

# Indicators of rational drug use and health services in Hadramout, Yemen

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## مؤشرات الاستعمال الرشيد للأدوية وللخدمات الصحية في حضر موت، اليمن خالد عوض باسراحيل

الخلاصة: لا يزال الاستخدام غير الرشيد من المشكلات الصحية الرئيسية في الكثير من البلدان النامية. وتستخدم هذه الدراسة المؤشرات المعيارية لمنظمة الصحة العالمية حول الاستخدام الرشيد للأدوية لتحليل 550 وصفة صادرة عن 20 مرفقاً صحياً تتوزع على مستويات مختلفة في مختلف أرجاء حضر موت، اليمن. واتضح للباحثين أن متوسط عدد الأدوية التي توصف في كل وصفة 2.8 (بانحراف معياري 0.2)، مع معدل منخفض لوصف الأدوية ذات الاسم الجنييس (غير المحدد الملكية) (39.2%). وقد بلغت نسبة وصف المضادات الحيوية (66.2%) ونسبة وصف الأدوية التي تعطى حقناً (46.0%) ونسبة وصف الفيتامينات والمقويات (23.6%). وكانت قائمة الأدوية الأساسية متوافرة لدى (78.9%) من المرافق، وأن نسبة مئوية مرتفعة من الأدوية توصف من تلك القائمة (81.2%). أما المصادر الرسمية الأخرى للمعلومات عن الأدوية المحلية فكانت أقل توافراً.

ABSTRACT The irrational use of drugs remains a key health problem in many developing countries. Using WHO standard indicators of rational drug use, this study analysed 550 prescriptions from 20 health facilities at different levels throughout Hadramout governorate, Yemen. A mean of 2.8 (SD 0.2) drugs were prescribed per prescription, with a low rate of prescribing drugs by generic name (39.2%). The proportion of prescriptions for antibiotics was 66.2%, for injectable drugs 46.0% and for vitamins/tonics 23.6%. The essential drugs list was available in 78.9% of facilities and a high percentage of drugs were prescribed from the list (81.2%). Other official sources of local drug information were less available.

## Indicateurs d'usage rationnel des médicaments et des services de santé dans le gouvernorat d'Hadramout (Yémen)

RÉSUMÉ L'usage irrationnel des médicaments reste un problème de santé majeur dans de nombreux pays en développement. À l'aide des indicateurs standard de l'OMS relatifs à l'usage rationnel des médicaments, cette étude a analysé 550 ordonnances provenant de 20 établissements de santé de différents niveaux du gouvernorat d'Hadramout, au Yémen. En moyenne, 2,8 médicaments (écart type 0,2) étaient prescrits par ordonnance, avec un faible taux de prescription par nom générique (39,2 %). Les antibiotiques représentaient 66,2 % des prescriptions, les médicaments injectables, 46,0 % et les vitamines/fortifiants, 23,6 %. La liste des médicaments essentiels était disponible dans 78,9 % des établissements de santé et un fort pourcentage des médicaments était prescrit à partir de la liste (81,2 %). Les autres sources officielles d'informations sur les médicaments locaux étaient moins accessibles.

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## Introduction

In Yemen, as in many developing countries, inappropriate, ineffective and inefficient use of drugs is common in health facilities at all levels [1–5]. There are many factors influencing irrational prescribing, e.g. patients, prescribers, the workplace environment, the supply system (including industry influences), government regulations and drug information and misinformation [6–10]. Additionally, health workers receive very little initial or continuing education about the rational use of drugs.

The concept of an essential drugs list aims to promote the rational and efficient use of drugs. First developed by the World Health Organization (WHO) in 1977, it has provided a rational basis not only for drug procurement at the national level, but also for establishing drug requirements at various levels within health care systems [6]. Essential drugs are selected to fulfil the real needs of the majority of the population in diagnostic, prophylactic, therapeutic and rehabilitative services using parameters of risk–benefit ratio, cost, effectiveness, quality and practical administration as well as patient compliance and acceptance [6,7,11].

Yemen was one of the first countries in the Region to adopt an essential drugs programme in 1986, and to implement this in the public sector [12]. The first national essential drugs list (EDL) was based on the WHO list of essential drugs and other resources [13].

This study is the first to appraise the level of development of health and pharmaceutical services in Hadramout, the largest governorate in Yemen. The aim was to apply the WHO standard indicators of rational drug use to describe health workers' prescribing practices, to investigate the availability of essential drugs and local information sources, and to use the results of the study for recommending future interventions to promote the rational use of drugs.

## Methods

A descriptive cross-sectional survey was carried out from December 2002 to February 2003 in 20 health facilities from different areas of Hadramout governorate. All levels of health facility, both government and private, were surveyed: 11 hospitals, 4 health centres and 5 health units (including Ibn Sina University Hospital and Hadramout University Health Centre in Mukalla, the capital city of the governorate). All suitable health facilities were surveyed, selected on the basis of their large size, easy accessibility and availability of documented prescriptions at the time of the survey.

Hospitals in Yemen deliver services to a population of around 50 000 or more, with surgery, internal medicine, preventive medicine, paediatrics and maternity beds as well as diagnostic services. Health centres deliver primary health care services to the community population of around 15 000, such as mother and child services and first aid, as well as health awareness and health promotion services. Health units, with no beds, usually deliver primary health care services to a population of around 1500.

A total of 550 prescriptions were collected randomly from the selected health facilities and examined to record information about prescribing indicators using a predesigned proforma. The number of selected prescriptions was proportional to the size of the health facility, i.e. to the number of daily outpatient visits. The standard WHO prescribing indicators were calculated:

- Mean number of drugs/prescription,
- Percentage of drugs prescribed by generic name,
- Percentage of prescriptions containing antibiotics,
- Percentage of antibiotics prescribed from all prescribed drugs,
- Percentage of prescriptions containing injectable drugs,

- Percentage of injectable drugs prescribed from all prescribed drugs,
- Percentage of prescriptions containing vitamin/tonic preparations,
- Percentage of vitamin/tonic preparations prescribed from all prescribed drugs.
- Percentage of drugs prescribed from the national EDL.

At each health facility the following indicators were recorded:

- Availability of local drug information sources: availability of national EDL; availability of national standard treatment guidelines; and availability of the newsletter of the Supreme Board of Drugs and Medical Appliances (named *Albalsam*).
- Availability of 12 essential drugs chosen from the national EDL. They covered the key drugs recommended for the treatment of common health problems in the public health facilities in Hadramout.

Data are presented as simple frequency, mean and standard deviation (SD).

## Results

### Prescribing indicators

The 550 prescriptions were for a total of 1527 drugs, i.e. a mean of 2.8 (SD 0.2) drugs per prescription (range 1–10 drugs per prescription) (Table 1). Slightly fewer drugs were prescribed per prescription in health centres [mean 2.5 (SD 0.2)] compared with health units [mean 2.8 (SD 0.2)] and hospitals [mean 2.9 (SD 0.2)].

A low percentage of drugs was prescribed by generic name in the studied health facilities (39.2% of all prescribed drugs) (Table 2).

Antibiotics accounted for 28.8% of the total number of prescribed drugs (Table 2). The maximum number of antibiotics prescribed in any prescription was 4. The lowest rate for prescribing

**Table 1 Mean number of drugs prescribed per prescription in health facilities in Hadramout governorate, Yemen**

Health facility	No. of drugs prescribed	No. of prescriptions	Mean (SD) no. of drugs per prescription
Health units (n = 5)	290	103	2.8 (0.2)
Health centres (n = 4)	409	163	2.5 (0.2)
Hospitals (n = 11)	828	284	2.9 (0.2)
Total (n = 20)	1527	550	2.8 (0.2)

SD = standard deviation.

antibiotics (26.7%) was recorded in hospitals; 66.2% of prescriptions overall contained antibiotics (Table 3). However, the highest percentage of prescriptions containing antibiotics (68.0%) was recorded in health units.

Injectable drugs accounted for 24.6% of total drugs prescribed (Table 2); the maximum number prescribed in any prescription was 5. The lowest percentage of injectable drugs (22.2%) was recorded for hospitals. Table 3 shows that 46.0% of total prescriptions contained injectable drugs, with the highest proportion (51.5%) recorded in health units.

Vitamin/tonic preparations accounted for 11.2% of the total drugs prescribed (Table 2), with the maximum number prescribed in any prescription reaching 5. These preparations were included on 23.6% of prescriptions; the highest percentage (36.9%) was recorded for health units (Table 3).

Drugs from the national EDL accounted for 81.2% of those prescribed (Table 2), with the highest percentage (85.5%) recorded for health units.

### Health facility indicators

Copies of the national EDL were available in 35% of the studied health facilities (Table 4); 50% had the national standard treatment guidelines but none had the newsletter of the Supreme Board of Drugs and Medical Appliances.

Overall, 78.8% of essential drugs were available at the studied health facilities (Table 5). The highest rate for availability of essential drugs (91.0%) was recorded in hospitals and the lowest (51.7%) in health units.

### Discussion

In this descriptive study, the mean number of drugs per prescription was 2.8, similar result to in the survey of Abdo-Rabbo et al. conducted in 24 health facilities from 4 different governorates in Yemen (Sana'a, Aden, Taiz and Hadramout). [10]. Polypharmacy is common in Yemen, as well as in other developing countries such as Nigeria [12,14,15]. This over-prescribing may lead to complexities in monitoring, confusion due to different instructions and

risk of drug interactions and contraindications. One possible explanation for overprescribing is patient demand, i.e. patients prefer doctors who prescribe more drugs because they think this will ensure improvement and cure of their condition quickly [16].

There was a high rate of prescribing drugs by brand name (60.8%), similar to Abdo-Rabbo et al.'s previous study in Yemen (68%) [10]. It is also similar to results from a study of health units in Nepal [17]. These results may indicate a strong influence of the pharmaceutical industry on prescribers [16].

Antibiotics and injectable drugs were also overprescribed (66.2% and 46.0% of prescriptions respectively). Similar high rates were found by Abdo-Rabbo et al. (58% and 37% respectively) [10], as well as in a study in Sudan [9]. The highest rates were recorded in health units, which may be due to the lower experience of prescribing by health assistants and the absence of professional doctors. The percentage of antibiotics prescribed was high (28.8%). This is similar to previous studies in Yemen [1] and Jordan [18]. Overuse of antibiotics can lead to serious clinical problems, such as development of drug resistance, super-infection, allergies and other health hazards. The disadvantages of injections are that they are inconvenient, more expensive, less safe, painful and require skilled personnel to administer.

Vitamin/tonic preparations were frequently prescribed, as found also by Abdo-Rabbo et al. in Yemen [10]. Our field experience and observations

**Table 2 Frequency of drugs prescribed by generic name, for antibiotics, injectable drugs and vitamins/tonics, and drugs prescribed from the national essential drugs list (EDL)**

Health facility	Total drugs prescribed		Drugs prescribed by generic name		Antibiotics		Injectable drugs		Vitamins/tonics		Drugs prescribed from EDL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Health units	290	19.0	117	40.3	89	30.7	92	31.7	59	20.3	248	85.5
Health centres	409	27.0	136	33.3	130	31.8	100	24.5	32	7.8	339	82.9
Hospitals	828	54.0	345	41.7	221	26.7	184	22.2	80	9.7	653	78.9
Total	1527	100.0	598	39.2	440	28.8	376	24.6	171	11.2	1240	81.2

**Table 3 Frequency of prescriptions for antibiotics, injectable drugs and vitamins/tonics**

Health facility	Total prescriptions		Prescriptions for antibiotics		Prescriptions for injectable drugs		Prescriptions for vitamins/tonics	
	No.	%	No.	%	No.	%	No.	%
Health units	103	68.0	70	53	38	36.9		
Health centres	163	67.5	110	77	47.2	28	17.2	
Hospitals	284	64.5	184	123	43.3	64	22.5	
Total	550	66.2	364	253	46.0	130	23.6	

**Table 4 Availability of local drugs information at different levels of health facility**

Local drugs information available	Health units (n = 5)	Health centres (n = 4)	Hospitals (n = 11)	Total (n = 20)
	%	%	%	%
National EDL	40	0	45	35
National standard treatment guidelines	60	25	55	50
Newsletter of Supreme Board of Drugs and Medical Appliances	0	0	0	0

EDL = essential drugs list.

**Table 5 Availability of essential drugs at different levels of health facility**

Essential drugs available	Health units (n = 5)	Health centres (n = 4)	Hospitals (n = 11)	Total (n = 20)
	%	%	%	%
Oral rehydration solution	100	100	100	100
Co-trimoxazole	60	100	100	90
Paracetamol paediatric syrup	40	100	82	75
Chloroquine	60	75	100	85
Ferrous sulfate + folic acid	40	100	91	80
Tetracycline eye ointment	40	75	91	75
Iodine	60	75	91	80
Gentian violet	60	75	100	85
Benzoic acid + salicylic acid	0	50	64	45
Retinol (vitamin A)	20	50	73	55
Paracetamol or aspirin	60	75	100	85
Aluminium/magnesium hydroxide	80	75	100	90
Mean	51.7	79.2	91.0	78.8

suggest this may be due to the belief among many patients and some prescribers that they are useful to improve general health and quality of life.

We found a much higher proportion of drugs were prescribed from the national EDL in our study (81.2%) than in Abdo-Rabbo et al.'s previous

Yemen survey (56%) [10]. However, there is still room for improvement: the national EDL provides prescribers with a standard list of drugs which are effective, safe, inexpensive and specific in treating important health problems in our country [19]. The availability of the national standard treatment guidelines

and the Supreme Board of Drugs and Medical Appliances newsletter were 50% and 0% respectively. These results were better than those of Abdo-Rabbo et al. for the different governorates of Yemen, where the availability of national standard treatment guidelines at that time was 2%, and availability of the drugs newsletter was 0% [10]. The increase in the availability of the EDL (35%) as compared with the previous study (5%) [4] and the higher proportion of drugs prescribed from the EDL was probably due to the increased availability of essential drugs (78.8%) at health facilities compared with the above-mentioned study (47%). There was progress in the prescribing rationality and availability of essential medicines compared with previous studies conducted in Yemen.

## Recommendations

Prescribers in all health facilities should be advised to use the generic names of drugs in prescriptions, to prescribe the lowest number of drugs needed and to avoid symptomatic treatment whenever possible. Antibiotics and injectable drugs should be prescribed with care. More effort is needed to ensure that local drug information resources such as national standard treatment guidelines and the national formulary of essential drugs are available at all health facilities.

The Ministry of Public Health and Population should supervise, monitor, and give feedback to health workers, by developing and implementing interventions about drug use in general and prescribing in particular in order to improve prescribing practices and rational use of drugs.

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### ***Pan Arab Conference on Diabetes (PACD 14): Cardiometabolic Risk Initiative***

Cardiometabolic Risk Initiative is the main theme of the Pan Arab Conference on Diabetes, to be held in Cairo, Egypt on 23-26 March 2010.

The objective is to gather together all those interested in this area of medical knowledge so that they can share new insights and thus contribute to improving the care of patients, which is our primary mission. Experts from different countries will exchange their experiences in the field of diabetes. Recent advances in population studies and clinical and basic research will be presented. International scientists will give state-of-the-art lectures. Several sessions will be devoted to presentations of original contributions and a number of satellite symposia will be held during the conference. The programme can be accessed at: <http://www.arab-diabetes.com>.