

## HOW RATIONAL ARE DRUGS USED IN MALAYSIAN PRIMARY HEALTH CARE SECTOR?

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*Irrational drug use is a serious health problem and causes various consequences: medical, economic and social impacts. No study in Malaysia has been conducted extensively using World Health Organization (WHO) indicators to evaluate the rational drug use status in this country. The general aim of this study is to explore the country's pharmaceutical situations with regard to the implementation of Essential Drug List (EDL). Specifically, the objective is to assess the WHO rational drug use indicators in the pharmaceutical sector. Rational drug use is measured by examining the patterns of drug use. A survey in 20 randomly selected public health clinics in the primary health care sector was used to gather information about prescribing habits in five different areas in Malaysia. Thirty outpatient encounters at each public health clinic were sampled. The methodology used was adopted from the WHO Protocol. Significance testing was carried out using Kruskal-Wallis test with a priori significance level of 0.05. The average number of drugs prescribed per prescription was 2.79. The average percentage of antibiotic used was 23.2% and the percentage of injection used was low, with an average of 1.7%. All of the drugs prescribed to patients were listed in the EDL. The average percentage of drugs adequately labeled was 92.0%. The percentage of patients who had adequate knowledge of how to take their drugs was 74.9%. The percentage of the public health clinics who kept the Standard Treatment Guidelines (STG) in their premises was 95.0%, but none kept the EDL in their premises.*

**Keywords:** Rational drug use, WHO indicators, Primary health care, Essential Drug List, Standard Treatment Guidelines

### INTRODUCTION

Irrational drug use not only poses a health hazard to the individual and the society, but it also has a variety of medical, economic and social impacts. On the other hand, rational drug use promotes cost-effective therapy and quality of care. This concept of rational use of medicines has been adopted by the Pharmaceutical Services Division of the Malaysian Ministry of Health. It advocates patients to receive medicines appropriate to their clinical needs for a sufficient period of time and at the lowest possible cost.

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Malaysia subscribes to the WHO global strategy of "Health for All" and to the primary care as an approach towards the attainment of health that will permit socially and economically productive life. The Ministry of Health recognizes that the quality of primary care often determines the strength and viability of a health care system. Health services in Malaysia have always been provided by both the public and private health care sectors. These services are comprehensive; encompassing promotive, preventive, curative, and rehabilitative care for both its urban and rural population. This is achieved through a network of general hospitals, district hospitals, polyclinics, public health centres, midwife and mobile clinics. The pharmaceutical system in Malaysia, which promotes pharmaceutical care activities, is managed by the Pharmaceutical Services Division.

Studies on rational drug use, especially those using the WHO indicators, in Malaysia are lacking. This study is very significant and timely as the government is in the process of establishing the National Medicines Policy. The findings may be used as a baseline indicator for further improvement of the pharmaceutical situation in the country.

### **Study Objectives**

The general aim of the overall study is to explore and describe the country's pharmaceutical situations (i.e., rational use of drugs, affordability, and accessibility) in the primary health care sector in the context of EDL implementation and its foundation in Malaysian National Medicines Policy. Specifically, the objective of this study is just to assess the WHO Rational Drug Use indicators in the Malaysian public health clinics.

### **METHODS**

The degree of attainment of the strategic pharmaceutical objectives of improved rational use of drugs is measured by indicators (Hardon, Brudon-Jakobowiz and Reeler 1992; Management Sciences for Health 1995; Brudon, Rainhorn and Reich 1999). A nationwide survey of 20 randomly (through stratified and systematic random sampling methods) selected public health clinics (approximately 2.5% of the total number of clinics) was used to gather information about prescribing habits in five different regions (i.e., North, East, Central, and South of Peninsular

Malaysia and East Malaysia). This number was suggested by WHO and has been widely used in other countries. The number of premises in each state was chosen based on the total number of public health clinics. Thirty outpatient encounters at each public health were sampled. Patients were chosen non-randomly after they have obtained their medications from the pharmacy counter. In addition, the study also looked into the availability of STG and EDL in the clinics. The methodology used was adopted from the WHO Protocol (Brudon, Rainhorn and Reich 1999; WHO 2001a). Significant testing was carried out using the Kruskal-Wallis test with a priori significance level of  $p < 0.05$ .

### **Average Number of Drugs Prescribed in Public Health Clinics**

The purpose was to determine the prevalence of polypharmacy, which is one measure for unnecessary prescribing (Hardon, Brudon-Jakobowiz and Reeler 1992). Only encounters for single disease/complaint/symptom at pediatric and medical curative cases were considered. Combination of products were counted as one drug.

The number of drugs given per encounter was listed. The formula is stated as: *the average number of drugs per encounter per public health clinic was calculated as the total number of drugs prescribed in all the encounters sampled in that public health clinic divided by the number of encounters sampled.* The national indicator was calculated as: *the sum of the average number of drugs prescribed at all public health clinics sampled divided by the number of public health clinics sampled.*

### **Percentage of Antibiotics Used in Public Health Clinics**

The intention was to find out the prevalence of antibiotic prescribing, since over-prescribing of antibiotics is one common form of inappropriate drug use. Products considered as antibiotics were listed. Encounters where antibiotics had been prescribed were determined.

The percentage of antibiotics prescribed per public health clinic was calculated by: *the number of encounters in which one or more antibiotic was prescribed divided by the total number of encounters sampled, then multiplied by 100.* The national indicator was calculated as: *the sum of the percentage of antibiotics prescribed at each public health clinic divided by the number of public health clinics sampled.*

### **Percentage of Injections Used in Public Health Clinics**

The intention was to find out the prevalence of injection use, since over-prescribing of injections is one common type of inappropriate drug use. Immunizations and injectable contraceptives were excluded.

Encounters where an injection had been prescribed were determined. The percentage of injections used per public health clinic was calculated as: *the number of encounters in which one or more injections was prescribed divided by the total number of encounters sampled, then multiplied by 100*. The national indicator was calculated as: *the sum of the percentage of injections used in all public health clinics divided by the number of public health clinics sampled*.

### **Percentage of Prescribed Drugs Included in Essential Drugs List in Public Health Clinics**

The purpose was to assess the degree to which prescribing practice conforms to the national EDL. The essential drugs concept is one of the main strategies being promoted in a drug policy (WHO 2001b; WHO 2004). More and more countries are formulating EDL. For most, this should be the basis for all public drugs procurement and prescription.

The current national essential drugs list which was endorsed by the Ministry of Health was referred. Drugs prescribed that were included in the EDL were determined. The percentage of prescribed drugs included in the EDL per public health clinic was calculated as: *the number of drugs prescribed included in the list divided by the total number of drugs prescribed, then multiplied by 100*. The national indicator was calculated as: *the sum of the percentage of prescribed drugs included in the EDL in all facilities divided by the number of public health clinics sampled*.

### **Percentage of Adequately Labeled Drugs in Public Health Clinics**

The purpose was to evaluate the quality of dispensing practice. If drugs are to be used rationally, they should be labeled appropriately during dispensing. Usually a label which has the name of the patient, the name of the drug, individual dosage, and duration specific for the patient was defined as adequate labeling (Quick *et al.* 1997).

Thirty outpatient encounters were prospectively sampled at each health facility, and whether the drug label conformed to the minimum requirement (i.e., name of patient, medicine name, regimen, indication)

was assessed. Drugs dispensed to patients were assessed after the patients leaved the pharmacy counter. The percentage of drugs adequately labeled (i.e., with minimum requirement) per public health clinic was calculated as: *the dispensed drug with correct label in each public health clinic divided by the total number of drugs dispensed, then multiplied by 100*. The national indicator was calculated as: *the sum of percentage of prescribed drugs with adequate label in all public health clinics sampled divided by the number of public health clinics sampled*.

### **Percentage of Patients Who Know How to Take Their Drugs**

The idea was to assess if patients have adequate knowledge on how to take their drugs. At least 10 prospective outpatient encounters at each public health clinic were sampled. Whether the patients had adequate knowledge (e.g., the name of the drug, the indication, how to take the drug) about the dispensed drugs was determined. The percentage of patients who had adequate knowledge was calculated as: *the number of patients who knew how to take the drugs divided by the number of patients interviewed, then multiplied by 100*. The national indicator was calculated as: *the sum of the percentage of patients with adequate knowledge divided by the number of public health clinics sampled*.

## **RESULTS AND DISCUSSION**

### **Description of the Pharmaceutical Situation in the Five States**

In Kuala Lumpur (capital of Malaysia), only one public health clinic was surveyed, while five was surveyed in Johor, five in Perak, four in Pahang and five in Sabah.

The average number of drugs prescribed in the public health clinic in Kuala Lumpur was 3.33. The percentage of encounters where an antibiotic was used in the clinic was 36.7%. Injections were prescribed in 6.7 of encounters. In the public health clinic, it was found that 100% of prescribed drugs were listed in the EDL. The percentage of drugs that were adequately labeled was 93.2%. In assessing whether patients had adequate knowledge on how to take their drugs, it was found that only 63.3% of the patients knew how to take their drugs. In determining if prescribers have the key sources of therapeutic information they need in

daily practice, it was found that the health clinic had STG, but no EDL was kept.

In Johor, the average number of drugs prescribed in the public health clinics was 2.82. The average percentage of antibiotics prescribed was 20.7%. Only one of the public health clinics surveyed was found to prescribe injections. The average percentage of injection use in Johor was 0.7%. All of the prescribed drugs in the public health clinics surveyed were listed in the EDL. An average of 85.4% of the drugs dispensed was adequately labeled. The percentage of patients who had adequate knowledge of how to take their medications was 74.2%. All of the public health clinics surveyed had STG available, but no EDL was kept.

The average number of drugs prescribed in the public health clinics in Perak was 2.68. The average percentage of antibiotics prescribed was 17.3%, while the average percentage of injections use was 2.6%. All of the prescribed drugs in the five public health clinics surveyed were listed in the EDL. An average of 98.8% of the drugs dispensed was adequately labeled, whereas the average percentage of patients who had adequate knowledge of how to take their medicines was 81.7%. All of the public health clinics surveyed were found to have STG available, but no EDL was kept.

The average number of drugs prescribed in the public health clinics in Pahang was 2.75. The average percentage of antibiotic prescribed was 16.7%. Only one public health clinic was found to prescribe injections. Thus, the average percentage of injection use for the state of Pahang was 0.8%. All of the prescribed drugs in the public health clinics surveyed were listed in the EDL. An average of 97.6% of the drugs dispensed was adequately labeled. The percentage of patients who had adequate knowledge of how to take their medicine was 77.9%. All public health clinics had STG, but no EDL was kept.

In Sabah, the average number of drugs prescribed from the five public health clinics surveyed was 2.78. The average percentage of antibiotics prescribed was 33.9%. Only one public health clinic was found to prescribe injections. The average percentage of injection use for the state of Sabah was 1.3%. The percentage of the prescribed drugs in the clinics which were listed in the EDL was 100%. An average of 87.3% of the drugs dispensed was adequately labeled. However, only 68.7% of the patients had adequate knowledge of how to take their medicine. Three public health clinics had STG (80.0%). However, no EDL was kept in the public health clinics.

### Pharmaceutical Situation of Malaysia

The average rational drug use indicators for the five areas are shown in Tables 1 and 2. There was no significant difference between the states in terms of the average number of drugs prescribed per prescription, antibiotic use, injection use, prescribed drugs included in the EDL, drugs adequately labeled, patients who had adequate knowledge, and whether STG and EDL were available in the public health clinics (all  $p$ -values > 0.05).

The average number of drugs prescribed per prescription for the country which was 2.79 might indicate that there is not much of unnecessary prescribing was done and a low possibility of polypharmacy practices. This may reflect that drugs may have not being prescribed indiscriminately to the public. Unnecessary prescribing will not only increase health care cost, but also may result undesirable effects to the patients.

**Table 1:** Rational drug use indicators for five states in Malaysia

Indicators	Public Health Clinic (Mean $\pm$ SD)					$p$ -value
	Kuala Lumpur (n = 1)	Johor (n = 5)	Perak (n = 5)	Pahang (n = 4)	Sabah (n = 5)	
Number of drugs prescribed	3.33	2.82 $\pm$ 0.34	2.68 $\pm$ 0.33	2.75 $\pm$ 0.29	2.78 $\pm$ 0.39	0.58
% of antibiotic use	36.67	20.66 $\pm$ 7.94 (median = 23.30)	17.32 $\pm$ 8.30 (median = 20.00)	16.68 $\pm$ 2.74 (median = 16.70)	33.92 $\pm$ 21.54 (median = 30.00)	0.11
% of injection use	6.67	0.66 $\pm$ 1.48 (median = 0.00)	2.64 $\pm$ 1.48 (median = 3.30)	0.83 $\pm$ 1.65 (median = 0.00)	1.34 $\pm$ 2.99 (median = 0.00)	0.15
% of prescribed drugs included in EDL	100.00	100.00	100.00	100.00	100.00	1.00

In Malaysia, the percentage of antibiotic use was 23.2%. The percentage did not reflect a high usage of antibiotic. Kuala Lumpur and Sabah had a higher percentage of antibiotics used, i.e. more than 30% compared to the other states; they were slightly on the high side and should be of a concern. This might suggest that the tendency to use

antibiotics in the two states was slightly higher compared to the other states. From the international perspective, a study in Ghana showed that the percentage was 65% (WHO 1998). The percentage of patients in primary health care centers who received antibiotics (perhaps twice to what was clinically needed) from studies done both in developed and developing countries (Quick 2003) is 30–60%. Although the percentage of antibiotics used in Malaysia was not as high as compared to some other countries, it is important to promote judicious use of antibiotics to limit the spread emergence of resistance. In any strategy, education and improvement of surveillance should be an integral part (Isturiz and Carbon 2000). According to WHO (2000), antibiotics misuse has contributed to the worldwide increase in antimicrobial resistance that is now being observed for major infectious diseases including tuberculosis, gonorrhoea, malaria, bacterial diarrhoea and pneumonia. In primary health care, 30–60% of the patients obtain antibiotics, perhaps twice to what is clinically desired. Misuse is frequent and it may take in the form of incorrect dosage or improper prescription (Quick *et al.* 1997).

**Table 2:** National indicators of rationale use of drugs for public health clinics in Malaysia

Indicators	Value
Average number of drugs prescribed	2.79
% of antibiotic use	23.15
% of injection use	1.66
% of prescribed drugs included in the EDL	100.00
% of drugs adequately labeled	92.03
% of patients who have adequate knowledge	74.88
With STG (%)	95.00
With EDL (%)	0.00

From the survey, it reflected that no over-prescribing of injections was done. The average percentage of injection use was low with an average of 1.66%. In Indonesia, of every 10 patients treated in one study area, seven received an injection. In the second region, the mean injection rate was even higher with almost 9 of 10 visits there ending with one or more injections being given (Bosu and Adjei 1997). In Ghana, a study showed that injections were prescribed in 80% of the cases (WHO 1998). This showed that injections were not routinely used in Malaysia as



compared to these countries. The high prevalence of injections may be due the cultural belief of the people who think that injections are more powerful than tablets or capsules, and prescribers tend to prescribe them because of the expectation of the patients (Quick *et al.* 1997). Therefore, efforts need to be made not only to educate the people about the use of injections, but also the prescribers. According to WHO (1996), a lot of patients and even health workers in many countries think that injections are more effective than tablets. This may lead to unnecessary expenditure and health risks. Irrational drug prescribing with overuse of injections was found to be widespread in developing countries, as reported in Indonesia, Thailand, Uganda and Senegal, and had adverse economic impact on unnecessary expenditure on the injections (Hadiyono *et al.* 1996).

All the drugs prescribed in all the states were those listed in the EDL, suggesting that prescribing practices conformed to the national EDL. The average percentage of drugs adequately labeled for the country was 92.0%. The average percentage of drugs adequately labeled for Johor and Sabah was found to be below 90%. Although the problem was not very serious, an effort should be made to improve the situation because it may lead to patients taking the drugs wrongly.

Similarly, with percentage of patients who have adequate knowledge, the average for the country was 74.9% showed that quite a substantial percentage of patients did not have adequate knowledge of how to take their drugs. The percentage of patients who has adequate knowledge for Kuala Lumpur and Sabah was found to be below 70%, and this should be of concern. Patients who goes to the public health clinics come from different backgrounds. Thus, effort should be made to educate them on taking their medications appropriately. Although Malaysia had a high percentage of patients who have adequate knowledge, this needs to be improved because without sufficient knowledge about the risks and benefits of using medicines, and when and how to use them, people may not get what is expected from the medicines clinically, and may expose themselves to adverse effects. Education and training strategies should be implemented not only in educating the public but also to the health personnel in encouraging rational drug use. Rational drug prescribing habits and use should be emphasized in the curriculum and in training modules. Drug information should be readily available not only to health personnel at all levels, but also to patients and the public in general.

Drug information must be accurate, independent, unbiased and understandable.

The average for the country for STG availability was 95.0%, which was good. All the states had STG kept in the health clinics except for Sabah. However, in all states, the health clinics did not keep any EDL. This might suggest that although the EDL was implemented more than one and a half years ago from the time of the survey, the information was not well disseminated or made available to the public health clinics. Although the drugs prescribed in the public health clinics were those that were listed in the EDL, this might be due to the fact that the Malaysian National Essential Drugs was formulated by using the Malaysian Ministry of Health Drugs List as a basis. Therefore, almost all drugs in the national formulary are considered essential. This list was not rationally developed. It was established due to the national and international pressures to have an EDL, rather than basing it on STG, country's needs, etc. It does not give a true reflection of whether prescribing was based on EDL or not. Another unfortunate finding was that the list of essential drugs was not provided in all clinics since its launching. It is only found in the website. If the country would like to promote and see rational prescribing and to contain cost, the development and implementation of EDL must be seriously look into.

This study can be improved if the number of public health clinics is increase to represent the whole country. It will be better if each state is represented and the indicators studied definitely will give a better picture of the country. Therefore, the study might face with the potential limitation of generalizability of the findings to the whole country.

## CONCLUSIONS

As a developing country, Malaysian pharmaceutical situation indicators are remarkably good, but however, it can still be further improved. This can be attributed through the average number of drugs prescribed per prescription, the average percentage of antibiotic used, the percentage of injection used, the average percentage of drugs adequately labeled and the percentage of patients who have adequate knowledge of how to take their drugs. Almost all of the public health clinics had the STG kept in their premises. Even though, all of the drugs prescribed to the patients were listed in the EDL, but the concept of EDL is unfamiliar and should be promoted to all health professionals.

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