



How to investigate the use of medicines by consumers



WORLD HEALTH ORGANIZATION



UNIVERSITY OF AMSTERDAM



ROYAL TROPICAL INSTITUTE

How to investigate the use of medicines by consumers

Anita Hardon

*University of Amsterdam
The Netherlands*

Catherine Hodgkin

*Royal Tropical Institute
The Netherlands*

Daphne Fresle

*Formerly of the Department of Essential Drugs
and Medicines Policy, WHO*

© World Health Organization and University of Amsterdam 2004

All rights reserved.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization and the University of Amsterdam concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization and the University of Amsterdam in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

The World Health Organization and the University of Amsterdam do not warrant that the information contained in this publication is complete and correct and shall not be liable for any damages incurred as a result of its use.

Cover illustration by Victoria Francis

Designed by minimum graphics

Printed in Switzerland

Contents

Acknowledgements	iv
Preface	v
1 Why study medicines use by consumers	1
1.1 Introduction	1
1.2 Common patterns of inappropriate medicines use	2
1.3 From research to action	4
2 What influences medicines use by consumers	7
2.1 Introduction	7
2.2 The household level	7
2.3 The community level	10
2.4 The health institution level	11
2.5 The national level	13
2.6 The international level	16
3 How to study medicines use in communities	20
3.1 Introduction	20
3.2 Describing and identifying medicines use problems	20
3.3 Study of documents	22
3.4 Semi-structured interviews	24
3.5 Focus group discussions	28
3.6 Observation techniques	31
3.7 Structured interviews	33
3.8 Weekly illness recalls	36
4 Prioritizing and analysing community medicines use problems	43
4.1 Introduction	43
4.2 Prioritizing problems: the criteria	44
4.3 Rating the problems	45
4.4 Analysing problems and identifying possible solutions	47
5 Sampling	57
5.1 Introduction	57
5.2 Selection of study sites and study units	57
5.3 Purposeful sampling for qualitative studies	58
5.4 Probability sampling methods for quantitative studies	60
5.5 Bias in sampling	63
5.6 Sample size	64
6 Data analysis	67
6.1 Introduction	67
6.2 Sorting and ordering data	68
6.3 Making quality control checks	68
6.4 Processing qualitative data	69
6.5 Analysing qualitative data	70
6.6 Processing quantitative data	71
6.7 Analysing quantitative data	72
6.8 Conclusion	77
7 Monitoring and evaluating rational medicines use interventions in the community	78
7.1 Introduction	78
7.2 Monitoring	79
7.3 Evaluation	79
7.4 Summary guidelines	88

Acknowledgements

We thank Hans Hogerzeil, Jonathan Quick, Richard Laing, Ane Haaland, Michael Tan, Pimpawun Boonmongkon, Luechai Sringernyuang, Harriet Birungi, Andrew Chetley, Trudie Gerrits, Kathy Holloway and Kath Hurst for their very valuable comments on earlier versions of this manual, and Lisa Greenough and Annelies Dijkstra for their administrative support. We are grateful to Sheila Davey for editing our text.

The chapters in this manual have been used as training modules in the *Promoting Rational Drug Use in the Community* courses. Since 2000 these courses have been co-organized annually by the University of Amsterdam, the Royal Tropical Institute of the Netherlands and the WHO Essential Drugs and Medicines Policy Department, together with various host institutions in developing countries. Feedback from participants has been of great value in improving the manual. We thank our colleagues at the Centre for Health Policy Studies, Mahidol University, Bangkok, Thailand, and the Child Health and Development Centre at Makerere University, Kampala, Uganda, for their help in conducting the courses and evaluating the modules.

Chapters 5, on sampling, and 6, on analysis, are based on modules 30, 36 and 39 of the *Applied Health Research Manual* (Hardon et al. 2001¹). We thank the publisher, Ben van der Camp at Aksant, for permission to use parts of the modules for this manual.

Finally, we wish to express our gratitude to the Department of Essential Drugs and Medicines Policy, the Ministry of Foreign Affairs of the Netherlands, and the University of Amsterdam for their financial support, without which we would not have been able to write and publish this manual.

¹ Hardon A et al. 2001. *Applied health research: anthropology of health and health care*. Aksant, Amsterdam.

Preface

In developing countries, medicines may account for 30–40% of health expenditure. Many of these payments are made by individuals purchasing medicines for self-medication and only rarely on prescription. Understanding how and why consumers make the choices they do is the critical first step to intervening to ensure that these precious resources are spent as safely and productively as possible.

This manual is a successor to the 1992 WHO publication, *How to Investigate Drug Use in Communities*, a small but important book that has been reprinted eight times. A year later came *How to Investigate Drug Use in Health Facilities*. Since then numerous courses have been held and many studies undertaken, with valuable experience gained in understanding the use of medicines in health facilities and communities. This manual's authors have been leaders in the movement to better understand and improve medicines use in the community.

Study methods have been developed and adapted for use in different environments. They are no longer the sole province of social scientists with advanced training but can be used by many different people interested in this subject. The manual aims to bring these methods and approaches to community-based organizations, consumer groups, health workers and health system researchers. By understanding medicine use practices, focused, effective interventions can be designed, implemented and evaluated. To add further impetus, a companion volume is in preparation – *How to Improve the Use of Medicines in Communities*, describing how to plan and implement such interventions.

Since 1992, when the first manual was published, the world of medicines use has changed dramatically. At that time, the major concerns were treatment of acute diseases, misuse of injections and antibiotics, and wasted spending on ineffective tonics and vitamin preparations. In 2004, some of these concerns remain, particularly the misuse of antibiotics, however, injection rates have declined and many consumers are more aware of the issues relating to tonics and vitamins. But today new challenges exist! Chronic diseases such as AIDS and TB need long-term therapy, with all of the difficulties of ensuring adherence to that therapy. TB programmes have used Directly Observed Therapy (DOT) with variable success in differing environments. Treating AIDS is even more difficult, with lifelong therapy to be taken at least twice a day. Understanding what can be done in the community to help patients take all of their medicines will be crucial for ensuring the success of treatment and preventing the emergence of resistance.

This manual provides a practical guide to the methods that can be used to:

- investigate the use of medicines by consumers to identify problems
- design interventions, and
- measure changes.

Readers are encouraged to “learn by doing”. Health workers are trained to diagnose and treat individual patients. The manual aims to help health workers and many others to go beyond the individual and to study the community as a focus. By understanding why people take medicines as they do, it is possible to design interventions which are sensitive to the particular beliefs, practices and needs of that community.

Although resources and the capacity to do studies are limited in many settings, it is hoped that this book will encourage readers to undertake research on medicines use practices, if only on a small scale, and to report the results. The editor of the WHO journal the *Essential Drugs Monitor* is keen to receive such reports with a view to publication.

WHO is grateful to the authors who have drafted, field tested and revised this manual. We also appreciate the many comments that we have received from reviewers and from participants in Promoting Rational Drug Use in the Community Courses and the 2nd International Conference on Improving Use of Medicines, who have made suggestions on previous drafts. We welcome further suggestions and examples of instruments used that could be included in future revisions. Please send these to medmail@who.int or to the address below.

Dr Richard Laing
Medical Officer
World Health Organization
Department of Essential Drugs and Medicines Policy
Avenue Appia, 1211 Geneva 27, Switzerland



1

Why study medicines use by consumers

1.1 Introduction

Essential medicines are one of the vital tools needed to improve and maintain health. However, for too many people throughout the world medicines are still unaffordable, unavailable, unsafe and improperly used. An estimated one-third of the world's population lack regular access to essential drugs, with this figure rising to over 50% in the poorest parts of Africa and Asia. When available, the medicines are often used incorrectly: around 50% of all medicines are prescribed, dispensed or sold inappropriately, while 50% of patients fail to take their medicines appropriately (WHO 2002).

Since the beginning of the 1980s the essential drugs concept has become one of the cornerstones of international and national health policy – influencing decision-making in not only developing but also industrialized countries. The selection and rational use of medicines are accepted as key principles of health service quality and management in both the public and private sectors. WHO has vigorously promoted the essential drugs concept and the rational use of drugs – at first through the Action Programme on Essential Drugs, which became a powerful advocate for the new policies. National drug policies were promoted by WHO and others as a guide to action and a key framework within which to coordinate the various policy components needed to guarantee access to and rational use of medicines.

For essential medicines to contribute to improved health, countries need to develop national medicines policies, ensure access to these essential drugs, strengthen drug regulation, and improve rational use of drugs in both the public and private sectors, and by both health professionals and consumers. Although much progress has been made in all these areas, health policy-makers have tended to focus more on the provision and regulation of medicines, and on efforts to improve health workers' prescribing, than on efforts to ensure rational use of drugs by consumers. What is rational use? WHO's definition is, "Patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community" (WHO 1985).

Rational drug use interventions that focus on health worker prescribing can only partly improve the use of drugs. This is because, as studies on medicines use by consumers have shown, self-medication is the most common form of therapy

choice and people often rely on informal drug distribution channels as much as on pharmacies. To address the problem of irrational use of medicines, health planners and administrators need specific information on:

- the types of irrational use that occur in their country or district, so that strategies can be targeted towards changing specific problems
- the amount of irrational use, so that the size of the problem is known and the impact of the strategies can be monitored
- the reasons why medicines are used irrationally, so that appropriate, effective and feasible strategies can be chosen. People often have very rational reasons for using medicines “irrationally”.

1.2 Common patterns of inappropriate medicines use

Not using the medicine in the way intended by the prescriber

This is the problem which health workers tend to stress and which has been the focus of many drug use studies (Homedes and Ugalde, 1993). These studies, though suffering from methodological limitations, give a general view of low levels of adherence to medical regimes.¹ People tend to forget the details of the advice given, or fail to purchase all the drugs that are prescribed, because they lack the financial means to do so. Patients sometimes stop taking the prescribed drugs or take the wrong dosage.

Homedes and Ugalde identify four types of patients who request medical advice but do not follow it:

- those who are motivated to comply but do not know, or have forgotten, all or part of the recommendations
- those who are knowledgeable but insufficiently motivated to follow them
- those who may not be able to adhere because of poverty, inaccessibility to medication or other external constraints
- those who change their minds and for a variety of reasons decide not to follow the recommendations.

Homedes and Ugalde argue that poor consumer adherence to medical regimes is problematic but they also argue that adherence should be viewed in the light of the quality of health workers' prescribing practices. Interventions to improve adherence only make sense if health workers' prescribing practices are appropriate and rational.

Self-medication with prescription drugs

Another problem is that in many countries people can purchase drugs over-the-counter that legally should only be sold on prescription. In the Philippines, Hardon (1991) found that people keep copies of prescriptions to re-use. Doctors' consultations are expensive and repeated use of prescriptions is a way to economize.

Self-medication with prescription drugs is especially a problem in developing countries where pharmacies freely supply medicines over-the-counter, as do informal drug shops and small groceries. Sometimes people even self-medicate with prescription drugs on the advice of traditional healers. People keep stocks of leftover medicines in their homes, and re-use them or give them to neighbours or relatives who request them. These practices also occur in countries where dispensing of medicines is regulated more strictly. The possibility of buying medicines through the Internet

¹ NB: Compliance and adherence are words used to describe whether a consumer takes a medicine in the way intended by the health professional who prescribed it or according to the instructions on the packaging. Some people prefer not to use the word compliance because it implies a normative view that the consumer should obey/comply with instructions. The word concordance may also be encountered in this context. It refers to a consultation process between the health professional and the consumer, who reach agreement about the best course of treatment in a way which values the perceptions and opinion of both parties.

means that drugs available only on prescription in one country can be obtained by post from a country where regulation is less strict. Immigration and people's increased mobility mean that more people buy medicines where it is easy to obtain them – or obtain them through family and friends. For example, immigrants, used to the free availability of “prescription drugs” in their countries of origin, may still obtain these medicines from visiting friends and family members.

Misuse of antibiotics

Antibiotics are important drugs, but they are over-prescribed and overused in self-medication for the treatment of minor disorders such as simple diarrhoea, coughs and colds. When antibiotics are used too often in sub-optimal dosages, bacteria become resistant to them. This is a serious concern to public health policy-makers. The result is treatment failure when patients suffering from serious infections take antibiotics. People buy sub-optimal dosages because they cannot afford the full course prescribed, or because they are not aware of the need to complete antibiotic courses. Even in industrialized countries where antibiotic dispensing is better regulated, non-compliance with the prescribed regime is a common problem. People who have not understood the need to complete the course stop using antibiotics when the symptoms disappear, while others take an overdose as they think that this will lead to faster recovery.

Studies by Lansang et al. (1990, 1991) and others highlight some of the problems with antibiotic use in the Philippines. Surveying 59 drug stores in Makati, Metro Manila, the authors found that two-thirds of 1608 antibiotic transactions were made without prescriptions. They also found that for each antibiotic prescribed the customers purchased only 10 units (tablets or capsules) or less. In a rural setting in the Philippines, the authors found that 57% of 6404 antibiotic transactions were without a prescription. The median number of antibiotics dispensed in a single visit was six tablets or capsules. These findings indicate widespread sub-optimal use of antibiotics in self-medication in the Philippines.

Another interesting study by Boomongkon and colleagues (1999), reveals how concerned women are about chronic and recurrent uterus-related problems in Northeast Thailand. Women refer to symptoms, ranging from abdominal and lower back pain to vaginal discharge, itching, odour and rash, using the term *pen mot luuk* (literally “it’s the uterus”). They fear that these problems will turn into cervical cancer if not treated, a perception inadvertently perpetuated by the cervical cancer education and screening programmes. Eighty percent of women surveyed (n = 1028) reported self-medicating the last time they experienced symptoms. Two-thirds of them bought antibiotics, specifically under-dosages of two brands of tetracycline, Gaano and Hero. Tetracycline is medically inappropriate for many of the problems that women classify as *mot luuk*, but the manufacturer of Gaano appears to endorse its use by having a picture of a uterus on the package.

Overuse of injections

Health workers and patients in many countries believe that injections are more effective than tablets. This not only leads to unnecessary expenditure (in many cases tablets are a cheaper form of therapy), it also leads to unnecessary health risks when the injections are administered in unhygienic conditions or syringes and needles are re-used without being sterilized.

A WHO study on injection practices in developing countries found that in Uganda around 60% of patients bring along their own syringe and needle when they visit health facilities for treatment. The instruments have generally not been sterilized properly. People keep the injections at home because they do not trust the injections provided in the health facilities (Van Staa and Hardon, 1996).

Overuse of relatively safe medicines

In many countries people believe that they need a “pill for every ill”. At the onset of all kinds of minor disorders they immediately take drugs. Vitamins and analgesics such as multivitamins, acetylsalicylic acid and paracetamol, though relatively safe, are the most commonly used drugs in many countries. This practice is not without risks. Aspirin can cause stomach bleeding and paracetamol, if taken in excess, can cause death.

In a community study in Thailand, Sringermyuang (2000) describes the overuse of analgesics in rural Thai communities. People are addicted to analgesics for pain relief, related to hard agricultural labour. For the agricultural labourers a painkiller a day is essential. It allows them to continue work and have a regular income. Health workers recognize that the practice is unsafe, as it can lead to stomach bleeding, a commonly reported health problem in Thailand.

Unsafe use of herbal medicines

In developing countries people use herbal medicines routinely in self-care. In many countries programmes exist that test the safety and efficacy of these medicines, and some of them are selected for inclusion in national health programmes. The production of herbal medicines is commercialized in countries, such as China, India and Thailand, and marketing is similar to that for modern pharmaceuticals. In industrialized countries the use of herbal medicines is also increasing. People believe that they are more natural than modern pharmaceuticals. Some herbal medicines are potent, and their safety is not as evident as people think. Also they can be dangerous when taken in combination with modern pharmaceuticals. For example, the antidepressant herb St John’s Wort cannot be used in combination with Selective Serotonin Re-uptake Inhibitors (SSRIs).

Use of non-essential combination drugs

When suffering from coughs and colds, people tend to take all kinds of cough and cold remedies that contain more than one active ingredient. Sometimes these drugs even contain substances that counteract each other: one substance to **suppress** a cough and another to **encourage** it. Hardon (1991) notes that the most popular cough and cold remedies in the communities where she conducted her study combine substances that counteract each other. Such remedies do not contribute to a cure and are a waste of money. People should take the active ingredient that they need, and if they need two drugs then they can take two different preparations.

Use of needlessly expensive medicines

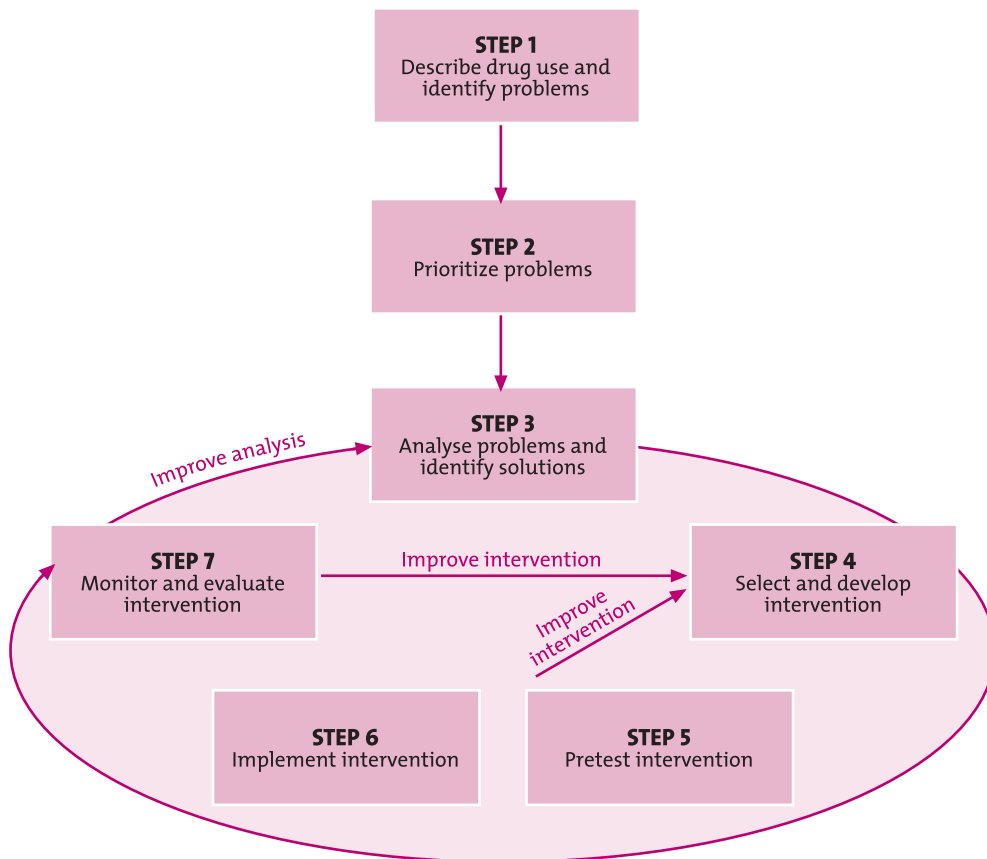
In many countries people rely on brand name drugs when choosing therapies. Branded products are often more expensive than the same products under generic name. Also people do not realise that two different brand name drugs may contain exactly the same substance. The price of medicines is an important concern for consumers.

1.3 From research to action

Organizations working with medicines programmes need to pay more attention to educating consumers on the appropriate use of medicines. Interventions directed towards consumers are most relevant if they focus on common patterns of irrational medicines use, and examine medicines use problems that consumers consider to be important.

Policy-makers need to be involved in research into drug use interventions to facilitate the process of translating evidence into action. Drug use studies should be an integral part of the process by which we develop interventions to enhance more

Figure 1. Steps in developing an effective intervention aimed at enhancing rational drug use by consumers



appropriate drug use by consumers. An overview of the process is given in figure 1.

Research is an integral part of this intervention cycle. It is the main activity in all steps, except 4 and 6 that concern the actual selection and implementation of interventions.

Step 1: Identify medicines use problems. To identify drug use problems you first need to describe common drug use practices and assess to what extent these are rational, and to describe what people in the communities and health workers consider to be drug use problems. In this step you aim to get an overview of community drug use problems. You can use existing (secondary) data, and if resources are available new data on drug use by consumers can be collected. In this phase drug use studies should focus on what people do with drugs and what they consider to be problems in drug use, not on why they take drugs the way they do.

Step 2: Prioritize medicines use problems. The overview of problems identified in step 1 forms the basis for step 2, in which problems are prioritized and selected as the focus of your intervention.

Step 3: Analyse medicines use problems and identify possible solutions. In this step you analyse the factors that contribute to and cause the selected problem and identify possible solutions. Research in this step aims to describe the core-problem(s) in more detail and analyse *why* the problems occur. In conducting such an analysis you need to consider the various layers of influence, as discussed in Chapter 2 of this manual. These layers include the family, the community, the health institution, the state, and the global environment. Such analysis helps you develop an appropriate intervention aimed at changing the inappropriate medicines use practices. The analysis is done in consultation with key stakeholders. They also help to identify possible solutions.

Step 4: Select and develop interventions. How to select and develop rational drug use interventions is dealt with in the forthcoming companion manual, *How to Improve the Use of Medicines in Communities*. This guide will provide information on how to develop and use printed materials, folk and mass media, and video, as well as giving information on how to work with journalists, and advocate for better health and medicines policies. The intervention methods presented in the manual can be used to change individual behaviour and to convince health policy-makers and politicians that they need to change health and medicines policies.

Step 5: Pretest interventions. Once an intervention has been developed you will need to pretest it. Pretesting involves trying out the intervention and/or educational materials to be used in the intervention with a small group of the target audience. The group's feedback and the results are used to fine-tune the intervention and the evaluation and monitoring activities.

Step 6: Implement interventions. Pretesting can lead to changes in the way the selected intervention is implemented. Once the intervention has been optimized, it can be implemented.

Step 7: Monitor and evaluate interventions. Research plays a role in monitoring and evaluating interventions. Evaluation results serve to improve an intervention, and help in sharing successes and failures with others.

References

- Boonmongkon P, Pylpa J, Nichter M (1999). Emerging fears of cervical cancer in the Northeast of Thailand. *Anthropology and Medicine*, 6(3):359–380.
- Hardon A (1991). *Confronting ill health: medicines, self-care and the poor in Manila*. Quezon City, Health Action Information Network.
- Hardon A, Le Grand A (1993). Pharmaceuticals in communities. Practices, public health consequences and intervention strategies. *Bulletin* 330. Amsterdam, Royal Tropical Institute.
- Homedes N, Ugalde A (1993). Patients' compliance with medical treatments in the Third World. What do we know? *Health Policy and Planning*, 8(4):291–314.
- Lansang MA et al. (1990). Purchase of antibiotics without prescription in Manila, the Philippines. Inappropriate choices and doses. *Journal of Clinical Epidemiology*, 43(1):61–67.
- Lansang, MA et al. (1991). A drugstore survey of antibiotic use in a rural community in the Philippines. *Philippine Journal of Microbiology and Infectious Diseases*, 20(2):54–58.
- Sringernyung L (2000). *Availability and use of medicines in rural Thailand*. Amsterdam, Academisch Proefschrift, University of Amsterdam.
- Ugalde A, Homedes N, Collado J (1986). Do patients understand their physicians? Prescription compliance in a rural area in the Dominican Republic. *Health Policy and Planning*, 1(3): 250–259.
- Van Staa A, Hardon A (1996). *Injection practices in the developing world: a comparative review of field studies in Uganda and Indonesia*. Geneva, World Health Organization. WHO/DAP/96.4.
- WHO (2002). Promoting rational use of medicines: core components. *WHO Policy Perspectives on Medicines*, No.5. Geneva, World Health Organization.



2

What influences medicines use by consumers

2.1 Introduction

This chapter discusses the various factors that influence medicines use by consumers. It provides a framework which links individual drug use behaviour to the multi-layered environment which shapes it. This includes the:

- household level
- community level
- health service institution level
- national level
- international level.

The framework described provides a basis for the analysis of medicines use problems. It can also assist in the development of interventions aimed at changing behaviour and the environment in which medicines use takes place, in order to bring about more appropriate use.

The framework helps to identify why medicines are used irrationally, so that appropriate, effective and feasible strategies can be chosen to confront the drug use problems.

2.2 The household level

The way medicines are used is influenced by individual beliefs about them, which in turn may have been shaped by members of the immediate family and those in extended family networks. Important factors at this level are outlined below.

Perceived need for medicines

Evidence suggests that people have lost their trust in the body's ability to fight disorders without the 'help' of medicines, even for self-limiting disorders, such as colds and diarrhoea. Studies on drug use by consumers show that people think that they should take medicines immediately at the onset of illness to prevent it from becoming worse.

People take medicines not only to treat symptoms of ill health but because they believe that medicines are also needed to stay healthy. Preventive use of drugs is a

BOX 1. MEDICINE BELIEFS AMONG RURAL VILLAGERS IN PAKISTAN

“Medicine is needed for every illness. If medicine is not used, the illness will become serious.”

“All illnesses need medicine. No illness will be cured without medicine.”

“Medicine is to the sick, what water is to the thirsty.”

“If we don’t get medicine, how will we get cured?”

Rasmussen ZA et al. (1996). Enhancing appropriate medicine use in the Karakoram Mountains. Community drug use studies. Amsterdam, Het Spinhuis.

topic often neglected in discussions on appropriate medicines use. However, drug sales increasingly tend to involve products such as vitamins, which are commonly taken because people think they will prevent illness.

Ideas about efficacy and safety

People use medicines according to their own ideas about drug safety and efficacy. Anthropological studies reveal that people believe that the safety and efficacy of medicines are determined by a number of factors including:

- the colour and shape of medicines. In Sierra Leone, for example, red medicines are thought to be good for the blood (Bledoe and Goubaud, 1985)
- the method of administration. In Uganda, for instance, people believe that medicine injected into the bloodstream does not leave the body as quickly as that administered orally. Oral medicine is compared to food, which enters the digestive system and eventually leaves the body through defecation (Birungi, 1994)
- compatibility between the medicine and the person taking it. A medicine that is effective for one person may not be effective for another. In the Philippines, people use the concept *hiyang* to explain why a medicine did not work for a particular patient. In Indonesia and Thailand similar concepts exist
- whether a medicine was effective in the past. If so, they are likely to use it again
- the “newness” of a medicine (new medicines are believed to be more effective).

People’s choice of medicine usually also depends on the cause that they attribute to the illness and its perceived severity. In Ghana, for example, people consider heat to be the main cause of measles. Heat also causes constipation and stomach sores in children. To treat measles people use Septrin (cotrimoxazole) syrup, multivitamin syrup, calamine lotion, *akpeteshie* (local gin) and a herbal concoction given as an enema to ‘flush out’ the heat (Senah, 1997). If illnesses are thought to be caused by witchcraft, it is likely that a traditional healer will be used rather than medicines bought at a local shop. However, if the illness is believed to be caused by bodily imbalance related, for example, to hot-cold notions, it is likely to be treated with medicines. More severe disorders may be brought to the attention of health workers or traditional healers, depending on what the cause of illness is believed to be.

Finally, people’s ideas about a medicine can actually affect its efficacy. This has been documented in numerous studies on the psychological and physiological effects of placebos (harmless substances that look like the actual medicine but contain no active ingredient). In double-blind trials on new drugs, for example, approximately one-third of the participants respond to a placebo.

Uncertainty resulting in poly-therapy

People are often uncertain about the cause of disorders as well as the most effective treatment. As a result, they tend to use several therapies at the same time, often

combining modern and traditional remedies. If the condition is serious they may consult a variety of modern and traditional health providers.

Drug consumption roles

Drug use is not only defined by people's ideas about medicines but is also determined by the role people play within families in the process of buying, administering and deciding about medicine use (see box below).

BOX 2. CULTURAL INFLUENCES ON THE SELECTION AND USE OF MEDICINES

In the Philippines, (Hardon, 1991) mothers decide whether or not they should buy and give medicines to their children. Men are usually not involved in decision-making on the treatment of common childhood illnesses. Instead, women consult with neighbours and relatives on treatment options. Married women in this country manage household expenses and the family's income, and do not have to consult their husbands about the cost of medicines. Husbands take a more active role only when a health problem becomes severe.

In contrast, in Pakistan, (Rasmussen et al., 1996) women are constrained in their efforts to treat children's health problems. They cannot go to the bazaar or hospital in town to obtain drugs, as cultural norms forbid such mobility for women. Because male family members must buy medicines, men are more closely involved in decisions about children's treatment. They often receive information on a medicine's use at the bazaar or health facility and pass this on to their wives who actually administer the drugs.

The cost of medicines

Cost is a major factor shaping drug use at the family level in developing countries and among those patients in industrialized countries who are not covered by insurance schemes. When presenting a prescription for several different medications at a pharmacy, consumers have to decide which medicines they can afford to buy. In developing countries, 50%–90% of medicines are paid for 'out-of-pocket'. In parts of Africa, Asia and Eastern Europe, drugs account for up to 80% of household health expenditures.

People frequently waste money on drugs. Often they are unaware that cheaper, generic alternatives exist or they do not realize that many medicines are ineffective. Public health workers are sometimes surprised that people pay for medicines in the private sector when they could obtain them free of charge at public health centres. Studies show that people are willing to pay for what they consider to be good and effective remedies. Moreover, people often believe that more expensive medicines (usually brand name products) are more effective than cheaper ones. Interventions which enable people to find cheaper alternatives for medicines, by teaching them how to identify the active component of a drug, and how to compare prices, can draw on strong community interest. This is because such interventions help to deal with the high cost of medicines, an important day-to-day concern for people who are poor.¹

Literacy levels of consumers

Literacy determines the extent to which people have access to written information on medicines, such as package inserts or educational posters with a written message. However, people who cannot read sometimes ask others, including their children, to explain what is written on or inside medicine packages.

¹ WHO and HAI (2003) have developed a new approach to measuring medicine prices, see references.

The “power” of medicines

At the family level, medicines use is also influenced by the pharmaceutical efficacy of medicines. Analgesics are popular because they relieve pain; cough syrups because they stop the cough; antibiotics because they cure infections. Some medicines, such as tranquillizers, are even more “powerful” and may cause dependencies.

2.3 The community level

The community is the immediate context in which individuals and families deal with their health problems. People talk to each other about therapies, creating and reinforcing existing drug use cultures, and they rely on local sources of drugs. Factors that influence medicines use at the community level include:

Medicines use cultures

Drug use studies often find a clear, local drug use culture in communities. A set of medicines is used routinely to treat the most common health problems. People know what medicines are needed for these problems and they obtain them at local drug stores, general shops or the market. For example, in Uganda, most people use chloroquine as first-line treatment for malaria and buy it at general stores.

Medicines supply systems

The community drug supply system plays an important role in drug use by consumers. Public health managers often assume that people get medicines at public health facilities, such as local primary health centres, which stock essential medicines. However, this is usually not the case.

Most studies on community drug use show that people tend to rely on informal and private channels for their drug needs, using these outlets to buy medicines without a prescription. An additional advantage is that purchases can also be made at convenient times, as these private and informal channels have long hours and open at the weekend. Consumers’ decisions on where to obtain their medicines, or whether to obtain any at all may be influenced by previous experience, distance and transportation costs, the stigma attached to visiting formal health outlets, work or family demands or similar considerations. Figure 2 shows the drug supply channels used by consumers in a poor urban community in the Philippines. It reveals that 75% of medicines are obtained from the private sector, either directly from town pharmacies or through *sari-sari* (neighbourhood) stores.

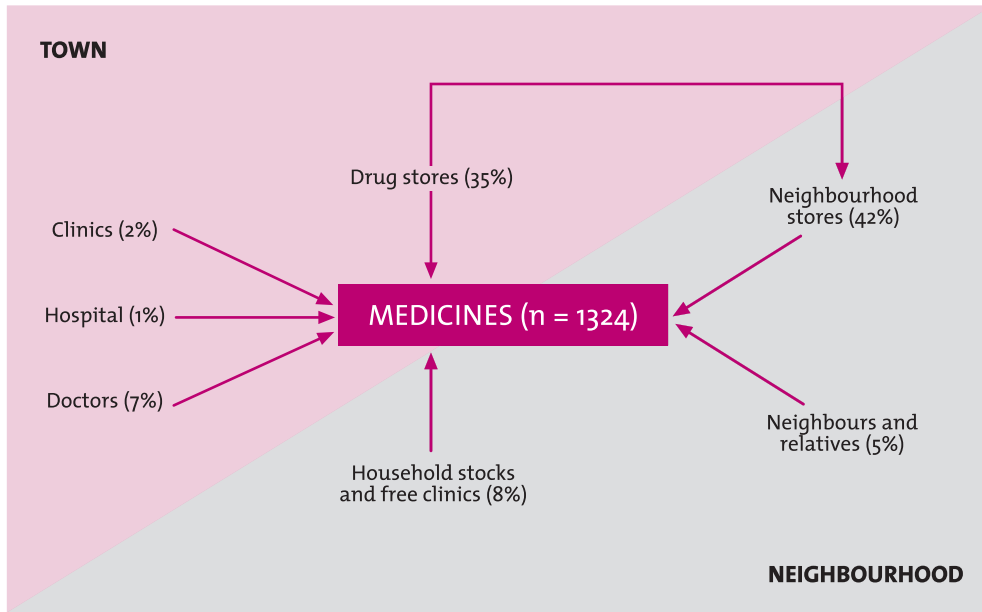
Information channels

Information on medicines is a valued commodity which also shapes drug use. Drugs bought at the pharmacy rarely include package inserts and the brand name is often the only information available to consumers. Other possible information sources include:

- radio and television programmes
- educational sessions organized as part of primary health care programmes
- community health workers
- drug sellers in small shops or markets
- traditional healers who have incorporated pharmaceuticals into their therapeutic regimes
- magazines, newspapers and comics, re-used prescriptions and popular health books
- advertisements.

Primary health care programmes that aim to enhance appropriate use of medicines

Figure 2. Community drug distribution channels: an example from the Philippines



Source: Hardon, AP. (1991). *Confronting ill health: medicines, self-care and the poor in Manila*. Quezon City, Health Action Information Network.

often ignore the messages relayed to consumers through mass media drug promotion by manufacturers. In the Philippines, Hardon (1991) found that the most commonly used medicines in self-care were those promoted most frequently on the local radio station during times when women listened while performing household chores. The station aired three to four of these advertisements per hour.

2.4 The health institution level

Health facilities, including health centres and hospitals in the private and public sectors, influence consumers' medicines use.

Consulting health workers

Household drug use studies in developing countries suggest that most medicines are taken without advice from health workers. Of particular importance are the findings of community-based studies conducted in Thailand, the Philippines, Pakistan and Ghana (Hardon and Le Grand, 1993). In these studies, researchers visited families at regular intervals to record the occurrence of common health problems, such as cough and diarrhoea, and the chosen therapy. The findings suggest that a large proportion of common health problems are treated by family members without first seeking health worker advice. Roughly half of the self-care cases were treated with modern pharmaceuticals (Hardon and Le Grand, 1993; Rasmussen, 1996).

Quality of prescribing

The quality of health workers' prescribing is a major determinant of how consumers use medicines. This is true, even if in terms of volume, most medicines are taken without health worker advice. The quality of prescribing plays a crucial role in the treatment of serious health conditions when people do tend to consult health workers. It also affects the treatment of less severe conditions, as people tend to remember the advice given and use it in later episodes of self-medication. In the Philippines it was observed that people keep prescriptions in their homes for re-use (Hardon, 1991).

BOX 3. CONSUMERS' ADVICE-SEEKING BEHAVIOUR

Researchers conducted a household survey in four Thai villages covered by a primary health care (PHC) programme that promoted the use of herbal medicines in self-care. One hundred and twenty families participated in the two-month study in which a total of 1,755 cases of illness were recorded. The study found that people in the four villages only consulted a health professional in 7% of the illness episodes. Seventy percent of the illnesses were initially treated by self-care. Approximately half of the cases were treated with modern pharmaceuticals and the other half with herbal remedies.

Le Grand A, Sringernyuang L (1989). *Herbal drugs in primary health care*. Amsterdam, Royal Tropical Institute.

A household survey was conducted in two villages covered by an NGO primary health care programme (AKHS) and two control communities in Pakistan's Karakoram Mountains during a period of seven months. A total of 897 illness episodes were recorded. In the PHC communities 44% of the recorded illness episodes were treated without health worker advice; in the control communities this percentage was slightly higher, 52%. Self-care practices included the use of traditional and herbal remedies, the use of modern pharmaceuticals and no treatment. In the PHC communities 16% of the recorded illness episodes were treated with modern pharmaceuticals without health worker advice. This number was 11% for the control communities.

Rasmussen ZA et al. (1996). *Enhancing appropriate medicine use in the Karakoram Mountains*. Community Drug Use Studies. Amsterdam, Het Spinhuis.

Studies conducted by members of the International Network for Rational Use of Drugs (INRUD) document how health workers practice poly-pharmacy. A study conducted in Indonesia found that the average number of drugs used to treat illnesses presented to the health worker was 3.8, both for children under five and for the five and over age group. Patients seemed to receive a similar mix of vitamins, analgesics and antibiotics irrespective of their disorders. The way in which health workers prescribe multiple medicines reinforces consumer beliefs that they need "a pill for every ill"; and that a cure is unlikely without using medicines.

In some countries, professional organizations have been created to inform health workers about rational prescribing and rational drug use. Health institutions can also adopt an essential medicines list and standard treatment guidelines in order to increase rational use of medicines.

Quality of the consultation

Numerous studies on adherence (Homedes and Ugalde, 1993) suggest that people rarely take medicines as prescribed. Some obvious examples include the use of antibiotics and antituberculosis medications in inadequate dosages. People also follow irregular drug regimes for chronic conditions such as hypertension and diabetes. It has been estimated that half of the medicines prescribed for chronic conditions are not taken (Haynes et al., 1996).

Non-adherence can be related to the health worker – consumer interaction. If the health worker does not explain the need to complete treatments, the dosages required, and ways to handle side-effects, then adherence to the prescribed regime is less likely. In a study of 69 hypertensive and diabetic patients in Zimbabwe, Nyazema (1984) found that 60% of the patients did not understand their diagnosis and how to take the prescribed drugs. A study of 119 patients in the Dominican Republic found that 50% could not recall the dosage, frequency or interval of recommended use (Ugalde et al., 1986). This was particularly problematic among the elderly, those with minimal literacy skills and when multiple prescriptions were given.

While non-adherence generally has a negative connotation, Conrad (1985) points out its positive aspects. Children with asthma, for example, have been reported to keep their medicines as their own property, and adjust the frequency and intensity

of inhalations depending on the severity of their symptoms (Sanz, 2003). Middle-aged patients with multiple health problems have likewise been shown to adopt ‘flexible’ drug use regimes, in response to their experiences of symptoms and side-effects and varying demands of their daily lives. They generally intend to take as few drugs as possible because they hope to maximize the quality of their lives (Hunt et al., 2003). Doctors say that not taking medicines according to the prescription means poorer health outcomes, but patients argue that only they can know what works for them and what does not. To bridge this gap, it has been proposed that concordance is a better concept. It means shared decision-making and arriving at an agreement on the use of medicines that respects the beliefs and experiences of the patient (Jones, 2003).

Quality of dispensing

Medicine dispensing is strictly regulated in most industrialized countries. Those who dispense drugs must complete certain levels of training depending on the types of medicines they dispense. It is increasingly recognized that pharmacists have an important role to play in providing information on medicines, to complement the information given by doctors.

Pharmacies are also important targets for drug promotion campaigns. In developing countries untrained pharmacy workers tend to dispense medicines in shops owned by pharmacists. These workers have little background knowledge about medicines. However, they are important sources of information on a wide range of medicines (including prescription-only drugs). Medicines are often dispensed in small sachets with little information about their content, use and precautions. Often package inserts meant to inform consumers about a medicine are not given to them when the drug is purchased. Medicines dispensed at markets or informal drug stores usually include no written information at all. Often they are wrapped in newspaper and sold by the tablet.

Doctors who also dispense drugs for profit are likely to prescribe more than non-dispensing doctors. A comparative study in Zimbabwe found that dispensing doctors prescribed on average 2.3 drugs per prescription, while non-dispensing doctors prescribed only 1.7 drugs. Dispensing doctors were also more likely to inject patients, 18.4% versus 9.5% (Trap et al., 2002).

Regular supply

People judge health centres by whether they have a regular supply of medicines. Often when consulting health workers in developing countries, people find that there are no drugs available. Because consumers know that public health centres often lack medicines, they may go directly to pharmacies and informal drug shops when they or someone in the family become ill.

Cost of medicines

Often fees for medicines in public health services are relatively low. People pay more in the private sector. They often do so because medicines in the private sector are believed to be more effective.

2.5 The national level

In most developing and transitional economies, medicines represent the second largest government health expenditure after personnel costs. Getting the best health care value for such expenditure is vital. Consumer use of medicines is affected by government policies on provision of essential medicines through public health channels and by the regulation of the supply and promotion of medicines by the private sector.

Implementing essential medicines policies

Today more than 150 countries have an essential medicines list. In 1999, 71 countries reported to WHO that the list guides drug procurement in the public sector (WHO, 2000). However, drug supply in the private sector is generally neither regulated nor guided by the essential medicines policy. This is a problem, as studies show people rely heavily on private and informal sources of medicines. The Philippine market, for example, includes more than 14,000 medicines. Many of these drugs are not essential, expensive, unsafe and ineffective. Most of them can be bought over-the-counter even if they are registered as prescription-only products. It is impossible for rational drug use programmes to inform consumers about all 14,000 medicines on the market.

Essential medicines policies tend to emphasize drug procurement and supply, and appropriate prescribing by health workers. Promotion of rational drug use by consumers is not a priority in many countries.

Reductions in spending in the public sector make it difficult for governments to provide quality health care and the essential medicines that people need. It also becomes more difficult to control the way in which drugs are used. The current focus on private/public partnerships makes it much harder for governments (or international agencies) to promote policies which may not be consistent with the interests of major players in the private sector or with 'free market' philosophies. Social solidarity and support to the public sector are less of a priority and the solutions to lack of access are increasingly sought in terms of stimulating the private sector and partnership with the industry rather than in strengthening basic services and reallocation of resources.

In some countries, particularly in Latin America, the increasing importance of the private sector has been accompanied by reduced government regulatory control of pharmaceuticals. However, as WHO has pointed out, as the role of the private sector increases stronger not weaker central, i.e. government regulatory control, is required.

The private sector includes private pharmacies and drug sellers, private not-for-profit NGOs (for example, the Church is a major provider in many African countries) and the informal or illegal sector (many drugs exchange hands through market stalls or are sold again after being prescribed by a health worker). The private sector is harder to regulate/control and influence than the public sector. Improving drug use and implementing the essential drugs concept in the informal and illegal sectors is very hard.

Drug promotion

Drug promotion creates demand for medicines in various ways. Firstly, it defines illness conditions that need treatment. It also promotes the idea that medicines are the best remedy as opposed to non-drug alternatives. Lastly, it tends to emphasize a medicine's efficacy while minimizing possible health risks.

Companies spend vast amounts of money (an estimated one-third of sales revenues) on marketing. This is often more than double the amount spent on research and development (Mintzes, 1998). Campaigns to promote the rational use of medicines have much less money to spend. In the absence of effective regulation of drug promotion, community interventions to promote rational drug use will have limited impact.

Drug promotion to consumers is becoming an increasingly important component of drug companies' marketing strategies (Mintzes, 1998). In the past, most consumer advertisements promoted over-the-counter medicines. More recently, companies have started promoting prescription drugs to consumers. Direct-to-consumer advertising (DTCA) for prescription drugs is allowed in the United States and New Zealand. It is now under consideration by regulatory authorities elsewhere. The pharmaceutical industry has devised ways to create consumer demand for prescription products even where DTCA for prescription medicines remains illegal (Mintzes, 2002).

WHO's Ethical Criteria for Medicinal Drug Promotion (WHO, 1988), adopted at the 1988 World Health Assembly, call for promotion of prescription and over-the-counter drugs to contain reliable claims without misleading or unverifiable statements. The Criteria also state that promotion should not contain omissions that could lead to health risks. They emphasize that promotion should not be disguised as educational or scientific activities. Ten years later, WHO reported that the Criteria have only been adopted to a 'modest' degree in national drug policies. Criteria for drug promotion are only mentioned in 17 of 42 national medicines policies studied and their implementation remains weak (WHO, 1998). A separate study done in Australia, for example, analysed 140 advertisements to the public and found that only 29% provided warnings or cautions about possible health risks (Watson, 1995).

Financing and reimbursement

One of the big differences between consumers in industrialized countries and most of those living in developing countries is the payment mechanisms for drugs. In industrialized countries, the cost of prescribed medicines tends to be covered by social security or private insurance schemes. At the national level, insurance companies' reimbursement policies play an important part in shaping medicine use. In some countries, such as the Netherlands and the United Kingdom, the government decides which medicines will be reimbursed, so ensuring equitable access to essential drugs. In the United Kingdom, the National Institute for Clinical Excellence (NICE) is charged with determining which new drugs should be available in the National Health Service. In developing countries, medicines are sometimes available in public health services. To obtain them, people must often pay a user fee, a cost that is sometimes proportional to the amount of medicine received. However, access to medicines in the public sector is limited. The majority of medicine purchases occur in the private sector in most countries. Drug costs are an important factor in consumers' decisions on how to treat illness episodes, as we have seen.

Consumer advocacy

Consumer advocacy can influence drug use at the national level of health care. Advocacy initiatives include monitoring implementation of essential medicines policies, informing health workers and consumers about the rational use of medicines, and highlighting unethical drug promotion practices. However, many developing countries, particularly in sub-Saharan Africa and the Western Pacific region do not have consumer organizations. Those that do exist may not be powerful enough to influence policy. Patient organizations tend to focus on the medicine needs of specific patient populations. At times they push governments to allow new drugs on the market and lobby for these drugs to be reimbursed. In such campaigns patient groups are often the allies of pharmaceutical manufacturers.

The media

The media can play a key role in raising awareness on problems with drugs, publicizing serious health hazards related to drugs, when these are brought to their attention. Also, unethical promotion is an issue that journalists tend to pick up. Media attention can have a positive effect on consumer drug use, but can also sensationalize the discovery and potential efficacy of new untried and often unregistered drugs. The media are frequently used by the pharmaceutical industry to covertly promote products in the guise of what has come to be known as "advertorials". Moreover, the pharmaceutical industry is often a significant advertiser and broadcasting companies, newspapers and journals may be hesitant to publish information perceived by the industry to be negative.

Pharmaceutical companies attempt to interest mass media journalists in their

medicines. For example, one study reported that even though journalists tend to be sceptical about information from industry sources, in practice they often use industry materials for articles on medicines (van Trigt, 1995). The researcher found that drug manufacturer, GlaxoSmithKline, informed Dutch journalists about its new anti-migraine drug sumatriptan (Immigran) at a scientific meeting before the product was officially registered. The announcement led to a series of newspaper and magazine articles that reported on the “new drug against migraine, not yet available in the Netherlands” and stated that the “new anti-migraine drug is effective”. This media coverage led to a discussion in the Dutch Parliament on ‘clandestine advertising’. The same debate has taken place in the United Kingdom, with an incontinence campaign initiated by the company Pharmacia and Upjohn as the focus. Television advertisements used in the campaign encouraged women with bladder control problems to see their doctors although DTCA is illegal. In an interesting twist, some of these ‘disease awareness’/DTCA campaigns are strongly supported by patient groups. This may be linked to the fact that patient groups (both national and international) are increasingly and sometimes solely funded by the pharmaceutical industry (Herxheimer, 2003).

Public education on medicines for consumers

Few countries have effective public education programmes. Often the programmes are limited in coverage and content, for example, there may be educational programmes on malaria treatment, but not on other diseases. School curricula are often put forward as an ideal medium for public education on medicines, but only a few countries have such curricula.

2.6 The international level

Drug use by consumers is also influenced by factors at the international level including:

Global trade regulation and access to drugs

Globalization and the international regulation of trade have important consequences for health policy. Concerns about the consequences of globalization and international trade agreements and what were described as the ‘non-level playing field’ on which they were developed, were first raised at the 1996 World Health Assembly. The lack of financial access to patented HIV/AIDS medicines in developing countries and alliances between health and development groups in both developed and developing countries have brought these issues to the forefront of national and global agendas.

The World Trade Organization’s (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) obliges all WTO Member States to provide 20 years of patent protection for medicines. Industrialized countries should have implemented TRIPS by 1996, developing countries had to introduce national regulation on intellectual property by the year 2000 and least developed countries have until 2016 to do so. The 2001 meeting of the World Trade Organization in Doha acknowledged that access to medicines should have primacy over commercial interests (see Médecins Sans Frontières, 2003).

Donor support

Over the past decade there has been a shift in donor support away from vertical programmes, such as essential drugs programmes, and towards health reform and sector-wide approaches. Health reform policies affect local-level implementation of essential drugs programmes. They generally promote collaboration with the private sector, the introduction of user fees and decentralization of health care decision-making, including pharmaceutical procurement and supply.

There have been several recent efforts to mobilize resources in order to increase access to specific, greatly needed medicines and vaccines in developing countries. Examples of this trend include the Global Alliance for Vaccines and Immunisation (GAVI), the Medicines for Malaria Venture public-private partnership to enhance malaria drug supply and the Global Fund for HIV, TB and Malaria. These initiatives can potentially increase access in developing countries to urgently needed medical technologies.

An interagency committee including a wide range of NGOs and UN agencies has published the second edition of *Guidelines for Drug Donations* (WHO/EDM/PAR/99.4) which aim to ensure appropriate supply and rational use of donated medicines.

Global consumer advocacy

As is the case at the national level, consumer advocacy at the global level is vital for rational drug use. Consumer organizations operating in the global arena lobby for rational medicines policies within the formulation of world health policies. They monitor the adoption and implementation of international agreements. Such groups also publicize inappropriate or harmful activities carried out by the pharmaceutical industry. The global advocacy movement also supports national organizations in their campaigns for structural change and rational drug use.

The Internet

The Internet is a very important source of information on health and medicines for people who can access it. It also serves as a tool for advocacy and networking. However, its lack of borders and regulation also makes it a popular way to promote drugs on industry-sponsored web sites and sites containing material on specific health conditions. WHO has published guidelines to help consumers (and health workers) find reliable information on the Internet (WHO, 1999).

Table 1 overleaf gives an overview of the main factors influencing drug use by consumers, according to their level of influence. You can add factors to this list based on local discussions and your own analysis of what influences consumers' drug use in your own country.

References

- Birungi H et al. (1994). *Injection use and practices in Uganda*. Geneva, World Health Organization. WHO/DAP/94.18.
- Bledsoe CH, Goubaud MF (1985). The reinterpretation of western pharmaceuticals among the Mende of Sierra Leone. *Social Science and Medicine* 21(3):275–82.
- Conrad P (1985). The meaning of medications: another look at compliance. *Social Science and Medicine* 20(1):29–37.
- Hardon A, Le Grand A (1993). *Pharmaceuticals in communities. Practices, public health consequences and intervention strategies*. Bulletin 330. Amsterdam, Royal Tropical Institute.
- Hardon A (1991). *Confronting ill health: medicines, self-care and the poor in Manila*. Quezon-City, Health Action Information Network.
- Hardon A (1987). The use of modern pharmaceuticals in a Filipino village: doctor's prescription and self-medication. *Social Science and Medicine* 25(3):277–292.
- Haynes RB, McKibbon A, Kanani R (1996). Systematic review of randomised trials of interventions to assist patients to follow prescriptions for medications. *Lancet* 348:383–6.
- Herxheimer A (2003). Education and debate. Relationships between the pharmaceutical industry and patients' organisations. *British Medical Journal*, 326:1208–1210.
- Homedes N, Ugalde A (1993). Patient's compliance with medical treatments in the Third World. What do we know? *Health Policy and Planning*, 8(4):291–314.
- Jones G (2003). Prescribing and taking medicines, [editorial]. *British Medical Journal* 327(7419): 819–820.

Table 1. Main factors influencing drug use by consumers

LEVEL OF INFLUENCE	FACTORS
Household	<ul style="list-style-type: none"> • Perceived need for drugs • Ideas about efficacy and safety • Uncertainty resulting in poly-pharmacy • Division of drug consumption roles • Cost of medicines • Literacy levels • The power of medicines
Community	<ul style="list-style-type: none"> • Drug use culture • Drug supply system • Information channels
Health institution	<ul style="list-style-type: none"> • Extent to which health workers are consulted • Quality of health worker prescribing • Quality of the consultation • Quality dispensing • Regular supply • Cost of medicines
National	<ul style="list-style-type: none"> • Implementation of essential drugs policy • Drug promotion • Financing and reimbursement • Consumer advocacy • The media • Public education
International	<ul style="list-style-type: none"> • Health consequences of global trade agreements • Donor support for essential drugs programmes • Global consumer advocacy • The Internet

References continued

Le Grand A, Sringerinyuang L (1989). *Herbal drugs in primary health care*. Amsterdam, Royal Tropical Institute.

MSF (2003). *Doha derailed: a progress report on TRIPS and access to medicines*. Médecins Sans Frontières Briefing for the 5th World Trade Organization Ministerial Conference, Cancún 2003.

Mintzes B (1998). *Blurring the boundaries. New trends in drug promotion*. Amsterdam, Health Action International Europe.

Mintzes B (2002). Women and drug promotion: the essence of womanhood is now in tablet form. *WHO Essential Drugs Monitor*, 2002, 31:2.

Nyazema NZ (1984). Towards better patient drug compliance and comprehension: a challenge to the medical and pharmaceutical services in Zimbabwe. *Social Science and Medicine* 18(7):551–4.

Rasmussen ZA et al. (1996). *Enhancing appropriate medicine use in the Karakoram Mountains. Community drug use studies*. Amsterdam, Het Spinhuis.

Sanz E (2003). Concordance and children's use of medicines. *British Medical Journal* 327: 858–60.

Senah KA (1997). *The popularity of medicines in a rural Ghanaian community. Community drug use studies*. Amsterdam, Het Spinhuis.

Townsend A, Hunt K, Wyke S (2003). Managing multiple morbidity in mid-life: a qualitative study of attitudes to drug use. *British Medical Journal* 327:837–840.

Trap B, Hansen EH, Hogerzeil HV (2002). Prescription habits of dispensing and non-dispensing doctors in Zimbabwe. *Health Policy and Planning* 17(3):288–95.

van der Geest S (1998). Use and misuse of pharmaceuticals: anthropological comments. In: Streefland P, ed. *Problems and potentials in international health: transdisciplinary perspectives*. pp. 195–221. Amsterdam, Het Spinhuis.

van Trigt AM (1995). *Making news about medicines* [Ph.D thesis]. University of Groningen, Enschede, Febo.

- Ugalde A et al. (1986). Do patients understand their physicians? Prescription compliance in a rural area of the Dominican Republic. *Health Policy and Planning* 1(3):250–259.
- Watson R (1995). *A participatory evaluation of the implementation of the WHO ethical criteria for medicinal drug promotion in multiple countries: Australian results*. Melbourne, La Trobe University.
- WHO (1988). *WHO ethical criteria for medicinal drug promotion*. Geneva, World Health Organization.
- WHO (1998). *WHO ethical criteria for medicinal drug promotion: a strategy for review and assessment of effectiveness*. Geneva, World Health Organization. WHO/DAP/1998. (Draft document).
- WHO (1999). *Guidelines for drug donations*. 2nd ed. Geneva, World Health Organization. WHO/EDM/PAR/99.4.
- WHO (1999). *Medical products and the Internet*. Geneva, World Health Organization. WHO/EDM/QSM/99.4.
- WHO (2000). *Progress in essential drugs and medicine policy, 1998–1999*. Geneva, World Health Organization. WHO/EDM/2000.2.
- WHO and HAI (2003). *Medicine prices: a new approach to measurement*. Geneva, World Health Organization and Health Action International. WHO/EDM/PAR/2003.2.



3

How to study medicines use in communities

3.1 Introduction

The medicine use investigations presented in this manual are intended as a basis for developing an intervention project.

Such drug use studies should be:

Efficient: Do not collect more information than needed and do not measure more accurately than needed.

Flexible: Learn-as-you-go approach, whereby newly generated information helps to set the agenda for the later stages in the development of interventions.

Participatory: Methods which allow for stakeholder participation in data gathering and analysis are preferred.

Triangulated: Use more than one, and generally three, methods to cross-check the information.

In the community: Learning takes place in the community or population groups which experience the problem, in short, intensive periods of fieldwork.

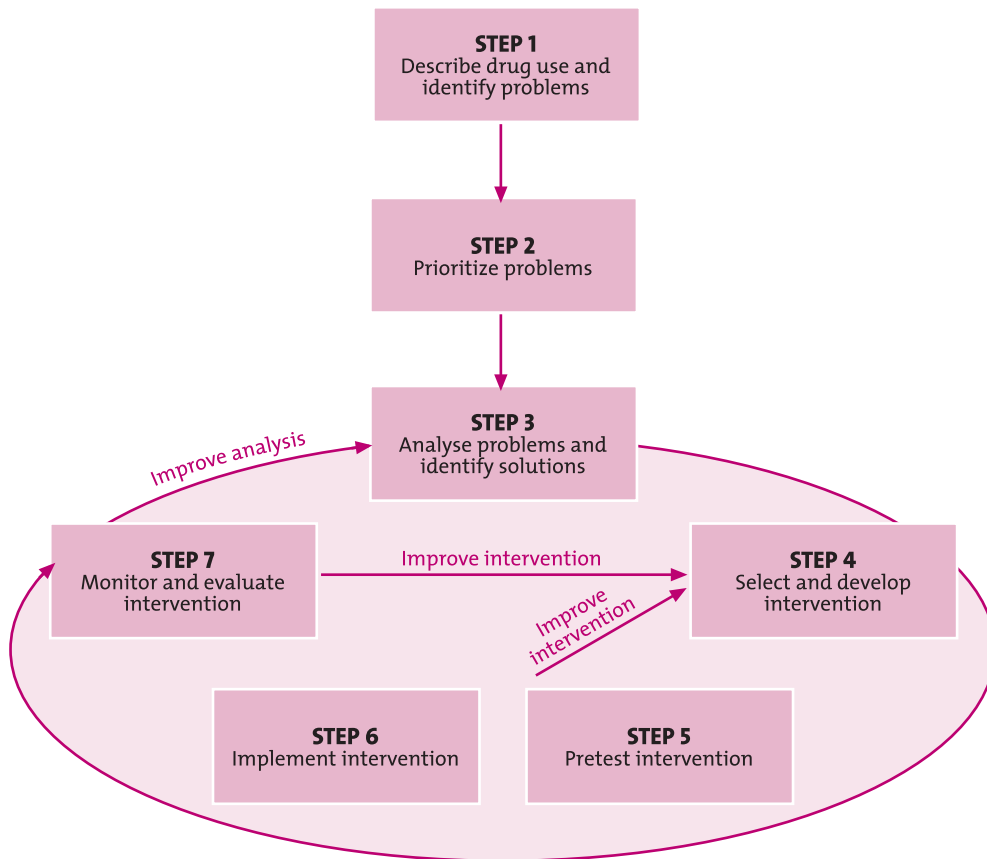
As explained in Chapter 1, the planning and implementation of community drug use interventions is a step-by-step process (see figure 3). In this chapter we focus on step 1, Describe drug use practices and identify problems. The aim in step 1 is to get an overview of the drug use problems in a region or a country. We want to identify the many different kinds of problems that occur. In steps 2 and 3 (see Chapter 4) we prioritize the problem and analyse why it occurs, as a basis for developing an effective intervention. Evaluation studies (step 7) aim to measure whether the intervention has been effective (see Chapter 7).

3.2 Describing and identifying medicines use problems

To identify drug use problems, it is best to focus on common health problems and on how these are treated. Examples of common health problems include respiratory infections, diarrhoea, aches and pains, and infectious diseases such as malaria, tuberculosis and AIDS.

However, as seen in Chapter 2, people increasingly use medicines such as vitamins and tonics to improve their quality of life as well as to treat illness. So we need to know more about such preventive use of medicines too.

Figure 3. Steps in developing an effective intervention aimed at enhancing rational drug use by consumers



We also need to find out what health workers, women and men in communities, opinion leaders, and essential drugs programme planners consider to be problems with drug use in communities. Key research questions in step one of developing effective communication interventions are:

- Where do you go if you or a family member is sick? If you don't go there what do you do?
- What are the common health problems in the community? What do people do if they suffer from them? What medicines, if any, do people use to treat them? To what extent are these drug use practices rational?¹
- What are the most common medicines used to promote health? To what extent are these practices rational?
- What do people consider to be drug use problems in their communities?
- What do health workers believe are drug use problems in the community?

Additional questions that can help describe community drug use patterns include:

- What medicines do people keep in their homes? What are they used for?
- What medicines are commonly sold in community shops and other sources of medicines in the community? What are they used for? How much do they cost?
- Where do people go to obtain medicines? What are the advantages and disadvantages of the various sources?

¹ In chapter 1 rational use was defined as: patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community.

Various quantitative and qualitative methods can be used to describe and analyse drug use problems. Each method has its own weaknesses and strengths. In the following sections, you will find more details on a selection of methods that are especially useful for collecting data in communities on drug use.

Quantitative data are needed to describe how often certain drug use practices occur. They are frequently used when the study's aim is to obtain a representative picture of the situation amongst a given population. In that case, researchers need to use a so-called probability sample to make sure that the study population has all the important characteristics of the general population from which it is drawn. The size of the sample depends on what you want to measure. We give an overview of sampling methods in Chapter 5. This will help you to take decisions. You should consult a researcher with statistical knowledge to decide on the sample size. Because of the relatively large number of respondents involved, the number of questions to be included in a quantitative study should be limited. You need to define key variables and indicators that will be measured in the study in order to answer the research questions.

Qualitative methods are used to find out more about people's ideas, the reasons why problems occur, what people see as possible solutions and constraints. The emphasis is not on representation but on in-depth understanding. When selecting informants you should choose people who can provide the information you need. Make sure you cover the heterogeneity in the population, as views and ideas may differ between older and younger people, men and women, and people with different religious or social backgrounds. Qualitative studies can also be used to formulate appropriate questions for a quantitative survey, or they can be used to elucidate findings from quantitative studies.

The following data collection methods are often used to investigate drug use:

- a. Study of documents
- b. Semi-structured interviews
- c. Focus group discussions
- d. Observation techniques, including simulated client visits
- e. Structured interviews, including weekly health recalls

For each of these five research methods, we discuss how to use the method, and its relative strengths and weaknesses (see Additional Reading at the end of the chapter, which includes publications covering research methods in more detail).¹

3.3 Study of documents

In the field of drug use and distribution there are many secondary data sources that researchers can tap. These include:

- published studies
- reports of agencies involved in the implementation of health care (baseline surveys, health surveys, monitoring reports and evaluations)
- sales and consumption figures
- prescriptions.

All these data sources can be used to:

- get a global overview of drug consumption, prescription and distribution
- get specific information on drug use in commonly occurring diseases
- identify drug use problems.

¹ The methods we discuss can also be used in step 3 of developing an intervention, when we aim to analyse why specific problems occur (see Chapter 4).

How to do document reviews

Before conducting fieldwork on drug use practices, we should ask: What do we know about the problem in the local settings? Have studies on the problem been done in other countries? What reasons for the problem were identified? What sub-problems have been described? What population groups are affected? What can you learn from drug sales statistics in your country? Have studies been done on community members' perception of the problem in your country? What data are still lacking?

There are several websites which help you to find published – and sometimes unpublished – information (see box). Increasingly, journals offer their articles online. Articles can be downloaded free of charge, see for example <http://bmj.bmjournals.com>.

BOX 4. INFORMATION SEARCHES

A computerized literature search using key words in Medline (which has abstracts of medical articles) and Popline (which covers family planning and related health issues). A site where you can search these and other health-related databases free of charge is: <http://igm.nlm.nih.gov/>

The INRUD Drug Use Bibliography, an annotated bibliography of published and unpublished articles, books, reports and other documents related to drug use, with a special focus on developing countries, contains over 4,000 entries and is updated regularly. See: www.inrud.org

Getting hold of unpublished reports is usually more difficult. If possible, it is often best to visit a few well-functioning documentation centres of health-related organizations and institutions. UNICEF national offices can be a good source of information. Also, when conducting key informant interviews ask for any relevant reports or data. It is best to ask health workers in the research area what data they or others have collected, and if they can be accessed. It is very important to do this, in order not to bother people in the area with questions and surveys that have already been undertaken by others.

A survey of prescriptions can give a very accurate picture of physician prescribing practices. To study prescriptions you need to request permission from health care institutions or pharmacies. However, they may not be systematically collected, for example, patients keep them. In that case, interviews with consumers can include a question on prescriptions kept at home, or you can conduct exit interviews at health facilities. Prescriptions are a good starting point for discussion on (non) compliance.

Sales statistics provide useful information and can be obtained from IMS Health affiliates in each country, though this may be expensive. Sales figures can be used to describe national drug consumption patterns; one can, for example, identify the 10 most commonly used drugs. A drawback is that the agencies collating sales figures often ask researchers to pay for these data; only outdated figures are available free of charge. Sales statistics reflect private sector drug consumption. Procurement data from the ministry of health can provide a good indication of volumes of drug use in the public sector. Ministries of health may also have collated data on medicine provision by type of health facility and region.

Strengths and weaknesses of document reviews

The **strengths** of using document reviews are:

- they are a cost-efficient way of doing research
- they avoid duplication of efforts.

The **weaknesses** of document reviews are:

- consent is often needed from the “owner” of the data
- it is sometimes difficult to assess the reliability and accuracy of the data
- data are often outdated
- data may be costly.

3.4 Semi-structured interviews

Semi-structured interviews are based on the use of an interview guide. This is a written list of questions or topics that need to be covered during the interview. These interviews can help you collect information on:

- local terms for common health problems and types of medicine used
- sources of medicines: where do people go to obtain medicines, and what are the advantages and disadvantages of the various sources, in their view?
- sources of advice: where do people commonly go for advice on day-to-day health care problems?
- perceived drug use problems: what do people and health workers consider to be drug use problems in their communities?
- why people use medicines irrationally
- what the possible solutions are.

How to conduct semi-structured interviews

Semi-structured interviews follow an open and informal interview style. They allow for a listing of health problems using local illness terms and a listing of medicines commonly used, as well as an exploration of problems, the reasons why they occur, and possible solutions. Interviewers can continue to ask questions until they fully understand the situation. Ordinary conversation makes it easier to reassure informants and to win their cooperation and trust.

Make sure that you interview different types of people: a variety of key informants (knowledgeable individuals) – men and women, poor and rich people; and those of different ethnic backgrounds.

Potential key informants in the community are:

- school teachers
- community leaders
- medicine sellers
- nurses, midwives and other health workers who serve the community.

You will need to limit the number of interviews, as semi-structured interviews are quite time-consuming to conduct and analyse. The aim is not to get a representative sample of the various categories of informants, but to gather a substantial body of information from them. Try to limit the list of the people you will interview to around 20–30 who are likely to give you most information on the problem and can choose from a variety of perspectives. You usually only need to interview 3–5 people from each of the identified groups (see also Chapter 5).

When conducting semi-structured interviews, the interviewer is prepared with a list of questions and topics to be discussed. However, the order of the questions and topics is undefined. It depends on the flow of the discussion. It is best to start with a topic that is not sensitive and is important to the respondent. Thus, an informal, friendly atmosphere can be created, facilitating a ‘natural’ flow of ideas and opinions. The researcher acts as a moderator, guiding the respondent from one topic to another. Conducting such interviews requires a skilled moderator.

It is best to do a small pilot study in which the interview guides are pretested, preferably not in the community where the actual study will be done. The best way to

BOX 5. GROUND RULES FOR A GOOD INTERVIEW

Conducting the interview:

- Greet your informant at the beginning of the interview in a culturally appropriate way.
- Explain the purpose of the interview and ask the informant for consent.
- Explain how the information will be recorded. Ask for permission to tape-record the session if you plan to do so.
- Arrange comfortable seating to facilitate communication.
- Introduce the people present at the interview. The respondent should be asked for permission for all of them to stay.
- Start with a topic that is not sensitive and is important to the respondent. This helps create an informal, friendly atmosphere facilitating a 'natural' flow of ideas and opinions.
- Be an "active" listener; look at your informant's face (not at your interview guide), and always behave in a culturally sensitive way.
- Pick up phrases that the informant uses and use these to phrase your questions. Instruct your translator to do this too.
- Avoid giving opinions or judgements about what the informant says, and treat him/her as an equal.
- Jokes, or friendly gestures towards any small children present can help break the ice.
- Use open-ended questions not closed ones which only allow for 'yes' – or – 'no' answers.
- Avoid asking leading questions.
- Follow the flow of the discussion, but make sure that all the topics are covered.
- Ask 'probing' questions to clarify points or to encourage more explanation.
- Respond to issues raised by your informants, which are not on your interview guide, and probe on these as well.

Thank the informant at the end and give him/her time to ask more questions.

Recording the interview:

- Use 'telegram-style' short notes to record the responses of your interviewee but where (s)he uses important terms or interesting expressions record as much as possible of the responses 'verbatim' (using the words the informant used). This should also be done if you are tape-recording the interview (sometimes the quality of the recording turns out to be bad).
- Find a balance between taking notes (looking down at the paper) and talking with the respondent; (s)he will feel uncomfortable if you spend too much time writing. If you conduct the interview in pairs, one person can do the interviewing and the other can make notes. Complete the interview record immediately after the interview so you can still recall what was said.
- Observe and make notes on non-verbal communication like silences, laughing, worried expressions, etc.

conduct a semi-structured interview depends on the communication rules that exist in any given society. Generally the guidelines given in box 5 can help you.

These interviews should be relatively short. The questions on the checklist should help you find out not only WHAT people do. If you are analysing a specific problem you will want to find out the REASONS WHY the drug practices which you have defined as problematic occur. Limit the questions. The semi-structured interviews will reveal that the drug use problem which you selected as a priority problem, is in fact a set of related sub-problems, with a variety of causes. How to conduct the prioritization analysis of core problems is presented in more depth in Chapter 4.

The recording of in-depth interviews can be done in various ways. The simplest method is to prepare a form which you can use to fill in information on the interview topics. Below are examples of two simple forms (A1 and A2) that you can use to fill in the common health problems mentioned, the types of treatment used, who generally gives advice on these treatments, the source of the treatments, and the advantages and disadvantages of these sources.

A1. Key informant interviews on treatment of common health problems

Name:	Community:
-------	------------

Type of key informant:	Interviewer:
------------------------	--------------

Date of interview:	
--------------------	--

COMMON HEALTH PROBLEMS	TYPES OF TREATMENT	WHOSE ADVICE	SOURCES OF TREATMENTS

A2. Advantages and disadvantages of various sources of medicines

Name:	Community:
Type of key informant:	Interviewer:
Date of interview:	

SOURCE OF MEDICINES	ADVANTAGES STATED	DISADVANTAGES

You should make extended notes of the drug use problems identified by key informants. It is best to capture the informants' exact words used to describe the problem as far as possible. If you made a recording of the interview, type the whole text verbatim, including the questions asked (see also Chapter 6 on processing and analysis of qualitative data).

The results of semi-structured interviews are hard to generalise, as they are based on interviews with a limited number of people. Focus group discussions can be used to further validate to what extent the problems identified reflect what people in the community perceive to be problems, and to compare the practices and views of different categories of people. Structured interviews can be done to further quantify key findings.

Strengths and weaknesses of semi-structured interviews

The **strengths** of semi-structured interviews are:

- depth of information
- respondent can influence the topic, so unexpected issues/topics emerge
- researcher can probe to understand perspectives and experiences
- topic guide ensures that a core list of questions is asked in each interview
- because the order of questions is not fixed, flow and sharing of views are more natural.

The **weaknesses** of semi-structured interviews are:

- trained interviewers are needed to probe without being directive or judgemental
- analysis of findings is difficult – must be done by people who did the interviews
- researcher has to avoid bias in analysis
- researcher needs to know something of the local culture to capture the interviewees real meaning
- analysis is time-consuming
- difficult to generalize findings.

3.5 Focus group discussions

Focus group discussions (FGDs) can be used to collect information on:

- common health problems and medicines used to treat them
- sources of medicines
- sources of advice
- perceived drug use problems
- reasons why drug use problems occur
- possible solutions.

The results from the FGDs complement the findings from the semi-structured interviews. They can be further used to contrast drug use patterns among different groups of respondents and to compare their views on drug problems.

How to conduct FGDs

Instead of having an interview with one person, a researcher preparing for an FGD invites several people to participate. The selection of group members demands careful planning. When organizing FGDs it is generally advisable to choose 'homogeneous' groups in terms of age, sex, socio-economic status, etc. since this facilitates open discussion. In mixed groups considerations of status and hierarchy can affect the discussions. Groups should be relatively small, between six to a maximum of 10 members. Possible groups for a study on drug use include:

- young men
- young women
- women who have small children
- married men
- elderly men
- elderly women
- people of different ethnic backgrounds, if relevant.

It is best to conduct at least two FGDs per category of respondents.

Question lists for FGDs should include a limited number of questions. Preparing five or six good and relevant questions is generally more than enough for about one and a half hours discussion with six to 10 people. If more questions are prepared, the facilitator will have to rush through the discussion. One should not forget that in FGDs – contrary to individual interviews – the reaction of one person leads to contributions from others. To encourage lively discussion it is often good to start with a little ‘ice-breaker’, for example a game, or a lively way of introducing the participants to each other. The questions should be neutral and open-ended. Often FGDs start with general questions, which everyone responds to, then, in the course of the discussion, more specific issues are raised.

The moderator's role

The most important requirement for a successful FGD is a skilled moderator. Group discussions, though very efficient as a data-gathering tool, are not easy to conduct. The moderator does not need to have high academic qualifications, but (s)he must understand the aim of the discussion, and must have good communication skills. The moderator's role is to:

- encourage everyone to participate in the discussion
- stimulate discussion between participants, particularly when new information is given, or a diverging perspective is put forward
- guide the group from one discussion topic to another
- not express his or her own opinion – facilitate do not teach
- not act as an expert, but retain control over the discussion.

The choice of venue for an FGD is important. The place should be viewed as neutral by participants. It is better not to choose the local health centre as a venue, as people may not feel free to express their ideas where health workers are present. Providing small extras such as refreshments can create a friendly, relaxed atmosphere, which encourages discussion. Providing child care may be necessary.

The interviewer should be present in the venue before people arrive, to start talking with the participants and to create an informal atmosphere that encourages a group discussion. The discussion's aim and structure should be explained to the group members.

In practice, it is hard to control the composition of the group involved in such a discussion. In public settings, people passing by or those who happen to be in the setting may start observing the discussion. They may even start interfering in it. It is important that the moderator has an appropriate response to such unplanned interference. For example, if men stand by watching a session with mothers, the moderator can inform the men that there will be a separate group discussion for them. The moderator can also prevent such interference by selecting a neutral, relatively secluded place. It may also be helpful to inform people who may interfere about the discussion's purpose before it takes place and to explain why they were not invited to take part.

Recording and reporting

Finally, FGDs are usually recorded on tape. These recordings should be done with care. Always ask the participants for their consent before taping. In addition, one observer/researcher should make notes. It is sometimes unclear from the tape which participant is speaking, and in the notes, the observer can also record non-verbal communication. You can also choose not to use a tape recorder. It is then best to ask two observers to make notes, which they consolidate into a single record of the FGD after the session.

The results of the group discussion can be analysed and interpreted in the same way as the semi-structured interviews described above. FGDs are ideally combined with semi-structured individual interviews. These interviews can be used to gain understanding of ideas and views that were not expressed in the group.

BOX 6. FOCUS GROUP DISCUSSIONS

A community-based study conducted in the Philippines

The following guide for discussion with mothers of small children was used in a community drug use study in the Philippines. The researchers use focus group discussions to elicit the mothers' ideas about medicines. These ideas are being used in the development of educational materials. To encourage a lively discussion, the moderator starts the discussion with a sorting game. Twelve popular medications (herbal and pharmaceutical) are put on a table and the participants are asked to sort the medications into piles. (The popular medications have been elicited from key informant interviews done prior to the focus group discussions). The recorder notes the comments made during the sorting.

1. The respondents are then asked why medications have been grouped together and in what way they differ from other medications.
2. The interviewer then asks the participants if they use each of these medicines. They are then asked for its uses and their experiences with it.

After this exercise, a different point of departure is taken: the area's most common illnesses.

3. The interviewer first asks what the common illnesses are in the area. She or he writes the answers on cards; and probes for additional common disorders.
4. For each of the mentioned disorders, (s)he then asks what the mothers do to treat it. The interviewer uses flashcards to indicate the disorder that is the subject of discussion.
5. For each type of treatment mentioned, (s)he then asks why the treatment is used and where it is obtained.

Strengths and weaknesses of focus group discussions

The **strengths** of FGDs are:

- the method is quick and cheap
- a greater pool of expertise is tapped than in individual interviews; a more diverse picture of drug use will emerge
- the contribution of one person often triggers others to share their views and experiences.

The **weaknesses** of FGDs are:

- a skilled moderator is required
- the success of a group discussion is a bit unpredictable
- in some cases one or more participants dominate; the views of others are not recorded and so are under-represented
- the depth of information may be limited. It is hard to probe one person's ideas, as others also have to be given a chance to speak
- analysis of the information gathered is demanding.

3.6 Observation techniques

Direct observation produces more reliable information than interviews on actual behaviour. The researcher can see which medicines are being sold, prescribed or used, or are available in medicine cabinets; what information on their use the seller or doctor provides; whether drugs are purchased on prescription, etc. The most common observational techniques to study drug use are:

- simulated client visits
- inventories of community drug outlets and medicine cabinets.

How to conduct simulated client visits

Observational research is often done to describe drug distribution patterns in informal drug outlets and pharmacies. However it is difficult to carry out because drug sellers may not want to have an onlooker present. They may feel that it will disrupt or even endanger their business, particularly if some transactions are illegal. If they have a researcher present, they may do business in a more 'correct' way than they normally would, and they may feel that their professional competence is being tested.

This problem can be solved by conducting simulated client visits. A researcher or an assistant can pose as a patient or client. The advantage is obvious; it gives an unbiased picture of normal procedures. Simulated client methods are often used to measure the quality of prescribing and dispensing drugs in health facilities, pharmacies and drug shops. It involves a researcher posing as a client and going to a health centre or pharmacy with a complaint. The objective is to determine how a sample of providers react to the complaint; what treatments they recommend, and what information they give.

Posing as a patient or client, however, reduces the amount of information that can be gathered. The researcher can only observe his or her own visit, and in pharmacies at most a few drug purchases while waiting in turn. Furthermore it is difficult to pose many questions and make notes, without revealing one's true identity. To counter this restriction, researchers can combine unobtrusive observation with interviewing. This approach was used by Wolffers (1987), who had assistants visit 28 pharmacies to buy tetracycline over the counter, and then let other assistants interview the pharmacy personnel about tetracycline a few days later. You may also consider using different kinds of 'clients', representing the diversity in wealth, gender, age and ethnicity of people visiting the facility.

The method is somewhat controversial. One can question how ethical it is to conduct such visits without asking health workers and/or drug sellers for informed consent. The ethical issue can be resolved by asking the respondents or their professional organization for consent before conducting the visits and without giving details on when the visit will take place, to avoid bias. In the fieldwork it is recommended to use the simulated client visit to observe what information and advice drug sellers give. If a drug is bought during a visit, funding and accountability measures are needed.

An advantage of the simulated client visit is that it is a rapid method. A typical transaction does not last more than five minutes. It can also be used to evaluate the effects of rational drug use interventions, such as to measure information provided on drugs before and after an intervention. Ross-Degnan and colleagues (1996) tested the effects of a face-to-face education outreach intervention in Kenyan and Indonesian pharmacies.

Using trained surrogate patients posing as mothers of a child under five with diarrhoea, they measured sales of oral rehydration salts; sales of antidiarrhoeal drugs; and history taking and advice to continue fluids and foods. Sales of oral rehydration salts in intervention pharmacies increased by an average of 30% in Kenya, and 21% in Indonesia, compared to controls. Discussion of dehydration during pharmacy visits increased significantly in Kenya.

When planning to use simulated client visits as a method, you need to take decisions on how to sample the drug outlets and how many observations to do per outlet (see 6.2). It is important to consider the usual opening hours and the volume of transactions each day. For example, on market day pharmacies may be very busy and minimal advice given.

The guidelines provided in box 7 will help you to conduct effective simulated client visits.

BOX 7. GROUND RULES FOR CONDUCTING GOOD SIMULATED CLIENT VISITS

- Simulating a client requires insight into how clients usually behave. This can be obtained by conducting unobtrusive observations in pharmacies; or by asking informants during semi-structured interviews how they would ask for medicines and present a complaint at a pharmacy.
- Don't step out of your role.
- Consider also the details of the transactions: will the advice be followed and a medication bought? What if the medicine is very expensive? Does the client then ask for a cheaper alternative?
- Make a realistic 'script'.
- Make sure the 'client' looks like a real client. What will the client wear?

On recording:

- You cannot record what happens during the visit, as that would be unnatural, but this should be done immediately afterwards. Design a form for this purpose to make sure that all relevant information is covered.

Record the results of the simulated client visits systematically. It is helpful to make a simple form to be filled in immediately after the visit. However, as with non-formal interviewing, the researcher has to be alert for the unexpected. The analysis and interpretation of the data depends on the extent to which the observations are structured. In some cases the analysis is quantitative, for example, when reporting in how many cases prescription drugs were sold over-the-counter. In other cases the observation is less structured, for example, focusing on the communication during the drug transaction. The researcher then has to categorize and analyse the findings in much the same way as with semi-structured interviews (see Chapter 6 for more information on analysis).

Strengths and weaknesses of simulated client visits

The **strengths** of simulated client visits are :

- they can provide more reliable information than interviews
- drug use and distribution in its natural context can be observed
- if done well, this method gives information on what drug sellers really do
- a representative sample of pharmacies/health centres can be observed.
- results can be generalized
- results can be quantified
- they can be used to evaluate effects of training of pharmacy sellers and health workers
- they can be used as a participatory method. You can ask people living in the communities that you are studying to act as surrogate clients, and collect data.

The **weaknesses** of simulated client visits are:

- data are sometimes hard to interpret
- it is difficult to do a lifelike simulation, especially if you are playing a type of client you are not so familiar with (female students acting as mothers, for example)

- the observation period is short (the time needed to buy the drug, or consult a health worker)
- it is difficult to probe on why advice is given
- the depth of information collected is limited
- the findings need to be complemented by interviews.

Inventory of community drug outlets and medicine cabinets

Inventories of medicine outlets and medicine cabinets are a second useful observation tool. The main aim of this tool is to describe the types of medicines commonly used in the community. The assumption is that commonly used medicines are those that people store in their medicine cabinets, and that storekeepers sell in community drug outlets. This tool can provide information about medicines used to promote health (such as vitamins and tonics) as well as illness-related medicine use. And, it can be used to conduct surveys of drug prices.¹ The form overleaf can serve as an aid in collecting the information on medicine cabinets.

You need to explain to the respondents how the data will be used, as you do with the other tools. It is also important that you ask for their consent.

To conduct the inventory of medicines in community stores, ask a key informant to guide you around the community and introduce you to storekeepers. Explain that you are interested in common drug use practices and why. Say that for this purpose you would like to know what medicines are sold in the general shops and what they are used for. You can make an inventory of the types of medicines, and what they are used for. You can combine this method with (semi-) structured interviews. At the household level the inventories can be used as the basis for semi-structured interviews about drug use practices and perceptions.

Strengths and weaknesses of medicine inventories

The **strengths** of medicine inventories are:

- they give an accurate picture of medicines commonly used in the community
- the medicines inventories are a good starting point for discussion on how medicines are used, and why they are used
- they can be a good participatory method – community health workers can help in making the inventories
- they can be used to collect data on pricing of drugs in different outlets.

The **weaknesses** of medicine inventories are:

- they can be time-consuming if households/shops have large medicine stocks, unless a selected list of medicines is surveyed
- sometimes people/sellers do not have the package information – it is hard to validate the types of medicines kept.

3.7 Structured interviews

Structured interviews include a number of questions in a pre-defined order. They can deal with various aspects of medicines' provision. Either drug providers or consumers may be interviewed. The most common form of structured interview confronts the provider or consumer of drugs with hypothetical patients: e.g. what would you prescribe/use for complaint x, in patient y? Structured interviews are also used to complement observations that the researcher makes during consultations. Physicians are then asked what they prescribed, and why they chose a certain treatment.

¹ See WHO/HAI (2003), Medicine prices: a new approach to measurement.

FORM FOR THE INVENTORY OF HOUSEHOLD MEDICINE CABINETS

Name of informant:		Date:						
Name of interviewer:		Community:						
MEDICINE NAME	MANUFACTURER	CONTENTS (GENERIC NAMES)	EXPIRY DATE	USED FOR WHICH SYMPTOMS	WHERE OBTAINED?	WHOSE ADVICE?		

In EXIT INTERVIEWS, people leaving health facilities, dispensaries or private pharmacies can be asked in a structured way about the consultation, treatment and information given, and the perceived quality of care.

Consumers may be interviewed at home, in a hospital, a health centre, and at formal or informal drug outlets. Questions could cover topics such as:

- types of medicines available/ being purchased
- complaints for which medicines are purchased
- prices of the medicines
- source of advice on the purchase
- treatment taken before buying drugs
- ideas about the correct use of the medicines.

Consumers can be interviewed in their home, which is where they are most likely to take the medicines. An advantage of household interviews, unlike interviews at drug outlets, is that a sample can be selected which is representative of the population in a certain area (by random sampling).

How to conduct structured interviews

In conducting the interviews the researcher uses a questionnaire as a tool. Developing a questionnaire is not an easy task. First the researcher has to clearly define the objectives of the study, and the specific research questions. Only then can appropriate questions be formulated. The following points can serve as a guideline:

- use the objectives of the study to compile a list of topics, and hypotheses
- identify the variables to be measured, and the independent variables (such as socio-economic status, age, etc.) to which the findings should be related. It is best to design the tables that are wanted as a study output, before designing the questionnaire
- use semi-structured interviews or FGDs to learn about the way in which people talk about the topics in the local language. Use this understanding when preparing questions for the questionnaire
- write the questionnaire in the local language, and translate it back to the original language to check that the content has not changed in the “translation” process
- questionnaires should be short; omit any questions that are not needed to answer the study objectives
- write guidelines for the interviewers, and pre-test the questionnaire in an area which is not where the actual research will be conducted but which has similar characteristics.

In designing and pre-testing the questionnaires the interviewers should check for each question:

1. If it is understood.
2. If the question is neutral, i.e. it avoids leading the respondent to one of the possible answers.
3. That it does not contain implicit assumptions that are not valid, for example the question “which side-effects did you experience?” assumes that side-effects occur.
4. That it is needed; maybe there are other – easier and more reliable – ways to answer the research question.
5. That it elicits answers that are sufficiently precise to meet the objectives of the research. For example, the question “which drugs did you take in the past months?” is not a useful question, because people simply cannot remember over

such a long time span. The question “which drugs did you take yesterday, and the day before yesterday?” is much more reliable, as people are likely to remember what they did in the past two days quite accurately.

This checklist can serve as a guideline to prevent the most obvious mistakes. If the researchers have limited research experience, it is best to consult a social scientist with experience in quantitative surveys when constructing a questionnaire. If the data are to be processed by computer, then data-processing personnel should be asked for advice on the best way to design the questionnaire and code the responses. The extent to which the responses can be coded depends on the questions. If so-called open questions are used, then the researchers have to code the responses after conducting the interviews. In the case of closed questions, containing a pre-defined list of possible answers, then each answer can be assigned a code on the interview form. This makes data processing easier.

Finally, it is essential that the data forms are easy to use by the interviewers. Leave sufficient space for the answers.

In the small-scale surveys that are proposed in this guide, computer analysis is usually unnecessary. Because the questionnaires are short and the number of respondents are limited to around 100, the researcher can hand-tally the results. The statistics that are used are generally descriptive involving simple frequency tables and percentages.

Strengths and weaknesses of structured interviews

The **strengths** of structured interviews are:

- useful for large-scale studies with many respondents who represent the population
- they can be used to describe how often drug use practices occur
- findings can be compared with other studies and used to measure the impact of interventions
- can test hypothesis using statistical tests.

The **weaknesses** of structured interviews are:

- respondents have little control over the interview
- no data are obtained on aspects of the problem not included in questions
- the validity of the responses may be low due to an “unnatural” atmosphere in the interview.

One specific type of structured interview that has proved to be of great use in studying community medicines use is the weekly illness recall.

3.8 Weekly illness recalls

Weekly illness recalls are a useful method for determining how people actually treat common health problems and how often certain drug use practices occur. Using this method, household members are interviewed about illnesses occurring recently (in the past few weeks) and related medicine use. This method can be used to collect information on:

- illness-related medicine use
- sources of medicines
- sources of advice on medicines
- spending on medicines.

How to conduct weekly recalls

Answers on medicine use are most reliable when they concern actual illness cases (as opposed to hypothetical ones) and cover a short period of time. If respondents

FAMILY HEALTH CALENDAR

August		Father	Mother	Children, list names						
Friday	1									
Saturday	2									
Sunday	3									
Monday	4									
Tuesday	5									
Wednesday	6									
Thursday	7									
Friday	8									
Saturday	9									
Sunday	10									
Monday	11									
Tuesday	12									
Wednesday	13									
Thursday	14									
Friday	15									
Saturday	16									
Sunday	17									
Monday	18									
Tuesday	19									
Wednesday	20									
Thursday	21									
Friday	22									
Saturday	23									
Sunday	24									
Monday	25									
Tuesday	26									
Wednesday	27									
Thursday	28									
Friday	29									
Saturday	30									
Sunday	31									

Please fill in every day if a family member had, for example, cough, cold, diarrhoea, headache or anything else.
 Note: Researchers should adapt this list to local health problems before giving out the Family Calendar.

are asked to recall illness episodes, the best recall period is one week. In areas where respondents can read and write, a health calendar may be given to the households as a memory aid. The illnesses that occur during the study period can be noted on this calendar.

During the first visit to the households selected for the weekly illness recall, the researcher explains the aims of the research and asks the respondents if they want to participate in the study. The researcher can also explain to the respondent how to use a health calendar, if appropriate. The respondent should be told that the next visit will take place one week later, and that the illnesses occurring during that week should be recalled. It is important to stress that the research team will not provide medical aid. In past studies we have found that people tend to over-report illnesses if they expect that medicines will be given to them.

A sample questionnaire designed for such a household interview and the form to record the data are given below. They are adapted from ones used for a comprehensive study on community drug use that aimed at: quantifying self-medication patterns; drug provision channels; the appropriate use of medicines; and most specifically, the appropriate treatment of diarrhoea and acute respiratory infection episodes.

When conducting weekly illness recalls, you will need to decide how often the families should be visited. We suggest at least three times: once to explain the objectives of the study, and then twice more to interview them about illnesses occurring in the family and the treatments given. This means that the study will last at least three weeks. When visiting a family to recall illnesses the second time, you need to follow up on the illness cases recorded during the first visit. You may need to add treatments to the cases recorded during the first visit. During the last visit when you have established a certain level of rapport with the respondents, you can ask to see their medicine cabinets to find out more about the medicines they use in self-care.

You will also need to decide how many families you intend to interview and if you want to draw a representative population sample. Your sample size will be limited by budgetary constraints. To obtain a reasonable amount of information, we suggest that you interview at least 100 families. Often researchers focus on families with pre-school children as relatively they suffer a high burden of disease. This fact makes them an important target group for interventions. In the same way, you can purposely decide to sample households with elderly people, as this group consumes medicines regularly. If you do want to draw a representative sample for your study, make sure you consult a statistician (see Chapter 5 on sampling).

When people are ill, they have several options: they may do nothing (no treatment), seek traditional therapy, seek treatment from a health care provider, or self-medicate with medicine. Weekly illness recalls such as the example given in the box above provide you with reliable data on people's therapy choice.

You can use the data on medicines used to describe:

- sources of medicines: give a frequency distribution for specified sources. You can also present these data in a diagram, as given in figure 3 in Chapter 2, "What Influences Medicines Use by Consumers"
- most popular medicines in self-medication: list the 10 top names and give their generic contents and cost
- most popular medicines used for specific health conditions: select a number of predominant health conditions (such as acute respiratory infections, diarrhoea and malaria), and list the top 10 medicines named.

More information on processing and analysis of data collected in weekly illness recalls is given in Chapter 6.

WEEKLY ILLNESS RECALL QUESTIONNAIRE

Note for the interviewers: This questionnaire is to be used for the weekly visits to the respondent-families. During the first visit explain that you are conducting this study to find out more about the health problems in the community, and the way they are treated. Explain that you will be visiting them once a week for three weeks, and that they can use the health calendar to fill in any illnesses that occur during the week. Explain that their information will be treated anonymously, and that their privacy will be respected. After explaining this, ask if they have any questions, and then ask the respondents if they are willing to participate in the study. If yes, ask them to sign the informed consent form.

You should fill in one illness form for each illness case identified, see next page.

1. Has anyone in your family been ill during the past week? If yes continue below.

2. Who was ill? How old is (s)he?

3. What did (s)he suffer from? (Write down local terms used by respondent).

4. Did you give any treatment? Specify: none, or if treatment was given, the type of treatment, Specify the names of home or traditional remedies, as well as any Western medicines given.

5. What is the effect of the treatment? (Probe for all types of treatment given).

For any pharmaceuticals given, ask:

6. Can I see the package of the medicine? Copy details of the medicine's contents, if given on the package.

7. Ask about the dosage/duration: When did you start giving pharmaceutical medicine? How many days did you treat the problem? How many times per day did you give the medicine(s)?

For all treatments ask:

8. Who advised you to take the treatment?

9. Where did you get the treatment? How much did it cost per capsule, tablet or per bottle? (Specify the number of mg active ingredient per capsule or tablet. If the drug is a syrup specify the number of mg/ml active ingredient and the total number of ml in the bottle). If you had an injection who gave it?

ILLNESS FORM

Name of patient: _____

Illness suffered:

(write down terms used by respondent)

Date: _____

Interviewer: _____

Community: _____

Treatment:

Age patient: _____

	1st treatment	2nd treatment	3rd treatment	4th treatment
Name of treatment				
Effect of the treatment according to respondent				
For pharmaceuticals, give contents as written on package				
Dosage form (tablet, capsule, syrup, etc.)				
Duration of treatment in days, and number of doses/day (give start date in brackets)				
Who advised?				
Where obtained?				
Cost per unit, specify mg per tablet, ml per bottle				
Comments on appropriateness (to be made by pharmaceutical adviser to the study)				

Specific strengths and weaknesses of weekly illness recalls

The main **strengths** of weekly illness recalls are:

- data can easily be quantified and compared with results of other studies (measuring the same variables, using similar questionnaires)
- a lot of data can be collected in a short time
- they provide information on actual illnesses, and actual treatment practices (as opposed to hypothetical ones).

The main **weaknesses** of weekly illness recalls are:

- the interviewer controls the discussion, and may influence the responses
- no data on other aspects of the problem (not contained in a question) are collected
- the reliability of responses may be low, because the interview is held in an “unnatural” manner
- the information on illness-related medicine use is collected, not on the use of vitamins, tonics and other medicines to promote health
- the information on less common health problems is lacking.

The need for triangulation

As mentioned in the introduction to this chapter, when conducting intervention-oriented studies, we intend to be efficient, flexible, participatory and interactive. The data are not collected for the sake of research, but as steps in a process towards the development and implementation of effective rational drug use interventions. We have seen that many different methods can be used. The selection of methods will depend on the research questions. Each method has strengths and weaknesses. To overcome these, it is best to combine methods. Observations, for example, can teach us what people do. Semi-structured interviews and FGDs teach us why people do what they do. The combination of various methods (usually three) to cross-check information is called ‘triangulation’. Table 2 overleaf gives an overview of the methods discussed above, by level of health care, including what the methods can be used for.

Additional reading

Abramson JH, Abramson ZH (1999). *Survey methods in community medicine*, 5th ed. Edinburgh, Churchill Livingstone.

de Zoysa J et al. (1988). Research steps in the development and evaluation of public health interventions. *Bulletin of the World Health Organization*, 76(2):127–133.

Debus M (1986). *Methodological review: a handbook for excellence in focus group research*. Washington, DC, Academy for Educational Development, HEALTHCOM. (To request a free copy write to: BASICS, Information Center, 1600 Wilson Blvd., Suite 300, Arlington, VA 22209, e-mail tperez@basics.org).

Hudelson PM (1994). *Qualitative research for health programmes*. Geneva, World Health Organization. WHO/MNH/PSF/94.3.Rev.1.

Ross-Degnan D et al. (1996). The impact of face-to-face educational outreach on diarrhoea treatment practices in pharmacies. *Health Policy and Planning* 11(3):308–318.

Zimmerman M, Newton N, Frumin L, Wittett S (1996). *Developing health and family planning print materials for low-literate audiences*. Revised ed. Washington, PATH.

WHO and HAI (2003) *Medicine prices: a new approach to measurement*. Geneva, World Health Organization and Health Action International. WHO/EDM/PAR/2003.2.

Table 2. Overview of quantitative and qualitative methods to collect information on drug use by consumers

DATA SOURCE	TYPE OF METHODS	USEFUL TO COLLECT DATA ON:
Households Homes	Weekly illness recalls	<ul style="list-style-type: none"> • illness-related medicine use • sources of treatments • sources of advice/information on medicines • perceived effects of medicines
	Semi-structured interviews	<ul style="list-style-type: none"> • types of drug use practices • advantages and disadvantages of medicine sources • perceived drug use problems • why medicines are used irrationally
	Inventories of medicine cabinets	<ul style="list-style-type: none"> • commonly used medicines • what medicines are used for • where medicines are obtained/who gave advice • experiences with medicines • costs of medicines
Community	Inventory of community drug outlets	<ul style="list-style-type: none"> • commonly sold medicines • information provision on medicines • cost of medicines
	Focus group discussions	<ul style="list-style-type: none"> • types of drug use practices • perceived effects of medicines • perceived drug use problems • division of drug consumption roles • perceived quality of care in health institutions • sources of medicines, and perceived advantages and disadvantages of each • source of information on medicines
Health institution	Review of patient records	<ul style="list-style-type: none"> • quality of health worker prescribing by facility
	Structured observations	<ul style="list-style-type: none"> • information provided to patients • quality of health worker prescribing
	Exit interviews	<ul style="list-style-type: none"> • what people actually remember about prescriptions they received some time ago • the prescriptions they received
	Simulated client visits	<ul style="list-style-type: none"> • types of medicines prescribed/sold • information given by the health worker/drug seller



4

Prioritizing and analysing community medicines use problems

4.1 Introduction

In order to select and develop interventions aimed at enhancing rational drug use by consumers, it is important that the problems identified in step 1 are prioritized and choices made about which problems to address. The more focused rational medicines use interventions are, the more likely it is that consumers will understand them. In order to prioritize the problems, criteria need to be developed that are relevant to the operational setting in which the problem is to be addressed, and relevant to the people who are affected by the problem. This chapter first discusses how you can prioritize drug use problems (step 2 in the development of effective consumer oriented rational drug use interventions), and then how through a participatory process, using research methods given in Chapter 3, you can analyse the problems and identify possible solutions (step 3).

A process of prioritization can be carried out by policy-makers or health professionals but it can also be a participatory process in which various stakeholders are fully involved in identifying problems, setting and defining criteria and discussing how the priorities should be set. If stakeholders are involved there is likely to be more ownership of the problem and support for the result of the priority setting process.

To identify problems, define criteria and prioritize problems you could hold FGDs with people who are affected by the problem (stakeholders), such as:

- men/women in the community
- health workers in primary health care centres
- provincial/district health policy-makers.

It is best to hold separate discussions for each of these categories, as community members may not openly discuss their views with health policy-makers. But limit the number of participants. For our purpose it is important to choose key people who are knowledgeable, and whose views matter. In some cases, where community members are vocal and willing to express their views in 'mixed' groups, it may be possible to hold group discussions with people representing a variety of stakeholders. In such cases, good moderation is essential, to ensure that all parties speak up.

The group discussions can be used to achieve various objectives:

Present the problems identified. You can explain what essential drugs experts consider to be important public health problems. The various groups of stakeholders should be given the opportunity to comment on the list of problems identified and to add to it.

Develop criteria for priority-setting. You can ask the respondents to explain why each problem is important. Ask probing questions about why this is the case. In this way you can help to elicit criteria which determine why a problem is important.

Set the priorities. This can be done in discussion and also with the use of tools such as rating, see below.

4.2 Prioritizing problems: the criteria (Step 2)

Criteria which are commonly used to prioritize problems are:

Scale of the problem

One important question is how many people are affected by the drug misuse problem? Is misuse common or rare? Does it concern a common health problem, and therefore affect many people?

Health risks

The drug use problem can affect the health of individuals taking the medicines in various ways. You should consider the seriousness of the adverse effect of the medicines involved. For example, overuse of paracetamol can be described as a problem, but the adverse effects of this medicine (in normal dosages) are minimal. The health risks related to the way that the drug is administered should also be considered. For example, unhygienic injections can lead to abscesses and serious infections.

Health consequences can be severe when life-threatening conditions, such as malaria with convulsions in small children, are treated incorrectly. Failure to provide the right treatment can lead to death. Palliative medicines can be relatively safe as medicine, but still have adverse health effects because they mask the severity of a disease. For example, the use of cough and cold remedies can mask the severity of a pneumonia episode. Drug use practices can have further negative health effects, because they contribute to microbial resistance. Inappropriate dosage of antibiotics leads to resistance, so the antibiotics become less effective when really needed.

Costs

The costs related to drug use problems should also be considered. Overuse of unnecessarily expensive medicines is a major problem that needs to be addressed. People may spend their scarce resources on non-essential vitamins and cough/cold remedies, leaving them with less to spend on food for their children. Poor people frequently borrow money to obtain medicines for sick family members. Problems related to inappropriate self-medication can lead to hospitalization, which is costly for them.

Appropriateness of a community intervention to deal with the problem

This criterion deals with the extent to which the people affected by the problem actually recognize it as serious, and whether a community intervention is an appropriate way to deal with it. For example, if the problem is related to health workers' prescription practices, it does not make sense to prioritize it for community action. If the issue is very sensitive (such as use of medicines to induce abortions in a country where

abortion is illegal), the feasibility of starting a health communication campaign is questionable.

4.3 Rating the problems

One way of prioritizing the problems is to rate them according to the criteria you have selected. You should examine each problem in the light of the criteria and you can award a mark or a rating (for instance on a scale of 1 to 5). If you do this for each of your problems you will come up with a number of points for each problem, which can enable you to make a quantitative comparison for priority-setting. The problem with the highest total rating should be the most important.

You will need to consider whether all the criteria are of equal value. If, for example, you decide that one of your criteria – such as the appropriateness of a community intervention – is essential, you may focus your discussion on the problems that score high on that criterion, and then check which ones score high on other criteria as well.

Rating¹ is a useful way of shedding light on a difficult choice, but evaluating complex problems with a numerical value can produce questionable results. Rating should be seen as a tool to help you understand your choices and to provide you with a framework for discussing priorities. It should not be used to impose a choice according to a set of rules. The rating technique should be used to support informed discussion on prioritizing problems for action – not as a means to avoid difficult discussion.

When you rate problems you will find that it is not as easy as it seems. You may lack the necessary data to rate the problems; or problems may be so different that it is hard to prioritize them. Some problems are related. For example, misleading drug promotion on Viagra results in its overuse as an aphrodisiac. Below, we discuss an example to clarify how rating can be used to prioritize problems.

Figure 4. Rating matrix

CRITERION Rate (1–5)	problem 1	problem 2	problem 3	problem 4	problem 5
Scale of the problem					
Health risks					
Costs					
Appropriateness of an intervention					
TOTAL RATE					

¹ Instead of rating you can also *rank* problems in terms of the criteria. For each criterion you rank the problems, assigning 1 (most important) to 5 (least important) problem. The difference with rating is that you can only assign a rank once: so, as in a competition, only one problem gets the first prize (rank 1); and only one problem ranks 2. This method leads to a lively discussion on which problem is most important, but can also be distorting, as some problems may score equally for one or more of the criteria.

RATING TO HELP IN THE PROCESS OF PRIORITIZING: AN EXAMPLE

Background information

In recent research three problems have emerged in a community:

Problems

- Over-use of cough mixtures
- Over-use of analgesics
- Misuse of antibiotics

In analysing these problems three criteria have been identified for priority-setting:

Criteria

- Scale of the problem
- Health risks
- Costs
- Appropriateness of an intervention

It has been agreed that one intervention will be developed to focus on one problem. A rating exercise is carried out with a group of stakeholders to select a priority.

Rating the problems

When you rate you look at one problem at a time and measure it against your criteria.

Scale

You can choose which scale to use – in this case a scale of 1–5 has been chosen. You need to make sure that everyone knows whether 1 is more serious or less serious. (In this case a high rating means more serious).

Stakeholder meeting

First cough mixtures are considered and discussed at some length by the stakeholder meeting. People regard the health risks as not very important. The economic waste is considered rather important. Resistance was not considered to be a major factor but it was not insignificant as a few of the combination cough mixtures contained antibiotics. After much discussion of the three problems the table is completed as follows:

Rating	Over-use of cough mixtures	Over-use of analgesics	Misuse of antibiotics
Scale of the problem	3	3	5
Health risks	2	2	5
Costs	4	2	4
Appropriateness of an intervention	3	3	5
Total	12	10	19

The discussion and the rating exercise have helped the group to see that they regard the misuse of antibiotics as an urgent priority.

You will need to consider whether all the criteria are of equal value. If, for example, you decide that one of your criteria e.g. the appropriateness of a community intervention – is essential, you may focus your discussion on the problems that score high on that criterion, and then check which ones score high on other criteria as well.

4.4 Analysing problems and identifying possible solutions (Step 3)

A good analysis of the prioritized drug use problem, and participatory identification of possible solutions are essential requirements for a successful intervention. Specific objectives for this pre-intervention step are:

- a. Describe the prioritized drug use problem in more detail, by finding out about different sub-problems, which population groups are involved, and how different stakeholders see the problem.
- b. Analyse the core problem(s), by identifying what the different stakeholders see as the main causes of the core problem(s), including socio-cultural and health system factors which contribute to the problem(s).
- c. Collect additional information on these factors.
- d. Identify what different stakeholders see as possible solutions to the problem, including proposed messages, target audiences and communication channels for drug use interventions.
- e. Identify factors which can facilitate interventions aimed at improving drug use, as well as factors which are likely constraints to change.

You can meet these objectives by conducting a *participatory problem appraisal*, including the following five activities:

1. A review of literature, unpublished reports and secondary data.
2. Semi-structured interviews to further describe the problem and its related sub-problems, and to gain insight into the reasons for the present practices.
3. A multi-stakeholder workshop to focus on a core problem(s), further define causes of the problem, and develop a problem analysis diagram.
4. Fieldwork on a core problem as a basis for community health education interventions.
5. A focus group discussion on finding solutions.

This process may seem cumbersome and unnecessary. Interventions are often developed without such careful preparation. Indeed short cuts are possible. You could skip activities 2 and 3, and decide to define the core problem and develop your problem analysis diagram without consulting key informants and without organizing a workshop. You could even skip the fieldwork, assuming that you know enough about the problem. But be aware that if you skip these steps, your problem analysis is likely to be less comprehensive than if you had involved different stakeholders in its development. As a result your interventions may turn out to be inappropriate and ineffective. An investment in a well-designed rapid appraisal is worth it, if you have the resources. The five proposed activities are discussed in detail below.

ACTIVITY 1

Review of literature, unpublished reports and secondary data

The first step to be taken is another review of documentation and literature. The first literature review is done in step one, when you describe and identify drug use problems. The difference is that this second review of literature is more focused. What do we know about the *priority* problem in the local settings? Have studies on the problem been done in other countries? What reasons for the problem were identified? What sub-problems have been described? What population groups are affected? Have studies been done on community members' perception of the problem in your country? What data are still lacking?

In Chapter 3 we refer to several websites that help you to find published reports. Getting hold of unpublished reports is usually more difficult. If you are able, it is often best to visit a few well-functioning documentation centres of health-related

organizations and institutions. UNICEF national offices are often be a good source of information. Also, when conducting key informant interviews ask for any relevant reports or data.

ACTIVITY 2

Describe the problem and its related sub-problems

For this activity you need to decide who your informants on the priority drug use problem are. Informants are people who are confronted with the problem (for example, mothers, if the problem concerns the misuse of antibiotics for childhood respiratory infections), and other people who are knowledgeable about it.

Try to limit the list of the people you will interview to around 15–20 who are likely to give you most information on the problem and have varied perspectives. Make sure that you interview different types of people: health workers and lay people; men and women; people from different socio-economic groups; and those of different ethnic backgrounds.

BOX 8. SEMI-STRUCTURED INTERVIEWS ON THE INAPPROPRIATE USE OF ANTIBIOTICS

Based on a descriptive drug use study, a country team selected the inappropriate use of antibiotics as a priority problem. This problem has been selected because it:

- occurs on a wide scale
- costs a lot, as antibiotics are expensive; non-essential use is a waste of scarce family resources
- has severe health implications, not only for the individual who is not cured properly, but also for the population in general as it contributes to antibiotic resistance.

Step 1 resulted in very little data on the drug use problem. The team was only able to obtain the sales statistics for 1998, which gave insight into the most commonly sold brands in the country.

In **Step 2** of the rapid appraisal the team conducts a series of key informant interviews using the following simple checklist:

1. What antibiotics are commonly used in the community?
2. What are they used for?
3. Why are they used for those conditions?
4. What are the problems related to the use of antibiotics for these conditions?

The discussion during the round of key informant interviews on the use of antibiotics reveals that the problem is complex and can be divided into many different sub-problems:

- People use antibiotics for many different types of health problems, including children's coughs and colds, abdominal pain suffered by women, and men use them to prevent and treat STDs when visiting commercial sex workers.
- In self-care people tend to use antibiotics for non-severe conditions that could be treated with home remedies or drugs which are less strong. People use antibiotics because they fear that the conditions will worsen and become life threatening.
- Antibiotics are sold illegally by informal providers, who may or may not know how to use these drugs correctly.
- Consumers have "learnt" which antibiotics to take for which conditions from observing prescriptions given for former illness episodes.
- Economic reality leads patients to buy a few "magic capsules", expecting instant cure from the powerful drugs.
- Health workers over-prescribe antibiotics for self-limiting conditions, because they fear criticism by clients if they fail to treat the illness adequately.
- Once prescribed, the problem is that people don't comply with the advice to use a full course of antibiotics. They don't see why they should continue to buy medicines when the condition has improved.
- Neither health workers nor informal providers give people adequate advice on WHY they should take a full course of the medicines, and thus do not motivate consumers to take the (biomedically) correct action.

The questions on the check-list should help you find out not only WHAT people do, but also the REASONS WHY the problematic drug practices occur. Limit the questions. At this stage you are not yet trying to analyse the problem in-depth. Rather, you are trying to get a better picture of it. The round of key informant interviews will make clear that the priority drug use problem is in fact a set of related sub-problems, with a variety of causes. In the next step we propose that you organize a workshop to further analyse the problem, and select the core problem which will be the focus of your intervention.

The round of key informant interviews should result in a list of sub-problems and factors associated with the problems (see box 8).

ACTIVITY 3

Focus on a core problem(s) in a multi-stakeholder workshop

This activity aims to prioritize the sub-problems and identify the core problem for intervention. The various interested parties interviewed in activity 2 are invited to a multi-stakeholder workshop to discuss and analyse the problem of antibiotic misuse. Limit the number of participants, and try to conduct the workshop in one day. The list of sub-problems and related factors identified in activity 2 serves as input.

Workshops are important in rapid appraisals as they are a means of bringing together the research team and representatives of various groups of stakeholders. Objectives must be clearly established at the outset. Ideally the workshop should be partly structured and partly informal, alternating plenary sessions with small sub-groups working on particular tasks.

Note that the interviews, which were done prior to the workshop, allowed the various interested parties to give their views in individual interviews. The advantage is that they could speak relatively openly, without being intimidated or influenced by the views of others. This is a good basis for a consultation where representatives of the various parties now interact.

You will need to define clearly the workshop's aims and the process you want to follow to achieve those aims.

We suggest the following three objectives:

1. Review the list of problems identified in the key information interviews and identify core problem(s).
2. Add further core problems that emerge.
3. Develop a problem analysis diagram.

The rating exercise used to prioritize problems can be used here again to establish why people consider the sub-problems to be important and needing action. The stakeholders will need to identify a set of criteria for the scoring and rating exercise. Box 9 below gives an example of what the rating criteria and the outcome of such a process could be for the problem "inappropriate use of antibiotics".

Once the stakeholders have selected a core problem, they need to analyse its nature in more detail in the form of a problem analysis diagram. You should identify with them the factors that contribute to the core problem, and clarify the relationship between the problem and the contributing factors. To develop a problem analysis diagram, the core problem and contributing factors may be placed in boxes. The relationships between the factors can be indicated by one-way or two-way arrows. You can identify the core problem with a double line around it. See figure 5 as an example.

BOX 9. THE INAPPROPRIATE USE OF ANTIBIOTICS: SELECTING A CORE PROBLEM

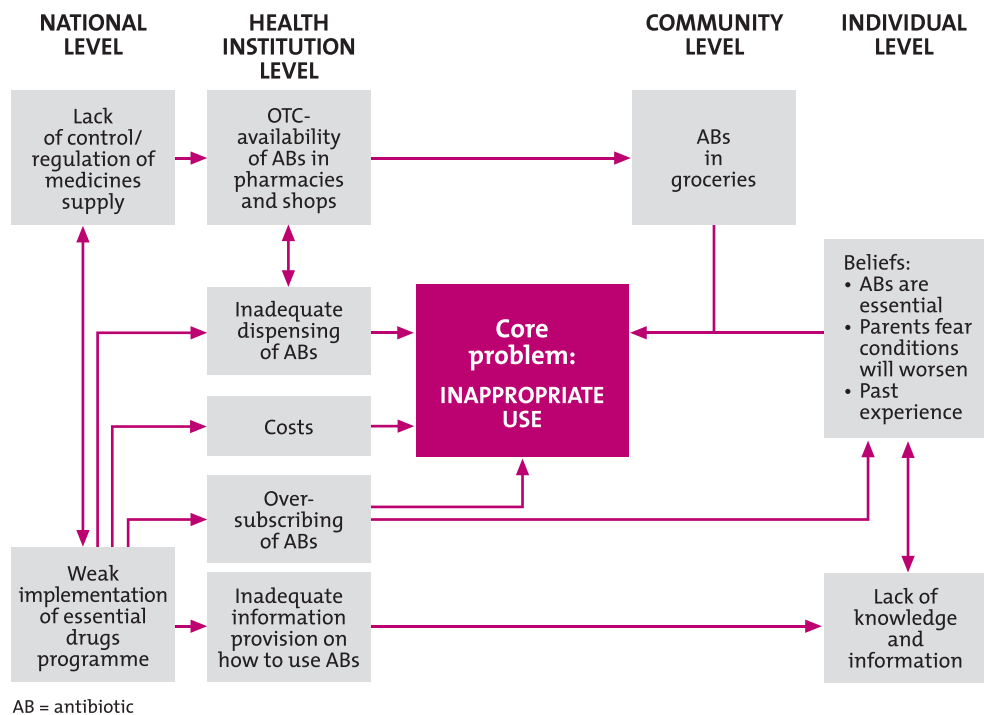
In the multi-stakeholder workshop on the inappropriate use of antibiotics, the following criteria are used to select a core problem:

- magnitude of the problem
- severity of the health consequences
- vulnerability of the population affected
- related costs
- eagerness of the population to gain knowledge about the problem
- relevance of a community intervention to address the problem.

The core problem identified in a matrix rating exercise is the inappropriate use of antibiotics in coughs and colds of pre-school children. It was selected as the core problem to be tackled because:

- it affects children, who are a vulnerable group; mortality due to inappropriately treated pneumonia is high
- children suffer a lot of coughs and colds, and antibiotics are often given: thus, this form of antibiotic abuse is frequent
- sub-optimal dosages of antibiotics contribute to antibiotic resistance which affects the whole population
- non-essential use of antibiotics in non-severe coughs/colds is a waste of scarce financial resources
- mothers are eager to gain more knowledge on how they can best treat their children's health problems
- clear guidelines on when antibiotics are needed exist in health programmes
- a community health education intervention is an appropriate way of addressing the problem.

Figure 5. Problem analysis diagram
Example of a problem analysis diagram of the inappropriate use of antibiotics



Note the flexible nature of the proposed methodology for focusing and analysing the core problem. It involves learning-as-you-go, whereby newly generated information collected in key informant interviews serves as input into the workshop, where a core problem is selected.

Brainstorming in small groups helps to identify various types of factors contributing to the problem. Consider also the factors discussed in the previous section:

- what influences drug use by consumers?
- are there factors at the community, health institution or national level which should be added to the problem analysis diagram?

Diagrams are important tools in rapid appraisals because they present information in a readily understandable visual form. This usefulness is twofold. First the participatory act of constructing the diagram is an analytical procedure and second, the diagrams become a means of creating communication and discussion.

We have now defined and analysed a core problem, and factors related to it. In the next activity you conduct field research to gather data that will help you to design an appropriate intervention.

ACTIVITY 4

Fieldwork on a core problem

It is unlikely that after activities 1–3 you will have sufficient information on your core problem to conduct an intervention. Using the problem analysis diagram as a point of departure you can define what questions need to be answered through fieldwork.

Formulating fieldwork questions

Formulating good fieldwork questions is essential to the success of the appraisal. The questions should be worked out together with people who will be responsible for the health interventions. This will increase the possibility of them being motivated to carry out the intervention (they will have ownership of the product/research), and it will add their practical experience to the perspective of the researcher(s). Ask stakeholders who participated in activities 1–3 to comment on the questions and

BOX 10. QUESTIONS ON THE INAPPROPRIATE USE OF ANTIBIOTICS IN CHILDHOOD ACUTE RESPIRATORY INFECTIONS

For the fieldwork on the inappropriate use of antibiotics, the following questions need to be answered:

Treatment practice

- To what extent do people treat coughs and colds with antibiotics in self-care (without consulting a doctor)?
- What other treatments are used (including non-drug therapies)?
- What are the most commonly used antibiotics?

Knowledge/attributes

- Why do people use antibiotics; what is their perceived efficacy?
- What are the attributes of these other treatments, according to respondents, as compared to antibiotics?
- Are people aware of risks related to antibiotic use?
- How many tablets/capsules over how many days do parents think are needed for specific cough/cold conditions?

Sources of antibiotics

- What kinds of antibiotics are stocked in town pharmacies and community grocery shops for the treatment of children's coughs and colds?
- Where do people obtain the antibiotics?

Advice/information

- Do sales people give advice on the need to use a full course of medicines?
- What advice do health workers give on antibiotics?
- What are sources of advice/information on the treatment of coughs and colds and on the use of antibiotics?

help you to reformulate them so that they are sensitive to local realities and use appropriate language.

To analyse your core problem you will need to find out: what people do, how often, which sub-groups in the population are most affected and why the practices occur.

Do not forget to check if all the factors included in the diagram are covered in your list of research questions; and if not, why it is not necessary to include questions on them. Remember that one of the principles of rapid appraisal is efficiency: do not collect more information than you need to develop a good intervention.

Selecting fieldwork methods

A mix of methods is usually the most appropriate for answering your research questions (see also Chapter 3). You will need to use both quantitative and qualitative methods. This allows you to answer questions on how often practices occur, as well as on why they occur. Quantitative methods are especially important as they allow you to collect baseline data on the drug use problem, which can be used to evaluate the effect of the intervention. In the section on *Monitoring and evaluation* we discuss how you can define relevant outcome measures on which you would need to collect baseline data.

Use a set of different methods to cross-check on findings and look at the problem from different “angles”. This is called triangulation, which we have seen is one of the principles for rapid appraisal. To decide on which methods to use you need to review your research questions – what do you want to know and how can you find it out?

The following quantitative and qualitative methods are often used to describe and analyse drug use problems. More details on how to use the methods can be found in Chapter 3.

Weekly illness recalls: If your core problem concerns drug use in a specific illness condition, and if that illness condition is relatively common, you can use focused illness recalls which aim to collect data on people’s treatment practices. This involves interviewing a sample of the population on whether the illness has occurred in the past week, and if it has, conducting a very short interview on what was done and why. This is a very efficient way of collecting accurate information on drug use practices. It is accurate because the data collected refer to actual illness cases, rather than hypothetical ones which are often used in surveys.

Simulated patient/client methods: A research assistant, who has been prepared in advance to present a standardized complaint, visits health facilities, pharmacies and drug shops seeking treatment. The objective is to determine how a sample of providers react to the complaint, what treatments they recommend, and what information they give. (These can also be used as qualitative tools).

Review of medical records: Medical records can be reviewed to describe prescribing patterns of health workers in facilities.

Structured observations: These can be used to describe client-provider interactions in health facilities, pharmacies and drug shops. (These can also be used as qualitative tools).

Semi-structured interviews: These interviews can be used to gain more understanding of why the drug use problem occurs. Select respondents who can provide a lot of information on the problem, either because they are likely to have experience with it, or because they are involved in the problem in another way – as health care providers or dispensers of medicines.

Focus group discussions: These can be used for the same purpose as the semi-structured interviews. Limit the number of FGDs, as they require a lot of time to prepare. We

suggest that you conduct focus groups only with the people affected directly by the medicines use problem. Others, such as health care providers and drug sellers, can be interviewed individually with a semi-structured list of questions (see above). Some problems may be too sensitive for FGDs, such as antibiotic use to prevent sexually transmitted diseases. In that case it is better to only do individual interviews.

It is best to make a matrix in which you list all your research questions and the methods that you intend to use to answer them. Make sure that you use a set of methods, so that you can triangulate the results. Consider the principle of efficiency: do not collect more information than you need to answer your research questions.

The matrix (see page 54) gives an example of methods selected to answer the research questions related to inappropriate use of antibiotics in pre-school children's coughs and colds. Four sub-sets of questions have been made that can each be answered using a specific set of methods.

In planning your fieldwork you need to take decisions on how many surveys, interviews and observations you want to do. Sampling strategies are different for the qualitative and quantitative methods (see Chapter 6).

The result of the fieldwork is a report on the core problem and factors contributing to it. This forms the basis for Activity 5 of this participatory problem appraisal that aims to find solutions and constraints to change.

ACTIVITY 5

Finding solutions

Looking at reasons for the problems from the point of view of the “target” audience is essential to finding the right solutions to the problems. Possible solutions should be developed together with the target audiences. A common reason for health education projects to fail is the lack of attention to this point. Reasons for problems are commonly assigned by researchers and planners, based on the “objective” biomedical explanatory model. Solutions are prescribed based on this understanding. They are often defined as “lack of information”, with giving more knowledge as a standard solution. Very often, community members do not understand or identify with these reasons, and therefore the prescribed solutions are not experienced as relevant. The result is that they may not be implemented.

Specific aims of this phase of step 3 (analysing problems and identifying solutions) are to:

- a. Identify possible solutions to the drug use problem, specifically
 - identify target audiences
 - identify possible communication channels in the community. What channels are currently used for communication on health matters? What channels are trusted? What types of events are likely to be understood?
 - formulate messages which encourage better use of drugs.
- b. Identify constraints to change. What factors will make it difficult for people to change their behaviour?
- c. Identify enabling factors. What could motivate people to change their behaviour?

You can use different participatory appraisal techniques to identify possible solutions, constraints and enabling factors. If you have sufficient resources it is good to do a series of focus group discussions. Feed back results of the fieldwork to these groups, asking them to comment (this is also a way to validate results). Then ask them to give recommendations on how the problem can be addressed; what the messages and who the target audiences should be; what communication channel should be used.

You can also organize a small-scale workshop again. Follow the same principles

Example of a research matrix

Questions and methods for fieldwork on the inappropriate use of antibiotics in childhood acute respiratory infections

QUESTIONS	SUGGESTED METHOD
<p>To what extent do people treat their children's coughs and colds with antibiotics in self-care (without consulting a doctor)?</p> <p>What other treatments are used (including non-drug therapies) and what are the attributes of these other treatments according to respondents as compared to antibiotics?</p> <p>What dosages of antibiotics are used?</p> <p>Where do people obtain the antibiotics?</p> <p>What are sources of advice/information on the treatment of coughs and colds and on the use of antibiotics?</p>	<p>Weekly illness recalls among families with pre-school children on the occurrence of coughs and colds and the treatment of these disorders. Start with this method, as it provides information that can be used in the following sub-sets of methods.</p>
<p>Why do people use antibiotics: what is their perceived efficacy?</p> <p>Are people aware of risks of antibiotics?</p> <p>What are the attributes of these other treatments according to respondents as compared to antibiotics?</p> <p>How many tablets/capsules over how many days do parents think are needed for specific cough/cold conditions?</p>	<p>FGDs with mothers of pre-school children, with a drug-sorting exercise (see the example of such an FGD in Chapter 3). For the drug-sorting exercise use actual packages of medicines which are reported in the weekly illness recalls.</p> <p>Semi-structured interviews with a sub-sample of mothers who actually report a cough/cold case that is treated with an antibiotic.</p>
<p>What advice do health workers give on treatment of coughs and colds?</p>	<p>Review of medical records.</p> <p>Structured observations using a checklist to document what advice is given on various aspects of medicine use.</p> <p>Semi-structured interviews in which health workers are presented with hypothetical illness cases, i.e. a detailed case-description of a child with a non-severe episode of cough and cold (no longer than five days; with only slight fever, and no accompanying symptoms).</p>
<p>What kinds of antibiotics for the treatment of children's coughs and colds are stocked in town pharmacies and community grocery shops?</p> <p>What advice do sales persons give on the use of these antibiotics?</p> <p>Do they advise on the need to use a full course?</p>	<p>Inventory of community stores and pharmacies on the kinds of antibiotics they sell for coughs and colds.</p> <p>Simulated client method. Community members pose as the mother of a child who has cough/cold (use the same hypothetical case as presented to the health workers above). The simulated clients ask for advice on therapy for their sick child. If they are not advised to take an antibiotic, they specifically ask for one, referring to a brand which is often used (as reported in the weekly illness recalls).</p>

as for the workshop described above in activity 3: set clear objectives. Those key objectives are likely to be:

- a. Review the results of the fieldwork; present your findings on the size of the problem: who it affects most; why it occurs; where people obtain medicine and where they go for advice. Ask participants to comment on the findings. Do they have anything to add?
- b. Ask participants to:
 - propose specific ways in which people could be convinced to use drugs more appropriately
 - identify those health behaviours that are most amenable to change
 - define who the target of an intervention should be
 - identify appropriate communication channels to reach the identified target audience
 - formulate key messages to be used to encourage more appropriate use of medicine.
- c. Ask what the implications are of implementing the solutions: What will/can happen if...?
- d. Define enabling factors: What can be done to make the intervention work? How can people be convinced that the recommended behaviour is better? Who do people trust in health matters? Can these people be involved in the implementation of the intervention?
- e. Discuss constraints: Why would people not adopt the recommended behaviour? How can structural constraints (such as lack of drug supplies or distance to the health centre) be overcome to enable appropriate behaviour?

BOX 11. KEY MESSAGES

In the workshop on the rapid appraisal of inappropriate use of antibiotics in childhood acute respiratory infections, participants defined as key messages for the intervention:

1. Seek advice from your health worker if your child breathes rapidly and is coughing.
2. Take a full course of antibiotics, when antibiotics are prescribed.

When asked why people would not follow such advice, participants at the workshop identified the following constraints:

- The clinic is far away, and not open at convenient times.
- The transport to the clinic is expensive/not easily available.
- The health worker treats the clients very roughly, and always blames the mother for not coming sooner.
- There are no drugs in the clinic, the drugs have to be bought at the local community pharmacy.
- The health worker does not explain why it is necessary to take a full course of antibiotics, she just tells people to do it.
- A full course of antibiotics is very expensive.
- Parents see that children get well after a few days on the medicine, and do not want to waste scarce resources without good reason.

When asked what could convince people to adopt the recommended behaviour, participants pointed out that there may be people in the community who use antibiotics in a correct way, and have had very good results from this (i.e. healthy children). These individuals would be very useful positive motivators to help implement the solutions.

There are also trained and/or motivated informal drug sellers in the community who should get further training in assessing when children should be referred to a clinic, and also to follow up on them buying and taking a full course of the drugs when they return. Informal providers are an important source of information on medicines in the community.

Training programmes for health workers exist. However, they focus on technical aspects of drug prescribing. The addition of a module on face to face education on rational use to health workers' training would encourage them to be better educators on appropriate drug use.

- f. Discuss an action plan: Who can do what to help implement the solutions (short-term and long-term)?

The outcome of the participatory appraisal can guide you in the selection of interventions, the messages to include, the target audiences that you intend to reach, and the communication channels you intend to use. The involvement of stakeholders in the formulation of possible solutions to the drug use problem is also likely to enhance their participation in the implementation of an intervention.

Additional reading and cited references

Cornwall A, Jewkes R (1995). What is participatory research? *Social Science and Medicine*, 4(12):1667–1676.

Curtis V et al. (1997). Dirt and diarrhoea: formative research for the design of hygiene promotion programmes. *Health Policy and Planning* 12(2):122–131.

Oyoo AO et al. (1991). Rapid feedback from household surveys in PHC planning: an example from Kenya. *Health Policy and Planning* 6(4):380–383.

Scrimshaw SCM, Hurtado E (1987). *Rapid assessment procedures for nutrition and primary health care*. Tokyo, United Nations University/Los Angeles, University of California.

Varkevisser CM, Alihonou E, Inoussa S (1993). *Rapid appraisal of health and nutrition in a PHC project in Pahou, Benin. Methods and results*. Cotonou, CREDESA/Amsterdam, Royal Tropical Institute.

Vlassof C, Tanner M (1992). The relevance of rapid assessment to health research interventions. *Health Policy and Planning*, 7(1):1–9.

Video “Who holds the stick” has been produced by World Wildlife Fund and the Institute of Development Studies. For copies contact: WWF International, Avenue du Mont-Blanc, Gland, CH-1196, Switzerland.

5

Sampling

5.1 Introduction

Sampling involves the selection of a number of study units from a defined study population. When drawing a sample, a researcher first needs to decide which population (s)he intends to study. This depends on the research objectives and questions. Sampling strategies need to be defined as you can rarely cover every person in the selected population. In qualitative studies they aim to identify information-rich cases or informants. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the research, so the term purposeful sampling is used when such people are selected.

For example, when understanding is needed of how infertile women cope, in-depth interviews should be conducted with women who experience infertility. Probability sampling typically depends on large samples selected randomly. A truly random and statistically representative sample allows for generalization from the sample to the larger population. The purpose of such sampling methods is not to gain in-depth understanding of an issue, but to be able to generalize findings. Such sampling can be stratified to ensure that all groups of interest are included.

5.2 Selection of study sites and study units

Before selecting health facilities, drug outlets, households or individuals, a researcher needs to identify relevant study sites or in other words, the population from which a sample is to be drawn.

The selection of study sites depends both on the objectives of the study and on pragmatic factors (such as the distance to be travelled, the willingness of key individuals to be involved in future rational drug use interventions, and contacts which can facilitate entry into the community).

The research objectives provide the researcher with criteria to select study sites. For example, a study on treatment practices in childhood malaria is best done in communities with a high incidence of malaria.

The next step is to consider the heterogeneity of the potential study population – i.e. households with children who live in malaria-endemic areas. If economic status or educational level are important factors, the researcher may want to select communities with different socio-economic profiles.

In the preparatory phase of a study, researchers should identify various research sites, taking into consideration the research objectives. During on-site visits, they should discuss the study's objectives and plans for future research with health programme managers, community leaders and representatives of other relevant institutions. Final selection of study sites is based not only on the research site characteristics, but also on the willingness of health workers and community leaders to participate in and facilitate the study, and conduct the research.

When the research sites have been selected, the researchers need to decide on the sampling method to be used to select the study units: health facilities, drug outlets, individuals and/or households in the community. The most commonly used qualitative and quantitative sampling methods are discussed below.

5.3 Purposeful sampling for qualitative studies

There are several strategies for purposeful sampling of information-rich cases. The methods most commonly used in qualitative studies are given here, including the purpose for which the method is especially useful and its disadvantages.

Convenience sampling

Convenience sampling is a method in which, for convenience sake, the study units that happen to be available at the time of data collection are selected in the sample. Many health facility or drug-outlet-based studies use convenience samples. If you wanted to study information provision on medicines in pharmacies, you could observe all client-drug-seller interactions during one particular day. This is more convenient than taking a random sample of people in the village and it gives a useful first impression. A drawback of convenience sampling is that the sample may be quite biased. Some people may be overselected, others underselected or missed altogether. In this example, the interactions observed may be biased because the pharmacist does not work on the day observed. You also miss the clients who obtain their medicines from other sources. Informal drug outlets in communities are often as important as pharmacies as sources of medicines. It is necessary to study interactions at those outlets as well, to get a good impression of the provision of information on drugs.

Maximum variation sampling

This sampling method aims to select study units which represent a wide range of variation in dimensions of interest. For example, the researcher may be interested in the reasons that people do not comply with antibiotic prescriptions, and assume that gender and socio-economic status are important background variables. The researcher is afraid to miss men, who are often not at home when researchers visit to conduct semi-structured interviews. Therefore, the researchers decide to conduct interviews during the day and in the evenings, and to ensure that at least 15 men and women are included in the sample.

Maximum variation can also be used as a strategy to select communities in which to do research. In the example, this would imply that the researcher selects one relatively rich and one poor community. Maximum variation sampling is also often used when deciding on which groups to involve in focus group discussions. Remember, the informants participating in each FGD should be relatively homogenous as far as key background variables for the study are concerned.

Snowball sampling

Snowball sampling is perhaps the most common sampling method used in qualitative studies. The researcher starts by identifying some (at least two) individuals who are relevant to the study, for example, women with pre-school children in a study on

home-treatments in malaria, and then asking them to locate other useful informants, i.e. other mothers of pre-school children. The advantage of this method is that one informant refers the researcher to another, so that the researcher has a good introduction for the next interview. A disadvantage is that the variation in the sample may be limited because it consists of informants who belong to the networks of the index cases. This is why it is important to have at least two different additional entrances in the community.

Sampling contrasting cases

Comparative studies sampling will involve two or more population groups with distinct characteristics. This sampling method is useful in comparative studies that aim to explain problems by establishing which factors are associated with them or cause them. For example, in a study aimed at understanding why mothers do not use oral rehydration therapy (ORT) to prevent childhood death in diarrhoea cases, both women who use ORT and those who do not can be sampled and compared.

Contrast sampling can also be used in selecting research sites. For example, when evaluating a health programme, a research site can be selected where (according to statistical information) the programme has been successful (for example, in promoting ORT) and where this is not the case. Comparison can help in analysing which factors contribute to success and which factors constrain programme success. Contrast sampling can also be used to select participants for focus group discussions. Within each group the informants should be relatively homogenous in terms of the important dimensions of the study; but for the different groups you select contrasting cases (for example, men and women; younger and older; users and non users).

Qualitative sampling respondents for semi-structured interviews and FGDs

The qualitative methods presented in Chapter 3 for investigation on drug use include semi-structured interviews and FGDs. How can we sample respondents for these methods?

Sampling for semi-structured interviews

First you need to define whom you want to interview. If you are aiming to get an overview of drug use problems, it is best to select a wide range of individuals. If you are analysing a specific drug use problem, you concentrate on people who have direct experience with the drug use practice that is problematic, and people who are knowledgeable about it. Snowball sampling is the most common sampling method used in selecting respondents for semi-structured interviews. You can also decide to conduct contrast sampling. You can get an idea about which groups to select by reviewing your problem analysis diagram. Which socio-cultural factors seem to be related to the problem? Can we test these assumptions by comparing ideas and practices in different groups? It is also useful to contrast groups that use drugs appropriately with those who do not. Information on whether or not drugs are used appropriately can be obtained from the focused illness recalls. By conducting semi-structured interviews with both groups and comparing findings you can get an idea of the reasons for appropriate and inappropriate practices.

Sampling for focus group discussions

The main decision you need to take when planning focus group discussions is what focus you intend to have, and how many FGDs you intend to hold. FGDs are often used to contrast views of different 'focused' groups: for example, adolescents versus adults; or men versus women. Decide which population sub-groups need to be interviewed. Limit the scope of the study to those sub-groups which have direct

experience with the problem. Usually local leaders are asked to select respondents for the focus groups. Aim for around 6–8 participants per group; and conduct at least two FGDs per population group involved. So, for example, two with men and two with women, or two with adults and two with adolescents. If the conclusions of the two groups are not in agreement you may need to hold a third FGD to further investigate the issues.

5.4 Probability sampling methods for quantitative studies

In quantitative studies we aim to measure variables and generalize findings obtained from a representative sample from the total population. In such studies, we will be confronted with the following questions:

- which group of people (study population) do we want to draw a sample from?
- how many people do we need in our sample?
- how will these people be selected? Is there an administrative list of the (sampling frame) units of the population involved?

The study population has to be clearly defined, for example, according to age, sex and residence. Apart from people, a study population may consist of villages, institutions, records, etc. Each study population consists of study units. The way one defines the study population and the study unit depends on the problem to be investigated.

If researchers want to draw conclusions that are valid for the whole study population, they should take care to draw a sample in such a way that it is representative of that population.

A representative sample is one that has all the important characteristics of the population from which it is drawn.

If it is intended to interview 100 mothers to obtain a complete picture of drug use practices in District X these mothers would need to be selected from a representative sample of villages. It would be unwise to select them from only one or two villages, as this might give a distorted or biased picture. It would also be unwise to interview only mothers who attend the under-fives clinic, as those who do not attend this clinic may wean their children differently. An important issue influencing the choice of the most appropriate sampling method is whether a sampling frame is available, that is, a listing of all the units that compose the study population. If a sampling frame does exist or can be compiled, probability sampling methods can be used. With these methods, each study unit has an equal or at least a known probability of being selected in the sample.

Five probability sampling methods are discussed below:

- Simple random sampling
- Systematic sampling
- Stratified sampling
- Cluster sampling
- Multi-stage sampling.

Simple random sampling

This is the simplest form of probability sampling. To select a simple random sample you need to:

- make a numbered list of all the units in the population from which you want to draw a sample or use an already existing one (sampling frame)
- decide on the size of the sample (this will be discussed in section 5.6)
- select the required number of sampling units, using a 'lottery' method or a table of random numbers.

Simple random sampling can be used for the weekly illness recall method and when selecting facilities for simulated client visits (see Chapter 3).

Systematic sampling

In systematic sampling, individuals or households are chosen at regular intervals from the sampling frame. For this method we randomly select a number to tell us where to start selecting individuals from the list.

For example, a systematic sample is to be selected from 1,200 students at a school. The sample size selected is 100. The sampling fraction is $1200/100$. The sampling interval is therefore 12. The number of the first student to be included in the sample is chosen randomly, for example, by blindly picking one out of 12 pieces of paper, numbered 1 to 12. If number 6 is picked, then every twelfth student will be included in the sample, starting with student number 6, until 100 students are selected. The numbers selected would be 6, 18, 30, 42, etc.

Systematic sampling is usually less time-consuming and easier to perform than simple random sampling. However, there is a risk of bias, as the sampling interval may coincide with a systematic variation in the sampling frame. For instance, if we want to select a random sample of days on which to count clinic attendance, systematic sampling with a sampling interval of 7 days would be inappropriate, as all study days would fall on the same day of the week, which might, for example, be a market day.

Stratified sampling

The simple random sampling method described above does not ensure that the proportion of some individuals with certain characteristics will be included. If it is important that the sample includes representative groups of study units with specific characteristics (for example, residents from urban and rural areas, or different age groups), then the sampling frame must be divided into groups, or strata, according to these characteristics. Random or systematic samples of a predetermined size will then have to be obtained from each group (stratum). This is called stratified sampling.

Stratified sampling is only possible when we know what proportion of the study population belongs to each group we are interested in. An advantage of stratified sampling is that it is possible to take a relatively large sample from a small group in the study population. This makes it possible to get a sample that is big enough to enable researchers to draw valid conclusions about a relatively small group without having to collect an unnecessarily large (and hence expensive) sample of the other, larger groups. However, in doing so, unequal sampling fractions are used and it is important to correct for this when generalizing our findings to the whole study population.

A survey is conducted on self-medication practices in a district comprising 20,000 households, of which 20% are urban and 80% rural. It is suspected that in urban areas self-medication is less common due to the vicinity of health centres. A decision is made to include 100 urban households (out of 4,000, which gives a 1 in 40 sample) and 200 rural households (out of 16,000, which gives a 1 in 80 sample). This allows for a good comparison between urban and rural self-medication practices. Because we know the sampling fraction for both strata, the rates for self-medication for all the district households can be calculated.

Cluster sampling

It may be difficult or impossible to take a simple random sample of the units of the study population, either because a complete sampling frame does not exist or because of other logistical difficulties (e.g., visiting people scattered over a large area may be too time-consuming). However, when a list of groupings of study units is available (for example, villages or schools) or can be easily compiled, a number of these groupings

can be randomly selected. The selection of groups of study units (clusters) instead of the selection of study units individually is called cluster sampling.

Clusters are often geographic units (for example, districts, villages) or organizational units (e.g., clinics, training groups). In a study of the knowledge, attitudes and practices related to family planning in a region's rural communities, a list is made of all the villages. Using this list, a random sample of villages is chosen and a defined number of adults in the selected villages are interviewed.

Multi-stage sampling

A multi-stage sampling procedure is carried out in phases and usually involves more than one sampling method. In very large and diverse populations sampling may be done in two or more stages. This is often the case in community-based studies, in which the people to be interviewed are from different villages, and the villages have to be chosen from different areas.

In a study of a district's treatment of acute respiratory infections, 150 households are to be visited for interviews with family members, as well as for observations on medicines kept in the homes. The district is composed of six wards and each ward has between six and nine villages. The following four-stage sampling procedure could be performed:

1. Select three wards out of the six by simple random sampling.
2. For each ward, select five villages by simple random sampling (15 villages in total).
3. For each village select 10 households. Because simply choosing households in the centre of the village would produce a biased sample, the following systematic sampling procedure is proposed:
 - go to the centre of the village
 - choose a direction in a random way: spin a bottle on the ground and choose the direction the bottleneck indicates
 - walk in the chosen direction and select every third or every fifth household (depending on the size of the village) until you have the 10 you need. If you reach the boundary of the village and you still do not have 10 households, return to the centre of the village, walk in the opposite direction and continue to select your sample in the same way until you have 10. If there is nobody in a chosen household, take the next nearest one.

Decide beforehand who to interview (for example, the head of the household, if present, or the oldest adult who lives there and who is available).

Strengths and weaknesses of cluster and multi-stage sampling

The **strengths** of cluster and multi-stage sampling are that:

- a sampling frame of individual units is not required for the whole population. Initially a sampling frame of clusters is sufficient. Only within the clusters that are finally selected do we need to list and sample the individual units
- the sample is easier to select than a simple random sample of similar size because the individual units in the sample are physically together in groups, instead of scattered all over the study population.

The **weakness** of cluster and multi-stage sampling is that:

- compared to simple random sampling, there is a larger probability that the final sample will not be representative of the total study population. The likelihood of the sample not being representative depends mainly on the number of clusters selected in the first stage. The larger the number of clusters, the greater the likelihood that the sample will be representative. If you use cluster-sampling, you should increase your sample size by about 50%.

5.5 Bias in sampling

Bias in sampling is a systematic error in sampling procedures that leads to a distortion in the results of the study. Bias can also be introduced as a consequence of improper sampling procedures that result in the sample not being representative of the study population. For example, a study to determine the drug information needs of a rural population and plan a community drug use intervention failed to give a picture of the health needs of the total population because a nomadic tribe, which accounted for one-third of the total population, was left out of the study.

There are several possible sources of bias in sampling. The best known source of bias is non-response. In a survey trying to establish how men treat sexually transmitted infections (STIs), it was found that many men refused to answer certain questions, such as whether they had attended an STI clinic in the past month. It is possible that these men feared the consequences of disclosing such sensitive information to an outsider. The researchers may therefore not get a realistic picture of the treatment of STI in the community. Non-response is encountered mainly in studies where people are being interviewed or asked to fill in a questionnaire. They may refuse to be interviewed or forget to fill in the questionnaire. The problem lies in the fact that non-respondents in a sample may exhibit characteristics that differ systematically from the characteristics of respondents. There are several ways to deal with this problem and reduce the possibility of bias:

- data-collection tools (including written introductions for the interviewers to use with potential respondents) have to be pretested. If necessary, adjustments should be made to ensure better cooperation.
- if non-response is due to absence of the subjects, follow-up of non-respondents may be considered.
- if non-response is due to refusal to cooperate, a few extra questions to non-respondents may be considered to discover to what extent they differ from respondents.
- another strategy is to include additional people in the sample, so that non-respondents who were absent during data collection can be replaced. However, this can only be justified if their absence was very unlikely to be related to the topic being studied.

The bigger the non-response rate, the greater the need to take remedial action. It is important in any study to mention the non-response rate and to discuss honestly whether and how it might have influenced the results. Other sources of bias in sampling may be less obvious, but are at least as serious:

- **Studying volunteers only.** This produces selectivity (or bias) in assigning subjects to various groups. The fact that volunteers are motivated to participate in the study may mean that they are also different from the study population in the factors being studied. It is better to avoid using non-random procedures that introduce the element of choice.
- **Sampling of registered patients only.** Patients reporting to a clinic are likely to differ systematically from people using self-medication.
- **Seasonal bias.** It may be that the problem under study exhibits different characteristics in different seasons of the year. For this reason, data on the prevalence and distribution of malnutrition in a community, for example, should be collected during all seasons rather than just at one time. When investigating health services' performance, to give another example, one has to take into account that towards the end of the financial year shortages may occur in certain budget items which may affect the quality of services delivered.
- **Tarmac bias.** Study areas are often selected because they are easily accessible. However, these areas are likely to be systematically different from more inaccessible areas.

If the recommendations from a study will be implemented in the entire study population, you should aim to draw a sample from this population in a representative way. If part way through the research new evidence suggests that the sample was not representative, this should be mentioned in any publication concerning the study, and care must be taken not to draw conclusions or make recommendations that are not justified.

5.6 Sample size

We now have to determine our sample size. It is a widespread belief among researchers that the bigger the sample, the better the study becomes. This is not necessarily true. In general it is much better to increase the accuracy of data collection (for example, by improving the training of interviewers or by better pretesting of the data-collection tools) than to increase the sample size after a certain point.

In qualitative studies the aim is not to be representative of the population. The validity, meaningfulness and insights generated from such studies have more to do with the information richness of the cases selected, and the analytical qualities of the researcher than with the sample size. There are no rules for sample size in qualitative research. It depends on what one wants to know, the purpose of the study and practical factors. Often qualitative researchers refer to the redundancy criterion: that is when no new information is forthcoming from new sampled units, stop collecting data. One can also use pragmatic criteria in defining sample size, considering the amount of time it costs to do and transcribe the interviews and the number of sub-groups from which one will select respondents. A qualitative study with 40 informants is a relatively large study. Generally qualitative comparative studies have at least 10 informants per group.

In quantitative studies, as a general rule we can say that the desirable sample size is determined by the expected variation in the data: the more varied the data are, the larger the sample size we will need to attain the same level of accuracy. You need to consult a statistician, who can usually make precise calculations to determine the desirable sample size. Examples of such calculations follow below. For descriptive studies, we cannot say more than that the sample size needs to be large enough to reflect important variations in the population, but small enough to allow for intensive study methods. You should aim for at least 30 people in each group of interest. The EPI-Info 6.04 software includes an easy to use sample-size calculator.

In a study on reasons for non-use of oral rehydration therapy, you may decide to interview two categories of informants (non-users and users), and start with 20 to 30 interviews per category. This number could be increased if the data obtained for each category do not indicate a certain trend or if results are conflicting. The eventual sample size is usually a compromise between what is desirable and what is feasible.

A quantitative study should aim to quantify well-defined variables, for example, the proportion of under-five-year-olds treated with oral rehydration therapy. Sample size calculations are based on estimates of what these proportions are likely to be (informed guess or results of previous surveys). These estimates are made before selecting a sample. For a simple random sample the table can be used to determine the required sample size.

Example: The aim of the survey is to measure the proportion of people going to the village shop. Although there is no clear information on this, it is assumed that 40% of the people would go to a village shop. This is taken as the preliminary estimate, i.e. a population of 0.4 goes to the village shop. From table 3, it is seen that the desirable sample size for a proportion of 0.4 is 145.

Sampling size calculations for multi-stage sampling are more complicated. It is best to consult a statistician. Statistical advice is also needed to define sample sizes

Table 3. Sample size for a simple random sample¹

ESTIMATED PROPORTION	DESIRABLE SAMPLE SIZE*	ESTIMATED PROPORTION
0.05	420	0.95
0.10	325	0.90
0.15	290	0.85
0.20	255	0.80
0.25	225	0.75
0.30	195	0.70
0.35	170	0.65
0.40	145	0.60
0.45	120	0.55
0.50	100	0.50

The desirable sample size is given in the middle (second) column. The table is entered using either the left (first) column or the right (third) column depending on whether the estimated proportion is less than or greater than 0.5

* For the information of survey specialists: In this table the estimated S.E./p gradually increases from 0.10 for $p = 0.5$ to 0.21 for $p = 0.05$

for comparative studies (such as those done in evaluation studies when experimental groups are compared with control groups), where one wants to test differences between two groups. The desirable sample size can usually be calculated, with some assistance, if the researcher is able to make a rough estimate of the outcome of the study, and is clear about its main objectives and variables.

The feasible sample size is determined by the availability of resources:

- time
- human resources
- transport
- money.

Remember that if people are to be interviewed in their homes, it is often more time-consuming to go and trace the people than to actually do the interview. In addition, remember that resources are not only needed to collect the information, but also to analyse it! If many variables are included in the study (which is usually the case in an exploratory type of study) the sample size should be relatively small to avoid problems during analysis. If one has few variables, one can afford to have a larger sample.

The following general rules may help to determine the desirable sample size of any given study:

- the desired sample size depends on the rates one expects for key variables.
- the desirable sample size also depends on the expected variation in the data (of the most important variables): the more varied the data, the larger the sample size one would need to attain the same level of accuracy. For descriptive studies it is important that the sample size is large enough to reflect important variations in the population, but small enough to allow for intensive study methods.
- the desirable sample size also depends on the number of cells one will have in the cross-tabulations required to analyse the results. A rough guideline is to have at least 20 to 30 study units per cell.

¹ Source: Lutz. W. 1982, *ibid.*

References

Hardon A et al (2001). Analysis of qualitative data. In: *Applied health research manual: Anthropology of health care*. Amsterdam, Het Spinhuis.

Hudelson PM (1994). *Qualitative research for health programmes*. Geneva, World Health Organization. WHO/MNH/PSF/94.3.Rev.1.

Lutz W (1982). *Sampling: how to select people, households, places to study community health*, 3rd ed. International Epidemiological Association. Edinburgh.

Varkevisser CM, Pathmanathan I, Brownlee A. (1992). *Designing and implementing health systems research projects*. Volume 2: Geneva, Health Sciences Division of the International Development Research Centre and World Health Organization.



6

Data analysis

6.1 Introduction

Before conducting a study, a plan for data processing and analysis should be prepared. Such a plan helps the researcher ensure that at the end of the study:

- all the necessary information has been collected
- unnecessary data that will never be analysed are not collected.

This means that the plan for data processing and analysis must be closely linked to the study objectives and research questions, as well as a list of relevant variables.

The procedures for analysis of data collected through qualitative and quantitative techniques are quite different. For *qualitative data*, it is a matter of expanding notes from interviews and/or transcribing tapes, and then ordering, describing, summarizing, and interpreting data obtained for each study unit or for each group of study units. Here the researcher starts analysing while collecting the data, so that questions that remain unanswered (or new questions that come up) can be addressed before data collection is over.

For *quantitative data*, the variables have been defined prior to the study. Variables are characteristics of persons, objects or phenomena that can take on different values. The values of variables can be expressed as numbers (for example age, expressed in years); such variables are called numerical variables. Or, they can be expressed in categories (for example, 'source of advice'; the categories for this variable are: no advice; family; health worker; pharmacist; and others). Such variables are 'categorical variables'. If you develop a problem analysis diagram in preparation for a field study, you identify factors that influence the core problem, see table 4.

Note that in the table, waiting time is easy to operationalize as a numerical variable. It can be measured in minutes. The other variables can be made operational as categorical variables. Operationalizing variables means making them measurable. To measure knowledge, you could, for example, ask five questions. 0–2 correct answers can be categorized as poor knowledge, 3 as reasonable, and 4 to 5 as good knowledge. Availability of antibiotics can be measured by using a list of five different antibiotics that every health facility should have as a minimum. Likewise, availability of only 0–2 of these antibiotics could be categorized as poor, 3 as reasonable, and 4 to 5 as good.

Table 4. Factors rephrased as variables

FACTORS AS PRESENTED IN A PROBLEM ANALYSIS DIAGRAM	REPHRASED AS VARIABLES
Long waiting time	Waiting time
Absence of antibiotics	Availability of antibiotics
Inadequate dispensing of antibiotics	Appropriateness of antibiotic dispensing
Lack of knowledge on how to use antibiotics	Knowledge of antibiotic use

Preparation of a plan for data processing and analysis will provide you with better insight into the feasibility of the analysis to be performed, as well as the resources that are required. It also provides an important review of the appropriateness of your data-collection tools. When developing the plan it is very helpful to prepare dummy tables and charts of data.

Note: The plan for processing and analysis of data must be prepared before the data are collected in the field, so that it is still possible to make changes in the list of variables or the data-collection tools. This chapter gives you an overview of what you should consider when preparing such a plan.

6.2 Sorting and ordering data

An appropriate system for sorting data is important for facilitating subsequent processing and analysis. It is useful first to sort the data by type of instrument used. The data collected can, for example, be filed as:

- records of FGDs
- expanded notes of semi-structured interviews
- questionnaires
- reports of simulated client visits
- inventories of personal medicines.

Within each of these types of data, you may have different study populations. It is useful to number the questionnaires and field notes belonging to each of these categories separately. You would number them separately by sex: so F1, F2 etc; and M1, M2. Numbering of questionnaires is important as it allows you to process and analyse the data in an efficient way; and it ensures privacy for the respondents. You can also use colour-coding to facilitate ordering of your materials, using a marker or different colour of paper for different types of data.

6.3 Making quality control checks

When conducting qualitative or quantitative studies you should check each observation or interview in the field, to ensure that all the information has been properly collected and recorded. Before and during data processing, the information should be checked again for *completeness and internal consistency*.

If a questionnaire has not been filled in completely you will have *missing data* for some of your variables. If there are many missing items in a particular questionnaire, you may decide to exclude the whole questionnaire from further analysis. If an inconsistency is clearly due to a mistake made by the researcher or assistant, it may still be possible to check with the person who conducted the interview and to correct the answer. If the inconsistency is less clearly a mistake in recording, it may be possible (in a small-scale study) to return to the respondent and ask for clarification.

If it is impossible to correct information that is clearly inconsistent, you may consider excluding this particular part of the data from further processing and analysis. If a certain question produces ambiguous or vague answers throughout, the whole question should be excluded from further analysis.

Note: A decision to exclude data should be considered carefully, as it may affect the validity of the study. You should keep an accurate count of how many answers to specific questions and/or questionnaires you have had to exclude because of incompleteness or inconsistency, and discuss this point in your final report.

6.4 Processing qualitative data

In qualitative studies using techniques such as observation and semi-structured interviews, variables have not been identified prior to data analysis. Data processing and analysis in such studies are ongoing processes. Try to expand and organize these notes as soon as you can during and after the fieldwork. Immediately after each interview or FGD, make sure to transform raw field notes into a well-organized set of notes. During the interviews it is not necessary to do a word-for-word transcription. You should make enough notes, with key statements that can be expanded for analysis. When reading through/reviewing such expanded field notes you may find that, no matter how good the discussion guidelines were, the informants jump from topic to topic. You may also find that your notes contain information that is not immediately useful, or is totally irrelevant. As such data may be useful later on do not discard them.

To make the analysis easy, qualitative data have to be ordered. Ordering is best done in relation to the research questions or discussion topics. If you have a lot of data, it is helpful to use codes for ordering the data. The list of topics/questions in your interview guide can serve as an initial set of codes. Read through the expanded notes of your interviews and/or transcripts of tapes to add to this list of codes. Unexpected topics may come up. Codes for these topics should be included in the analysis. You may need to review your data several times before you decide on a final coding system.

Unlike quantitative data, where codes are usually numbers, the codes for qualitative data are usually *labels* which can be remembered easily. In an FGD about treatment of common illnesses in a village, you might code the data in the following way:

<i>Cause</i>	Causes of illness
<i>Sign</i>	Signs of illness
<i>Tx1-Person</i>	Persons sought for first form of treatment
<i>Tx1-Med</i>	Medicines used for first form of treatment
<i>Tx1-Result</i>	Result of first treatment

Note: Devise codes that you and your co-researchers can easily understand. The codes should usually follow the topics of the discussion guide or of the checklist for observations.

Qualitative research findings are basically a set of texts (observations, interview records, reports of FGDs). In order to facilitate coding, make sure the texts have a wide margin. Once you have decided on the set of codes, you can apply them to the texts in the margins. Use the same codes where possible for the different datasets (observations, interviews etc.).

While reading through the texts, also make analytical notes: these are notes on the relation between factors; i.e. why people take drugs in specific irrational ways. Also make methodological notes: how did the interviewer influence the respondent? What additional questions need to be asked in a next round of interviews? What is unclear?

Data-processing and analysis in qualitative research is an ongoing process: data are summarized and new questions raised. Ideally in conducting qualitative research you have time to go back to the field to collect additional data or to verify conclusions.

Qualitative research involves processing of large amounts of textual data. This is usually done manually. Qualitative data analysis software is available, which can support data-processing. Such programmes help to organize, code, and search and

retrieve data. Commonly used ones are Atlas (see: www.atlasti.de), Ethnograph (see: www.QualisResearch.com) and Kwalitan (see: www.kwalitan.net). In this chapter we focus on manual processing and analysis. If you understand how to analyse qualitative data manually, you will also be able to apply the principles to a computer assisted analysis. It continues to be the researcher who determines all the steps in the process.

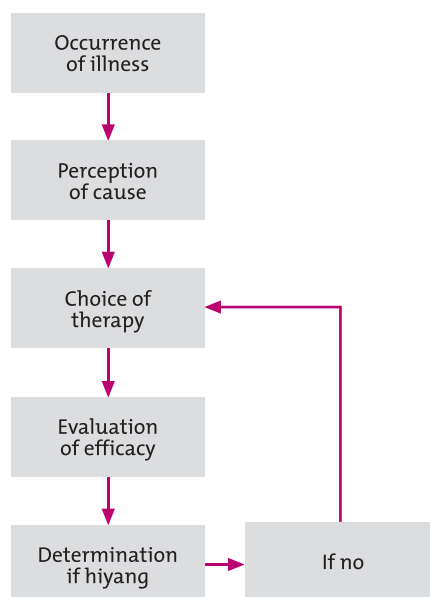
6.5 Analysing qualitative data

After sorting and processing the data, they have to be analysed. The first step is to list the data that belong together. After coding the data, we list all the data that have been given the same code, e.g. all the different ‘signs’ of fever. The data are usually summarized in tables. The data collected in your fieldwork on types of fever suffered by children, and the treatments used can be summarized in table 5.

Table 5. Summary of fieldwork data

TYPE OF CHILDHOOD FEVER	NUMBER OF RESPONDENTS WHO REPORT IT	SIGNS AND SYMPTOMS	TREATMENTS USED

Figure 6. Flow of events in childhood illnesses in the Philippines (Hardon, 1991)



Data can also be summarized in flow-charts. In a study in the Philippines on self-care of childhood diseases, it was found that respondents often use the word ‘hiyang’ to describe the suitability of a medicine for an individual. A medicine can be ‘hiyang’ for one child and not for another. Based on the results of the study the following flow-chart was developed summarizing the decisions people take in treating health problems, see figure 6.

In analysing qualitative data you should try to identify **why** certain practices occur. In a study on the treatment of childhood diarrhoea, when reading through all the answers to the relevant question(s) we may find, for example, that mothers differentiate between general causes for contracting diarrhoea, like drinking bad water, and the cause of their own child having diarrhoea: bad luck. We may also gain insight by looking at the indigenous concepts that people use to explain their views. When discussing the causes of diarrhoea, informants may, for example, think that diarrhoea is a ‘hot’ condition.

They would then naturally perceive 'heat' as being the actual cause of the diarrhoea and not a contaminated water supply. Hot-cold notions are common in traditional medical systems. Such concepts are also applied by informants to their choice of medicines used to treat a number of health problems. If the cause of diarrhoea is excessive 'heat', they then consider it only logical to take 'cooling' medications.

In answering the question 'What self-medication do people apply in case of childhood diarrhoea?' a researcher may wish to make a qualitative statement, explaining how people interpret the signs of diarrhoea and what they consider appropriate treatment. Such qualitative statements may be accompanied by a table providing quantitative data on the pattern of treatment. The importance of the qualitative statement is that it explains how people perceive diarrhoea and its treatment and *why* a certain treatment is preferred. The quantitative data can show *how often* specific causes and treatments were mentioned, and how often certain treatments were given.

The results of qualitative studies form parts of a jigsaw puzzle; the researcher is trying to find out how they fit together. Such analysis is a continuous process. A multi-method approach is used to verify conclusions; and cross-check findings. Observations can be used to check if people really do what they say they do.

In writing up the results of your study, try to make the report lively. Use case-histories and actual quotes from your respondents that are typical and can illustrate your findings. Do not simplify reality; illustrate how differences also occur.

6.6 Processing quantitative data

Quantitative data collected with questionnaires or other methods containing a structured set of open and closed questions or observations are easier to process. Prior to processing the data, variables which are being measured have to be listed.

For *numerical variables*, decisions concerning how to categorize numerical data can be made *after* they have been collected. For example, for the variable 'age' in the inventory of personal medicines, you may decide to have two age groups: 40 and above, and age below 40, with an equal number of respondents in each category. You may also want to have three categories: 20–29, 30–39, and 40 upwards.

For *categorical variables*, the categories have sometimes been decided on beforehand, especially for closed questions. The responses to open-ended questions can be categorized in two steps:

First, list the responses for each question; read through the whole list of answers. Then start giving codes for the answers that you think belong together.

Second, try to find a label for each category. After some shuffling you usually end up with 4 to 6 categories. Note again that you may include a category 'others', but that it should be as small as possible, preferably containing fewer than 5% of the total answers.

Coding is important for quantitative studies. If data are entered into a computer for subsequent processing and analysis, it is essential to develop a *coding system*. For computer analysis, each category of a variable is usually given a number, for example, the answer 'yes' may be coded as 1, 'no' as 2 and 'no response' as 9. The codes should be entered on the questionnaires (or checklists) themselves. When finalizing your questionnaire you should insert a box for the code in the right margin of the page for each question. These boxes should not be used by the interviewer. They are only filled in afterwards during data processing. Take care that you have as many boxes as the number of digits in each code.

For example:

Yes (or positive response)	code – 1
No (or negative response)	code – 2
Don't know	code – 9

Common responses should have the same code in each question, as this minimizes mistakes by coders.

Note: If you intend to process your data by computer, always consult a person experienced in computer processing before you finalize your questionnaire.

6.7 Analysing quantitative data

In the manual analysis of quantitative data, it is best to first summarize the data in a so-called *data master sheet* to facilitate analysis. On a master sheet, all the answers of individual respondents are tallied by hand.

Examples of data master sheets that you can use to tally results from the illness-recalls used in your field work exercise are given on the following pages.

Data are easier to tally from the master sheets than from the original questionnaires. Straight counts can be performed for key variables, such as “health worker advice”, or “use of modern medicine”. Using the data in the illness master sheet you can calculate the following four therapy-choice *measures*:

1. Percentage of total episodes which are *not* treated.
This is calculated by dividing the number of episodes which are not treated with any form of medication (including home remedies) by the total number of episodes, multiplied by 100.
2. Percentage of total episodes treated with traditional treatment.
This is calculated by dividing the number of episodes which are treated with traditional treatment by the total number of episodes, multiplied by 100.
3. Percentage of episodes seen by health worker.
This is calculated by dividing the number of episodes in which health worker advice is sought by the total number of episodes, multiplied by 100.
4. Percentage of episodes self-medicated with medicines.
This is calculated by dividing the number of episodes in which medicine is given without health worker advice by the total number of episodes, multiplied by 100.

Questionnaire data may be compiled or tallied by hand instead of using master sheets if it is difficult or impossible to put the information (such as answers to open-ended questions) in a master sheet. Hand compilation is also necessary if you want to go back to the raw data to make additional tabulations in which different variables are related to each other. In a survey, it is often useful to have several master sheets, depending on the nature and objectives of the study and whether you want to compare two or more groups.

Note: Take great care when filling in master sheets. You should verify that all totals correspond to the total number of study units (respondents). If not, all subsequent analytical work will be based on erroneous figures. There should be special columns for ‘no response’ or missing data, to arrive at accurate total figures. If a research assistant is entering the data, you should randomly check 5–10% of the entries. You can also have the data entry done twice, by different assistants. By comparing the master sheets for inconsistencies you can eliminate errors in entry.

From the data master sheets, simple tables can also be made with frequency counts for each variable. A frequency count is an enumeration of how often a certain measurement or a certain answer to a specific question occurs.

For example:

<i>Fever episodes treated with health worker advice</i>	63
<i>Fever episodes treated without health worker advice</i>	74
<i>Total</i>	137

If numbers are large enough it is better to calculate the frequency distribution in percentages (*relative frequency*). This makes it easier to compare groups than when only absolute numbers are given. In other words, percentages standardize the data. A percentage is the number of units in the sample with a certain characteristic, divided by the total number of units in the sample and multiplied by 100.

In the example above, the calculation of the percentage answers the question: If I had asked 100 people who had a fever episode, how many would have answered 'yes'? The percentage of people answering 'yes' would be:

$$\frac{63}{137} \times 100 = 46\%$$

A *frequency table* such as the following could then be presented:

Table 6. The extent to which health worker advice is sought in fever episodes (N= 140)

CATEGORY	FREQUENCY*	RELATIVE FREQUENCY
Health worker advice sought	63	46%
Health worker advice not sought	74	54%
Total	137	100%

* missing values 3

Note: Sometimes data are missing due to non-response or (in oral interviews) non-recording by the interviewer. Usually you do not use missing data in the calculation of percentages. However, the number of missing data is a useful indication of the quality of your data collection and, therefore, this number should be mentioned, see table above.

Be careful: 'Don't know' is *not* to be taken as a non-response. If applicable, a category 'don't know' should appear in the data master sheet and in the frequency table.

Cross tabulations

In addition to making frequency counts for one variable at a time, it may be useful to combine information on two or more variables to describe the problem or to arrive at possible explanations for it; or simply to compare between groups. For this purpose it is necessary to design *cross-tabulations*. To visualize how the data can be organized and summarized, it is useful at this stage to construct so-called *dummy cross-tabulations*.

A dummy table contains all elements of a real table, except that the cells are still empty. In the personal inventory of medicines, one of your objectives may be to compare the number of medicines that women have in their bags with those of men. A dummy table for this comparison is given below.

In a research proposal, dummy tables should be prepared to show the major relationships between variables.

Note: It is extremely important to determine before you start collecting the data what tables you will need to assist you in looking for possible explanations of the

Table 7. Number of personal medicines carried in their bags to the course by men and women

	NUMBER CARRYING LESS THAN TWO DIFFERENT KINDS OF MEDICINES	NUMBER CARRYING TWO OR MORE DIFFERENT KINDS OF MEDICINES	TOTAL
Men			
Women			
Total			

problem you have identified. This will prevent you from collecting too little or too much data in the field. It will also save you much time at the data processing stage. Take care not to embark on an unstructured comparison of all possible variables. The dummy tables to be prepared follow from the specific objectives of the study.

When preparing the dummy tables, consider the following rules:

If a dependent and an independent variable¹ are cross-tabulated, the independent variable is usually placed vertically (at the left side of the table in a column) and the dependent variable horizontally along the top of the table. All tables should have a clear title and clear headings for all rows and columns.

All tables should have a separate row and a separate column for totals to enable you to check if your totals are the same for all variables and to make further analysis easier. All tables related to each objective should be numbered and kept together so the work can be easily organized, and the writing of the final report will be simplified.

To further analyse and interpret the data, certain calculations or statistical procedures must usually be completed. Especially in large cross-sectional surveys and in comparative studies, statistical procedures are necessary if the data are to be adequately summarized and interpreted. When conducting such studies it is therefore advisable to consult a statistician from the start, in order that:

- correct sampling methods are used and an appropriate sample size is selected
- decisions on coding are made that will facilitate data processing and analysis and
- a clear understanding is reached concerning plans for data processing, analysis and interpretation, including agreement concerning which variables need simple frequency counts and which ones need to be cross-tabulated.

Data processing: manually or by computer

As you begin planning for data processing, you must decide whether to process and analyse the data: manually, using data master sheets or manual compilation of the questionnaires; or by computer, for example, using a microcomputer and existing software or self-written programmes for data analysis. Keep in mind that the people responsible for computer analysis should be consulted very early in the study, i.e. as soon as the questionnaire and dummy tables are finalized. Hand compilation is used when the sample size is small.

Before you decide to use a computer, you have to be sure that it will save you time or that the quality of the analysis will benefit from it. Note that feeding the data into a computer costs time and money. The computer should not be used if your sample is small and the number of variables large. The larger the sample, the more beneficial the use of a computer will be. Also be sure that the necessary equipment is available, as well as the necessary expertise.

A number of computer programmes are available on the market that can be used to process and analyse research data. The most widely used programmes are: Excel, a spreadsheet programme; Access, a data management programme; Epi Info version 6.04, a very consumer-friendly programme for data entry and analysis, which also has a word processing function for creating questionnaires, developed by the Centers for Disease Control, Atlanta, and WHO; and SPSS, which is a quite advanced Statistical Package for Social Sciences (by SPSS Inc.).

If you intend to use a computer, ask advice from an experienced person concerning which programme is the most appropriate for your type of data. Note that Epi Info may be freely used and copied. All the other programmes have copyrights.

¹ The dependent variable is the variable that is under study. The researcher does not control this variable but observes it. 'Drug use in the treatment of fever cases' is, for example, a dependent variable. Researchers are usually interested in the effects of other, 'independent', variables on this variable, for example, the effect of the educational status of the mother on drug use practices.

6.8 Conclusion

When making a plan for data processing and analysis always consider the following issues:

- time needed to expand notes and/or transcribe tapes of qualitative interviews
- the ways in which the collected qualitative and quantitative data will be sorted and ordered
- when and how you will perform quality control checks
- the ways in which you will process data; including descriptions of tables and data master sheets to summarize data, and whether all parts of the data should be processed by hand or computer
- how you will analyse data, including the preparation of dummy tables for analysis of quantitative data, the comparison of groups (if applicable), or the establishment of relationships between variables, guided by the objectives of the study
- an estimate of the total time needed for analysis and how long particular parts of the analysis will take
- whether additional staff are required for data-entry and the analysis
- an estimate of the total cost of the analysis.

A good plan for data processing and analysis will ensure that the data you collect do not end up unused in a drawer; and that you do not collect data which you do not need.

Additional reading and cited references

Abramson JH, Abramson ZH (1999). *Survey methods in community medicine*, 5th ed. Edinburgh, Churchill Livingstone.

Debus M (1986). *Methodological review: a handbook for excellence in focus group research*. Washington, DC, Academy for Educational Development, HEALTHCOM. (To request a free copy write to: BASICS, Information Center, 1600 Wilson Blvd., Suite 300, Arlington, VA 22209, e-mail tperez@basics.org).

Hardon A (1991). *Confronting ill health: medicines, self-care and the poor in Manila*. Quezon-City, Health Action Information Network.

Hardon A et al (2001). Analysis of qualitative data. In: *Applied health research manual: Anthropology of health care*. Amsterdam, Het Spinhuis.

Hudelson PM (1994). *Qualitative research for health programmes*. Geneva, World Health Organization. WHO/MNH/PSF/94.3.Rev.1.

Varkevisser, CM, Pathmanathan I, Brownlee A. (1992). *Designing and implementing health systems research projects. Volume 2*. Geneva, Health Sciences Division of the International Development Research Centre and the World Health Organization.

Scrimshaw SCM, Hurtado E (1987). *Rapid assessment procedures for nutrition and primary health care*. Tokyo, United Nations University/Los Angeles, University of California.



7

Monitoring and evaluating rational medicines use interventions in the community

7.1 Introduction

Throughout this manual we have seen that research plays a role in various stages in the development of drug use interventions. In this chapter we deal with the final stage: monitoring and evaluation of the intervention strategy. Plan these before doing the intervention. Advance data collection and/or reliable historical data may be needed. It is important to be clear about the difference between monitoring and evaluation, because they are often confused.

Monitoring is done during the implementation of the intervention to find out what has been achieved so far, and to identify any constraints.

Monitoring is a surveillance system used by those responsible for a project, to:

- check if, as far as possible, everything goes according to plan
- find out if there are unexpected difficulties
- adjust plans, if necessary.

Evaluation is done to find out if change has taken place and if so whether it occurred as a result of the programme.

We evaluate health education programmes for many reasons, to:

- assess whether the intervention worked
- determine if the costs were reasonable
- convince others that the intervention was done properly
- document experiences in order to help others replicate successful interventions and avoid any identified mistakes.

Evaluation is a way of looking at specific programmes or activities, in order to assess progress and effectiveness, consider costs and efficiency, show where changes are needed, and help to plan more effectively in the future.

Evaluation is rarely carried out in a systematic manner. Only a few of the projects approached for a WHO global survey of public education on rational use of medicines could produce evaluation reports. As a result very little is known about the impact of rational drug use interventions directed towards consumers – their coverage, their relative costs, their sustainability, and perhaps most importantly, the degree to which

a programme successfully implemented in one country may be replicated elsewhere (Fresle and Wolfheim, 1997). Good monitoring systems are a prerequisite for good evaluations.

7.2 Monitoring

Monitoring assesses whether your intervention is going according to plan. It helps you to identify difficulties, and adjust your plans. You may run into unexpected problems. For example, in the planning of a training programme for drug sellers in Uganda, one district medical officer refused to give permission for the training, because in his view drug sellers were breaking the law by selling antibiotics over the counter.

When making a plan to monitor your health education effort you need to decide:

- what you want to monitor, considering that it should be an ongoing programme activity and so not take up too much staff time
- how you will monitor.

A monitoring plan can include:

- checking for *timeliness* of the activities: are there delays in implementing workplans? and if so why?
- reviewing costs in relation to the initial budget – do activities cost more than planned? How can budget deficits be resolved?
- *supervising personnel* – are staff carrying out their assigned duties?
- *assessing cooperation* of others: are district health teams involved? Are NGOs collaborating? Have relevant authorities given permission for the intervention?

Depending on the stage of the intervention, specific monitoring questions can be formulated. For example:

- has rapid appraisal been done to analyse the problem further? Have all the methods which were planned been used? Has a report of the appraisal been written and has a workshop been held to define possible solutions?
- have appropriate messages and intervention methods been selected? Has the target audience been involved in defining the messages? Have the messages been checked for medical accuracy?
- have the intervention methods been pre-tested? Have the results of the pre-test been documented?
- have the interventions been implemented according to plan?

Methods can include:

- record keeping, and regular reviews of records by a task manager
- making reports on important events, such as training workshops and seminars
- field or supervisory visits
- regular meetings with people responsible for the implementation, to review progress.

Good monitoring will ensure that you have good data for your evaluation.

7.3 Evaluation

In making a good evaluation plan you should decide:

7.3.1 What to evaluate: process and/or effect?

When defining your evaluation questions you should primarily review the communication objectives. What does the intervention aim to achieve? At the end of an intervention you can measure the effects of a programme against its objectives (*effect*

evaluation). To understand why an intervention succeeds or fails, you need to collect information about the way the intervention was conducted, a *process evaluation*. If an intervention was not implemented well, an effect in terms of behaviour change is not expected. It is important to find out where in the process the communication activity failed, so that improvement can be made. Below is a list of process evaluation questions by stage of the intervention, and the most commonly asked effect questions.

Process evaluation:

Preparation

1. Who conducted the intervention?
2. Why was the intervention selected? (Was the intervention based on research that identified the drug use problem confronted? Was the target audience involved in defining the solution?)
3. Was a needs assessment done?

Planning

4. What objectives were set?
5. What activities were planned?
6. What target audiences were identified?
7. Were the interventions pre-tested?
8. Was a plan made for monitoring/evaluation?

Implementation

9. Which of the planned activities were actually carried out?
10. What messages were disseminated?
11. How many people did the message reach (coverage)?
12. Did the intended audience pay attention to the message?
13. Did the intended audience understand the message, and did it convince them?
14. What problems were encountered in implementing the intervention?

Effect evaluation

15. Did the intervention result in changes in knowledge?
16. Did it result in a change in behaviour?
17. Did it lead to improvements in health?
18. Did it have any negative and/or unexpected impact?

7.3.2 Evaluation methodology

It is not so difficult to document changes in knowledge, behaviour or health. It is much more difficult to *prove* that the changes are caused by your intervention, and not by another factor. In selecting an evaluation design you need to consider how best you can prove the effects of your intervention.

The best way to prove change is by comparing changes in your intervention communities with changes in control communities. The controls should be similar to the intervention communities in terms of economic status, ethnicity, education, disease and medicines provision profile, and age. There are two evaluation methodologies which involve controls:

- a randomized control design: you study a population over time, assigning randomly who is exposed to the intervention and who is not
- a quasi-experimental design: you specifically select an intervention group, and identify a comparable control group.

If you cannot include controls in your study design, because of lack of resources, or for other reasons, you can evaluate by using a:

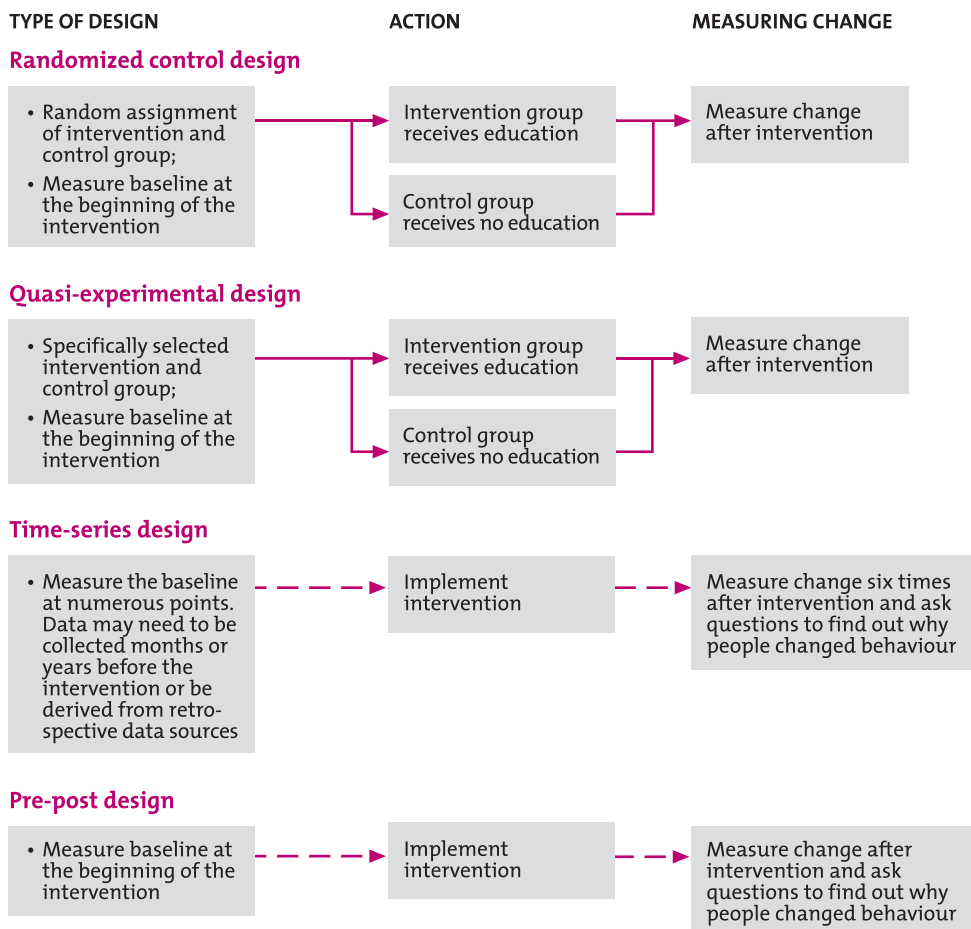
- time-series design: you collect information on your outcome measure and on factors which influence it at least three times: before the intervention, and twice after the intervention (for example, one month and six months after it). More frequent data collection both before and after the intervention improves the accuracy of such a method
- pre-post design: you collect data only twice, before and after the intervention. These are weaker designs that may not give clear results.

Figure 7 summarizes these four study designs. In all study designs it is crucial that you measure change using **key outcome measures**. You need to:

- review the intervention’s communication objectives
- identify in advance what behaviours are likely to change because of the intervention; and what changes in knowledge and attitudes you expect
- limit the number of outcome measures: don’t try to measure all possible changes
- measure more than one dimension. Decide whether you want to measure changes in attitudes, and/or changes in knowledge and/or changes in drug use behaviour
- choose outcome measures that can be clearly defined and reliably measured.

These designs are discussed below, see also figure 7.

Figure 7. Four evaluation designs



Randomized control design

In a randomized trial one group receives the intervention, while another group acts as a control. Random assignment is a statistical technique that can help you to ensure that the intervention group and the control group are equivalent. If the group that received the educational programme achieves a better performance than the control group, you can do a statistical test, which will provide strong scientific evidence for the success of your communication activities. The case-study from Indonesia is an example of a randomized control study.

BOX 12. SELF-LEARNING FOR SELF-MEDICATION, A CASE STUDY FROM INDONESIA

An Indonesian case-study used a randomized control design to evaluate a problem-based self-learning process in which people were taught how to extract information from package inserts of over-the-counter (OTC) medicines.

Type of intervention and its objectives: The aim of the intervention was to empower mothers to seek and critically assess information about the drugs they commonly use. Two different intervention methods were compared. The first method was to organize a large seminar on the appropriate use of OTC medicines. The second method was to organize small group (6–8 people per group) discussions, facilitated by a tutor. An activity guide, worksheets and reusable set of OTC drugs were used in the small group sessions. The specific objectives of both interventions were to help participants understand the package inserts, help them understand that several brand names have the same or similar active ingredients, and help them assess the quality of the drug information.

Evaluation methodology: The researcher recruited 112 mothers of low to moderate levels of education, and randomly assigned them to three groups. Group A received the intensive training in small groups. Group B attended the large seminar, and Group C served as control. The study aimed to measure changes in knowledge by means of a questionnaire, which was administered pre- and post-intervention; and changes in actual use of OTC medicines in a one-month period after the intervention.

Results: The study found that the score of knowledge was significantly higher, and the number of brand name products consumed in the previous month significantly lower, in the intervention group that followed the small group discussions. The researchers conclude that the problem-based self-learning approach is not only effective, but also all the mothers reported that they found the method enjoyable.

See: Suryawati S (2003).

Randomization is rare in studies that evaluate communication activities. One researcher reviewed 67 scientific articles that describe health education programmes in developing countries. He found that only four of these studies had used a randomized design (Loevinsohn, 1990). Partly this is due to lack of resources but it is also related to the way in which communication activities take place under field conditions.

A problem when opting for a randomized control design is that usually the organization implementing the intervention wants to select the groups/communities in which they pilot the intervention. The selection of communities is based on programmatic considerations; for example, communities are selected where community health workers are active, or where there is active community participation.

Quasi-experimental design

If for operational reasons you cannot choose your intervention and control groups randomly, you can use a 'quasi-experimental' design. For this you specifically select a control group/community which is comparable in a number of key ways to the community/group where the intervention is conducted, as in the example of Peru below.

BOX 13. AN INTERVENTION TRIAL TO DECREASE THE INAPPROPRIATE USE OF DRUGS FOR CHILDHOOD DIARRHOEA IN PERU

In Peru a study evaluated an intervention aimed at empowering carers of children to treat children with diarrhoea more appropriately.

Type of intervention and its objectives: The intervention's objectives were to discourage the use of anti-diarrhoeals and promote oral rehydration therapy (ORT) in childhood diarrhoea cases.

The interventions were developed based on results of formative research on people's treatment of diarrhoea. This research revealed that people want a quick cure for diarrhoea. Although they were aware of the need for ORT, they did not know that most diarrhoea cases do not need drugs. The intervention aimed to: reinforce the fluid replacement strategies already practised by people in the communities; to increase awareness of the normal duration of a watery diarrhoea episode; and to increase awareness of the possibly hazardous effects of drugs.

A 15-minute "motivational" video was developed to provide information in an entertaining and persuasive way, to change widespread and deep-rooted habits, and to increase participation through subsequent talks. The video included a Mrs. Druguser, who expressed the beliefs and perceptions that previously prevailed in the community, and challenged all the appropriate treatment messages that she received. The video was used to generate debate during community meetings, which it was found to do in a positive way. The messages given in the video were reinforced by radio and printed materials. Thus the evaluation was designed to measure the effect of a mix of health education methods. It did not provide evidence on the relative contribution of each of the methods used.

Evaluation methodology: The effects of the intervention were measured by conducting a pre- and post-intervention survey of actual treatment practices in diarrhoea cases in the intervention community and in a control. The selection of the control community was based on a number of criteria relevant to the study:

- similar diarrhoea prevalence
- similar socio-economic and ethnic characteristics
- availability of national health service and of NGOs.

Data on the process of the intervention were collected during the implementation phase, the effect measurement was done in a three-month period immediately after the intervention phase. Change in health seeking behaviour was measured by a household survey in families with pre-school children on the actual treatment of diarrhoea episodes in a 15 day recall-period. Changes in knowledge and attitudes were measured by means of a structured questionnaire.

Results: Knowledge levels increased significantly in the intervention communities. Results of the household survey revealed that the overall use of medicines in childhood diarrhoea cases dropped from 43% to 32% in the intervention community and from 49% to 42% in the control community. The percentage of episodes in which carers reported giving larger amounts of liquids every day of the episode increased significantly, from 51% to 59% in the intervention community; the control community showed a slight increase, but this was not significant.

See Paredes P et al. (1997). An intervention trial to decrease the unnecessary use of drugs during childhood diarrhea. Paper presented at the International Conference on Improving Use of Medicines, Chiang-Mai, Thailand, 1997. See: <http://www.who.int/dap-icium/group3pres.html>

Time-series design

In some cases a study design using controls is not possible. This is the case, for example, when you implement a mass media campaign. The whole population is then reached by the intervention. Or you may lack resources to include a control group in your study. You can then evaluate your intervention using a time-series design (although it is preferable that this type of design also incorporates controls). When not using a control group you collect information on your outcome measure at least six times before and six times after the intervention. This method is descriptive and does not provide strong scientific evidence on the effectiveness of your intervention. When you have no control groups, it is especially important to look carefully at what changes have occurred, in part by increasing the number of data points, to examine trends and

provide possible alternative explanations for observed changes in outcome measures. For this you need to develop a conceptual framework which lists the factors affecting your outcome measurement. By means of multivariate analysis (ask a statistician for advice) you can determine which factors (including your intervention) are correlated with the changes observed. You can also assess the effect of interventions qualitatively by interviewing the target audience on why they changed their behaviour – was it because of the interventions or were there other reasons?

The examples from Kenya (box 14 and box 15) give the results of two intervention studies using time-series designs.

Pre-post design

The pre-post design shares the same limitations as the time-series and is the lowest in scientific strength of the various experimental designs although it is commonly used in development situations. A pre-post evaluation is better than nothing but be very clear about the limitations of what it will tell you. If it is to be of any value you will need much more than numerical data to have any real idea of your intervention's success or lack of impact. You will need to include detailed qualitative investigation related to awareness and knowledge of the message, and underlying reasons for behavioural change.

7.3.3 Problems in proving effects of interventions

It may be difficult to decide on whether change observed in outcome measures is caused by the intervention and/or to determine the real strength of the impact. This is due to a number of methodological problems:

- *The communication messages targeted at the intervention communities 'contaminate' the control groups.* For example, people who live in the intervention community

BOX 14. CHANGING HOME TREATMENT OF CHILDHOOD FEVERS BY TRAINING SHOPKEEPERS IN RURAL KENYA

This intervention, aimed to improve the treatment of childhood fevers, took place in a malaria endemic area in Kenya. Research has shown that the majority of early treatments of childhood fevers are self-medicated with shop-bought, brand name drugs. These treatments are usually incorrect or sub-optimal.

The intervention and its objectives: The aim of the intervention was to train shopkeepers who sell drugs in Kenyan communities in giving advice on the type and quantity of drugs to buy for childhood fevers, and on how to use them. The ultimate objective was to improve the use of antipyretic and antimalarial drugs in childhood fevers. Shopkeepers were trained at a series of three workshops, each lasting three days. The methods used encouraged active participation, practical training and skill development. Shopkeepers were provided with dosage charts for chloroquine and aspirin/paracetamol-based drugs, and sets of rubber stamps depicting the correct way of using chloroquine in children of different ages.

Evaluation methodology: The impact of the training programme was evaluated in two rounds of observational studies and home interviews during peak malaria seasons.

Results: Before the training workshops 32% of antimalarial sales included an adequate dose of antimalarials. After the workshops this percentage increased to 83% three months after the intervention and then to 90% seven months post-intervention. Before the training, advice was only given in 2% of antimalarial sales. This increased to 94% and 98% in the two subsequent observation rounds post-intervention. The home interviews revealed that only 4% of childhood fevers treated with chloroquine were given an adequate dose of chloroquine before the training. This increased to 65% three months after the intervention and 75% seven months later. Appropriate dispensing and safe use of aspirin also increased after the intervention. The researchers evaluated the process and found major changes in the way the shopkeepers sold their drugs and that the community viewed the changes positively.

See Marsh et al. (1999)

BOX 15. INTEGRATING RESEARCH AND EVALUATION IN KENYA

The Youth Variety Show (YVS) in Kenya, a radio call-in for young people on the subject of sexual behaviour, was guided by intensive formative and evaluative research. This included: a national baseline survey of youth and parents (6,300 interviews); focus group discussions with more than 350 adolescents and parents in 5 districts; in-depth interviews among leaders and gate keepers; a review of legislation and policy environment; content analysis of newspaper coverage of youth issues; and, once the programme started, content analysis of letters from young people. During the radio broadcast, a panel of young people and a separate panel of parents listening to the show carried out monitoring. Their critiques were used to improve the content of the next programme.

The intervention and its objectives: The intervention aimed to increase adolescent knowledge on sexual health matters, and encourage adolescents to go to reproductive health clinics for their sexual health needs.

Evaluation methodology: Evaluation was done through a follow-up household survey conducted among adults and adolescents to assess audience exposure to the YVS. This was conducted by a market research firm that carries out omnibus surveys in the commercial sector several times a year. John Hopkins University Center for Communication Programmes bought some questions as part of this ongoing survey.

Results: Results showed that 38% of respondents listened to YVS but of 15–24 year olds 55% listened. Sentinel site surveys at clinics showed that increasing numbers of adolescents attending the clinics had listened to YVS and, along with friends, YVS was the most important source of referral. Content analysis of letters and radio listener panel studies corroborated this.

Marsh VM et al. (1999) Changing home treatment of childhood fevers by training shopkeepers in rural Kenya. *Tropical Medicine and International Health*, 4(5):383–389.

may be related to those living in the control community and spread the key intervention messages. Or a local radio station may decide to do a programme on the innovative community intervention, thus spreading key messages to the control groups. In that case you may observe changes in knowledge and behaviour in both control and intervention communities.

- *The intervention changes over time.* Under field conditions problems often occur in the implementation of interventions, and the key messages change over time. For example, in an evaluation of a programme on the appropriate treatment of malaria, the treatment guidelines issued by the ministry of health may change during the intervention. If that is the case, your outcome measures will have to change. This makes it difficult to describe changes in outcome measures, as the outcome measures which you used in the baseline are no longer appropriate.
- *The communication programme includes a mix of methods,* and it is very difficult to measure the effects of each separately as they are actually designed to reinforce each other.
- *Other agencies start implementing interventions in the research areas.* Evaluators do not own the communities they work in. Unexpectedly, other actors can decide to conduct interventions in the community. These interventions may diminish the impact of your intervention. If an intervention starts in your control communities, they may influence the case-control comparison that you intend to make.

When trying to assess effects of your intervention, you should be realistic about what changes to look for in your evaluation. Changes in knowledge and understanding might take place soon after the education input. However, changes in behaviour and health usually take longer to achieve. The Kenyan case shows that over time the effect of the intervention increased. It is a good idea to carry out a short-term evaluation fairly soon after the activity and a follow-up afterwards to look for long-term changes, as was done in the case-study.

Confounding factors need to be considered in your design

When drawing conclusions on effects of interventions it is important to consider other factors that may be responsible for the changes observed. They are known as **confounding factors**. An example can help explain why.

BOX 16. CONFOUNDING FACTORS

Let's assume that they are evaluating the effects of intensive training on the use of pre-packaged oral rehydration solution (ORS), by comparing ORS use in community A with use in a control community. Evaluation results reveal that ORS is often unavailable in the government health centre that services community B (where intensive education on the preparation of ORS did not occur); while in community A, the health workers of the NGO primary health programme ensure a regular supply of ORS to the community.

In the analysis of the drug use patterns, the evaluators find that people in community A use ORS more often in the treatment of pre-school diarrhoea than people in community B after the intervention. Is this the result of the intensive health education or is it related to changes in availability of ORS? A more qualitative evaluation of the intervention process in community A can help in assessing its effects. The evaluators, realizing that ORS availability is a confounding factor, should collect data on ORS availability before, during and after the intervention in both communities. The evaluators can further compare ORS use in the families of women who attended the health education sessions with those who did not attend. If there is a difference in use of ORS between these groups, then clearly the health education intervention makes a difference. Also the evaluators can use qualitative information collected among women who attend the health education sessions. If the messages given are understood by them, and if they themselves indicate that the training in ORS use has encouraged them to use ORS more often in childhood diarrhoea, then we can suggest that the health education played an important role. If the results of the study further indicate that women in community B have less knowledge on the use of ORS, then this conclusion is strengthened.*

*This case deals with health education on the use of ORS packages. If the health education input explains how people can make their own oral rehydration solution with sugar and salt, then the supply of ORS is of course less important as a contextual factor.

It is important to think about possible confounding factors before you conduct the intervention, so that you collect information on these variables in your baseline study. If you fail to do so, it may be very difficult to assess the effects of your intervention.

What data collection methods will you use?

In addressing the main objectives and the specific evaluation questions of the evaluation phase, evaluators can use a combination of research methods, similar to the approach chosen in a rapid assessment exercise. The methods you choose will depend on your evaluation question and design. The following methods are useful:

- **review of project documents:** records of monitoring activities can be very helpful for many of the process questions given above. These documents include workplans, minutes of meetings, workshop reports, notes from discussion with target audiences in pre-testing activities, interview guides, training and other printed materials etc.
- **semi-structured interviews with staff** and those responsible for managing and conducting the intervention. These interviews give you an insider's view of the intervention process.
- **semi-structured interviews and focus group discussions** with representatives of the target audiences. These interviews can answer questions such as:
 - whether respondents are aware of the intervention
 - whether they can recall the messages and information promoted
 - whether they like or approve of the messages and activities
 - whether they believe the messages
 - whether they follow the advice given.

- **short quantitative surveys** on awareness of the information campaign. Such a survey can give quantitative data on the same questions used in the semi-structured interviews (see above).
- **focused weekly illness recalls** to measure changes in drug use patterns. In interventions oriented towards the appropriate treatment of illnesses, quantitative data on drug use patterns by means of focused illness recall can be collected. This involves a short questionnaire to be administered to all people in the target audience who suffered the illness that is the focus of the intervention, in the previous week. An example is the survey done in the case-study from Peru (note that that survey used a 15 day recall period which is relatively long. It is better to use a one week recall period).
- **structured observations** can be used to evaluate the conduct of interventions. Observers can check if key messages are covered in training sessions, if the target audience listened attentively, and how many participants attended. Structured observations can also be used to evaluate changes in behaviour, as was done in the shopkeeper intervention discussed above.

7.3.4 Developing key outcome measures

One of the most challenging steps in an evaluation is the development of key outcome measures. These need to be directly related to your communication objectives. You need to do this in the planning stage of your intervention, as that is when you will collect baseline data. This will be explained in more detail in the manual *How to improve medicine use by consumers*. Try to limit the number of measures to those which show key aspects of your intervention. They should measure effects which are achievable. And collecting data to measure them should be feasible. Examples are given in the case studies above.

For the Peruvian evaluation a key outcome measure was:

- *the percentage of childhood diarrhoea cases treated with antidiarrhoeal medicines*
This was a key measure, as the intervention aimed at reducing the use of medicines in the treatment of diarrhoea.

In the shopkeeper intervention in Kenya, key measures were:

- *the percentage of total antimalarial sales which included an adequate dose of antimalarial drugs, and*
- *the percentage of childhood fever cases treated with chloroquine in which a full dose of chloroquine was given.*

These measures are directly related to the key communication objectives of the interventions.

When describing the key outcome measures in your evaluation plan, you should describe for each:

- its purpose: why you are measuring this, in relation to the intervention's communication objectives
- the method that will be used to collect data for it
- the way in which the indicator is calculated.

For example:

The percentage of total antimalarial sales which included an adequate dose of antimalarial drugs

Purpose: One of the main aims of the shopkeeper intervention is to teach shopkeepers to inform clients of the need for an adequate dose of antimalarial drugs. This measure calculated to what extent the client actually buys such a full dose.

Data-collection method: Data are collected by means of observation in the shops, three months and seven months post-intervention. Observation is done in all the 23 shops

with shopkeepers who received training. In each shop 10 drug purchases are observed. The observation forms included information on type of medicine sold, the patient's age and the dosage of the medicine given.

Calculation: A percentage is calculated by dividing the total number of purchases in which an adequate dose of antimalarial was given by the total number of antimalarial transactions.

7.3.5 Enhancing participation of the target audiences

Evaluations are often done by outside experts, as they are considered to be objective and have the necessary expertise to assess the effect of an intervention. An argument for conducting the evaluation in a participatory manner is that local staff and beneficiaries of programmes are more likely to increase their commitment to the programme's success if they are involved in the evaluation process. Moreover, they have significant knowledge about programme implementation, relevant views on the strengths and weaknesses of the interventions, and insights on the contextual factors that affect the interventions. By involving local staff and beneficiaries in the evaluation process the evaluation is, therefore, likely to be more appropriate and the results more valid.

However, in developing the plan for the evaluation phase, the evaluators should realize that not all aspects can be conducted in a participatory fashion. It is best to involve the local actors in evaluating interventions that they themselves are actively involved in. For example, mothers can be asked to participate in the evaluation of health education sessions that they regularly attend; and community health workers can be asked to participate in the evaluation of the training that they receive.

7.4 Summary guidelines

Evaluation is an integral part of any communications plan. It is important to begin planning the evaluation right from the beginning of your project. The following guidelines can ensure that you include evaluation components in your programme in an appropriate way:

- decide at the beginning of a programme how you are going to evaluate it
- make an evaluation plan
- prepare a set of realistic, achievable and measurable outcome measures which relate directly to your communication objectives
- evaluate both the process of the intervention and its effects
- look for changes in the short-term as well as long-term; find out if any benefits are long lasting
- encourage participation of target groups in all stages of your evaluation
- share your successes and failures with others.

An evaluation plan should have the following elements:

1. A statement of communication objectives
2. Evaluation questions (process and effect)
3. Key outcome measures
4. Methodology (use of controls or not; how to prevent 'contamination', possible confounding variables)
5. Data-collection methods
6. Plan for data processing and analysis
7. Plan for dissemination and use of results.
8. Discussion of known limitations to the evaluation strategy.

Additional reading

Feuerstein M (1986). *Partners in evaluation: evaluating development and community programmes with participants*. London, Macmillan.

Fresle DA, Wolfheim C (1997). *Public education in rational drug use: a global survey*. Geneva, World Health Organization. (WHO/DAP/97.5).

Loevinsohn BP (1990). Health education interventions in developing countries: a methodological review of published articles. *International Journal of Epidemiology*, 19(4):788–794.

Marsh VM et al. (1999) Changing home treatment of childhood fevers by training shop keepers in rural Kenya. *Tropical Medicine and International Health*, 4(5):383–389.

Øvretveit J (1998). *Evaluating health interventions*. Trowbridge, UK, Open University Press.

Piotrow P et al. (1997). *Health communication. Lessons from family planning and reproductive health*. Westport, CT, Praeger Publishers.

Suryawati S, Santoso B (1995). *Self-learning for self-medication: an alternative to improve the rational use of OTCs*. Report of the Department of Clinical Pharmacology, Faculty of Medicine, Gadjah Mada University, Indonesia. Unpublished.

Web sites

International Conference on Improving Rational Drug Use – Poster presentations <http://www.icium.org> INRUD/WHO Promoting Rational Drug Use Course. Decision-Making for Rational Drug Use Interventions module. http://dcc2.bumc.bu.edu/prdu/HTML_DOCS_TOC.htm

This manual is a practical guide to the use of research methods for investigating medicines use by consumers, particularly those in developing countries, in order to identify problems, design interventions and measure changes. It will help health workers, policy-makers, administrators, researchers, educationalists, medical and pharmacy students, and many others to go beyond the individual and to study the community as a focus. By understanding why people take medicines as they do, it is possible to design interventions that are sensitive to the particular beliefs, practices and needs of their community.

Topics covered include the reasons for studying medicines use by consumers, what influences consumer choice, and how to prioritize and analyse community medicines use problems. There are chapters on sampling and data analysis, and the manual concludes by looking at the important issues of monitoring and evaluating interventions.

The publication is an update of the manual developed by WHO's Essential Drugs and Medicines Policy Department, *How to investigate drug use in communities – Guidelines for social science research*. It also builds on session notes developed for the international training course, Promoting Rational Drug Use in the Community, jointly organized by WHO and the University of Amsterdam.