

## Original Research Article

# Prescribing patterns in primary and secondary level government health facilities in a district of Assam: a cross sectional study

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## ABSTRACT

**Background:** Indian markets are flooded with more than 100,000 formulations, compared to approximately 350 formulations listed in the World Health Organization (WHO) essential drug list. To promote rational drug use in developing countries, assessment of drug use patterns with the WHO drug use indicators is becoming increasingly necessary. This study was conducted to study the prescribing patterns using WHO prescribing indicators in government healthcare facilities in a district of Assam.

**Methods:** This was a cross sectional study carried out from July to September 2017. Out of total 4 blocks in Tinsukia district one (Ketetong) was randomly selected. All the primary and secondary level government health facilities were included and visited one by one. All the prescriptions on that day of visit were digitally photographed at the pharmacy of the health institution after taking written informed consent from the patient. A total of 353 prescriptions were scrutinized and analyzed using appropriate statistical tests.

**Results:** Out of total 353 prescriptions collected, 11 were illegible and excluded from the analysis. The average number of drugs per encounter was 3.8. In 62.3% of encounters antibiotics were prescribed and injections were prescribed in 30.1% encounters. 71.8% drugs were prescribed by generic name and 56.2% drugs were prescribed from the essential drug list (EDL).

**Conclusions:** The average number of drugs, percentage of injections and antibiotics per encounter was higher than recommended whereas prescription by generic name and from EDL or formulary was lower than recommended. Training of healthcare workers on rational drug use is need of the hour.

**Keywords:** Prescription audit, Rational drug use, WHO prescribing indicators

## INTRODUCTION

One of the most pressing problems facing public health providers and administrators in many countries is ensuring the rational use of drugs.<sup>1</sup> The Conference of Experts on the rational use of drugs, convened by the World Health Organization (WHO) in Nairobi in 1985, defined rational use as follows: The rational use of drugs requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community.

Irrational use occurs when one (or more) of these conditions is not met.

Indian markets are flooded with more than 100,000 formulations, compared to approximately 350 formulations listed in the World Health Organization (WHO) essential drug list.<sup>2</sup> Irrational drug prescription has been shown in several studies across India.<sup>3,4</sup>

The World Health Organization (WHO) suggests a set of drug use indicators that have proven useful in the investigation of drug prescribing patterns in health care

facilities.<sup>5</sup> Assessment of drug use patterns with the WHO drug use indicators is becoming increasingly necessary to promote rational drug use in developing countries. In India 68.9% population resides in rural areas (Census 2011) and primary and secondary level health facilities are usually the first point of contact with the health system.

A search for similar works in this region of country in major index journals revealed a dearth of studies so this study was conducted with the objective of studying the prescribing patterns in accordance with WHO prescribing indicators in primary and secondary health facilities in a district of Assam.

## METHODS

A cross sectional study was conducted in Tinsukia district, Assam from July to September 2017.

There are four health blocks in Tinsukia district out of which one block was randomly selected. Of the selected block, a list of government health facilities was obtained from district health authority along with permission to visit the health facilities for the purpose of the study. All the primary and secondary level government health facilities were included and visited one by one. Each health facility was visited for a day during the OPD hours. All the prescriptions on that day were digitally photographed at the pharmacy of the health institution after taking written informed consent from the patient.

The prescriptions collected were assessed on the basis of WHO prescribing indicators along with some other parameters relevant to prescription writing like name, age, sex and address of the patient as per model prescription format for the purpose of making prescriptions by the registered medical practitioners (MCI-211(2)(Gen.)/2014-Ethics/155202 dated January 30<sup>th</sup> 2015).<sup>6</sup> The WHO prescribing indicators are average number of drugs per encounter, percentage of drugs prescribed by generic name, percentage of encounters with an antibiotic prescribed, percentage of encounters with an injection prescribed, percentage of drugs prescribed from essential drugs list or formulary.<sup>5</sup>

The calculation for each indicator is as follows:

- Average number of drugs per encounter: Average, calculated by dividing the total number of different

drug products prescribed, by the number of encounters surveyed.

- Percentage of drugs prescribed by generic name: Percentage, calculated by dividing the number of drugs prescribed by generic name by the total number of drugs prescribed, multiplied by 100.
- Percentage of encounters with an antibiotic prescribed
- Percentage of encounters with an injection prescribed: Percentages, calculated by dividing the number of patient encounters during which an antibiotic or an injection are prescribed, by the total number of encounters surveyed, multiplied by 100.
- Percentage of drugs prescribed from essential drugs list or formulary: Percentage, calculated by dividing the number of products prescribed which are listed on the essential drugs list (EDL) or local formulary (or which are equivalent to drugs on the list) by the total number of products prescribed, multiplied by 100.

### Operational definitions

The drugs considered as antibiotics and included in the analysis were based on the WHO classification of antimicrobials for prescribing indicators.<sup>5</sup>

The drugs from EDL included in the analysis were based on 19<sup>th</sup> WHO Model List of Essential Medicines (April 2015).<sup>7</sup>

A fixed dose combination was treated as one drug.

### Statistical analysis

Data was analyzed using MS Excel 2010 and was expressed in frequencies, percentages, mean and standard deviation.

## RESULTS

During the study period two community health centres (CHCs) and four primary health centres (PHCs) were visited. A total of 353 prescriptions were collected and studied. 11 prescriptions were illegible and dropped from the analysis. Thus the final number of prescriptions included in the analysis was 342. Total number of drugs on 342 prescriptions was 1308.

**Table 1: Percentage of injections and antibiotics prescribed per encounter.**

	Minimum number/encounter	Maximum number/encounter	Sum	Number of encounters	Percentage per encounter (%)
<b>Total number of drugs</b>	1	7	1308	342	-
<b>Number of injections</b>	0	3	103	342	30.1
<b>Number of antibiotics</b>	0	3	213	342	62.3

**Table 2: Percentage of drugs prescribed by generic name and from EDL.**

	Minimum number/encounter	Maximum number/encounter	Sum	Total number of drugs	Percentage (%)
<b>Drugs prescribed by generic name</b>	0	7	939	1308	71.8
<b>Drugs prescribed from EDL</b>	0	7	735	1308	56.2

171 (50%) prescriptions were collected from the CHCs and 171 (50%) prescriptions were collected from the PHCs. Patient identifiers like name, age and sex were written on 100% prescriptions. Patient's address was not written on 46.5% prescriptions. In case of pediatric prescriptions weight of the patient was not mentioned on any prescription.

The average number of drugs per prescription was  $3.8 \pm 1.3$  of which 30.1% were injections per encounter and 62.3% drugs per encounter were antibiotics (Table 1). 71.8% drugs were prescribed by generic name and 56.2% drugs were prescribed from the essential drug list (EDL) (Table 2). 285(83.3%) prescriptions were legible and 57 (16.7%) prescriptions were legible with difficulty.

## DISCUSSION

In this study average number of drugs per prescription was found to be  $3.8 \pm 1.3$  which is similar to what was found by Ahsan et al.<sup>8</sup> Other studies have reported a varied range of average number of drugs per prescription from 1.9 to 8.8.<sup>9-13</sup> However it is much higher than the standard value of average number of drugs per prescription (1.6-1.8) set as ideal.<sup>14</sup> The reason for high number of drugs per prescription may be due to comorbid conditions or client demand or other reasons for which further studies are needed.

Percentage of encounters with injections was 30.1% in this study which is higher than the standard value of 13.4-24.1%.<sup>14</sup> Similar results were found in a study conducted by Jimma et al. where the percentage of injections per encounter was seen to be 28.3%.<sup>11</sup> Another study conducted by Kaur et al reports a low use of injections (12.07%).<sup>13</sup> A high percentage of injection use (38.1%) was reported by Anteneh et al in their study.<sup>12</sup> High injection per encounter may be due to physician's attempt at client satisfaction as most clients have a perception that injections can treat their illness better.

Percentage of encounters with antibiotics was high in this study (62.3%) compared to the standard value of 20.0-26.8%.<sup>14</sup> These results are similar to the studies conducted in west and south Ethiopia.<sup>11,12</sup> A few other studies have reported a low use of antibiotics per encounter, compared to what was found in this study, as low as 13.1% in a study conducted in Brazil.<sup>10</sup> In our study high prescription of antibiotics per encounter needs further

probing so as to know whether such prescriptions were rational or not.

In this study 71.8% drugs were prescribed by generic name. This was low compared to the WHO standard value of 100%, and also in contrast to Medical Council of India, MCI circular no. MCI-211(2\_(Gen.)/2017-Ethics/104728 dated April 21, 2017, which has urged all the physicians to use generic names of the drugs wherever possible and has threatened suitable disciplinary action against physicians failing to do so.<sup>14</sup> Other studies have reported prescription with generic name of drugs from nil to as high as 98.7%.<sup>8,12</sup> There may be few explanations of not prescribing the drugs with generic names, like unavailability of the drugs in hospital supply, marketing strategies of the pharmaceutical companies emphasizing the brand names or client demand, mandating further evaluation.

It was found that only 56.2% drugs in this study were prescribed from EDL or formulary which is low when compared to the standard value of 100%.<sup>14</sup> Ahsan et al report 79.2% drugs prescribed from EDL in their study.<sup>8</sup> Kaur et al report only 39.2% drugs prescribed from EDL.<sup>13</sup> In another study 96.6% drugs were prescribed from EDL.<sup>12</sup> One possibility of less drugs being prescribed from EDL maybe the lack of awareness about the essential medicines list among the treating physicians.

Medical Council of India has advocated use of capital letters to improve the legibility of prescriptions. In this study 16.7% prescriptions were legible with difficulty which is in contrast to findings of Ahsan et al where 66.8% prescriptions were legible with difficulty.<sup>8</sup>

One of the major limitations of our study was inability to meet the recommended sample size of 600 prescriptions, due to limited resources.<sup>5</sup>

## CONCLUSION

In this study it was seen that most of the prescribing indicators were not in accordance with the standard values. The average number of drugs, percentage of injections and antibiotics per encounter was higher than recommended whereas prescription by generic name and from EDL or formulary was lower than recommended. More studies are needed particularly qualitative studies to determine the reasons of such prescribing practices.

Orientation of treating physicians on good prescribing practices and regular prescription audit with feedback from time to time may improve the scenario.

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