%	97%	0%
Diarrhoea [∞]	108	3.5 (3.3 to 3.7) ^β	94%	89%	0%
Malaria	110	3.4 (3.3 to 3.6) ^β	28%	85%	0%
All prescriptions	686	3.3 (3.2 to 3.4)	77%	92%	0.1%

[¥]F-test= 3.201, df=2, p<0.05; [∞] 2 cases were dysentery; ^βF-test= 6.976, df=3, p<0.05

Table 3: Availability of key medicines at community health centres

Name of Facility	% Availability
CHC Baguia	70.8%
CHC Becora	58.3%
CHC Formosa	66.7%
CHC Laga	66.7%
CHC Maucatar	54.2%
CHC Tilomar	50.0%
CHC Vila	54.2%
CHC Wailili	62.5%
Average (95% CI)	60.4% (54.3% to 66.6%)

Table 4: Comparison of our findings and prescribing indicators from South-East Asia

Indicator	Current study findings	South East Asia findings	
		Median	No of Studies
Average number of medicines per encounter	3.3	2.5	105
% patients prescribed an antibiotic	77%	46.3%	94
% medicines prescribed by generic name	92%	44%	50
% patients prescribed an injection	0.1%	9.1%	61

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