Problems of Irrational Drug Use

Session Guide

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PURPOSE AND CONTENT

In both the developed and the developing world, medically inappropriate, ineffective, and economically inefficient use of pharmaceuticals commonly occurs in health care facilities. The costs of such irrational drug use are enormous in terms of both scarce resources and the adverse clinical consequences of therapies that may have real risks but no objective benefits.

This session will sensitize participants to the reality of medication misuse in the developing world, drawing on existing examples as well as inappropriate prescribing patterns in their own countries. In addition to providing an overview of problem areas in medication use, this session will also identify some of the more important causes that underlie such misuse. To improve the quality and efficiency of drug therapy, it is necessary to have a thorough understanding of the existing patterns of therapy, the magnitude of the ways in which such therapy departs from optimal practice, and the factors (clinical, psychological, political, economic, and cultural) that underlie these patterns.

OBJECTIVES

This session will develop your ability to—

1. Identify the magnitude and nature of inappropriate drug utilization.
2. Understand the adverse impacts of inappropriate use of drugs.
3. Describe the factors that influence the clinical decision-making process in drug use.
4. Identify factors that influence the behavior of prescribers and patients.
5. Relate these issues to specific medication use problems.

PREPARATION

1. Read the Session Notes.
2. Prepare a list of medication use problems to be referred to in the Activities section that follows.

FURTHER READINGS

Laing RO. Rational drug use: an unsolved problem. *Trop Doct*. 1990; 20:101–3.

Avorn J, Harvey K, Soumerai, SB et al. Information and education as determinants of antibiotic use. *Rev Infect Dis*. 1987; 9(S3):S286–96.

Vance MA, Millington WR. Principles of irrational drug therapy*. Int J Health Serv*. 1986;16(3):355–61.

Quick JD, Foreman P, Ross-Degnan D, et al. *Where Does the Tetracycline Go?: Health Center Prescribing and Child Survival in East Java and West Kalimantan, Indonesia*. Boston: Management Sciences for Health, October 1988.

Ross-Degnan, D, Laing RO, Quick, JD et al. A strategy for promoting improved pharmaceutical use: The International Network for Rational Use of Drugs. *Soc Sci and Med*. 1992 35 (11) 1329–41.

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SESSION NOTES

BACKGROUND

Medically inappropriate, ineffective, and economically inefficient use of pharmaceuticals is commonly observed in health care systems throughout the world, especially in developing countries. However, various forms of inappropriate prescribing often remain unnoticed by those who are involved in health sector decision making or delivery of health services. This problem will usually come to the attention of health decision makers or managers when there is an acute shortage of pharmaceutical budget that requires action for cost-efficiency.

Promoting appropriate use of drugs in the health care system is needed not only because of the financial reasons with which policy makers and managers are usually most concerned. Appropriate use of drugs is also one essential element in achieving quality of health and medical care for patients and the community. Obviously, quality of care is of concern to practitioners. Actions or intervention programs to promote the appropriate use of drugs should, therefore, be continuously implemented and systematically incorporated as an integral part of the health care system.

This session serves as an introduction to the entire issue of Promoting Rational Use of Drugs in developing countries. The definition of rational use will be discussed, and a description of irrational drug use will build on that definition, with common examples highlighted. The session addresses the impacts, as well as the underlying factors, of irrational use of drugs.

A series of examples will be presented, ranging from general to specific examples for ARI, diarrhea, and other common illnesses.

Defining Rational Use of Drugs

The terms "appropriate" and "rational" use of drugs will be used interchangeably throughout the session. What is rational use of drugs? What does rational mean? People may have different perceptions and meanings regarding rational use of drugs, or more specifically regarding rational prescribing. However, the Conference of Experts on the Rational Use of Drugs, convened by the World Health Organization in Nairobi in 1985, defined rational use as follows:

Rational use of drugs requires that patients receive medicines 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.

This is very much a medical-model definition.

The requirements for rational use will be fulfilled if the process of prescribing is appropriately followed. This process includes steps in defining a patient's problems (or

diagnosis); in defining effective and safe treatments (drugs and nondrugs); in selecting appropriate drugs, dosage, and duration; in writing a prescription; in giving patients adequate information; and in planning to evaluate treatment responses.

The definition implies that rational use of drugs, especially rational prescribing, should meet certain criteria as follows:

- *Appropriate indication*. The decision to prescribe drug(s) is entirely based on medical rationale and the drug therapy is an effective and safe treatment.
- *Appropriate drug.* The selection of drugs is based on efficacy, safety, suitability, and cost considerations.
- *Appropriate patient*. No contraindications exist, the likelihood of adverse reactions is minimal, and the drug is acceptable to the patient.
- *Appropriate patient information*. Patients are provided with relevant, accurate, important and clear information regarding their conditions and the medication(s) that are prescribed.
- *Appropriate evaluation.* The anticipated and unexpected effects of medications are appropriately monitored and interpreted.

Unfortunately, in the real world, prescribing patterns do not always conform to these criteria and can be classified as inappropriate or irrational prescribing. Irrational prescribing may be regarded as "pathological" prescribing when the above-mentioned criteria are not fulfilled. Common patterns of irrational prescribing may, therefore, be manifested in the following forms:

- The use of drugs when no drug therapy is indicated, e.g., antibiotics for viral upper respiratory infections
- The use of the wrong drug for a specific condition requiring drug therapy, e.g., tetracycline in childhood diarrhea requiring ORS
- The use of drugs with doubtful or unproven efficacy, e.g., the use of antimotility agents in acute diarrhea
- The use of drugs of uncertain safety status, e.g., use of dipyrone (Baralgan, etc.)
- Failure to provide available, safe, and effective drugs, e.g., failure to vaccinate against measles or tetanus, or failure to prescribe ORS for acute diarrhea
- The use of correct drugs with incorrect administration, dosages, and duration, e.g., the use of IV metronidazole when suppositories or oral formulations would be appropriate
- The use of unnecessarily expensive drugs, e.g. the use of a third generation, broad-spectrum antimicrobial when a first-line, narrow spectrum agent is indicated

Some examples of commonly encountered inappropriate prescribing practices in many health care settings include—

- Overuse of antibiotics and antidiarrheals for nonspecific childhood diarrhea
- Indiscriminate use of injections, e.g., in malaria treatment
- Multiple or over-prescription

- Excessive use of antibiotics for treating minor ARI
- Multivitamins and tonics for malnutrition
- Unnecessary use of expensive antihypertensives

The drug use system is complex and varies from country to country. Drugs may be imported or manufactured locally. The drugs may be used in hospitals or health centers, by private practitioners and often in a pharmacy or drug shop where over the counter preparations are sold. In some countries all drugs are available over the counter. Finally, the public includes a very wide range of people with differing knowledge, beliefs, and attitudes about medicines. Consumers may have a very different perspective of what is rational.

Factors Underlying Irrational Use of Drugs

Many different factors affect the irrational use of drugs. In addition, different cultures view drugs in different ways, and this can affect the way drugs are used.

The major forces can be categorized as those deriving from patients, prescribers, the workplace, the supply system including industry influences, regulation, drug information and misinformation, and combinations of these factors.

- Patients
  - drug misinformation
  - misleading beliefs
  - patient demands/expectations
- Prescribers
  - lack of education and training
  - inappropriate role models
  - lack of objective drug information
  - generalization of limited experience
  - misleading beliefs about drugs efficacy
- Workplace
  - heavy patient load
  - pressure to prescribe
  - lack of adequate lab capacity
  - insufficient staffing
- Drug Supply System
  - unreliable suppliers
  - drug shortages
  - expired drugs supplied
  -
- Drug Regulation
  - nonessential drugs available
  - informal prescribers
  - lack of regulation enforcement
- Industry
  - promotional activities
  - misleading claims

All of these factors are affected by changes in national and global practices. For example, the frequent use of injections is declining in many African countries because of the fear of AIDS. In some countries, however, the use of injectibles remains high due to false assumption of prescribers that injections will improve patient satisfaction and that they are always expected by the patients.

Impact of Inappropriate Use of Drugs
The impact of this irrational use of drugs can be seen in many ways:

- Reduction in the quality of drug therapy leading to increased morbidity and mortality
- Waste of resources leading to reduced availability of other vital drugs and increased costs
- Increased risk of unwanted effects such as adverse drug reactions and the emergence of drug resistance, e.g., malaria or multiple drug resistant tuberculosis
- Psychosocial impacts, such as when patients come to believe that there is “a pill for every ill.” This may cause an apparent increased demand for drugs.

Activity 1. Meaning of Appropriate Use
[See page 18.]

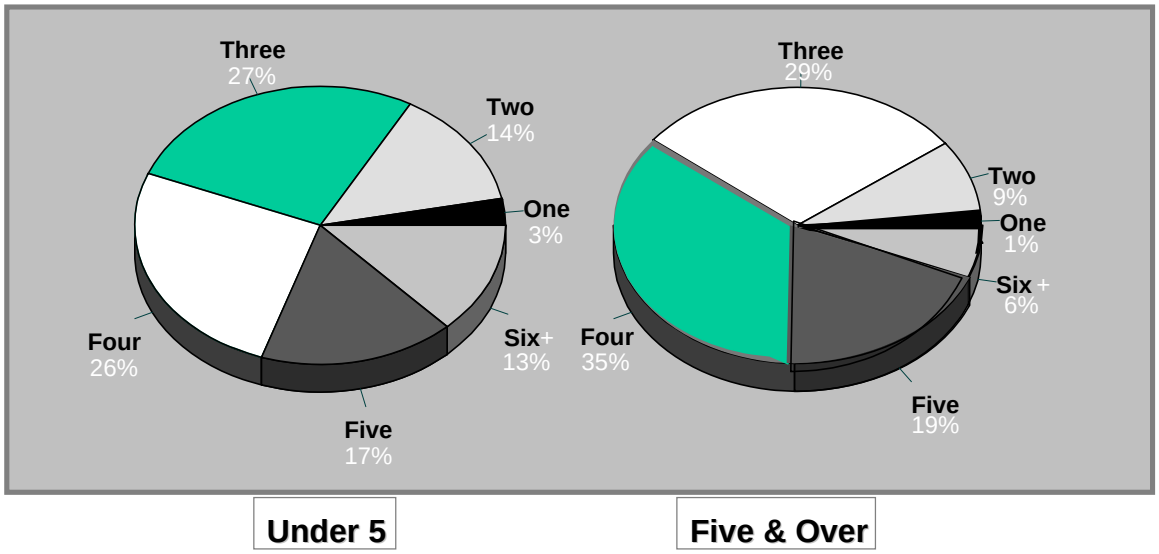
EXAMPLES OF IRRATIONAL DRUG USE

There are various forms of irrational use of drugs. Drug use can be measured in general and also for specific diagnoses. The following examples illustrate the extent of problems of misuse and overuse in studies from around the world.

All Diseases

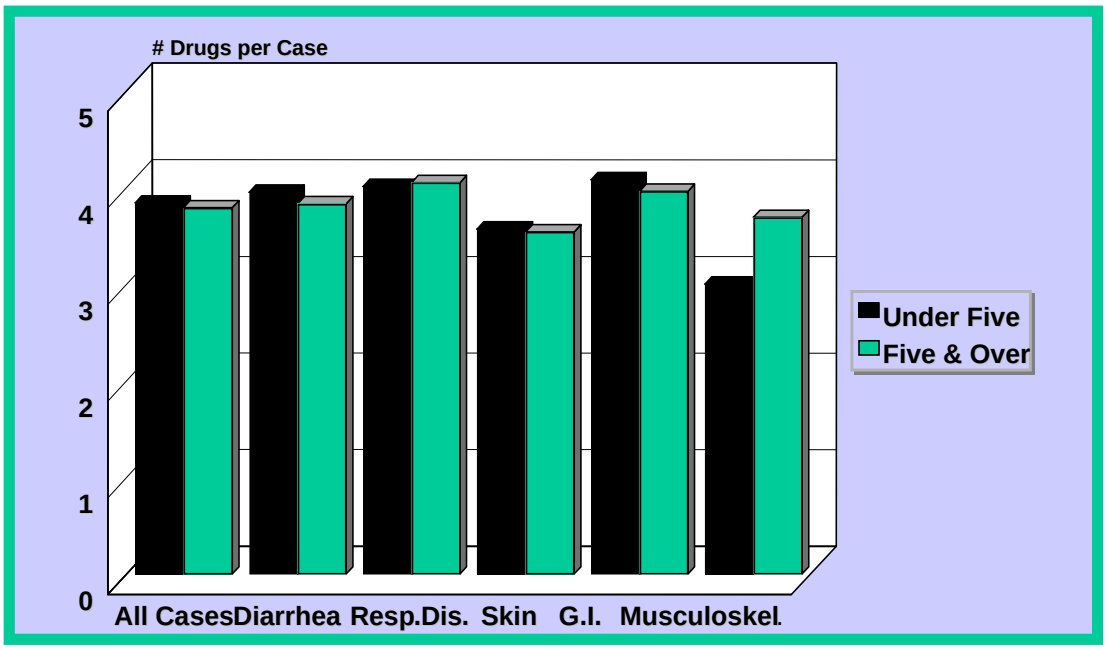
Polypharmacy
The number of drugs per case or per episode describes the pattern of polypharmacy, where more than one drug is prescribed (often unnecessarily) for a condition. In one study in Indonesia, the occurrence of polypharmacy or multiple prescribing was obvious. The average number of drugs per case was 3.8 both for the under-five and the over-five age groups. (For more information on the study, see Quick, Foreman, Ross-Degnan, et al. listed under Further Readings on p. 2.)

Drugs per Case, by Age Group, Indonesia, 1987



When the number of drugs per case was broken down by diagnosis, very little change was noted. The general pattern of polypharmacy occurs almost independent of diagnosis.

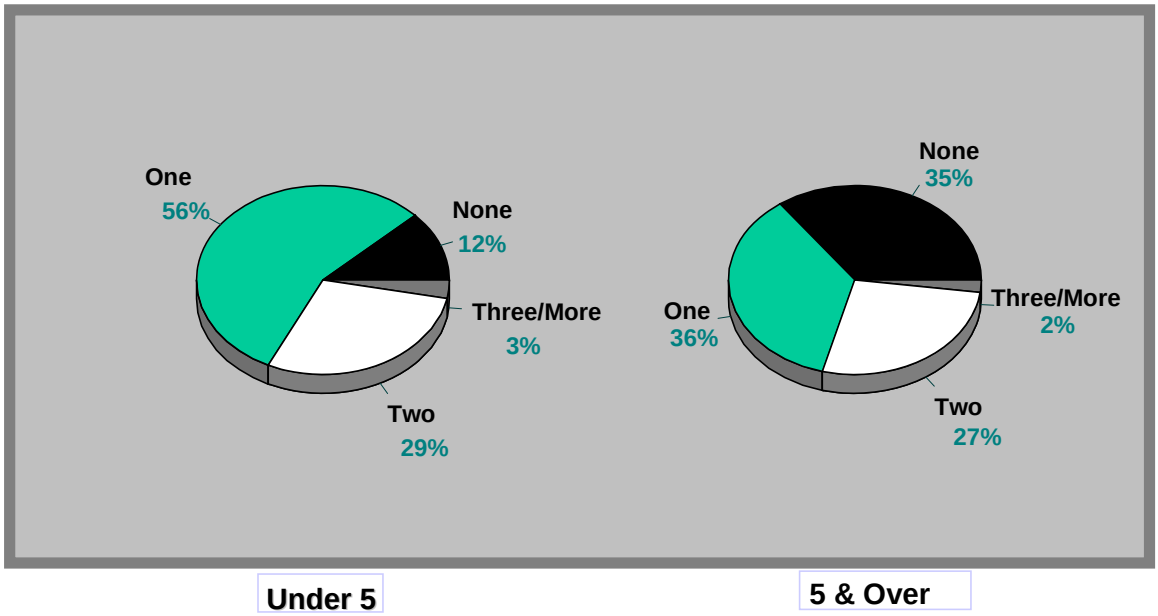
Drugs per Case, by Diagnosis, Indonesia, 1987



Antibiotic Use

Antibiotic use is a common drug use indicator. Excessive antibiotic use leads to resistance.

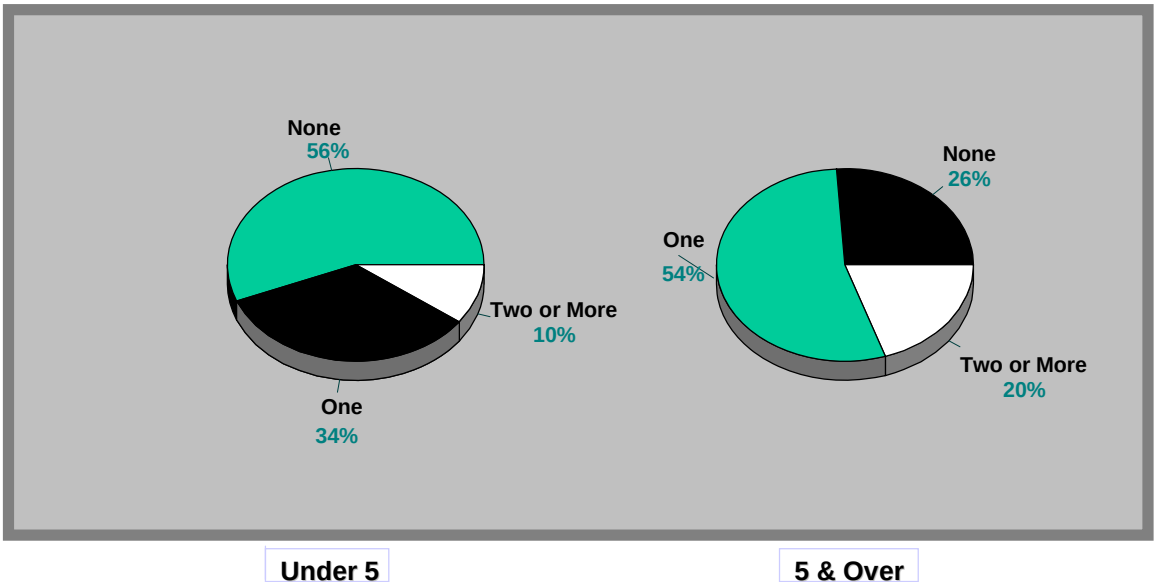
Percentage of Patients Receiving Antibiotics, Indonesia, 1987



Injection Use

Injection use is another simple indicator of therapeutic practices. In the study from Indonesia mentioned above, almost half of the under-fives and more than 70 percent of the over-five age group received at least one injection.

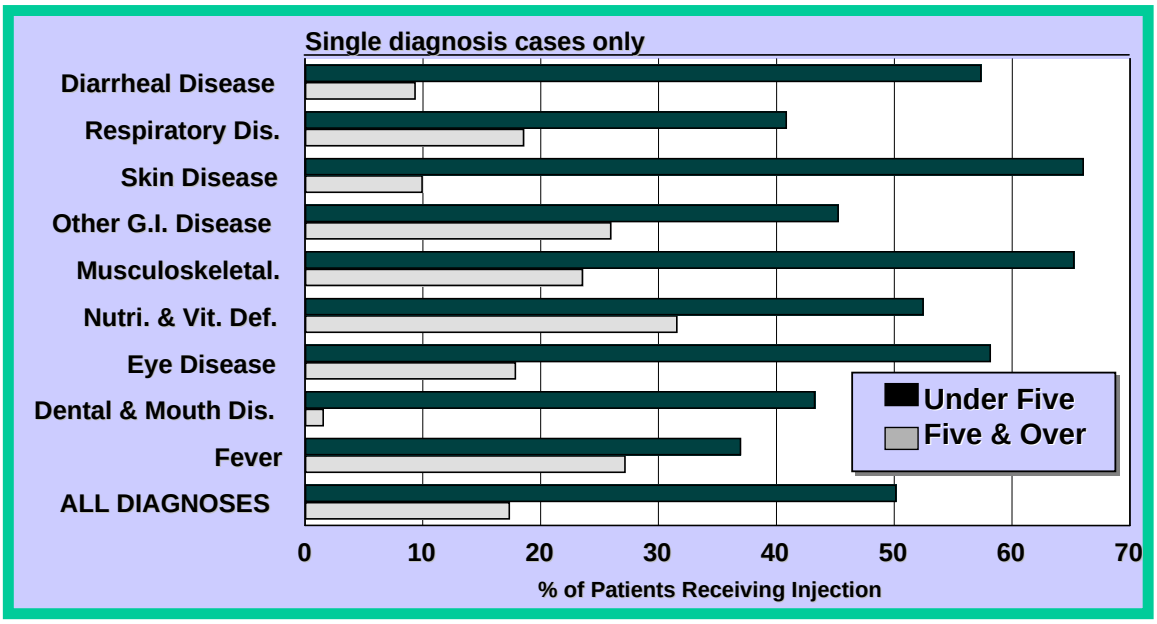
Percentage of Patients Receiving Injections, Indonesia, 1987



When injection use was broken down by diagnoses, overuse was seen to be common for many illnesses.

The reasons for the overuse of injections are complex. Prescribers tend to believe that patients expect and are satisfied by receiving injections. Some patients do ask for injections. Others dislike injections but accept them because "the doctor knows best." Attitudes vary greatly toward injections across different societies.

Injection Use, by Diagnosis, Indonesia, 1987



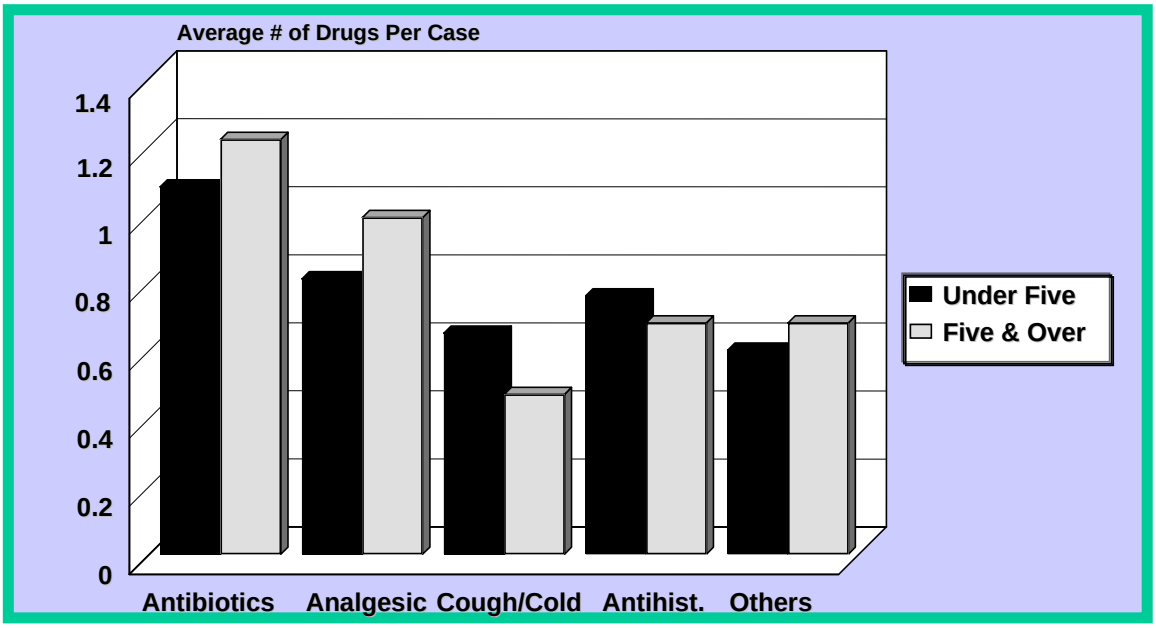
Disease-Specific Indicators

When drug use is studied for specific illnesses, useful insight can be gained.

Drug Use in ARI

Many drugs, particularly antibiotics, are used to treat minor upper respiratory tract infections. A major portion of the cost of ARI treatment is due to excessive use of antibiotics.

ARI Treatment Pattern, Indonesia, 1987



In many African countries, malaria is treated with injectible chloroquin rather than adequate doses of oral chloroquin. This leads to apparent treatment failure, which in Ghana is called “go slow malaria.”

Poor Compliance with Tuberculosis Therapy

In many countries with tuberculosis programs, less than 50 percent of patients fully complete their course of therapy, which may last for six to eight months. This results in treatment failures and the emergence of multiple resistant organisms (MDRTB). To counteract this dangerous trend, WHO and the International Union Against Tuberculosis have popularized the use of the Directly Observed Treatment Short course (DOTS). In this system, TB patients are directly supervised taking their medication. When this is done, cure rates of over 90 percent are possible. However, effectiveness has varied widely across different environments. (For more information about DOTS, visit the Web site http://www.who.ch/gtb/dots/index.htm.)

Underuse of Effective Drugs

In both developed and developing countries, some conditions for which effective medicines exist are undertreated. Examples of these include hypertension, depression, and anemia during pregnancy. These conditions can be life threatening and severely disabling. They are underdiagnosed because many health workers do not check for them regularly or consider them serious. However, these conditions are very amenable to therapy. Thus, failure to treat serious conditions is another form of irrational drug use.

Hospital Problems

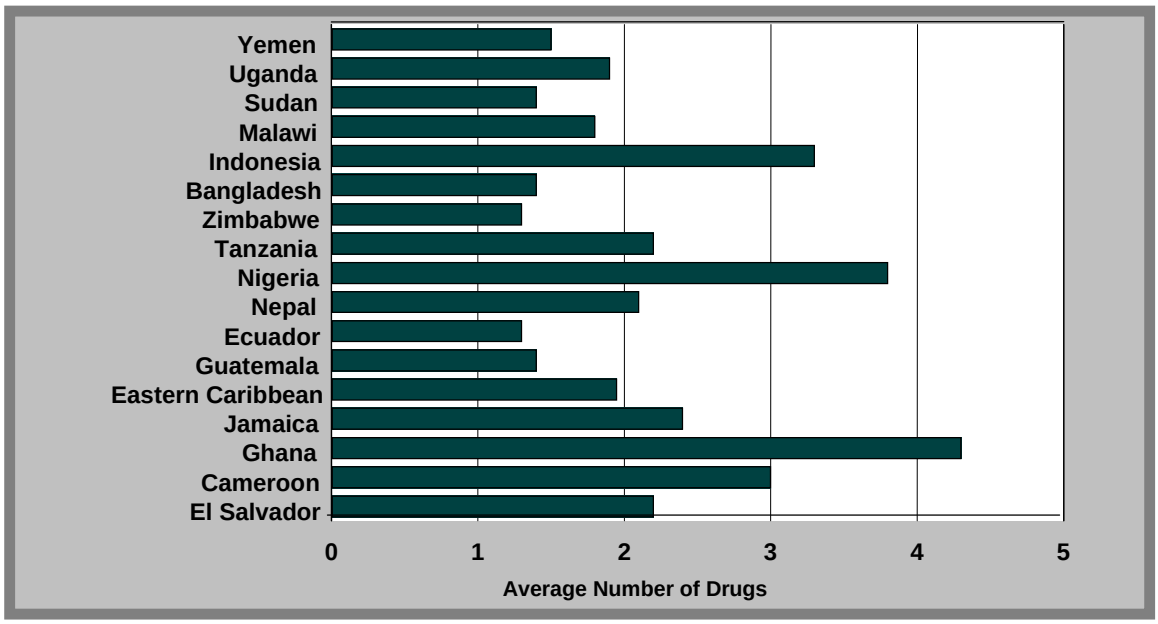
Drug use in hospitals has been a neglected area. However in both developed and developing countries, the misuse of antibiotics, particularly for surgical prophylaxis, has been widely reported. Hospitals have been able to improve antibiotic use through the use of formularies.

DRUG USE PATTERNS IN DEVELOPING COUNTRIES

In order to encourage a standard approach to measuring problems in drug use, INRUD coordinated the development of standard drug use indicators and encouraged indicator studies in a number of developing countries during the period 1990–1993. (Drug use indicators are described in more detail in other sessions.) These results are presented below.

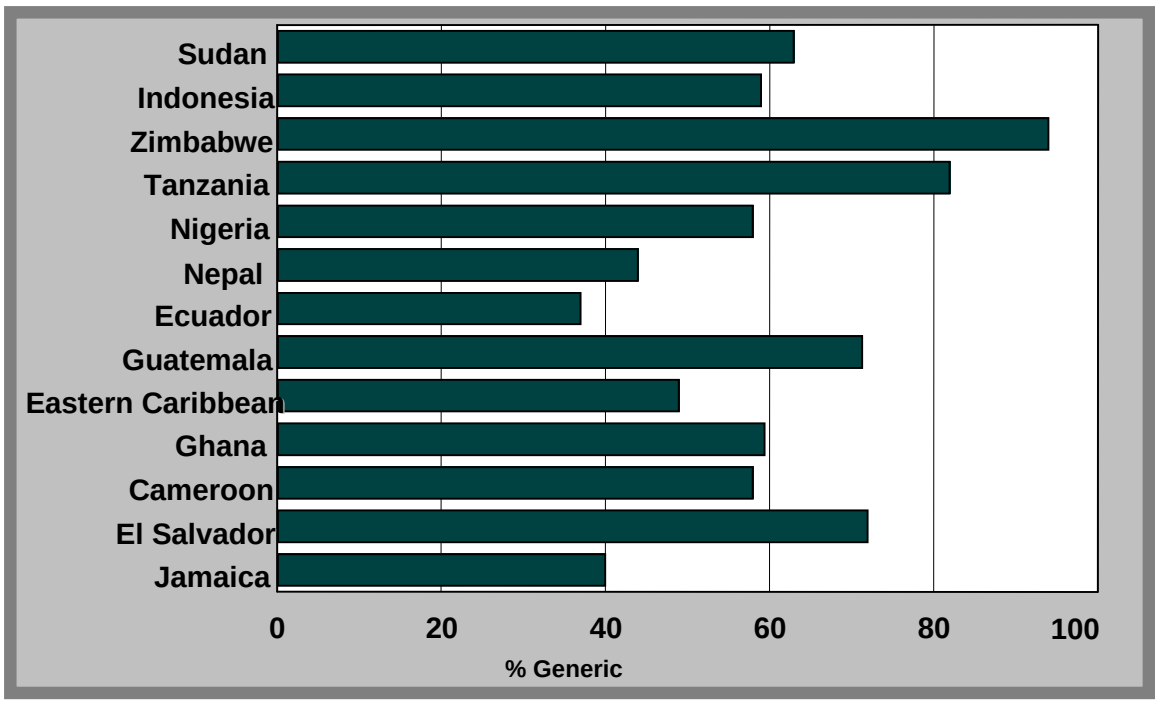
The average number of drugs prescribed in public sector facilities in most of these countries ranges from 1.3 to 2 drugs. However, Indonesia, Nigeria, and Ghana differ significantly from this average.

Average Number of Drugs per Patient, 1990–1993



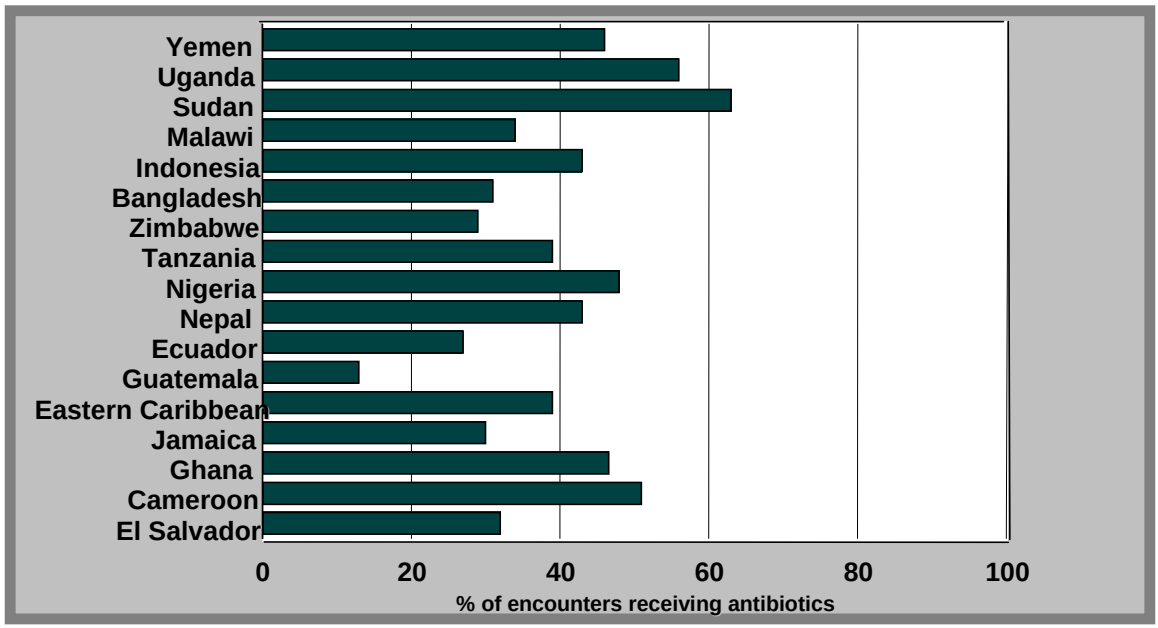
The use of generics varies from 37 percent to 94 percent. This tends to depend on government regulations and the enforcement efforts in the country.

Percentage Prescribed as Generics, 1990–1993



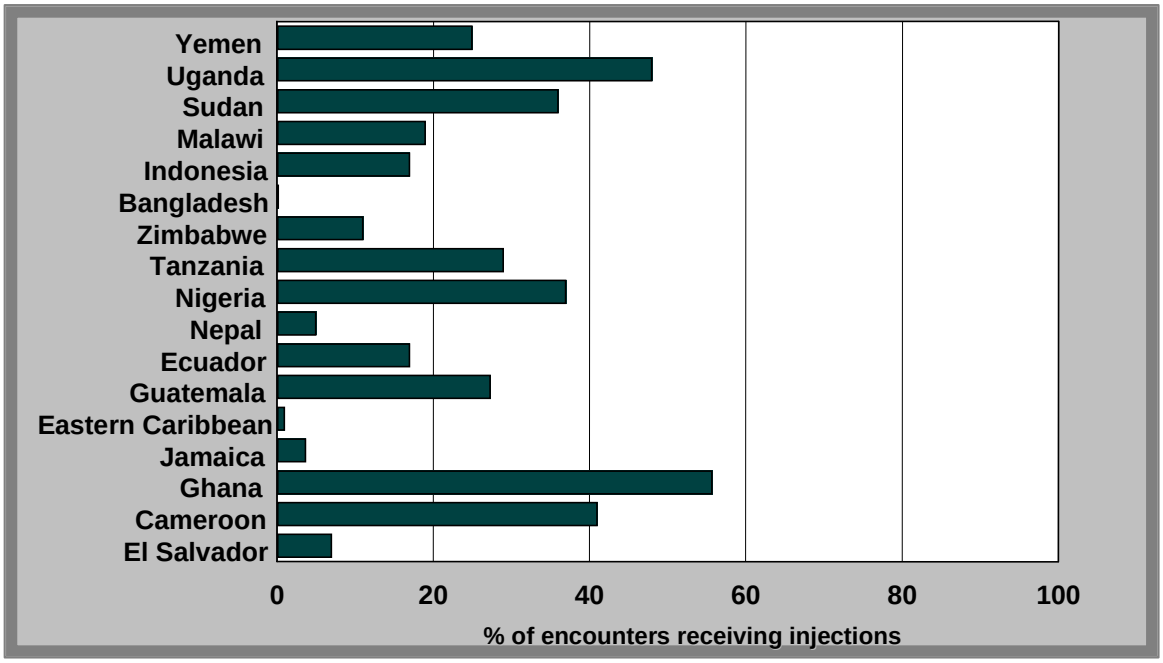
Antibiotics are commonly used in developing countries due to the high load of infection. Most countries tend to lie in the range of 25 to 40 percent, although some are considerably higher.

Percentage Receiving Antibiotics, 1990–1993



The use of injections varies considerably and seems to be declining in many countries. The use of injections is also affected by the availability of injectible drugs, syringes, and needles. However, rates as high as 48 percent, as occurred in Uganda in 1990, are clearly too high, particularly in the HIV/AIDS era.

Percentage Receiving Injections, 1990–1993



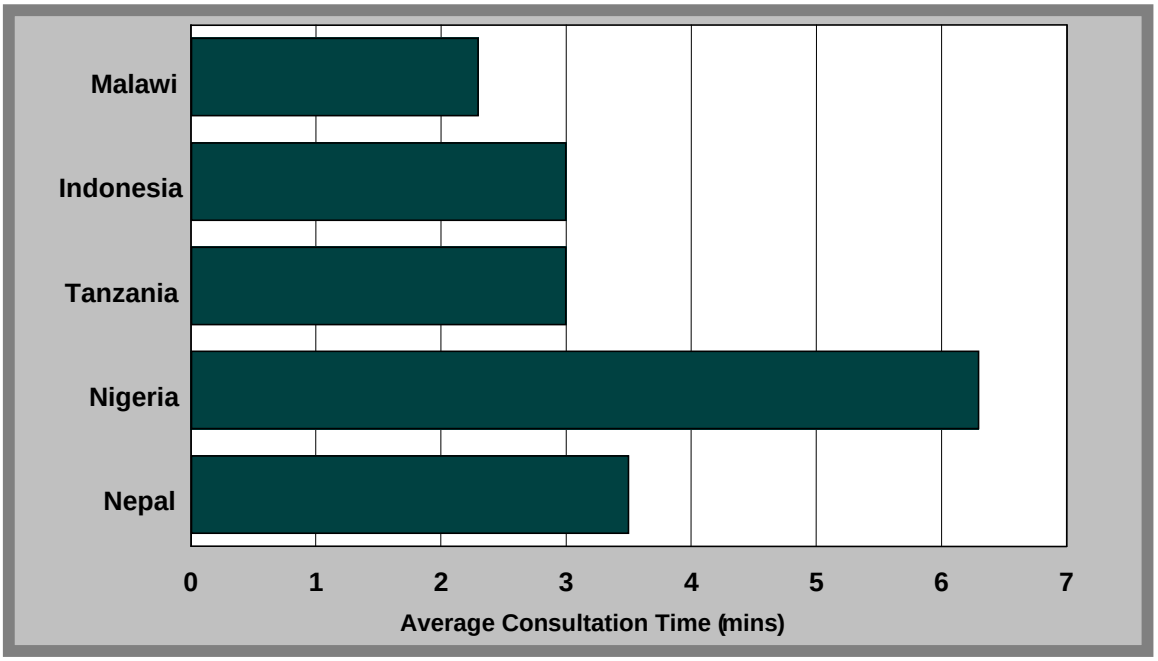
Patient Care Indicators

More recently efforts have been made to quantify the consulting and dispensing process.

Consultation Time

The consultation time in most country studies varies from 2.3 to 3.5 minutes. The events occurring during this time frequently do not include physical examinations.

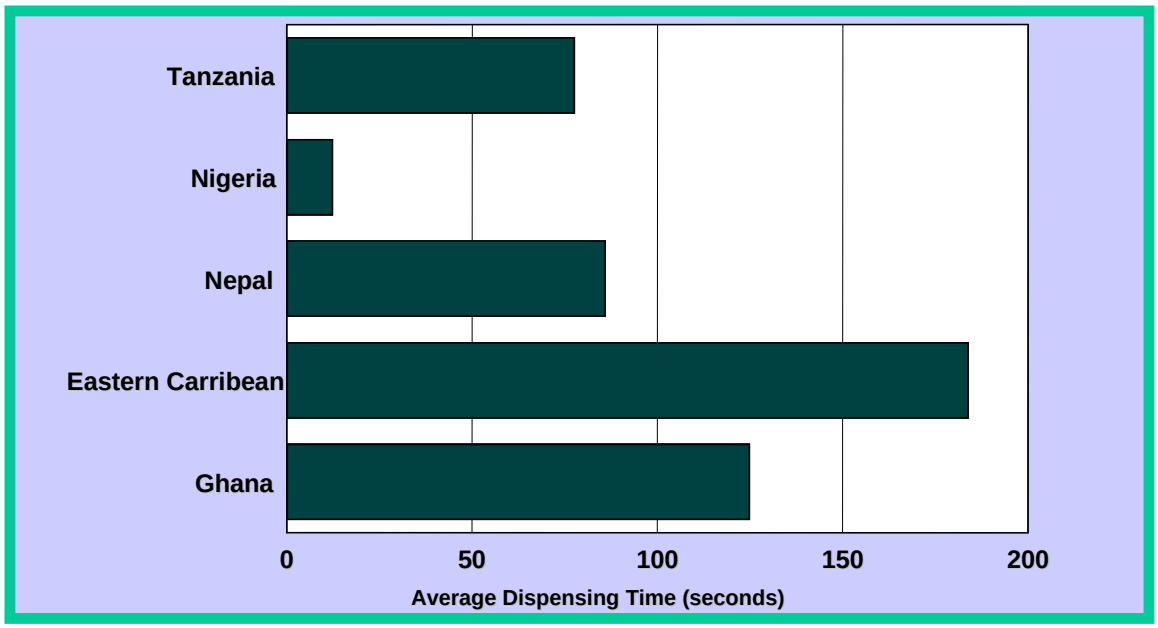
Average Consultation Time, 1990–1993



Dispensing Time

Dispensing has been observed in a limited number of countries. The average times vary from 12 seconds to 86 seconds, which is a short time to convey what may be complex information about prescribed drugs to the patient.

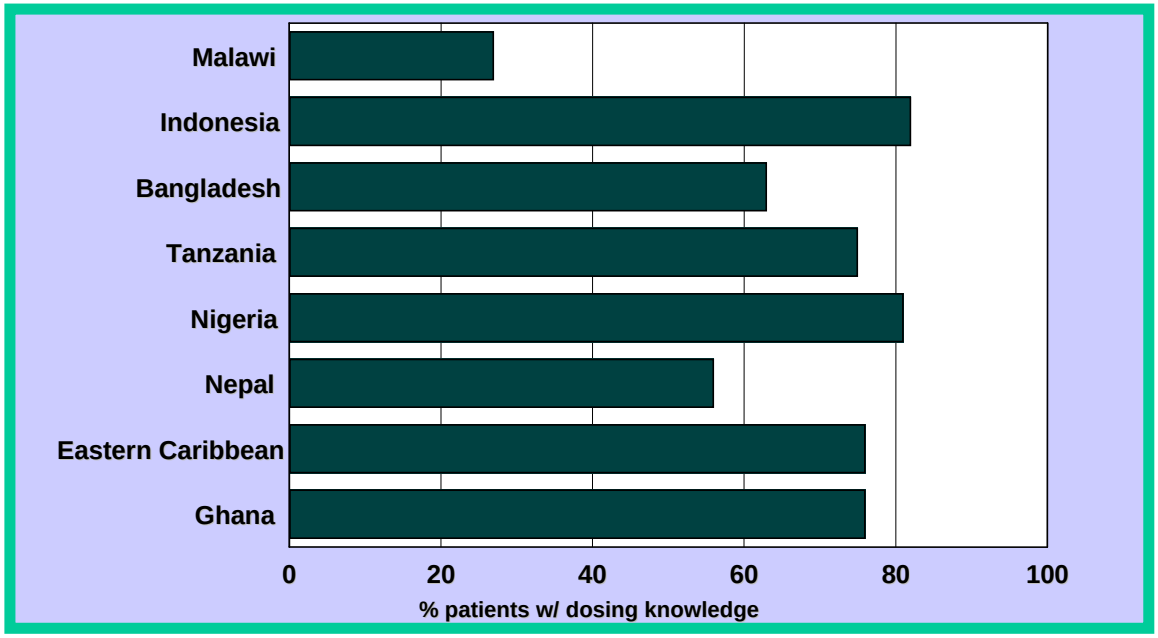
Average Dispensing Time, 1990–1993



Patients' Drug Dosing Knowledge

When patients are assessed as to their knowledge of how they should take drugs, between 27 percent and 83 percent know how and when to take their drugs. Potentially, this could result in major misuse of drugs.

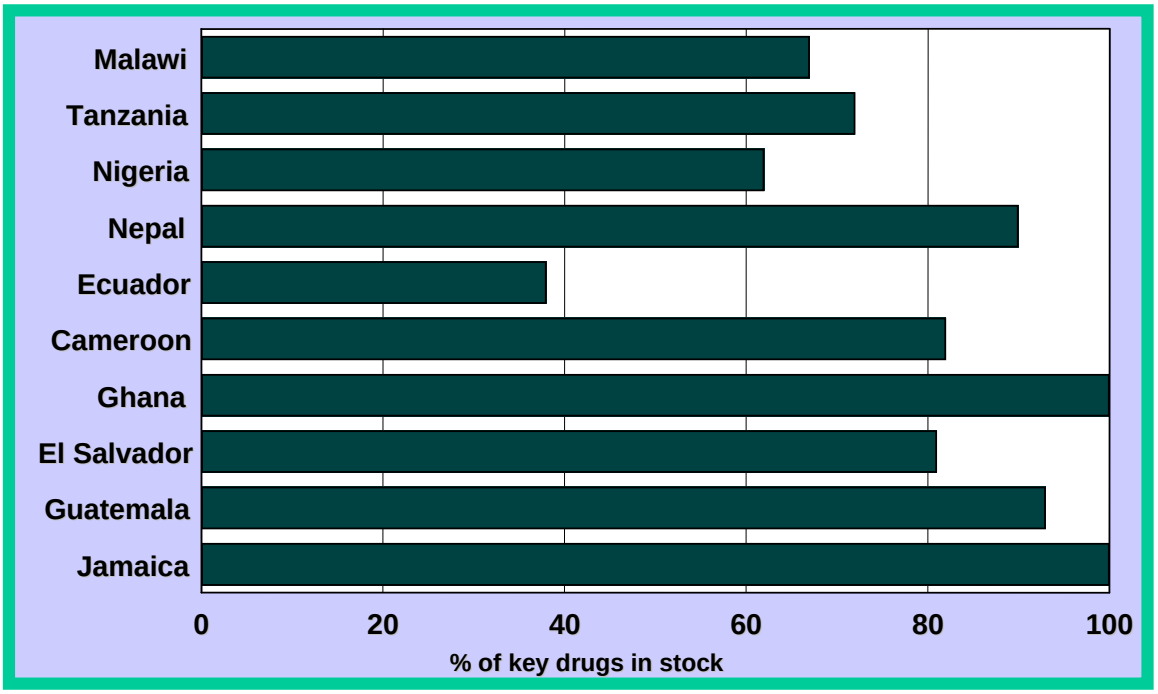
Percentage Patients with Drug Dosing Knowledge, 1990–1993



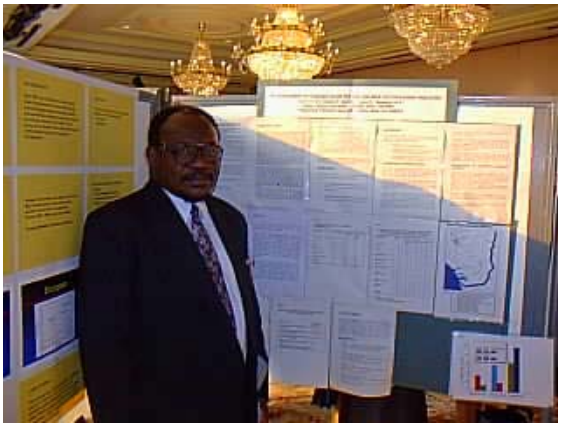
Facility Indicators

Drug treatment may vary according to the availability of drugs. In a series of surveys of the availability of 10 to 15 key drugs, the drugs were available between 60 percent and 90 percent of the time, except in Ecuador, where it was much lower.

Percentage of Key Drugs in Stock, 1990–1993



These data from different countries reflect the present situation in prescribing. At this stage, we do not know what is ideal. We do not have a gold standard to which we can compare drug use in a facility or a country. However, efforts are under way to develop methods of generating such standards in each country. The first effort to do this has been by Dr. Ambrose Isah in Nigeria. [http://www.who.ch/programmes/dap/icium/posters/1A2_txt.html]



Activity 2. Identifying a Priority Problem
[See page 19]

CONCLUSION

Drug use is the end of the therapeutic consultation. Ensuring that the correct drug is given to the correct patient is a high priority for all health professionals.

Means exist to measure drug use, to intervene to change drug use, and to evaluate these interventions.

Health planners and prescribers need to use these tools to improve the quality of care provided to their patients.

ACTIVITIES

Activity 1. Meaning of Appropriate Use
The term "appropriate drug use" means different things to different people. In your groups, discuss what the term means from the perspective of–

Group 1 - Patient

Group 2 - Physician

Group 3 - HS Manager

Group 4 - Retail Pharmacist

Group 5 - Drug Manufacturer

Use a flip chart to write words that describe the meaning from your group's perspective.

Activity 2. Identifying a Priority Problem
As part of this course you will work on a priority problem as an example.

For this activity, in consultation with local participants, you should–

1. Identify up to five problems (e.g., injection use or overuse of antibiotics for ARI).

2. Define up to five criteria for assessing the importance of each problem (e.g., clinical risk, economic impact, prevalence of the problem, importance to patients, ease of solution, extent or lack of knowledge, interest to industry).

3. For each criteria give a weight out of 10. (For example, if you thought that clinical risk was most important, you would give a weight of 10; if you thought spread of the problem was not very significant, you would weigh it at 5 or 6.) Enter the weights in the second column.

4. For each problem, assess what score out of the maximum weight you would give. For example if you had decided the weight of the criterion "Spread of the problem" was 5, you could only give a score of up to 5.

5. Prepare to present your results. Based on the group exercises, a common problem will be selected.

Worksheet for Activity 2
Identifying a Priority Problem

Drug Use Problems	Relative Weight					Total Score
	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5	