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BASELINE REVIEW OF PRESCRIBING PRACTICES

in SWAZILAND

T. Kenyon, M.D.

Z. Gama, M.B.C.H.B.

The People-to-People Health Foundation, Inc.
(Project HOPE)
Millwood, Virginia 22646 USA

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SUMMARY

An assessment of prescribing practices from a sample of outpatient settings was undertaken during November, 1991 to serve as a baseline prior to the introduction of a desk-top prescribing reference for common conditions in Swaziland. The purpose of the desk-top reference is to provide the outpatient prescriber (most often nurses in Swaziland) with a convenient and concise guide for the selection of first-line therapy for common conditions encountered in the outpatient setting. The assessment was conducted at 7 rural government clinics, 4 rural mission clinics, 3 urban government clinics, 3 urban mission clinics, and 3 health centres and included the following prescribing indicators:

- o what prescribing references and guidelines were available to the prescriber;
- o constraints they face in adhering to the guidelines;
- o number of drugs prescribed per outpatient visit;
- o proportion of outpatient cases receiving antibiotics/injections;
- o percentage of drugs prescribed in generic form;
- o percentage of cases who receive treatment according to the national treatment schedules as exist in current references and guidelines;
- o percentage of children under five with diarrhea receiving ORS, antidiarrheals, or antibiotics;
- o number of drugs (other than ORS) received by children under five with diarrhea.

It was found that nearly all outpatient settings sampled have the MOH Clinical Reference Manual, ARI and diarrheal disease guidelines, but only 75% have the Clinic Drug Formulary and Handbook and malaria treatment guidelines. The most frequent reason nurse prescribers noted for not adhering to these guidelines was a conflict between how they had been previously trained to prescribe and how the guidelines indicated they should prescribe. 80% of prescribers noted that drug outages made it impossible to adhere to guidelines at times. Half of prescribers, usually from the mission setting, noted that the recommended first-line drug therapy was not on their clinic drug list. 45% of prescribers noted that the existing guidelines are difficult to use, usually because it was too time-consuming to consult them in the busy clinic setting.

Using existing MOH treatment guidelines as the standard and the diagnosis-treatment as recorded in the clinic patient register, the drug prescription for 606 random cases and 200 cases of diarrhea in children under-five was assigned an "Appropriateness" designation, including, "Prescribed Appropriately", "Prescribed Inappropriately", "Underprescribed", "Overprescribed and Potentially Harmful", and "Overprescribed and NOT Potentially Harmful". Only a quarter (26.6%) of the 606 random cases reviewed had recorded prescribing which matched MOH treatment guidelines. Over half of the cases were assessed as having been overprescribed with respect to drug therapy, which most often represented overuse of symptomatic drug therapy and antibiotics.

Out of the 806 total cases reviewed, there were no instances whereby the patient did not receive drug therapy, ie, patients always receive medication regardless of the condition. The average number of drugs prescribed per patient was 2.59. 62% of patients receive an antibiotic and 30% receive an IM

injection when they visit the clinic. 54% of drugs are prescribed generically. Overprescribing, in general, and overuse of antibiotics and IM injections, specifically, have both financial and quality of care implications for health care in Swaziland. If every patient is receiving drug therapy for every illness every time they visit the clinic, then the notion that "a pill exists for every ill" is being perpetuated. It is well known that many clinical symptoms are caused by self-limiting conditions which will pass without treatment and that in many clinical settings, as few as half of all patients will actually benefit from a drug regimen. Quality of care would in fact receive a boost if prescribers prescribed less and gave greater attention to patient education and guidance. Prescribers need the additional skills and experience in physical assessment as the basis for the needed confidence in their diagnostic and case management decision-making in order to prescribe less.

This survey serves as a baseline for the introduction of a desk-top prescribing reference at the clinic level during January/February, 1992 and will be repeated in April/May, 1992 to assess the impact of this reference on prescribing. Prescribing could also be improved through such options as:

- o Inclusion of prescribing for common conditions during the orientation of nurses prior to being posted to the clinic;
- o Inservice prescriber training at the regional level utilizing existing health facilities as practical teaching sites;
- o Updating the MOH Clinical Reference Manual periodically;
- o Reinitiation of the Family Nurse Practitioner program.

1.0 Background

In October, 1990 a Project HOPE pharmacist consultant and the Chief Pharmacist in the MOH undertook an assessment of the current pharmaceutical sector in the MOH. Based on this assessment, Project HOPE and Ministry of Health planned collaboration in the pharmaceutical sector in five areas: preparation of a pharmaceutical development plan and national drug policy statement; development of a dispenser training program; Central Medical Stores management; development of a quality control laboratory; and prescriber training. This prescriber training component is to consist of the development and distribution of a simple desk-top reference for the nurse prescriber to quickly refer to for first-line therapy for common conditions, based on existing MOH standards found in current references and guidelines. In order to establish the effectiveness of the desk-top reference, a baseline assessment of current prescribing practices for common conditions at the out-patient level was undertaken. It is also planned to repeat this assessment once the reference has been distributed.

2.0 Methodology

It was recommended at the 1990 "First International Network for Rational Use of Drugs (INRUD) Meeting" in Indonesia that developing countries adopt the following methodology to measure various prescribing indicators:

1. "Select 10 rural and 10 urban health facilities randomly."

For this study, 11 randomly-selected rural government or mission clinics, 5 urban non-hospital government or mission health facilities (clinics and PHUs), and the 4 Health Centres in Swaziland were included for a sample size of 20 health facilities.

2. "Record diagnosis and drugs prescribed for 30 cases with any diagnosis at each health facility. Select retrospectively for the previous 5 months the first 6 cases appearing at the beginning of each month."

For this study, the clinic patient register showing diagnosis and treatment prescribed was reviewed. The reviewer assessed the treatment prescribed as either "Prescribed appropriately", "Underprescribed", "Overprescribed and potentially harmful", "Overprescribed and NOT potentially harmful", using MOH "Clinical Reference Manual for Clinics and Health Centres" in addition to special program protocols in ARI, CDD, and malaria as the prescribing standard. Diagnosis, drugs prescribed, age-group of the patient, number of drugs prescribed, number of drugs prescribed generically, and whether an IM injection or antibiotic were given were also recorded.

3. "In addition to overall prescribing, two indicators measuring diarrhea treatment practice for under-fives. If retrospective data were used above, count the number of diarrhea cases in children

under five included in the 6 cases already sampled. Continue recording data from the register for under-five diarrhea cases until there are at least 2 in each month sampled."

For this study, in addition to the two indicators recommended (% of children receiving ORS, % of children receiving antidiarrheal drugs), the use of antibiotics and total number of drugs per case other than ORS were also assessed.

The 2 questionnaires used are in Appendix 1. In addition to the above prescribing information, the enumerator also inquired about various constraints which the nurse prescriber may face in trying to adhere to MOH guidelines. The questionnaire, data entry, and analysis were all completed using Epi Info.

The following case definitions were used for the five "Appropriateness" categories:

1. "Prescribed Appropriately": Prescribed correct drug, dosage, and duration according to MOH references and guidelines
2. "Prescribed Inappropriately": Wrong drug for the diagnosis according to MOH references and guidelines
3. "Underprescribed": Correct drug, but lower dosage or duration than recommended in MOH references and guidelines
4. "Overprescribed and potentially harmful": Correct drug prescribed for condition according to MOH references and guidelines, but either at a higher dose/duration than recommended or additional unnecessary drugs were prescribed which could be potentially harmful to the patient because of side-effects or adverse effects on the designated medical condition. Eg., CNS depressants and unnecessary antibiotics in small infants, contraindicated drugs in pregnancy.
5. "Overprescribed and NOT potentially harmful": Correct drug prescribed for condition according to MOH references and guidelines, but either at a higher dose/duration than recommended or additional unnecessary drugs were prescribed which were not regarded as immediately harmful. Eg., multivitamins, Vitamin B complex, antibiotics, paracetamol.

It should be emphasized that in order to maintain objectivity, the "Appropriateness" determination was based on recommendations given in the current MOH references and guidelines and not on the enumerator's own prescribing preferences.

3.0 RESULTS

Data was collected from the 20 health facilities listed in Appendix 2 by one full-time enumerator (ZG) over a nine-day period. Prescribing records were readily available from the patient register in government clinics, though without respect to dosage and duration. Clinic cards were retrieved in mission clinics and were more informative on drug dosage and duration. Health centres do not keep patient registers and patients have prescribing information on their own personal clinic card. Therefore, outreach site registers were used to record outpatient prescribing practices at the health centre level. Once the relevant records had been retrieved, it took only 1-2 hours to complete the assesement of 30 random cases and 10 cases of gastroenteritis in under-fives over the past 5 months. Data entry and analysis (TK) using Epi Info required only approximately 20-30 minutes per facility.

3.1 Prescribing Practices in the 30 Random Cases Per Facility

As shown in Table 1, close to two-thirds of cases reviewed with respect to prescribing practices came from the rural setting in a mission or government clinic or health centre. Of these cases, 41.4%, 17.3%, and 41.9% were in under-fives, school-age, and adults, respectively. The complete list of diagnoses encountered can be found in Appendix 3.

Table 1. Type of Health Facilities Surveyed

Type of Facility	No. of Cases
oRural Government Clinic	210 (34.7%)
oRural Mission Clinic	121 (20.0%)
oUrban Government Clinic	96 (15.8%)
oUrban Mission Clinic	89 (14.7%)
oHealth Center (3 rural, 1 urban)	90 (14.9%)
TOTAL	606

Table 2 reveals that health facilities have most of the available prescribing references and guidelines to assist them in decision-making for first line drug therapy. These included the MOH "Clinical Reference Manual for Clinics and Health Centres", "Clinic Drug Formulary and Handbook", as well as MOH protocols for priority programs in diarrheal diseases, acute respiratory infections, and malaria, which were utilized as the standard by which to assess prescribing appropriateness.

The primary reason given by the clinic nurse in the 25% of facilities having

Table 2 Availability of MOH Prescribing References and Guidelines (N=20)

Available to Prescriber	Clinic Reference Manual	Clinic Drug Formulary	ARI	Guidelines:	
				Malaria	Diarrhea
Yes (%)	18 (90)	15 (75)	18(90)	15(75)	18(90)

no malaria treatment guidelines was "malaria isn't in our area". There was no explanation provided for the absence of the "Clinic Drug Formulary and Handbook" in 25% of facilities. In most instances, the manual or formulary was in close proximity to the area where the clients were seen and prescribing conducted. However, in some clinics the poster guidelines (ARI, diarrheal disease, or malaria) could be found in a different room, eg. the treatment room, where prescribing itself would tend not to take place.

Table 3 Constraints Nurse Prescribers Face in Adhering to MOH Prescribing Standards and Guidelines

Constraint Present (N=20)	Yes(%)
Guidelines not available	4 (20)
Recommended drug not on clinic list	10 (50)
Recommended drug out of stock	16 (80)
Pressure applied by patients	8 (40)
Guidelines difficult to use	9 (45)
Training conflicts with guidelines	18 (90)

Constraints which nurses face in adhering to the MOH prescribing standards available in these references are summarized in Table 3. The constraint concerning the recommended drug not being on the clinic drug list is relevant primarily to mission facilities. Periodic stock outages of drugs was noted to be a constraint by 80% of prescribers. Patient pressure was noted as an obstacle to adhering to guidelines by 40% of prescribers; a higher figure was actually anticipated, particularly with respect to injections. The difficulty most often noted with respect to the present prescribing references and guidelines was the time it takes to use them in a busy clinical setting. Prescribers also noted that they sense patient uneasiness when they consult references in the patient's presence. The most frequently noted constraint to adherence to prescribing standards was prior "training", referring to prescribing practices learned by the prescriber during previous pre-service,

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in-service, or supervisory training, eg. by the supervising doctor.

The drugs prescribed for the diagnoses encountered and their frequency are listed in Appendix 4.

Using the current MOH prescribing references and guidelines as the standard, each of the 606 diagnoses encountered was assigned an "Appropriateness" designation as previously described. As Figure 1 shows, only 26.6% of cases were regarded as having been "Prescribed Appropriately" according to current standards. Of the remainder, most (45.7%) fell into the category of "Overprescribed and NOT Potentially Harmful", followed by "Prescribed Inappropriately" (17.2%), "Overprescribed and Potentially Harmful" (8.7%), and "Underprescribed" (1.8%). The "Underprescribed" category is probably underestimated due to the fact that little information was available

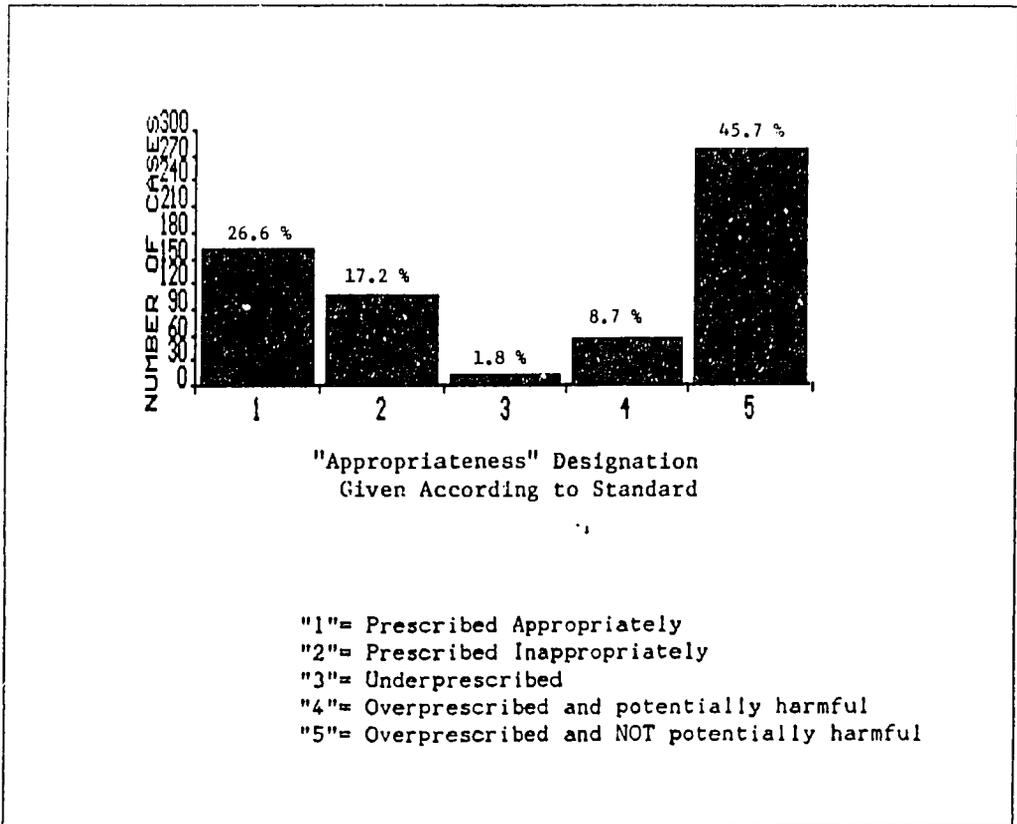


Figure 1 "Appropriateness" Assessment of Prescribing for 606 Cases

concerning drug dosage and duration. The "Overprescribed and NOT Potentially Harmful" category was largely comprised of vitamin and symptomatic therapy not called for in MOH standard treatment guidelines, but also included more serious overprescribing such as unnecessary antibiotic use. The

"Overprescribed and Potentially Harmful" category included instances of strong unnecessary medication such as CNS depressants for small infants, duplication of medications because of non-generic prescribing, use of acetylsalicylic acid and indomethacin concurrently, and use of antibiotics unnecessarily according to the diagnosis given in small infants. Further examples of prescribing practices by "Appropriateness" designation are included in Appendix 5.

Table 4 summarizes the "Appropriateness" designations assigned according to MOH standards for the top 15 diagnoses reviewed during the survey.

- o "Upper Respiratory Tract Infection"(URTI) was by far the most common diagnosis made and accounted for 17.3% of the 606 cases overall. Only 13% of URTIs were prescribed appropriately with 58% of URTI prescribing falling into the "Overprescribed and NOT Potentially Harmful" category, usually due to use of unnecessary symptomatic therapy and/or antibiotics. URTIs also had the highest number of all diagnoses in the survey to have prescriptions found to be "Overprescribed and Potentially Harmful", usually due to the use of CNS depressants in young infants and duplication of medications due to non-generic prescribing.

Table 4 The Appropriateness Designation for the Top 15 Diagnoses Reviewed

Diagnosis	Appropriateness Designation*					TOTAL
	"1"	"2"	"3"	"4"	"5"	
1. Upper Respiratory Tract Infection	14	15	0	15	61	105
2. Impetigo	8	11	0	1	26	46
3. Gastroenteritis	7	3	0	10	22	42
4. Scabies	16	2	0	0	15	33
5. Gonorrhoea	11	4	3	0	13	31
6. Pelvic Inflammatory Disease	5	11	1	0	7	24
7. Tonsillitis	2	7	0	0	13	22
8. Scabies, Impetigo	8	0	0	1	11	20
9. Pneumonia	6	4	0	0	8	18
10. Peptic Ulcer Disease	7	3	0	1	6	17
11. Intestinal Worms	7	0	0	1	7	15
12. Hypertension	13	0	0	0	0	13
13. Chancroid	3	5	0	0	4	12
Otitis Media	3	1	0	0	8	12
14. URTI, Gastroenteritis	2	0	0	3	6	11
15. Osteoarthritis	0	2	0	2	6	10

* "1"=Appropriately Prescribed; "2"=Inappropriately Prescribed;
"3"=Underprescribed;"4"=Overprescribed and Potentially Harmful;
"5"=Overprescribed and NOT Potentially Harmful

- o The high percentage (22/42, 52%) of "gastroenteritis" cases determined to be "Overprescribed and NOT Potentially Harmful" was due to unnecessary use of antibiotics, multivitamins, anti-parasitic therapy, and symptomatic medications. Gastroenteritis cases were second to URTIs in the "Overprescribed and Potentially Harmful" category, which was largely due to the use of CNS depressants (eg. Promethazine) in small infants, several as young as one month old.
- o "Impetigo" cases ranked high in "Overprescribed and NOT Potentially Harmful" (26/46, 57%) due primarily to the unnecessary combination of antibiotics topically, orally, and by injection in the same patient at times. The high number of "Prescribed Inappropriately" was due to the frequent incorrect selection of Benzathine Penicillin for this condition.
- o The high "Overprescribed and NOT Potentially Harmful" rate (15/33, 45%) for "scabies" relates to the frequent addition of multivitamins and intestinal worm therapy in addition to the appropriate use of Benzyl Benzoate.
- o "Gonorrhea" was the fifth most common diagnosis encountered (5.1% of all cases). Taken as a group, STDs (gonorrhea, PID, chancroid, syphilis) ranked second only to Upper Respiratory Tract Infections in frequency of diagnosis (79/606, 13% of all cases), ahead of impetigo, gastroenteritis, peptic ulcer disease, and so forth. Gonorrhea cases received appropriate therapy according to the MOH clinical reference manual only 35% of the time. Overall, STDs as a group are receiving appropriate first line drug therapy according to the manual 32% of the time.

Note the high level(100%) of appropriate prescribing for "hypertension". This determination was made on the basis of drug selection and dosage when available without, however, having the patient history and blood pressure determinations over time in response to first-line therapy.

Table 5 further demonstrates the finding that antibiotics are overprescribed primarily with respect to the two common conditions of "Upper Respiratory Tract Infections" and "Gastroenteritis" compared to similar diagnoses for which antibiotics are not indicated. 50% of "URTIs" and 48% of "Gastroenteritis" cases reviewed had been prescribed antibiotics. Of all the "gastroenteritis" diagnoses reviewed, only 20% were specified as "dysentery" or "amoebiasis" and thereby possibly indicating the need for antimicrobial therapy. An additional prescribing error with respect to antibiotics occurs with Benzathine Penicillin, which was prescribed in 97/606 cases (16%), yet the two main diagnoses for which it should be indicated, "tonsillitis" and "syphilis", accounted for a total of only 33 cases. Its appropriateness in other instances is questionable.

Indications are that Cotrimoxazole is also being overprescribed, since it was prescribed in 123 cases (20%), yet its primary indications, ie, "pneumonia", "UTI", "otitis media", "dysentery", and "chancroid" only totaled 70 cases of the 606 reviewed.

**Table 5 Antibiotic Usage in the Top 15
Most Common Diagnoses Reviewed**

Diagnosis	Antibiotic Used	
	Yes(%)	No(%)
1. URTI	52(50)	53(50)
2. Impetigo	46(100)	0
3. Gastroenteritis	20(48)	22(52)
4. Scabies	0	33(100)
5. Gonorrhoea	31(100)	0
6. PID	24(100)	0
7. Tonsillitis	22(100)	0
8. Scabies, Impetigo	21(100)	0
9. Pneumonia	18(100)	0
10. Peptic Ulcer	1 (6)	16(94)
11. Intestinal Worms	0	15(100)
12. Hypertension	0	13(100)
13. Chancroid	12(100)	0
Otitis Media	12(100)	0
14. URTI, Gastro.	5 (45)	6 (55)
15. Osteoarthritis	0	10(100)

Of the 606 cases reviewed, overall 62% were prescribed an antibiotic (Figure 2). The total number of drugs prescribed ranged from 1 to 5, with a mean of 2.59 drugs prescribed per patient (Figure 3). Note that there were no instances encountered whereby a patient was seen and did not receive a medication, ie, drugs are always given to patients when they visit the clinic. Only 54%, or approximately half of drugs are being prescribed generically at the outpatient level. This led to cases of duplication of the same drug in the same patient in some instances. Overall, 30% of clients in the patient register were found to have received an IM injection during the health facility visit.

**PRESCRIBER PRACTICES SURVEY
ANTIBIOTIC USE IN 606 CASES**

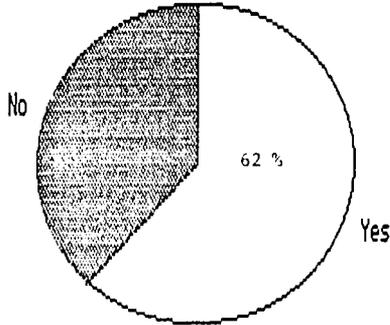


Figure 2 Overall Antibiotic Usage in 606 Diagnoses Reviewed

**PRESCRIBING PRACTICES SURVEY
NUMBER OF DRUGS PRESCRIBED - 606 CASES**

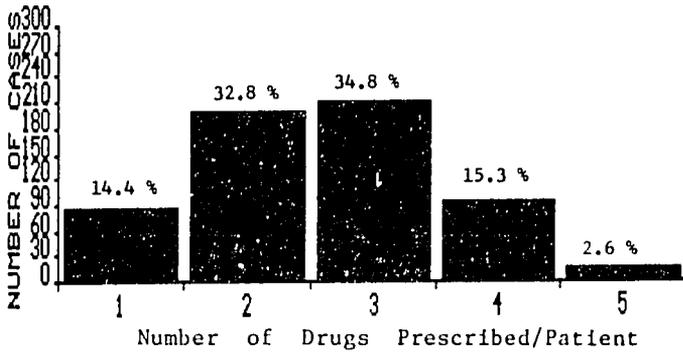


Figure 3 Number of Drugs Prescribed Per Patient in 606 Diagnoses Reviewed

3.2 Prescribing Practices in Diarrheal Diseases for Under-Fives

Prescribing practices were reviewed in 200 cases of diarrhea in under-fives. Figure 4 shows that 91.5% of cases seen in a health facility received ORS, though no information was available on quantity given or compliance. As the MOH diarrheal disease guidelines recommend, antidiarrheal agents were not prescribed nor are they supplied to the clinic. However, 55% of the "gastroenteritis" cases (110/200) did receive an antibiotic. This contrasts with the finding in the review of 606 diagnoses that "dysentery" or "amoebiasis", for which antimicrobials are indicated, totalled only 11 cases or 18% of "gastroenteritis" cases overall. This aspect of the study thus backs up the first which also demonstrated a high level of unnecessary antibiotic prescribing for simple "gastroenteritis" cases. The average number of drugs prescribed per patient other than ORS was 1.77.

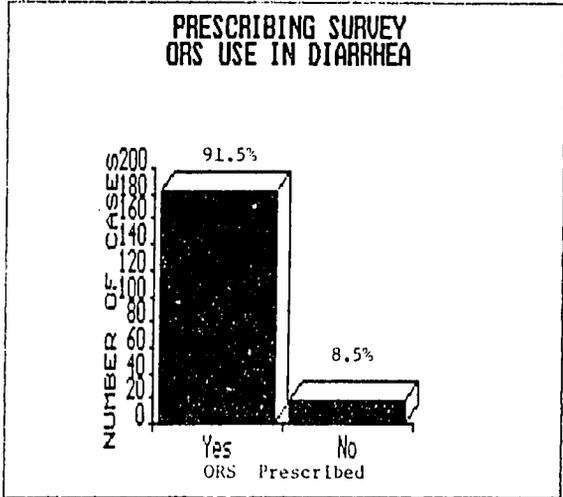


Figure 4 Use of ORS in Health Facility Gastroenteritis Cases (N=200)

3.3 Prescribing Indicators According to Type and Location of Health Facility

Table 6 compares various prescribing indicators as assessed in rural government clinics, rural mission clinics, urban government clinics (includes PHUs), urban mission clinics, and health centres. These include the % of patients receiving standard drug therapy according to current MOH references and guidelines in the clinic; average number of drugs prescribed per patient; % of drugs prescribed generically; % of patients receiving an injection; % of patients receiving an antibiotic; and % of children under-five with diarrhea who received ORS or an antibiotic.

With a few exceptions, it would appear that prescribing indicators are fairly consistent between the types of health facilities sampled. Favourable exceptions include the higher percentage of patients receiving standard drug therapy at the Health Centre level and the lower percentage of patients receiving an injection at the Rural Government Clinic level.

Table 6. Comparison of Prescribing Indicators According to Type of Health Facility

	Rural Gov. Clinic	Rural Mission Clinic	Urban Gov. Clinic	Urban Mission Clinic	HC
=====					
PRESCRIBING INDICATOR					
% of patients receiving standard drug therapy	27	22	22	29	33
Avg. number of drugs prescribed per patient	2.5	2.7	2.5	2.6	2.7
% of drugs prescribed generically	52	62	56	45	51
% of patients receiving an injection	17	38	23	49	38
% of patients receiving an antibiotic	59	67	58	69	60
% of under 5s with diarrhea receiving ORS	96	68	97	100	100
% of under 5s with diarrhea receiving an antibiotic	48	68	60	55	50

4.0 Discussion

The survey of prescribing practices in Swaziland was conducted with relative ease and provides objective baseline information with respect to prescribing parameters prior to the introduction of a desk-top prescribing reference. The findings are representative of nurse prescribing at the out-patient

department level in both rural and urban areas and cover the common conditions seen and treated in these settings.

Hospital and doctor prescribing were not assessed for two reasons. The first concerns the difficulty in applying the INRUD guidelines for the review of prescribing practices to these settings. The second, and perhaps more important reason, is the fact that there are no existing standard treatment guidelines in Swaziland for use as a standard by which to assess prescribing in the hospital setting. At the same time, the importance of the quality of prescribing applies to all levels of health care provision and a similar assessment should be someday be done at the hospital level when such standard treatment guidelines have been developed. An assessment of prescribing practices in the private sector was beyond the mandate of this study and was, therefore, not included.

A basic assumption of this study of prescribing practices is that the diagnosis recorded in the register is correct and complete. It is possible that nurse prescribers do not record all aspects of the diagnosis that may influence prescribing for the individual patient, such as severity of the case and secondary diagnoses. At the same time, this can not fully account for the low level of adherence encountered to MOH standard treatment recommendations. A more costly and time-consuming prospective study would be needed to assess the accuracy of current diagnostic decision-making at the clinic level.

MOH prescribing references and guidelines are largely available at the clinic level, though well below 100% for both the MOH "Clinic Drug Formulary and Handbook" and "Malaria Treatment Guide". In addition, nursing staff noted several key constraints to adhering to these guidelines when they are available. The most common is a conflict between how they were "trained" previously and how they are being asked to prescribe in the guidelines. This has implications for the prescribing aspects of pre-service and in-service training and should be explored further. Staff also expressed their view that the current guidelines took too much time to use in the busy clinical setting. A simple desk-top reference summarizing first-line therapy for common conditions will help to address this. The issue of stock-outages of essential drugs is an additional common barrier to the clinic nurse in being able to adhere to treatment guidelines. One can only speculate what impact the resolution of these constraints would have on the quality of clinic prescribing, but it could be substantial.

The high level of documented overprescribing of drugs to patients has financial implications to consider as well. This finding implies that the quality of care provided at the clinic level would not be compromised if prescribers adhered to current guidelines and prescribed fewer drugs for a given condition than is presently occurring. Quality and cost of care would both benefit from a de-emphasis on drug treatment in favor of prescribing drugs only when absolutely necessary at the correct dosage and duration, utilization of non-pharmacologic aspects of patient management, and conducting more patient education.

The specific conditions which constitute the bulk of patients seen at the outpatient level and which in particular warrant measures to improve

prescribing for include upper respiratory tract infections, sexually transmitted diseases, skin diseases, and gastroenteritis. The main prescribing finding in these and other conditions was "overprescribing", particularly with respect to symptomatic therapy and antibiotics. Overprescribing results in increased cost, increased side-effects, increased drug interactions, decreased compliance, and the development of bacterial resistance to antibiotics.

Just over half of all drugs are being prescribed generically. Overdosages have been documented as a result. If trade names change in the future, prescribers will be confused if they are not aware of the generic names leading to further prescribing errors.

The fact that nearly 1/3 of outpatient visits receives an IM injection seems high with respect to the degree of severity of most outpatient visits for which oral drug therapy alone could be suitable. Though clinics in Swaziland utilize disposable syringes and needles primarily, the recommendation worldwide is for clinicians to take steps to reduce the number of IM injections given and, thereby, reduce the risk of any HIV transmission in the clinical setting.

The rational use of drugs demands not only that the appropriate drug be prescribed, but that it be available when needed, and at a price people can afford; that it be taken in the right dose, at the right intervals and for the right length of time; and that it be effective, of acceptable quality and safe. This study has provided decision-makers with data concerning the current status of the rational use of drugs in the government and mission sector in Swaziland. A similar exercise will be repeated to assess the impact on the rational use of drugs following the introduction of a desk-top prescribing reference at the outpatient level.

Appendix 1. Questionnaire Used to Assess Prescribing Practices in Random Cases

PRESCRIBING PRACTICES SURVEY FORM - 30 CASES

Today's date <mm/dd/yy>

- | | |
|--|-----|
| 1. Rural government clinic (Mark Y or N) | <Y> |
| 2. Rural mission clinic | <Y> |
| 3. Urban government clinic | <Y> |
| 4. Urban mission clinic | <Y> |
| 5. Health centre | <Y> |

Name of health facility: _____

Prescriber has access to:

- | | |
|---|---|
| MOH Clinic Reference Manual (Mark Y or N): | Y |
| Clinic Drug and Formulary/Handbook (Y or N): | Y |
| diarrheal disease treatment guidelines (Mark Y or N): | Y |
| ARI treatment guidelines (Mark Y or N): | Y |
| malaria treatment guidelines (Mark Y or N): | Y |

Reasons prescriber notes for not adhering to guidelines:

- | | |
|---|---|
| Guidelines not available (Mark Y or N) | Y |
| Recommended therapy not on clinic drug list (Mark Y or N) | Y |
| Recommended therapy periodically out of stock (Mark Y or N) | Y |
| Pressure from patients to prescribe (Mark Y or N) | Y |
| Guidelines difficult to use (Mark Y or N) | Y |
| Training conflicts with guidelines (Mark Y or N) | Y |

 Prescribing practices for each of 30 cases (first 6 at beginning of past 5 mos).

Diagnosis: _____

- | | |
|---------------------------|-----|
| Under-fives (Mark Y or N) | <Y> |
| School-age | <Y> |
| Adult | <Y> |

- Drug 1. _____
 Drug 2. _____
 Drug 3. _____
 Drug 4. _____
 Drug 5. _____
 Drug 6. _____
 Drug 7. _____
 Drug 8. _____

For "Appropriateness" of prescription based on MOH manual and protocols, mark:

- 1 if "Prescribed Appropriately"
- 2 if "Prescribed Inappropriately"
- 3 if "Underprescribed"
- 4 if "Overprescribed and potentially harmful"
- 5 if "Overprescribed and NOT potentially harmful"

APPROPRIATENESS	#
NO. DRUGS PRESCRIBED	#
NO. GENERIC	#
IM INJECTION (Y or N)	<Y>
ANTIBIOTIC (Y or N)	<Y>

Appendix 1. Questionnaire Used to Assess Prescribing Practices in Diarrhea in Under-Fives

PREScribing PRACTICES SURVEY FORM - DIARRHEA IN UNDER-FIVES

Today's date <mm/dd/yy>

Type of health facility: 1.Rural government clinic <Y>
2.Rural mission clinic <Y>
3.Urban government clinic <Y>
4.Urban mission clinic <Y>
5.Health centre <Y>

Name of health facility: _____

Prescriber has access to:MOH Clinic Reference Manual (Mark Y or N): <Y>

Clinic Drug and Formulary/Handbook (Y or N): <Y>

diarrheal disease treatment guidelines (Mark Y or N): <Y>

ARI treatment guidelines (Mark Y or N): <Y>

malaria treatment guidelines (Mark Y or N): <Y>

=====

Treatment for under-fives diarrhea in 10 cases/facility (2/month over past 5 mo

RECEIVED ORS (Y OR N) <Y>

RECEIVED ANTIDIARRHEAL <Y>

RECEIVED ANTIBIOTIC <Y>

TOTAL NUMBER OF DRUGS RECEIVED #
(OTHER THAN ORS)

Appendix 2. Schedule for Prescribing Practices Survey Visits to Health Facilities

PRESCRIBER PRACTICES SURVEY SCHEDULE

DATE	NAME OF CLINIC,PUBLIC HEALTH UNIT, OR HEALTH CENTRE	
11 November	Mbabane Public Health Unit	(G,U)
	Piggs Peak Nazarene Clinic	(M,U)
12 November	Emkhuzweni Health Centre	(M,R)
	Mangweni Clinic	(G,R)
13 November	Bhalekane Clinic	(M,R)
	St. Marys Clinic	(M,R)
14 November	Musi Clinic	(G,R)
	Sigcineni Clinic	(G,R)
18 November	King Sobhuza II PHU	(G,U)
	Siteki Nazarene Clinic	(M,U)
	Siteki Public Health Unit	(G,U)
19 November	Zombodze Clinic	(G,R)
	Nhlangano Health Centre	(G,U)
	Hluti Clinic	(G,R)
20 November	Sithobela Health Centre	(G,R)
	Phunga Clinic	(G,R)
	New Heaven Clinic	(M,R)
21 November	Malindza Clinic	(M,R)
	Vuvulane Clinic	(G,R)
25 November	St. Therasas Clinic	(M,U)

G = Government
M = Mission
U = Urban
R = Rural

Appendix 3. Diagnoses Encountered and Frequency During Review of Prescribing Practices in First 6 Cases in Register Each Month over Last 5 Months

DIAGNOSIS	Freq	Percent	Cum.
ABSCESS	2	0.3%	0.3%
ABSCESS, GASTROENTERITIS	1	0.2%	0.5%
ABSCESS, URTI, SCABIES	1	0.2%	0.7%
AMENORRHEA	1	0.2%	0.8%
AMOEBIAS	1	0.2%	1.0%
AMOEBIASIS	6	1.0%	2.0%
ANTENATAL	1	0.2%	2.1%
ASTHMA	4	0.7%	2.8%
BILHARZIA	9	1.5%	4.3%
BILHARZIA, URTI	1	0.2%	4.5%
BREAST ABSCESS	1	0.2%	4.6%
BRONCHITIS	1	0.2%	4.8%
BRONCHITIS, CONJUNCTIVITIS	1	0.2%	5.0%
BURNS	6	1.0%	5.9%
BURNS, OTITIS MEDIA	1	0.2%	6.1%
CELLULITIS	2	0.3%	6.4%
CHANCROID	12	2.0%	8.4%
CHANCROID, PREGNANCY	1	0.2%	8.6%
CHANCROID, R/O SYPHILLIS	1	0.2%	8.7%
CHICKENPOX	2	0.3%	9.1%
CHICKENPOX, IMPETIGO	1	0.2%	9.2%
COLIC	1	0.2%	9.4%
CONJUNCTIVITIS	2	0.3%	9.7%
CONTACT DERMATITIS	2	0.3%	10.1%
DENTAL ABSCESS	2	0.3%	10.4%
DYSENTERY	4	0.7%	11.1%
DYSMENORRHEA	2	0.3%	11.4%
FOREIGN BODY	1	0.2%	11.6%
GASTROENTERITIS	42	6.9%	18.5%
GASTROENTERITIS, DERMATITIS	1	0.2%	18.6%
GASTROENTERITIS, GONORRHEA	1	0.2%	18.8%
GASTROENTERITIS, HEADACHE	1	0.2%	19.0%
GASTROENTERITIS, OTITIS MEDIA	1	0.2%	19.1%
GASTROENTERITIS, STOMATITIS	1	0.2%	19.3%
GASTROENTERITIS, TINEA CORPORIS	1	0.2%	19.5%
GASTROENTERITIS, TONSILLITIS	1	0.2%	19.6%
GASTROENTERITIS, URTI	2	0.3%	20.0%
GIARDIASIS	1	0.2%	20.1%
GONORRHEA	31	5.1%	25.2%
GRANULOMA INGUINALE	1	0.2%	25.4%
HEADACHE	2	0.3%	25.7%
HERPES	1	0.2%	25.9%
HYPERTENSION	13	2.1%	28.1%
HYPERTENSION, ANXIETY	1	0.2%	28.2%
IMPETIGO	46	7.6%	35.8%
IMPETIGO, GASTROENTERITIS	1	0.2%	36.0%
IMPETIGO, SCABIES	1	0.2%	36.1%
IMPETIGO, STOMATITIS	1	0.2%	36.3%
IMPETIGO, URTI	2	0.3%	36.6%
IMPETIGO, SCABIES	1	0.2%	36.8%
IMPOTENCE	1	0.2%	37.0%
INFECTED LACERATION	5	0.8%	37.8%
LYMPHOGRANULOMA VENERIUM	1	0.2%	38.0%
MALAISE	3	0.5%	38.4%
MALARIA	2	0.3%	38.8%

NOTE instances of multiple diagnoses in patients.

MASTITIS	1	0.2%	38.9%
MUMPS	1	0.2%	39.1%
OSTEOARTHRITIS	10	1.7%	40.8%
OSTEOARTHRITIS, GASTROENTERITIS	1	0.2%	40.9%
OTITIS MEDIA	12	2.0%	42.9%
OTITIS MEDIA, AMOEBIASIS	1	0.2%	43.1%
OTITIS MEDIA, GASTROENTERITIS	1	0.2%	43.2%
OTITIS MEDIA, SCABIES	2	0.3%	43.6%
OTITIS MEDIA, THRUSH	1	0.2%	43.7%
PELLAGRA	2	0.3%	44.1%
PEPTIC ULCER DISEASE	17	2.8%	46.9%
PEPTIC ULCER DISEASE, HEADACHE	1	0.2%	47.0%
PEPTIC ULCER DISEASE, IMPETIGO	1	0.2%	47.2%
PID	24	4.0%	51.2%
PNEUMONIA	18	3.0%	54.1%
PNEUMONIA, ASTHMA	1	0.2%	54.3%
PNEUMONIA, OTITIS MEDIA	2	0.3%	54.6%
PNEUMONIA, UTI, PEPTIC ULCER	1	0.2%	54.8%
PUBIC LICE	1	0.2%	55.0%
SCABIES	33	5.4%	60.4%
SCABIES, HEADACHE	1	0.2%	60.6%
SCABIES, HEADACHE, IMPETIGO	1	0.2%	60.7%
SCABIES, IMPETIGO	20	3.3%	64.0%
SCABIES, URTI	2	0.3%	64.4%
SCABIES, URTI, GASTROENTERITIS	1	0.2%	64.5%
SCABIES, IMPETIGO	1	0.2%	64.7%
SPRAIN	1	0.2%	64.9%
SPRAINED ARM	1	0.2%	65.0%
SYPHILLIS	7	1.2%	66.2%
SYPHILLIS, PREGNANCY	1	0.2%	66.3%
SYPHILLIS, PUBIC LICE	1	0.2%	66.5%
TAPEWORMS	1	0.2%	66.7%
THRUSH	2	0.3%	67.0%
TINEA CAPITIS	2	0.3%	67.3%
TINEA CAPITIS, IMPETIGO	1	0.2%	67.5%
TINEA CAPITIS, MUMPS	1	0.2%	67.7%
TINEA CORPORIS	7	1.2%	68.8%
TINEA CORPORIS, GASTROENTERITIS	1	0.2%	69.0%
TINEA CORPORIS, HEADACHE	1	0.2%	69.1%
TINEA CORPORIS, PID	1	0.2%	69.3%
TINEA PEDIS	1	0.2%	69.5%
TONSILLITIS	22	3.6%	73.1%
TONSILLITIS, PEPTIC ULCER DISEASE	1	0.2%	73.3%
TONSILLITIS, R/O MALARIA	1	0.2%	73.4%
URTI	105	17.3%	90.8%
URTI, BACTERIAL CONJUNCTIVITIS	1	0.2%	90.9%
URTI, CONJUNCTIVITIS	2	0.3%	91.3%
URTI, DERMATITIS	1	0.2%	91.4%
URTI, GASTROENTERITIS	11	1.8%	93.2%
URTI, HEADACHE	1	0.2%	93.4%
URTI, IMPETIGO	3	0.5%	93.9%
URTI, SCABIES	4	0.7%	94.6%
URTI, TINEA CORPORIS	1	0.2%	94.7%
URTI, WORMS	3	0.5%	95.2%
URTI, SCABIES	1	0.2%	95.4%
UTI	8	1.3%	96.7%
UTI IN PREGNANCY	1	0.2%	96.9%
UTI, MONILIASIS	1	0.2%	97.0%
UTI, URTI	1	0.2%	97.2%
WORMS	15	2.5%	99.7%
WORMS, HEADACHE	1	0.2%	99.8%
WORMS, IMPETIGO	1	0.2%	100.0%

Appendix 4. Drugs Prescribed and Frequency of Use Overall in 606 Cases

DRUG1	Freq	Percent	Cum.
ADRENALINE	1	0.2%	0.2%
AMINOPHYLLINE	1	0.2%	0.3%
AMPICILLIN	2	0.3%	0.7%
ASA	7	1.2%	1.8%
BENZOIC ACID	3	0.5%	2.3%
BENZOIC ACID OINTMENT	2	0.3%	2.6%
BENZYL BENZOATE	35	5.8%	8.4%
BENZATHINE PENICILLIN	1	0.2%	8.6%
BENZATHINE PENICILLIN	80	13.2%	21.8%
CALAMINE LOTION	3	0.5%	22.3%
CHLORAMPHENICOL EYE OINTMENT	1	0.2%	22.4%
CHLORAMPHENICOL	3	0.5%	22.9%
CHLORAMPHENICOL EYE OINTMENT	1	0.2%	23.1%
CHLOROQUINE	1	0.2%	23.3%
CLOTRIMOXAZOLE	5	0.8%	24.1%
COTRIMOXAZOLE	91	15.0%	39.1%
DIPHENHYDRAMINE	53	8.7%	47.9%
ERYTHROMYCIN	10	1.7%	49.5%
GENTIAN VIOLET	1	0.2%	49.7%
GRISEOFULVIN	3	0.5%	50.2%
HYDROCHLOROTHIAZIDE	8	1.3%	51.5%
INDOMETHACIN	1	0.2%	51.7%
MAGNESIUM TRISILICATE	17	2.8%	54.5%
MEBENDAZOLE	17	2.8%	57.3%
METHYL DOPA	6	1.0%	58.3%
METHYLSALICYLATE OINTMENT	2	0.3%	58.6%
METRIFONATE	7	1.2%	59.7%
METRONIDAZOLE	16	2.6%	62.4%
METRONIDZOLE	1	0.2%	62.5%
MULTIVITAMIN	1	0.2%	62.7%
ORAL CONTRACEPTIVES	1	0.2%	62.9%
ORS	4	0.7%	63.5%
PARACETAMOL	22	3.6%	67.2%
PENICILLIN V K	57	9.4%	76.6%
PIPERAZINE	6	1.0%	77.6%
PRAZIQUANTEL	1	0.2%	77.7%
PROCAINE PENICILLIN G	49	8.1%	85.8%
PROMETHAZINE	12	2.0%	87.8%
SALBUTAMOL	1	0.2%	88.0%
TETANUS TOXOID	1	0.2%	88.1%
TETRACYCLINE	39	6.4%	94.6%
TETRACYCLINE	1	0.2%	94.7%
TOPICAL ANTIBIOTIC OINTMENT	17	2.8%	97.5%
TRIPLE SULFA	4	0.7%	98.2%
TRIPLE SULPHA	2	0.3%	98.5%
VITAMIN B COMPLEX	3	0.5%	99.0%
VITAMIN B COMPLEX INJECTION	6	1.0%	100.0%
Total	606	100.0%	

NOTE: Drugs are listed by whether they were prescribed as "Drug 1", "Drug 2", etc.

DRUG2	Freq	Percent	Cum.
	57	14.4%	14.4%
AMINOPHYLLINE	1	0.2%	14.5%

ASA	34	5.6%	20.1%
BENZOIC ACID	2	0.3%	20.5%
BENZYL BENZOATE	20	3.3%	23.8%
BENZATHINE PENICILLIN	11	1.8%	25.6%
CALAMINE LOTION	2	0.3%	25.9%
CALCIUM GLUCONATE	2	0.3%	26.2%
CHLORAMPHENICOL EYE OINTMENT	2	0.3%	26.6%
CHLOROQUINE	2	0.3%	26.9%
CLOTRIMOXAZOLE	1	0.2%	27.1%
CLOXACILLIN	1	0.2%	27.2%
COTRIMOXAZOLE	21	3.5%	30.7%
DIPHENHYDRAMINE	45	7.4%	38.1%
DIPHENHYRAMINE	1	0.2%	38.3%
ERYTHROMYCIN	1	0.2%	38.4%
FERROUS SULPHATE	3	0.5%	38.9%
FERROUS SUPHATE	1	0.2%	39.1%
FOLIC ACID	1	0.2%	39.3%
GENTIAN VIOLET	9	1.5%	40.8%
GLYCOETHYML MOUTHWASH	2	0.3%	41.1%
HYDROCHLOROTHIAZIDE	5	0.8%	41.9%
HYOCINE BUTYLBROMIDE	6	1.0%	42.9%
HYOSINE BUTYLBROMIDE	1	0.2%	43.1%
INDOMETHACIN	1	0.2%	43.2%
MAGNESIUM HYDROXIDE	3	0.5%	43.7%
MAGNESIUM TRISILICATE	5	0.8%	44.6%
MEBENDAZOLE	6	1.0%	45.5%
METHYL DOPA	1	0.2%	45.7%
METHYL SALICYLATE OINTMENT	2	0.3%	46.0%
METHYLATED SPIRITS	1	0.2%	46.2%
METHYLSALICYLATE OINTMENT	1	0.2%	46.4%
METRIFONATE	1	0.2%	46.5%
METRONIDAZOLE	9	1.5%	48.0%
MULTIVITAMIN	42	6.9%	55.0%
MULTIVITAMIN SYRUP	1	0.2%	55.1%
MYCOSTATIN	1	0.2%	55.3%
NICOTINIC ACID	1	0.2%	55.4%
ORS	15	2.5%	57.9%
PARACETAMOL	111	18.3%	76.2%
PENICILLIN V K	16	2.6%	78.9%
PIPERACINE	2	0.3%	79.2%
POTASSIUM CHLORIDE	7	1.2%	80.4%
POTASSIUM CITRATE	19	3.1%	83.5%
PROBENECID	5	0.8%	84.3%
PROBENICID	1	0.2%	84.5%
PROCAINE PENICILLIN G	9	1.5%	86.0%
PROMETHACINE	31	5.1%	91.1%
PROMETHAZINE CREAM	1	0.2%	91.3%
SALBUTAMOL	5	0.8%	92.1%
SALINE NOSE DROPS	1	0.2%	92.2%
TETMASOL	5	0.8%	93.1%
TETRACYCLINE	3	0.5%	93.6%
TOPICAL ANTIBIOTIC OINTMENT	22	3.6%	97.2%
TRIPLE SULFA	2	0.3%	97.5%
TRIPLE SULPHA	1	0.2%	97.7%
VITAMIN B COMPLEX	3	1.5%	99.0%
VITAMIN B COMPLEX INJECTION	4	0.7%	99.7%
ZINC OXIDE	2	0.3%	100.0%

Total	608	100.0%	

DRUGS	Freq	Percent	Cum.
	238	47.5%	47.5%
ACETARSOL VAGINAL PESSARY	1	0.2%	47.7%
ALUMINUM HYDROXIDE	1	0.2%	47.9%
AMINOPHYLLINE	1	0.2%	48.0%
ASA	27	4.5%	52.5%
BENZOIC ACID	2	0.3%	52.8%
BENZYL BENZOATE	3	1.3%	54.1%
BENZYL PENICILLIN	1	0.2%	54.3%
CALAMINE LOTION	4	0.7%	55.0%
CALCIUM GLUCONATE	1	0.2%	55.1%
COTRIMOXAZOLE	1	0.2%	55.3%
DICYCLOMINE	1	0.2%	55.4%
DIPHENHYDRAMINE	20	3.3%	58.7%
FERROUS SULPHATE	4	0.7%	59.4%
FOLIC ACID	1	0.2%	59.6%
GENTIAN VIOLET	7	1.2%	60.7%
GLYCOETHYMOL MOUTHWASH	2	0.3%	61.1%
HYDROCHLOROTHIAZIDE	1	0.2%	61.2%
HYOCINE BUTYLBROMIDE	1	0.2%	61.4%
MAGNESIUM TRISILICATE	7	1.2%	62.5%
MEBENDAZOLE	10	1.7%	64.2%
METHYLSALICYLATE OINTMENT	1	0.2%	64.4%
METRONIDAZOLE	1	0.2%	64.5%
MIST POTASSIUM CITRATE	2	0.3%	64.9%
MULTIVITAMIN	1	0.2%	65.0%
MULTIVITAMIN	33	5.4%	70.5%
ORS	38	6.3%	76.7%
PARACETAMOL	72	11.9%	88.6%
PENICILLIN V K	1	0.2%	88.8%
PIPERAZINE	1	0.2%	88.9%
POTASSIUM CHLORIDE	5	0.8%	89.6%
POTASSIUM CITRATE	5	0.8%	90.6%
PROCAINE PENICILLIN G	1	0.2%	90.8%
PROMETHAZINE	17	2.8%	93.6%
RESERPINE	1	0.2%	93.7%
SALBUTAMOL	1	0.2%	93.9%
SALINE NOSE DROPS	1	0.2%	94.1%
TETANUS TOXOID	1	0.2%	94.2%
TETMASOL	3	0.5%	94.7%
TETRACYCLINE	4	0.7%	95.4%
THROAT LOZENGES	2	0.3%	95.7%
TOPICAL ANTIBIOTIC OINTMENT	5	0.8%	96.5%
VAGINAL PESSARY	2	0.3%	96.9%
VITAMIN B COMPLEX	4	0.7%	97.5%
VITAMIN B COMPLEX INJECTION	7	1.2%	98.7%
VITAMIN C	5	0.8%	99.5%
ZINC OXIDE	3	0.5%	100.0%
Total	506	100.0%	

DRUGS	Freq	Percent	Cum.
	497	82.0%	82.0%
ASA	6	1.0%	83.0%

BENZYL BENZOATE		3	0.5%	83.5%
CALCIUM GLUCONATE		3	0.5%	84.0%
CHLORAMPHENICOL EYE OINTMENT		1	0.2%	84.2%
DIPHENHYDRAMINE		10	1.7%	85.8%
FERROUS SULPHATE		1	0.2%	86.0%
FOLIC ACID		1	0.2%	86.1%
GENTIAN VIOLET		1	0.2%	86.3%
GLYCOTHYMOL		1	0.2%	86.5%
MAGNESIUM TRISILICATE		1	0.2%	86.6%
MEBENDAZOLE		3	0.5%	87.1%
METHYL SALICYLATE		1	0.2%	87.3%
METHYL SALICYLATE OINTMENT		1	0.2%	87.5%
MULTIVITAMIN		14	2.3%	89.8%
ORS		20	3.3%	93.1%
PARACETAMOL		14	2.3%	95.4%
POTASSIUM CITRATE		1	0.2%	95.5%
PROMETHAZINE		10	1.7%	97.2%
PROMETHAZINE INJECTION		1	0.2%	97.4%
SALINE NOSE DROPS		2	0.3%	97.7%
THROAT LOZENGES		2	0.3%	98.0%
TOPICAL ANTIBIOTIC OINTMENT		2	0.3%	98.3%
VITAMIN B COMPLEX		3	0.5%	98.8%
VITAMIN B COMPLEX INJECTION		3	0.5%	99.3%
VITAMIN C		4	0.7%	100.0%

Total		606	100.0%	

DRUGS		Freq	Percent	Cum.
		590	97.4%	97.4%
ASA		1	0.2%	97.5%
BENZYL BENZOATE		1	0.2%	97.7%
BENZYL PENICILLIN		1	0.2%	97.9%
CALCIUM GLUCONATE		1	0.2%	98.0%
DIAZEPAM		1	0.2%	98.2%
MULTIVITAMIN		2	0.3%	98.5%
ORS		3	0.5%	99.0%
PARACETAMOL		4	0.7%	99.7%
VITAMIN B COMPLEX		1	0.2%	99.8%
VITAMIN B COMPLEX INJECTION		1	0.2%	100.0%

Total		606	100.0%	

**EXAMPLES OF PRESCRIBING PATTERNS ACCORDING TO
"APPROPRIATENESS" CATEGORY**

* = According to current MOH prescribing references

1. "PRESCRIBED APPROPRIATELY":

- o Benzyl Benzoate for scabies
- o Cotrimoxazole for UTI

2. "PRESCRIBED INAPPROPRIATELY:

- o Clotrimazole for tinea corporis
- o Benzathine penicillin for impetigo
- o Cotrimoxazole for gonorrhoea
- o Cotrimoxazole for UTI in pregnancy
- o Indomethacin for osteoarthritis

3. "UNDERPRESCRIBED"

- o Procaine penicillin for gonorrhoea, but no probenicid
- o Erythromycin for chancroid for only 7 days
- o Cotrimoxazole for otitis media for only 7 days
- o Tetracycline for pelvic inflammatory disease for only 7 days

4. "OVERPRESCRIBED AND POTENTIALLY HARMFUL:

- o For URTI in young infants - Diphenhydramine + "Cold and Flu"(paracetamol plus promethazine) + Paracetamol + Benzathine penicillin
- o Combination of ASA and Indomethacin for Osteoarthritis in adults
- o Use of Cotrimoxazole + Potassium citrate + Paracetamol for UTI in pregnancy
- o Use of ASA in adults with Osteoarthritis and Peptic Ulcer Disease
- o For Gastroenteritis in infants, use of ORS + Benzathine penicillin + Cotrimoxazole + Metronidazole + Paracetamol
- o For combined Hypertension and Peptic Ulcer Disease, use of Hydrochlorothiazide + Potassium + Magnesium trisilicate + Hyoscine butylbromide + Paracetamol

5. "OVERPRESCRIBED AND NOT POTENTIALLY HARMFUL":

- o Combination of Tetracycline and Cotrimoxazole for Gonorrhoea
- o Combination of Procaine penicillin + Probenicid + Tetracycline for Gonorrhoea
- o For URTI in adults, use of Benzathine penicillin + DPH + Paracetamol + Multivitamin
- o For URTI in children, use of DPH + Paracetamol + Penicillin V K or Cotrimoxazole + Benzathine penicillin + Multivitamin
- o For Hypertension in adults, Hydrochlorothiazide + Potassium + Aldomet + Paracetamol + Vitamin B complex injection + Multivitamin
- o For Impetigo in children, use of Benzathine penicillin + Penicillin V K + Topical antibiotic ointment