Injection practices in the developing world

Results and recommendations from field studies in Uganda and Indonesia

Prepared for WHO-DAP by

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Executive summary

In the health centres (pukesmas) in Central Java, Indonesia, a patient's treatment basically consists of the administering of an injection and the prescribing of several pills. It is foremost the nurses who are responsible for the diagnosis and treatment of patients. Often the consultations are very short and end with the rhetoric question: "Suntik, ya?" ("Injection, yes?"). As a consequence, about eighty to ninety percent of the patients leave the clinic with a new fluid in their bodies. (Sciortino 1993)

In a village in Northeastern Thailand injections are generally believed to be much more powerful and faster working than other forms of medicine administration, because injections 'run in the blood'. A respondent quantified the effect of injections as compared with pills: "one ampoule equals ten pills!". (Reeler 1993)

Widespread misuse of injections

Preference of injections to oral medications and widespread misuse of injections in many developing countries has long been of great concern to health professionals and the World Health Organization, but so far little systematic research has been conducted into this world-wide practice. Therefore, in 1990 the WHO Action Programme on Essential Drugs instigated a collaborative study on injection practices in three developing countries (Indonesia, Senegal and Uganda). Its purpose was: to examine the extent to which injections are used, the sources from which they are obtained, the way in which they are perceived, the indications for which they are given and the type and degree of improper and unsafe practices in the process of administration of injections. An additional objective was the development of a simple and rapid methodology to investigate injection use.

In this report the results and recommendations from the field studies in Uganda and Indonesia are presented and compared. In both countries, the high popularity of injections was confirmed: injection use was found to be very prevalent both at the household level and in health facilities. The results further indicate that this high prevalence of injection use cannot be biomedically justified. These injections are often not provided in a safe, hygienic way.

Rapid assessment methodology (RAM)

In the two countries the research used qualitative and quantitative methods to collect data from the point of view of users and providers. Injection use in the past two weeks was recorded through household surveys in two regions of each country. Preferences for injection therapy were investigated through in-depth interviews and focus group discussions. Provider-oriented methods included semi-structured interviews, reviews of prescriptions, patient exit interviews and observations in provider facilities. These included government and private medical clinics and various 'non-formal' sources of injections.

The strengths of this research project's methodology are the combination of qualitative and quantitative data collection methods; and the flexible research design which allowed for modifications according to local conditions. At the same time, the formulation of common injection practices indicators helped to provide cross-country comparable data.

Key aspects of the rapid assessment methodology

- Identification of variables to be measured and key indicators.

- Standardized systematic sampling procedures to cover a variety of health care   settings.

- User-oriented methods:
    - household survey using a standardized questionnaire which includes local concerns,
    - follow-up visits to households to improve quality of reporting,
    - in-depth interviews,
    - focus group discussions,
    - use of standardized and local tracer conditions and "hypothetical" illness cases.

- Provider-oriented methods:
    - identification of informal and private providers done through the household survey,
    - semi-structured interviews,
    - reviews of prescriptions,
    - patient exit interviews,
    - observation in provider facilities.

- Analysis using pre-defined indicators:
    - to measure the prevalence of injection use,
    - to measure the appropriateness of injection use.

- Strengths of research methodology:
    - combination of qualitative and quantitative data collection methods,
    - flexible research design to allow for cross-country comparisons and local concerns,

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> – formulation of common injection practices indicators and selection of universal tracer conditions.

Injection rates in countries

The ***prevalence of injection use***, defined as the percentage of households in the surveys receiving one or more injections in the past two weeks, is high in both countries under study. It ranges from around four in ten households in *Indonesia*, to about three in ten in *Uganda*. There are no significant differences between the injection rates of the urban, suburban and rural households in both countries even though accessibility to modern health services varied between the various locations. The great majority of the injections reported in the two-weeks recall period in both countries had been given for therapeutic reasons (85-90%). Intravenous drips are not very common and immunizations are infrequently reported. In *Indonesia* it could be established that the very young constitute a high risk group for receiving injections. The percentage of children under five receiving an injection was twice as high as the percentage for the entire research population.

- 40% of households in Indonesia had received one or more injections.
- 30% of households in Uganda had received one or more injections.

There is a marked difference between the two countries with respect to the ***source of the injections*** received in the households. The bulk of the injections received in the *Indonesian* household survey originate from the public sector. Private practices of nurses, who also work in the public sector, and of doctors are also popular. In contrast, in *Uganda* only a minority of the last injections received in the household was given in the government health facilities. Private medical practices are far more popular. Most striking, however, is the fact that many injections are given by non-formal providers or at home by family members. This reflects the trend of informalization in Uganda where public facilities are often mistrusted and held responsible for the spread of the AIDS epidemic.

- The bulk of the injections received in Indonesia were given in the public sector.
- The majority of injections received in Uganda were given by private, often non-formal, providers.

Injection use in public health facilities

Injection use rates at public health facilities are fairly high in both regions in *Uganda*: an injection is given in between six to seven out of ten treatments. In *Indonesia*, of every ten patients treated in Lebak, seven received an injection. In

Lombok, the mean injection rate is even higher: almost nine out of ten visits here end with the administration of one or more injections.

- 70-90% of all Indonesian patients in the public system received an injection.
- 60-70% of all Ugandan patients in the public system received an injection.

In both countries, high rates of injection use in uncomplicated, non-severe and self-limiting illnesses are found, indicating medical **inappropriateness of injection use**. In *Uganda*, fever is most often treated with injections - especially when accompanied by other symptoms. Over 95% of all injections prescribed are chloroquine, Penicillin Procaine Fortified (PPF) and Crystalline Penicillin. A very popular combination consists of PPF with chloroquine. In *Indonesia*, injections are given in half of the recorded illness cases in the households. The highest injection rates are found in the treatment of skin diseases (some 60%). The most commonly used injectables include antibiotics, vitamins, analgesics and antihistamines. Particularly striking is the popularity of oxytetracycline for the treatment of all recorded illnesses.

The enormous popularity of injections

In both countries the enormous **popularity of injection therapy** was confirmed. If self-medication with oral therapy brings no relief, or when a fast cure is desired, patients tend to solicit providers for an injection. This preference for injections is guided by local ideas and beliefs of illness and concepts of efficacy. It is further strengthened by the economic interests of private providers. In *Indonesia*, users stated that it is "*customary*" to receive injections in health facilities. Customers have little say over this routine treatment. When the providers are asked why they give injections, they usually claim that this is because of patient demand. This vicious circle (health workers give injections because they think patients expect them; patients want injections because health workers give them) and the lack of communication between both parties serves to continue the practice of routine administration of injections. The research confirms that communication between health workers and patients is unsatisfactory. Over half of the patients had not received any explanation from the health worker with regard to their treatment. Injections are popular because of:

- Local beliefs about illness and concepts of efficacy.
- Economic interests of private providers.
- Lack of patient-provider communication.

Hygiene problems and injections

Hygienic appropriateness of the injection administration was not adequate in both countries. The research demonstrates that injections in both countries are often unsafe since the minimum hygienic requirements are not being met. In *Indonesia*, the majority of providers interviewed used disposable syringes. However, most disposables are not discarded immediately after use but are reused after 'sterilizing'. In *Uganda*, as a consequence of the popular concern about AIDS and the distribution of injection equipment to the users by private and non-formal providers, personal appropriation of needles and syringes is now very common. The majority of households keep injection equipment at home. In the health facilities, it was observed that some 60% of the patients bring along their own syringe and needle, making it rather difficult to meet hygienic standards. At the same time, a high percentage of provider facilities in both regions does not meet the required minimum standards of hygiene at each stage of injection administration.

- In Indonesia, disposable syringes were reused by providers.
- In Uganda, households brought their own injection equipment to health facilities.

A higher level of training of the health worker was not related to the provision of safer injections. Although many Ugandan households are familiar with complications due to injections, particularly injection abscesses, they do not explain them by lack of hygiene but rather by the personal qualities (*'bad hand'*) of the provider.

Recommendations for interventions

The research teams recommended a number of managerial, educational and regulatory interventions.

Type of intervention proposed	Uganda	Indonesia
Regulatory	Improve control at the national level of the import, sale and use of injecting equipment Enforce the rules	Establish clear rules and regulations for the use of injections in medical practice Institute coercive measures and sanctions toward providers
Managerial	Supply disposables Improve supervision of health facilities Create incentives for providers with good practices	Supply disposables
Educational: Training of providers	Carry out clean injection programme for providers, including in-service training, refresher courses, and guidelines	Make health personnel aware of the negative impact of their injection practice on the spread of HIV and hepatitis
Educational: Training of the public	Train non-formal providers who operate from their homes Carry out clean injection programme for users, including information, education and communication (IEC) about the need for hygienic practices, and posters	Undertake massive and intensive educational programme, sensitive to the meaning people ascribe to injections

However, the above interventions will only be successful if they consider the underlying reasons for injection misuse both for providers and for users. For example, while training of health providers is necessary and worthwhile, it does not ensure correct use of injections and drugs in general. Also, in many contexts it is no longer possible to eliminate injections from the arsenal of treatments available. Such intervention would be met with both incomprehension and opposition from providers and patients. Therefore, any policy to be adopted must be based upon good understanding of the cultural meaning of injections, their place in medical practices, and their influence upon human relations.

Acknowledgements

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APPENDICES

1. Introduction

1.1 Background to the injection practices research

In many countries health workers are confronted with patients who prefer injections to oral medications. The historical background of this popularity of injections may be the spectacular cures achieved with injections such as quinine to treat malaria, and penicillin to treat jaws. However, apart from their reputed efficacy, economic factors may also determine their widespread use. It is evident that healers can demand a higher fee for administering an injection than for prescribing tablets. The unnecessary and overuse of injections has prompted increasing concern among international agencies such as the World Health Organization (WHO) and national health officials and policy makers, doctors and other health workers in the field. From a health point of view, administering injections without adequate medical knowledge or proper sterilization procedures leads to the risk of transmitting serious diseases such as hepatitis, poliomyelitis and possibly AIDS. In addition, the drug that is injected is often medically unnecessary, and potentially dangerous. From an economic point of view, the non-essential use of injections is undesirable as it imposes an unnecessary burden on household and health centre budgets that are often already limited - this is particularly the case in Africa - and are, in fact, still diminishing due to economic crises.

In many different cultures the belief in injections as a very powerful method of restoring or maintaining health is shared by providers and lay people alike. In fact, the problem of injection use seems to be so complex that it cannot be solved by training alone. Knowledge of the potential risks of injections is often not put into practice. Popular demand for injections will encourage informal injection providers to administer injections to clients in their homes and at market places. Formal providers may also administer more injections as a result of patient demand.

Essential Drug Programmes in developing countries want to diminish both the overuse and the non-essential use of injections. In order to improve the use of injections, programme managers need to know who is injecting, how often they give injections and for what purposes, if injections are given without medical justification, why injections are the preferred route of treatment, and under what hygienic conditions they are given. Acknowledging this, in 1990 the Action Programme on Essential Drugs of the World Health Organization, in consultation with the Expanded Programme on Immunization and the Global Programme on AIDS, initiated a research project in three developing

countries where the misuse of injections is reportedly a problem. The research focuses on two, largely unanswered, questions: *what is the extent of injection use?* and *why are injections so popular?* To answer this last question, the causal and contextual factors behind the popular demand for injections need to be explored. This was seen to require anthropological research methods including participant observation, in-depth interviewing and focus group discussions. Data on the *actual use of injections* both at the household level, and at the level of the health services, is needed in order to explore the extent of the problem, the indications for which injections are used and also to locate the most important sources of injections. This requires epidemiological research methods, including household surveys and interviews with providers and users of injections. The development of simple and rapid methods to estimate the prevalence of injection use was one important objective in the initiation of this research.

At the same time, similar research into injection practices in Thailand was supported by the WHO Action Programme on Essential Drugs[1] and recently published by WHO (Reeler & Hematorn, WHO/DAP/94.8). Similar methods and indicators were used, and many results are complementary to those of the injection practices research reported here.

1.2 Injection practices research: objectives and approach

The main objectives of the injection practices research project were to[2]:

- estimate the extent to which injections are used as a route for the administration of medications,

- determine the type and degree of improper and unsafe practices in the process of administration of injections,

- gain insight into why injections are so popular,

- develop a simple, and rapid survey methodology for future assessments of inappropriate injection use.

For the first two objectives, specific research questions were formulated (Appendix 1.A) and quantitative and qualitative research methods have been used (Appendix 2.A and 2.B). The third objective required in-depth

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[1]   This research was carried out by researchers from the Institute of Anthropology of the University of Copenhagen (Denmark) and the Department of Public Health of Mahidol University (Thailand), and formed part of a larger in-depth study.

[2]   Adapted from the Provisional Research Protocol published in the Report of an Informal Workshop on Injection Practices Research, (WHO/DAP/91.8) Geneva 1991.

anthropological research which was not possible within the scope of the present study. To explore this issue, a literature reviewed was performed, complemented with exploratory interviews with key informants and focus-group discussions in the field studies. The research design was flexible, allowing country teams to adapt the design to their local context. A number of common injection use measures were developed on the prevalence and the evaluation of injection use in order to assure comparison. These indicators are given in Appendix 1.B. The standards used for assessing hygienic practices are presented in Appendix 1.C.

1.3 Development of the injection practices research

The collaborative research project on the use of injections was conducted in three developing countries: Indonesia, Senegal and Uganda. The project involved not only researchers from these countries, but also the participation from WHO Headquarters[3] and from the Medical Anthropology Unit of the University of Amsterdam.

Three workshops were held in 1990, 1991 and 1993[4]. During the first workshop (2-5 May 1990), data collection instruments and data analysis techniques were discussed. The plans for the project were finalized, and the research protocols of the country teams revised and standardized. A number of common variables and core injection indicators were defined. The participation of the country teams in the formulation of the collaborative research protocol has contributed substantially to the successful conduct of a multi-country project, allowing both for comparison of the research results without compromising the need for country specific modifications in the conduct of the research.

The second workshop (21-22 October 1991) assessed the progress of the research projects and reviewed the problems encountered by the country teams during the implementation of their research protocol. Furthermore, the indicators which had been developed during the first workshop were reviewed. Several interesting themes for further qualitative research were identified. Finally, the results of the country studies were presented and discussed during a third workshop on 7-10 November 1993 in Geneva. This workshop was also attended by government representatives involved in

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[3]   Within the WHO Headquarters in Geneva, the Action Programme on Essential Drugs initiated the research project. The Expanded Programme on Immunization and the Global Programme on AIDS have also been involved in the formulation of the research project.

[4]   The proceedings of two workshops have been published by WHO:
I)   WHO/DAP/91.8
II)   WHO/DAP/92.2
        Combined in WHO/DAP/92.9

national policy-making from two countries included in the study and by representatives of other WHO programmes. After this final workshop, the country reports and the final synthesis report were revised and prepared for publication.

The country proposals aimed at answering the same research questions, using similar sampling frames, definition of key variables, and drug use measures. However, during the implementation phase of the research it became clear that the application of the research protocol in Senegal differed substantially from that of the other two countries. For example, in Senegal the study was only performed in three regions in the urban-capital region of Dakar and not in rural areas. It proved impossible to compare the results of the Senegalese study with the other countries. Therefore, it was decided to limit the discussion of the results in this report *only* to Uganda and Indonesia.

1.4 Contents of this report

This synthesis report of the injection practices research aims to:

- review existing literature on the prevalence of injections and the reasons for their popularity;

- compare the methods used in the country studies, review the problems in the implementation of the study, and assess the usefulness of the various methods;

- present and compare the results of the country studies concerning:
    - prevalence of injection use (Indicators Ia-If),
    - appropriateness of injection use both in biomedical and hygienic terms (Indicators IIa-IIf),
    - the popularity of injections;

- assess the usefulness of the indicators in describing inappropriate injection use.

The methods used to investigate injection use in both countries are assessed in **Chapter 2**. Since the development of simple and rapid methods to estimate the prevalence of injection use is an important objective of the research, the sampling frame and the various quantitative and qualitative methods are presented and problems encountered during the research phase are highlighted. The reasons for the popularity of injection therapy are discussed in **Chapter 3,** based on a review of the literature. The results of this literature review complemented with some exploratory data from the field studies shed some light on this surprising phenomenon: the almost universal popularity of injection therapy. The research results of the country studies are presented in the rest of the report. Firstly, in **Chapter 4**, after a brief introduction to the local

contexts, attention is paid to the prevalence of injection use. Some explanations for the popularity of injections in Uganda and Indonesia are discussed in **Chapter 5**. Then, the results on the appropriateness of injection use are presented in **Chapter 6**. Indicators referring to the medical appropriateness of injection use (using tracer conditions) are assessed, followed by a discussion of the results of the observation of minimal hygienic standards. General conclusions and recommendations are formulated in **Chapter 7**. **Appendix 1** gives the research questions, the indicators and the guidelines for evaluating hygienic practices; in **Appendix 2** a critical assessment is given of the methods used in the research while the research tools are presented in **Appendix 3**.

2. Towards a rapid assessment methodology for injection practices research

The country teams involved in the injection practices research used a variety of research methods of both a quantitative and qualitative nature, aimed at both users and providers.

2.1 General considerations regarding methodology

In designing the injection practices research it was considered important to strike a balance between various aspects of the study (Report of the First Informal Workshop, 1991:5-6):

- between the descriptive objectives (how often are injections used, how and for what?) and the analytical objectives (why are injections so popular?);

- between quantitative and qualitative research methods;

- between the comparative nature of the study and the country specific aims and objectives;

- between standardized and rigidly implemented research methods and a more flexible approach;

- between observing malpractice and intervening in it. Although the study is exploratory in nature, the results are envisioned to be of use to national health policy makers and workers. Appropriate forms of action need to be identified;

- and finally, between being comprehensive and doing cost-effective research.

In order for the country research projects to meet the needs of the country, it was seen as important that the objectives of the proposals be based on a country specific problem identification. Methods had to be adapted to local conditions. As a consequence, considerable differences exist between the country studies, for example in sampling procedures, sample size, focus of the research, use of specific research tools and in the analysis of the data collected. At the same time, by establishing common indicators measuring the prevalence and the appropriateness of injection use during the first two workshops, an attempt was made to ensure some level of comparability.

The research teams aimed at establishing the extent of injection use, in the general population via surveys both at the household level and in health facilities, either by

the review of prescriptions (Uganda) or through exit interviews with patients (Indonesia). The teams have also assessed the medical appropriateness (rationality) of injection use. This has been researched using certain tracer conditions and 'hypothetical' illness cases which were presented in household surveys and focus group discussions. The appropriateness of injection administration procedures (hygiene) in health facilities was also studied by both teams. As to the popularity of injections, the Indonesian team has relied on focus group discussions with users and providers, and on structured questionnaires with injection users (patients in health facilities). In Uganda, the study formed part of a larger ethnographic research project into the practice of injections. In-depth interviews with key informants were conducted which have produced interesting insights into the popularity and specific conditions of injection use in the Ugandan context.

During the final workshop both the advantages and disadvantages of a **flexible research design** were assessed. While the research protocol allowed the country teams to take local conditions and needs into account, a disadvantage of this flexible approach is that comparison of the results between countries is only possible to a limited degree. Therefore, comparisons between both countries in this report will be made only when appropriate, for example while discussing the common indicators measuring the prevalence and the appropriateness of injection use. Most of the common indicators proved to be effective in order to measure the popularity of injection use in various settings and relating prevalence to various variables, such as type of facility where injection was given, urban or rural setting, etc.

The **mixture of quantitative and qualitative methodologies** in the injection practices research allowed for cross-validation of data. Household questionnaires proved an effective way to estimate prevalence rates of injection use in these two countries where injections are a common route of treatment. There were no major problems with non-response or sampling. A follow-up visit to the same household after fourteen days - which was performed in Uganda - can produce even more reliable results, but is, of course, more costly and time-consuming. The design of a proper questionnaire can be improved by using information gathered from in-depth interviews with key informants. The use of simple tracer conditions to investigate the extent of medically inappropriate injection use proved to be a complicated issue with many methodological pitfalls. Still, it seems the only way to categorize complaints and to calculate injection rates for different illness categories. Focus group discussions, using hypothetical illness cases to generate discussion on the subject of injections, proved to be a useful method if a quick understanding of local ideas and practices is desired.

The study of providers' practices required a great deal of creativity. Serious problems of non-response and lack of cooperation by certain types of providers, particularly those without formal training were identified. Still, in both countries researchers tried to study injection use in health facilities in a number

of ways: through interviews with providers and patients, through observations and chart reviews. Although it is difficult to obtain consent, observation of actual practices and hygienic procedures seems paramount to estimate the extent of the problem of unsafe injections in developing countries.

Appendix 2 gives more details on the quantitative and qualitative methods used in the country studies. An assessment of the usefulness of each method is made. Following Van der Geest & Hardon (1988), a distinction is made between user-oriented methods (focusing on the consumers of injections) and provider-oriented methods (focusing on the providers of injections). All tools (questionnaires etc.) are presented in Appendix 3.

2.2 Sampling

Both country teams have used the sampling frame suggested in the initial research protocol, although in Indonesia more households than originally intended have been visited. This purposive sampling frame was designed to cover a variety of health care settings. In each country, two districts or provinces were chosen, sampling within each district three settings: one urban, one suburban, and one rural. In each of the three settings two communities were sampled in such a way that they varied in terms of socio-economic profile, relative distance to health facilities, household structure and level of urbanization. In each community a random sample of 60 families with pre-school children (under five years of age) was selected by cluster sampling, bringing the total of households visited in each district to 360. The study's sampling frame is presented in Figure 1.

Figure 1: **Original sampling frame, household survey - Uganda & Indonesia**
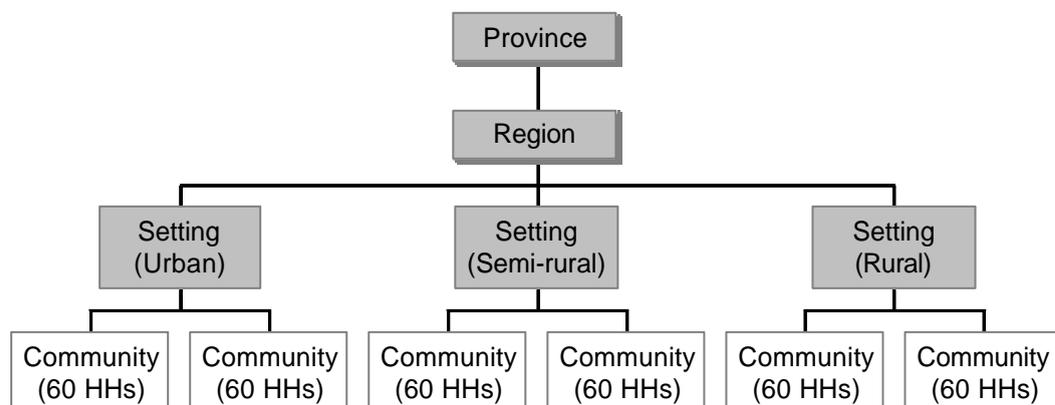
Within the households the person most responsible for health care of the household members (usually the mother) should be interviewed. Pre-school children were selected as the target-group because they are ill most often and they are a target audience of most PHC-programmes. Since only these

households have been sampled in both countries, the prevalence rates calculated from the data collected in household questionnaires are not representative of the population as a whole, but of families with pre-school children only.

In *Uganda*, the study was conducted in Ankole, Western Uganda and in Busoga, Eastern Uganda. In each of these provinces, three settings were selected (urban, semi-rural and remote). A total of 360 households in each province was visited twice. Two weeks after the initial interview, the household was visited again and the prevalence of injection use in the past two week recall period was recorded. This reduces memory bias in respondents as the interviewer can refer to a specific event: the last time (s)he visited the home. In Uganda the data collected during the follow-up visit produced slightly lower, but probably more reliable injection rates. No households were lost in the follow-up.

In *Indonesia* the study was conducted in two districts, Lebak (West Java) and the island of Lombok (east of Bali). In each district three sub-districts (urban, suburban, rural) were selected. The sampling frame of Figure 1 was not exactly followed by the Indonesian team, resulting in the total number of households amounting to 407 in Lebak and 409 in Lombok. All households were visited once.

There were no serious difficulties in sampling procedures or in conducting the surveys. In *Uganda*, some problems were reported as to who should be interviewed. In the provisional research protocol mothers had been envisaged as the prospective respondents, while in the actual research phase the head of the household, who was subsequently the key respondent, was often a man. The research team in Uganda solved this problem by asking which member of the household was most responsible for matters of health, and this person was asked to serve as the main respondent during the interview. In the actual interviews, it also quite regularly occurred that other household members 'joined in' the conversation. The Ugandan team decided to view additional information as vital, and included it into the survey results.

2.3 Use of indicators

A set of injection-use indicators was developed during the first workshop and reviewed during the second one[5]. More details on how to calculate these indicators are given in Appendix 1.B.

With the exception of the measuring of appropriateness of injection use in hypothetical illness cases (Indicator IIb), all indicators were considered feasible by the research teams (Report of the Second Informal Workshop, 1992:2).

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[5] Report of the Second Informal Workshop, WHO/DAP/92.2:6-10.

Nevertheless, in the questionnaires the indicators have not been applied strictly in all country studies making comparison of the data difficult. For example, the Ugandan questionnaire did not record the age and sex of all household members, making it impossible to determine the relative frequency of injection use in certain age groups, or in men or women. To avoid that vital information such as, for example, the age and sex distribution of the total reference population is accidentally excluded from the questionnaire, it would seem advisable in a multi-country study such as this one that the questionnaires are compared and revised before they are tested and applied in the field.

Apart from using the indicators as guidelines for developing questions for the surveys, the country teams included questions of their own interest or that were particularly relevant in their context. For example, in the household questionnaires in *Uganda* questions were included on the possession of injection equipment and injectables at home. Experiences with the complications of injections were also recorded. In *Indonesia*, in the exit interviews of patients at health facilities questions were included about whether the health worker had given an explanation; about the fact of whether injections are given on request and why the respondent liked injections.

EVALUATION OF THE PREVALENCE OF INJECTION USE

(Ia)　Percentage of households (HHs) in which one or more injections were given in the past two weeks.

(Ib)　Percentage of HHs that received a specific type of injection in the past two weeks. Calculated for:
- therapeutic injections
- infusions (large volumes)
- contraceptives
- immunizations

(Ic)　Percentage of people in a certain age category of the research population who have received at least one injection in the past two weeks.

(Id)　Percentage of females and the percentage of males in the research population who received at least one injection in the past two weeks.

(Ie)　Frequency of injection administration per health facility. Health facilities can be categorized into:
- government facilities
- private facilities
- non-formal facilities
- homes

(If)　Percentage of patients at a certain health facility who received at least one injection.
　　　Or, if the team decides not to interview patients at health facilities, a

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similar measure can be made based on an analysis of prescriptions: Percentage of prescriptions at a certain health facility that list at least one injection.

EVALUATION OF THE APPROPRIATENESS OF INJECTION USE

(IIa) Percentage of injection use in actual tracer conditions.

(IIb) Percentage of injection use in hypothetical tracer conditions.

(IIc) If prescription patterns of providers are monitored, then the percentage of injection prescription in the specified tracer conditions can also be calculated.

(IId) Frequency distribution of types of injections given per tracer condition. The injections can be categorized by generic and by brand name.

(IIe) Percentage of providers who do not observe minimal hygienic standards <u>before</u> administering an injection.

(IIf) Percentage of providers who do not observe minimal hygienic standards <u>during</u> administration of an injection.

(IIg) Percentage of providers who do not observe minimal hygienic measures <u>after</u> administration.

2.4 Use of tracer conditions

The selection of appropriate tracer conditions had already raised much debate during the workshops in 1990 and 1991. Tracer conditions were defined as common health problems for which injections appear to be used often while they are not medically justified. In order to be appropriate, tracer conditions should not refer to complicated and/or serious conditions which may warrant injection use. Other criteria were:

- the condition can be described accurately in local illness terms;
- a well defined treatment norm exists for the condition (Report of First Informal Workshop, 1991:21-22).

The teams had agreed to use two tracer conditions as hypothetical illness cases:

– cough and cold in any age;
– diarrhoea, less than five watery stools per day, in children under five.

It was also decided during the first workshop to include two or three additional country specific conditions for which indications injections are generally used (Table 1). Earlier research (MSH 1988) had indicated, for example, that in Indonesia injections are very popular for skin diseases so this

condition was included in Indonesia[6]. In Uganda, fever, intestinal worms and vomiting were included as tracer conditions based on the guidelines for the Uganda Essential Drugs Management Programme (UEDMP 1991). Ideally, these additional tracer conditions refer to illnesses which are either self-limiting (such as common colds) or can be treated in the majority of cases by oral therapy (such as uncomplicated malaria, intestinal worms or diarrhoea) or local therapy (skin diseases)[7].

Table 1:   Overview of tracer conditions used in the country studies

Uganda	Indonesia
Cough & cold	Cough & common cold
Diarrhoea in a child under five, less than five watery stools per day	Diarrhoea
Fever	Fever
Intestinal worms	Skin disease
Vomiting	

The tracer conditions were used for the presentation of hypothetical illness cases in the household interviews. In the questionnaires, the hypothetical illness cases were presented at the end of the interview. This may have lead to biased responses being given. The Ugandan team also reported some problems with the use of hypothetical illness cases as a way of probing on therapy choice. The respondents would often ask the interviewer for more details. For example, in the respondents' view, there are many types of fever, and the treatment depends on the type of fever. This problem can be circumvented by giving people a detailed case history for which they are asked to suggest a treatment, but this is not feasible in household questionnaires. In *Indonesia*, focus group discussions were conducted in Lebak where the presentation of hypothetical illness cases produced lively debate. Hypothetical case histories could also be useful in semi-structured interviews with several kinds of providers.

The *Ugandan* team reported some problems with the translation of the illness terms. Another problem is that the hypothetical illness cases do not take various **degrees of seriousness** into account. In-depth interviews in a limited number of households in Busoga from both remote and urban settings

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[6]   The most common skin disease in Indonesia is *pityriasis versicolour*, a fungal infection.

[7]   These conditions proved to be difficult to maintain in all cases. For example, 'fever' which was chosen as tracer condition in Uganda, may refer not only to uncomplicated malaria but also to many other diseases for which injections could be necessary. Furthermore, in the local language 'fever' is not a separate illness category but one which can be translated into many different words.

indicated that it is rather intricate to use the idea of 'scale of illness' to evaluate the appropriateness of injection use.

Both research teams did not only present hypothetical illness cases but they also recorded actual cases of the tracer conditions and their treatment within the household during the past two weeks. This allows comparison, to a certain extent, of 'actual' use, as it was reported, with hypothetical treatment preferences. This comparison will be presented in the section which deals with the results. In *Uganda*, actual illness cases in the past two weeks were also recorded during the follow-up visit, in *Indonesia* they were recorded during the first and only visit to the household.

In the research design, tracer conditions were treated as single disease entities while local people often categorized **combinations of tracer conditions** (such as cough & cold accompanied by fever), and specific forms of cough & cold indicating different degrees of seriousness. The in-depth interviews in Uganda highlighted the richness of indigenous categories of tracer conditions, and their implications for treatment preferences. The recording of actual illness cases in both countries confirmed that sick people often have several symptoms. Combinations of tracer conditions were the rule rather than the exception. The questionnaires did not allow for this and in the field, research assistants often decided (usually after discussion with the respondents) which symptom should be regarded as the 'main' condition, rendering this method rather imprecise and arbitrary. It would have been better to record all symptoms and deal with the categorization of illness episodes in the analysis.

2.5 Studying injection providers' practices

In both country studies providers were included in the research design. The survey was mainly aimed at establishing the prevalence of injection use at various provider facilities, evaluating the medical and hygienic appropriateness of injection use, and determining the source and type of equipment used. In *Uganda*, the provider study was strategically scheduled two months after the completion of the household survey to guide the identification of injection providers within the study communities. Based on the question in the household survey *"Where was the last injection administered?"*, the team was able to identify a variety of injection providers. In the urban communities, more different categories of health providers could be identified than in the rural areas where health resources are restricted.

Problems encountered in studying doctors and other providers of injections were many. Both country teams report problems with sampling, non-response or refusal to cooperate. For example, in *Uganda* the original idea was to make a random selection of providers. Often, only those who were willing to cooperate could actually be surveyed. In *Indonesia*, it was reported that doctors in private practice were especially unwilling to cooperate. In both countries under-

representation of (certain) private and non-formal or untrained providers is therefore a serious limitation. A further discussion of the study of prescribing practices in the country studies is given in Appendix 2.B.

2.6 Conclusion

It can be concluded that the two most important strengths of this research project's methodology were the combination of qualitative and quantitative data collection methods; and the flexible research design which allowed for modifications according to local conditions. Formulation of common injection practices indicators and two universal tracer conditions helped to provide cross-country comparable data. All indicators developed in this research, with the exception of the hypothetical tracer conditions, can be considered feasible.

With respect to the user-oriented methods applied in the research, household surveys provide excellent quantitative data on the extent and prevalence of injection use. A prerequisite is that the sampling frame be straightforward ensuring that representative data is collected. No major problems were encountered with the cluster sampling method used. It seems an unnecessary limitation that only households with children under five were sampled. Although it is justified to focus on children under five as a particularly vulnerable group, it is not necessary to exclude families without pre-school children. Prevalence of injection use was established retrospectively, using a two week recall period. In Uganda, the households were visited a second time fourteen days after the original interview. This follow-up visit proved to be a rather precise instrument in measuring the two-week prevalence of injection use as it reduces memory bias in respondents.

Allowing flexibility in questionnaire design, as opposed to a blue print design, has the great advantage that specific questions relevant to the local situation can be included. This has proven to be very useful, for example in Uganda where a question on home possession of syringes and needles could be included. The same question would have been quite inappropriate in the Indonesian context where injection technology has not been domesticated to the same extent. To ensure comparability, however, and to avoid that vital information is accidentally excluded from the questionnaire, it is advisable in a multi-country study such as this one, that the questionnaires be compared and revised before they are tested and applied in the field.

It is important to try to measure for which common health problems injections are preferred and used. In addition to universal tracer conditions, the inclusion of country-specific tracer conditions has the advantage of covering the most relevant diseases in that country. However, it proved to be rather difficult to find tracer conditions which meet the criteria (a self-limiting ailment for which other forms of treatment than injections are appropriate). For example, for symptoms such as fever or severe vomiting, injections could be medically

justified in some cases. Therefore it seems necessary to include the degree of severity in the definition of the tracer conditions. The defined tracer conditions proved useful for the recording of *actual* illness cases but many methodological and conceptual difficulties were not foreseen. Because combinations of tracer conditions are common, it is advisable that the interviewers in the field record all symptoms and classify them afterwards, using exclusive categories.

With respect to the provider-oriented methods applied in the research, the problems encountered in studying doctors and other providers of injections were numerous. Non-response and refusal to cooperate occurred often in both countries, affecting the reliability of the results. In addition, under-representation of (certain) private and non-formal or untrained providers is a serious limitation in both country studies.

Key aspects of the rapid assessment methodology

- Identification of variables to be measured and key indicators.

- Standardized systematic sampling procedures to cover a variety of health care settings.

- User-oriented methods:
    – household survey using a standardized questionnaire which includes local concerns,
    – follow-up visits to households to improve quality of reporting,
    – in-depth interviews,
    – focus group discussions,
    – use of standardized and local tracer conditions and "hypothetical" illness cases.

- Provider-oriented methods:
    – identification of informal and private providers done through the household survey,
    – semi-structured interviews,
    – reviews of prescriptions,
    – patient exit interviews,
    – observation in provider facilities.

- Analysis using pre-defined indicators:
    – to measure the prevalence of injection use,
    – to measure the appropriateness of injection use.

- Strengths of research methodology:
    – combination of qualitative and quantitative data collection methods,
    – flexible research design to allow for cross-country comparisons and local concerns,
    – formulation of common injection practices indicators and selection of universal tracer conditions.

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3. Background: the social and cultural context of injections

Although the use of injections is a worldwide phenomenon, little systematic research has been conducted into this practice[8]. This chapter will principally consider the social and cultural meanings of therapeutic injections. Vaccinations, infusions and other medical techniques which involve the penetration of the skin (acupuncture, for example) will not be dealt with here.

3.1 The prevalence of injection use: a literature review

The data currently available on how injections are administered and their medical consequences, their distribution and the meanings that individuals attach to them are largely based upon impressionistic and fragmentary observations. More specific information on injection use can be found in more recent - but still sparse - studies, most of which have been conducted in health care institutions. Sciortino (1992, 1993) reports that in some health centres in the Javanese countryside 80 to 90% of all medical consultations end with an injection being given. Ofori-Adjei & Arhinful (1994) calculate that an injection is included in 80% of all malaria treatments given in Ghanaian health centres. More than a decade earlier Barnett *et al.* (1980) concluded that 96% of all Ghanaians attending a health care institution received at least one injection as part of their treatment. Senah (1990) estimates that between 80 and 90% of the clients of one informal 'dispenser' in the Ghanaian village where he was conducting research received an injection. A start has been made on conducting more systematic research into injection practices with the recent publication by Bloem & Wolffers (1993) which includes contributions on Ecuador, Indonesia, Thailand and Uganda.

The popularity of injections has been reported in many different countries[9]. In Asia, for example, this preference is mentioned in India (Alexander & Shwaswamy 1971, Bhatia *et al.* 1975, Nichter 1980, Greenhalgh 1987, Burghart 1988), Thailand (Cunningham 1970, Reeler 1993, Reeler & Hematorn 1994), Vietnam (Ladinski *et al.*), Indonesia (MSH 1988, Sciortino 1992, 1993), and Taiwan (Kleinman 1980). From Latin America and the Caribbean reports come

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[8] This chapter is a revised translation of an article published by S. van der Geest and A. Hardon (1994) under the title 'The Power of Injections. Social and Cultural Aspects'. This reprint has the full consent of the authors.

[9] An earlier bibliographic exploration by van der Geest (1982a) gives still more references on the phenomenon of injection popularity.

from the Dominican Republic (Ugalde & Homedes 1988), Colombia (Browner 1985), Guatemala (Woods 1977, Cosminsky 1994), Nicaragua (Wolters 1993), El Salvador (Ferguson 1988). Other reports indicate the popularity of injections on the African continent: for example in Ghana (Barnett *et al.* 1980, Waddington & Enyimayew 1989, Senah 1994), Ivory Coast (Alland 1970), Gabon (Soeter & Aus 1989), Nigeria (Alubo 1985), Sierra Leone (Bledsoe & Goubaud 1988), Burkina Faso (Vincent-Ballereau *et al.* 1989), Cameroon (Van der Geest 1982b), Mozambique (Schapira & Moltesen 1984), Uganda (Whyte 1982, Birungi 1994a/b, Birungi & Whyte 1993), Morocco (Greenwood 1981), Tunisia (Bouraoui & Douik 1981), Ethiopia (Slikkerveer 1982). As early as 1968, Tayler *et al.* reported on injection use in Turkey.

The medical community has repeatedly reacted with concern to these reports (Michel 1985, Wyatt 1984, 1992, Nwokolo & Parry 1989). Injection use is thought by them to be often unnecessary and putting the patient at unacceptable risk of contracting malaria, Hepatitis B (Gopal Rao 1987), and other viral infections including the deadly Ebola-virus and possibly HIV[10]. According to Wyatt (1984), injections can increase the risk of paralysis when a child is infected with the polio-virus to an incidence of 25% (provocation poliomyelitis). Furthermore, the hygienic conditions under which these injections are administered are, in many cases, quite alarming resulting in many iatrogenic gluteal abscesses (cf. Berkley 1991; Guyer *et al.*1979; Soeters & Aus 1989; Wolffers & Bloem 1993; Wyatt 1993). Health economists and planners also point out that the cost of frequently administering injections places an intolerable strain upon the resources of local health care systems (cf. Guyer *et al.*1979, Hogerzeil *et al.*1989, Melrose 1982, Waddington & Enyimayew 1989).

Anthropologists find injection use an interesting phenomenon in that it is a spectacular example of the willing acceptance of Western medical technology by non-western cultures. The anthropologist's interest centres on the question: what makes injections so popular (cf. Reeler 1990) or, what do injections *do* which makes them so appealing? For analytical purposes this central question must be further sub-divided as follows: what meanings are given to injections; what role do they play in medical practices; how do they influence the world of social relations?

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[10] The magnitude of the risk of transmitting HIV through needle-stick injuries is subject to debate. Wyatt (1986) suggested that, although the risk of transmission of HIV by accidental needle-stick injections may be very small, the risk with multiple use and reuse of unsterile syringes and needles may be closer to that of intravenous drug users. In Zaire a possible correlation between a history of injections and HIV-positive babies with seronegative mothers has been reported by Mann *et al.* (1986). A similar study, conducted in Kigali (Rwanda), however, found no difference between the two groups of children in respect of the number of medical injections received (Lepage *et al.* 1986). Hrdy (1987) points out that while needle-stick injuries can transmit HIV, this mode of transmission is relatively uncommon. Injectionists utilize intramuscular injection which involves little exposure to blood, and their injections are often fairly widespread in time, which makes transmission of the rather unstable HIV even less likely.

3.2 Injection use: explaining their popularity

Often, the explanation for the popularity of Western medicines is sought in the dramatic cures by single shots of penicillin during mass campaigns to control yaws (Michel 1985, Nwokolo & Parry 1989). According to Wyatt (1984), the mass campaigns against yaws and kala-azar occurred in two waves, first with neosalvarsan in the nineteen-twenties and thirties and, after World War II, using a single injection of depot penicillin to cure horrible, disfiguring lesions in one or two weeks. This cure was described everywhere as quite extraordinary. For example, Reeler notes in her research in Thailand (1993) that older people still remember how a single shot could miraculously cure yaws or protect against dreaded diseases like smallpox[11]. The use of injections has therefore come to epitomize Western medicine itself: magical properties have been attributed to injections after their ability to bring about the miraculous cure of diseases had been demonstrated.

Although no miracle cures can be observed in the majority of the cases of injection use today, still the belief in their effectiveness remains strong. An explanation based solely upon past miracles is therefore insufficient to explain injections' present popularity. Even the most obvious answer to their widespread, probably even universal, use in combating illness - their chemical action - is not an altogether totally adequate explanation of their popularity. Medicines whose chemical composition exerts no biochemical influence upon the illness, amulets worn around the neck or holy objects placed in or around a house, for example, are often used as part of the therapeutic process. Western science is also well acquainted with the 'placebo effect' where tablets containing no chemically active constituents have been shown to be just as effective as 'real' medicines.

For a more comprehensive interpretation of the action of medicines we must look to the 'total drug effect' (Helman 1994:194). The characteristics of the medicine itself (its colour, taste, form, name), of the patient (his or her personality, experience, social-cultural background), of medicine providers, and of the situation in which the transaction takes places, all play a role in the final result of the medicine's use. Yet another characteristic particular of medicines is that it is a substance, an object which is physically present. The very tangibility of a medicine fosters trust in the patient that something can be *done* with a complaint which at first appeared to be rather elusive.

This movement from the abstract complaint to concrete action can also be applied to the use of injections, although their widespread popularity is also to be explained by certain characteristics specific only to this example of Western

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[11]   However, according to Wyatt (1984), vaccination campaigns have not contributed to the popularity of injections, because the connection between an injection now and *not* getting a disease in the future is too tenuous.

medical technology. Birungi and Whyte (1993) write that, in Uganda, patients show a preference for injected medicines against oral medicines as they believe them to be more effective: they go directly into the blood-stream. Hence they remain longer in the body than would oral medicines which will eventually leave the body through the action of the digestive system. Moreover, the injected medicine goes directly to the source of the illness which they believe is centered in the blood[12]. One remark by a woman interviewed by Birungi (1994a) clearly illustrates this: *"The illness is in the body so the injection attacks the illness directly"*. In other countries the idea that 'the injection goes straight into the blood' is also considered to be the greatest advantage of injection use (for example in Nicaragua, Wolters 1993; Indonesia, Sciortino 1993; Thailand, Reeler 1993). Injections enter deep in the body, to the root of the disease, according to supporters of injections in Borneo (Bloem & Naterop 1990). A study by Greenwood (1981) in Morocco suggests that the penetration of the needle during an injection produces the best effect against 'deep diseases'. A Thai respondent even quantified the effect of injections as compared with pills: *"one ampoule equals ten pills!"* (Reeler 1993:61).

In his discussions with an Ayurvedic healer in Northern India, Burghart (1988) came across comparable explanations of the action of injections. This healer often administered penicillin injections. His preference for the injection was based upon the notion that, through this trajectory, the medicine enters the body both quickly and directly. The normal route, through the digestive system, would take much longer. More importantly, this healer believed that medicines must pass a number of 'control points' in the body which bring about a gradual decrease in the medicine's potency. This healer thought that an injection is able to bypass these control points bringing the healing substance directly to the trouble spot. The result is an extremely fast, although dangerous, intervention. It is for this reason that the Ayurvedic healer said he was not in favour of the use of injections for young children and the aged. Nevertheless, he did often give injections to these two age groups explaining that *"people are often impatient"* and they had often already tried another remedies without positive result. Under these circumstances he decided that a more powerful intervention was indeed necessary, and administered an injection.

The extra charm of the injection is that it fits easily into many local systems of thought on illness and health. One consequence of this tendency is that rather than this new technology serving as a vehicle for the introduction of new ideas, as one might expect, it may often, in fact, simply serve to confirm current traditional notions on illness and health. One striking example is the cultural reinterpretation[13] given by the Ayurvedic healer to Burghart. The healer

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[12]   Similar ideas are reported by Cosminsky (1994:107). In Guatemala, injections are believed to go directly into the bloodstream *"like alcohol"*. That is why they work faster and are more effective than pills which are perceived to go in one way and out the other, like food.

[13]   This term has been borrowed from Herskovitz (1948) and has been applied by Bledsoe & Goubaud (1985). It means that old, familiar cultural meanings are ascribed to new elements, for example Western pharmaceuticals.

considered penicillin to be a medicine with both a hot and desiccating effect. An illness which is caused by a imbalance resulting in an excess of cold, a notion common to humoral etiology, cannot, therefore, be more quickly and powerfully combated than by a penicillin injection. This cultural adaptation of penicillin injections became cultural appropriation when the healer remarked to Burghart that penicillin is, in fact, an ancient Ayurvedic medicine. Another example of the importance of local ideas on balance is given by Sciortino (1992): some patients in Central Java ask for a 'double injection', one shot in the left and one in the right buttock, so as not to create an imbalance.

In many humoral traditions, injections are classified as 'hot' in hot-cold divisions. Nichter (1980:228) notes that in South Kanara (India) injections are believed to be powerful and 'heating'. The most powerful injections are those manifesting the greatest burning sensation. On the other hand, this classification also implies risks for the receiver of the injection. For example, in Nicaragua, when a person is *agitada* ('in an agitated state'), the blood runs faster and the body is in a 'hot' state. Administering an injection could then produce a dangerous effect. In addition, after injecting, the pierced skin is *agitado* and should not be exposed to the sun (Wolters 1993).

The direct access to the blood-stream offered by injections is of special importance when blood is conferred a central role in the process of illness and recovery, a notion found in many cultures. If injections are so powerful in a curative sense, then clearly they can also be used as a prophylactic. Illness is often seen as a succession of phases, with each becoming more serious than the last, unless an intervention is made. Etkin *et al.*(1990) describe how, in Northern Nigeria, this idea leads to patients continuously switching medicines in keeping with the progression of the phases. This notion then is instrumental in preventing a more serious phase. Birungi (1994a) describes how her informants in Uganda were even concerned about a common cold believing that this could lead to a more serious and dangerous complaint such as malaria. On the basis of this notion, an injection may even be used for a common cold simply to prevent something worse.

Another explanation for the superiority of the injection's effectiveness is related to pain. In Nicaragua a painful injection is considered to be strong, because pain is associated with more healing power (Wolters 1993). In Sierra Leone, injections are seen as the most potent remedy apparently because the pain associated with them must indicate efficacy (Bledsoe & Goubaud 1988). However, the pain injections may generate is also a reason given for disliking or fearing them (Sciortino 1993).

Injections also perhaps owe much of their popularity merely to the fact that they come from 'far away'. Syringes and needles are examples of an alien technology that cannot be made or copied using local resources. Cassava powder, for example, can be made to look like penicillin (Whyte & Van der Geest 1994), but instruments of injection are 'hightech'. Through its 'alien

origins', the injection appears to possess special qualities which only serve to further increase its symbolic power (Whyte 1988).

The image of the injection is so appealing to the imagination that it has become a symbol of western medical practices as a whole. Medical messages constantly reinforce the potency of injections as a force for good. Injections and the syringe have become the symbol of modern medicine (Wyatt 1992). Even outside medicine the latter has become a metaphor for everything that is fast and efficient. A syringe is equated with health in all sorts of propaganda. The injection is so dominant that it has lent its name to a whole array of, often informal, practitioners whose practices include, *among other things*, administering injections. Terms such as 'injectionist', 'injection doctor' and 'needleman' are used to describe healers who do much more than just give injections (Taylor *et al.* 1968, Cunningham 1970, MacLean 1974, Whyte 1982).

Yet, the preference for injections is not universal. Sachs & Tomson (1992) found no preference for injections in their drug utilization study in Sri Lanka although they give no reasons why. Herdt reports (personal communication) that injections are not popular in Papua New Guinea. He is of the opinion that injections are viewed as violation of the body. In the Philippines in community drug use studies, injections were also found to be used very rarely (Hardon 1991). In the Netherlands, as in many Western European countries, injections also do not appear to be popular. In contrast to many non-western countries, people in Western Europe cannot buy injecting equipment directly over the counter or acquire it through informal healers. They must resort to doctors who are perhaps rather less inclined to prescribe an injection than are their non-western colleagues[14].

Various authors have indicated that the injection of children is particularly mistrusted, for example in Indonesia (Sciortino 1992, 1993), India (Nichter 1989), Dominica (Krumeich 1994), Burkina Faso (Vincent-Ballereau *et al.*1989). In each case the justification given was that injections were too powerful for small children. Hagenbeek (Indonesia 1994) notes that many of his informants objected to the injecting of young children. The injection is considered too strong, and the child may be paralyzed or even die from this treatment. These fears, however, also influence immunization: it is believed the vaccination makes the child sick. According to Sciortino (1993) negative experiences in vaccination and treatment have made mothers cautious about injections in small children. Not everywhere is it thought that children are less suitable for injectable therapy. Many people in Thailand believe that even babies benefit from injections, notes Reeler (1993).

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[14]   As far as we are aware, no studies have been conducted into the cultural meaning of injections in European societies. It is plausible that great differences in the popularity of injections can be found within Europe, concomitant with variations in medical practices.

3.3 Injections and medical practice

A number of authors have pointed to the imperative character of medical technology. The reasoning behind this is that, where recovery to good health is concerned, no stone should be left unturned (Reiser 1978, Wolf & Bishop Berle 1981, Tymstra 1987, Koenig 1988). If a remedy for a particular illness exists then it would be irresponsible not to use it. The health 'market' varies from other markets in this respect. Patients demand injections and health centre staff often prefer them. In informal and clandestine medical practices, up to and including self-care, injections also enjoy a growing popularity.

Just as patients desire 'the best' for themselves - an injection, for example - health care staff also want to give them the best. Many publications make clear that doctors and nurses administer injections far more often than is medically justified. Health workers are convinced of the superiority of injections, and therefore frequently administer them. Injections work very fast, something particularly important when dealing with acute conditions. Another important reason is their desire to meet the perceived needs of the patient. When it occurs one could speak of reversed 'compliance': the doctors and nurses now obey the patient. Sciortino (1993) shows, however, that this situation could be the result of a misunderstanding between nursing staff and patient where the former simply assumes that the latter desires an injection. Many mothers in health centres in Java preferred their child not be injected, notes Sciortino, but dared not say so to the nursing staff.

According to many health workers, injections can also be instrumental in avoiding problems of non-compliance (Ofori-Adjei & Arhinful 1994, Sciortino 1993, Janszen & Laning 1993, Reeler 1993). When the health worker administers an injection, it is certain the patient has received therapy. This is certainly not the case when he or she prescribes pills to be taken later. Patients who are considered 'irresponsible', or those whom the doctor feels are too poorly educated to properly observe the instructions of a prescription are often given an injection simply to avoid these problems.

Financial considerations are a final important reason why many doctors and nursing staff show a preference for injections. Injections cost more than many other remedies and, as the prescribers will gain material advantage from the sale of the prescribed medicines, this serves as an extra stimulus to administer an injection (Kleinman 1980:287). Pharmacists have also discovered this profitable market. Injection administration in pharmacies has been reported from Ethiopia (Norberg 1974, Kloos 1988), Nigeria (Igun 1987), Somalia (Serkkola 1990), and from Ecuador (Janszen & Laning 1993). Pharmacies play a decisive role in the distribution of injectables and injection equipment to informal injection providers and the general public.

It is understandable that the ardent use of injections should spread far beyond the official circuit in which it belongs. Many community health workers and

traditional midwives who have received instruction in modern medical practices fear they may not be taken seriously unless they too can offer injections. Some are, in fact, trained to administer injections although most have learnt the required techniques themselves and, in doing so, transgress the boundaries of what is formally permitted. The use of injections by traditional midwives is reported by Schwarz (1981) in his article on Colombia, by Wolters in Nicaragua (1993) and by Sukkary in Egypt (1981).

Nowhere is the attraction of injection use greater than among informal medicine sellers. Reports of these lay people both administering injections and selling syringes, needles and injectable medicines have been made by a number of authors, for example, the reports on Ugandan needle curers (Whyte 1982) and itinerant injectionists (Birungi 1994a/b), Ethiopia (Slikkerveer 1982, Buschkens & Slikkerveer 1982), Zaire (Janszen 1978), Nigeria (MacLean 1974), Guatemala (Woods 1977), Colombia (Press 1971), El Salvador (Ferguson 1988), Thailand (Cunningham 1970), and India (Gould 1965; Bhatia *et al.*1975). Often, these lay injectionists are not aware of the need to sterilize their needles, and have received little or no training at all in Western medical techniques. An example from Ecuador:

> Injectionist Beatriz sees most of her patients on market day, when her little shop turns into a bar and clinic. Then she sees approximately 25-30 patients a day. According to her, patients trust her because she is friendlier and less formal than the doctors in the health centre. Patients confirm this. Her prices are much higher than elsewhere. She charges up to 7 US$ for a treatment, while most of her clientele only earn between US$ 0.10 and US$ 1.00 a day. Before starting her practice she followed a one month nursing course. She could not tell the names of the medicines she injected, but the researchers found a wide range of empty ampoules on the kitchen floor, ranging from oxytocin, to anti-histamines, vitamins and lincomycin. This last antibiotic she uses for rheumatic pains (adapted from Janszen & Laning 1993:52-54).

Even traditional healers are making increasing use of injections. Landy (1977) points out that traditional healers must make choices in order not to be supplanted by 'modern' Western medicine. They often take a very critical view of this 'imported' health care and, in response, cultivate particular practices not found in hospitals or health centres. Some specialize in problems for which Western medicine has no answer. Others have taken the opposing position and attempt to meet the increasing competition by appropriating the methods and practices of the dominant health culture, including the use of injections. Wolffers (1988) found that fifty percent of traditional practitioners in rural Sri Lanka used modern pharmaceuticals in their practice. Twenty years ago, Bhatia *et al.*(1975) established that of the 93 healers they had visited in three Indian states only 14% did not administer injections. Eighty-seven percent of

the healers possessed needles and syringes. An earlier survey of traditional healers in Mysore State (India) showed that half of the patients received injections (Alexander & Shivaswamy 1971). In 1963, Halpern already reported that traditional healers in Laos had adopted injections into their practice. Ndonko (1991) reports that traditional healers in Cameroon also use injections. In Nicaragua, the injectors are often traditional birth attendants or *curanderas* (traditional healers) (Wolters 1993).

The unregulated sale of syringes and injectable medicines also leads to their use in self-care. Often it is difficult to make a distinction between informal health services and self-care. People inject their neighbours and their relatives without money changing hands for the service, reports Wolters (1993). The major determinant is confidence in the person who injects: *"confidence derives from fame"*. Her informants stressed that it is necessary to have confidence in the injector, otherwise the injection will not 'drop' well.

3.4 Injections and human relations

Injections also influence human relations, although this influence appears, from the few accounts available, to be both complex and contradictory. While injections remain the reserve of the medical profession, they are being increasingly appropriated by lay people and absorbed into the self-care culture.

In societies where injections are still seen as being relatively 'hightech', they are administered exclusively by health workers (whether formal or informal). While other medicines, due to their free availability, allow individuals to solve their personal health problems without having to resort to a medical profession, medicines which require injection force the patient to call upon the services of a health worker in order to have the medicine administered. Under such circumstances they serve to confirm the inequality between the helper and the helped and become an instrument of social power.

Injection use indeed is one means by which health workers are able to give expression to their higher status. Sciortino considers this social 'by-product' of injection use as an important explanation for the enthusiasm with which workers in a Javanese health centre administered injections:

> In fact, only health workers command sufficient power to decide whether an injection should be given or not. Other medicines can also be purchased over the pharmacy counter; injections are only available in the *puskesmas* or through the private practices of nurses and doctors. (Sciortino 1992:27)

However, the patients' ability to obtain injections may also be the result of their bargaining power vis-à-vis the provider. If the patients are empowered by purchasing power or a special social relationship with the provider, it will be

easier for them to obtain a desired injection. Injections thus become the result of a social inequality which favours the patients to their perceived advantage (Reeler 1996).

Less educated health workers, and even unschooled employees of health centres, sometimes use injections more often than do doctors (Hardon 1993). Hardon attributes this finding to the status-elevating effect of injection use, as well as the financial rewards available to health workers for these services. Less educated health workers have less status and earn less; injection use is even more advantageous to them than it is to doctors. Van der Geest noted that this is the case in Burundi where cleaners and unschooled assistants in health centres appear to have gained command of the technique.

Social aspects of injections are also important in the informal sector. Senah (1990) noted that the clients of an illegal drug seller in a Ghanaian village considered this seller a 'good doctor' because he gave many injections. Cunningham (1970) writes that the 'injection doctors' in his Thailand research were so popular because the status gap between them and the general population was far less than between the official health workers and the general population. Comparable observations have been made by various other researchers.

Where patients themselves value personal contact with the help-giver, injections can become an effective means of communication. Nichter & Nordstrom (1989) point out that health care in Sri Lanka has become increasingly commoditized. One can buy medicines, just as any other product, on the market or in shops. However, if self-care does not effect a cure then one resorts to a specialist with 'power-of-hand'. The personal qualities of this specialist - expertise, dedication and care - are of fundamental importance in combating the complaint. In such cases, the relationship between the patient and the care-giver contributes towards the therapeutic effect. The importance of this personal relationship balances the trend towards impersonal commodification.

The use of injections offers an excellent means of expressing empathy: a personal involvement between patient and healer. To administer an injection is an action in which the health worker is able to demonstrate both concern and professional skill, whilst, at the same time, giving the patient faith in a successful recovery. While one oral medicine may be as good as any other, this is certainly not the case where injections are concerned. Giving an injection is an art. The informants in Birungi's (1994a) research in Uganda differentiated between injectors with a 'good' and those with a 'bad' hand. Injections from the former are painless and effective and cause no abscesses. A 'good' hand is, moreover, seen as a 'bringer of luck'. A similar remark is made by Wolters (1993) in her description of injection practices in a Nicaraguan town. Senah (1994) notes in his research in Ghana that if an injection draws blood, leads to pain and abscess or fails to effect cure, either the individual's constitution is

blamed or the hand of the injection-giver is said to be bad: the injection or the medicine is rarely faulted.

There is evidence to suggest that injections are becoming increasingly the domain of lay practitioners. The status which health workers draw from injection use is also conferred upon members of the community or family who have gained a command of injection techniques and use them within a limited circle. They too harvest the social prestige which injections offer. A number of examples of self-care through injection have been discussed in the previous section. These indicate that injections appear to be losing their esoteric character and are, instead, taking their place alongside other commercial products offered for sale on the open market, although other considerations may also play a role here. Birungi (1994b) found that informants in Uganda had become fearful of injections administered in public institutions because the syringes and needles used there had to be shared with other, unknown, patients. They thought that to be injected in a public institution carried a high risk of infection with HIV and greatly preferred to be given injections at home or from someone well known to them from their village. Injection use can, therefore, have the dual effect of promoting appeals to specialists and increasing medical care within the family circle itself.

3.5 Conclusion

Injection use is a striking example of the culture-generating ability of technology in general, and medical technology in particular. In societies where injections, and the biomedical thinking behind them, are thought to be 'strange' they appear to engender a high degree of trust and are highly sought after. Both impressionistic observations and directed research make apparent that injection use leaves its mark on both how people perceive illness and what steps they take to effect a cure. Injection use appears, moreover, to shape social relations entered into by individuals in the pursuit of their concern for maintaining or regaining an optimal state of health.

While injection use may indeed influence perceptions of illness, this does not mean that it will necessarily bring about a radical change in thinking. The hope that injection use would serve to promote the biomedical vision and thus influence traditional thinking on illness and health has been little realized. The influence which injection use exerts upon indigenous culture appears to vary somewhat. Surprisingly perhaps, injection use can actually be integrated into traditional notions on illness and, indeed, reinforce them. Injection use confirms existing ideas not only on the central role played by blood in illness and health but also on humoral etiologies, theories on maintaining a balance between 'hot' and 'cold', and on personalistic interpretations of therapy. This culture retaining characteristic of injections can be utilized in combination with ideas which emphasize the alien origin of injections ('foreign is beautiful') to become a formidable source of power.

The ubiquity of injections in medical practices is a logical consequence of cultural reinterpretation. It is not only a question of injections being a passive element of medical practice, but also one of injections, due to their culture-generating capacity, forcing themselves upon health workers. As only the best is good enough where matters of health are concerned, injections become a 'must'. Not only does this occur in formal health care but it is also found in the informal sector, including self-care.

The role of injections in nurturing human relations is both an ambivalent and a contradictory one. On the one hand, they are a means by which social distance and inequality are created and maintained and, at the same time, make patients dependent upon health workers. On the other, they may reflect the financial or social bargaining power of patients vis-à-vis various types of providers. They also serve as a means of communication which both expresses and fosters involvement and empathy between the helper and the helped. Injection use has then the ambiguous ability to both increase and stifle the use of public health institutions.

Many countries have begun information campaigns designed to discourage the use of injections. Because of the important cultural meanings attached to injection use, however, any improvement in the present use of injections in medical practices will probably not be easily achieved. Thorough, comparative research into the preferences for this mode of treatment seems therefore urgently needed.

4. The prevalence of injection use in Uganda and Indonesia

In this chapter the data on the prevalence of injection use in Uganda and Indonesia are presented. First, a brief overview of the health care context in Uganda and Indonesia is given. More information can be found in the country reports[15]. The results of the study are presented following the indicators described in Chapter 2.2. When appropriate, the results of the study in Thailand (WHO/DAP/94.8) where similar indicators were used are included.

For the data gathered in the household questionnaires, statistical significance tests (Chi Square) are performed when appropriate[16].

4.1 Health care context in Uganda and Indonesia

In terms of Gross National Product (GNP), Uganda and Indonesia are both low-income countries. Yet the differences between them are considerable: while Indonesia has undergone a rapid growth of industrial development and of GNP per capita in the last decade, Uganda has suffered negative growth rates which have had considerable effect upon health indicators. Infant Mortality Rates (IMR) in Uganda increased from 109 per 1,000 live births in 1970 to 118 in 1991. Over the same period, IMR in Indonesia dropped from 118 to 74 (World Bank 1993). Some health-related indicators comparing the two countries are given in Table 2.

Health conditions in Uganda and Indonesia differ, and thus the use of injections may be expected to vary accordingly. For example, while in Uganda malaria is the most common diagnosis at health facilities, in Indonesia this is acute respiratory infections, with malaria accounting for only 6% of the illness cases reported to government health facilities. With respect to the incidence of AIDS, Uganda has a much higher number of reported cases than Indonesia. There are also differences in other major health-related variables such as fertility rates, immunization coverage, access to formal health care services, and the implementation of an Essential Drugs Programme. Despite important

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[15]   *Indonesia*: Salan, R. & Murad J., 1994, *Injection Practice Research in Indonesia.* Jakarta: National Institute for Health Research and Development, unpublished report.
         Uganda: Birungi H, Asiimwe D, Whyte SR. 1994, *Injection Use and Practices in Uganda.* Geneva: WHO/DAP/94.18.

[16]   Results are called statistically significant when p=0.05. When results are highly significant, this is indicated by (*p=0.01) and (**p=0.001).

differences between Indonesia and Uganda in health care systems and the health status of the population, both countries share a common feature: a strong preference for injection therapy resulting in high injection prevalence.

Table 2:   Health-related indicators comparing Uganda and Indonesia[17]

Variable	Uganda	Indonesia
Infant mortality rate 1991	118	74
Under five mortality rate 1990	185	111
Urban population 1991	11%	31%
Fertility rate 1991	7.3	3.0
Contraceptive prevalence among married women of childbearing age 1989	11%	50%
Percentage of fully immunized one year olds, 1986-87		
Tuberculosis	74%	82%
DPT, third dose	39%	69%
Polio	40%	70%
Measles	48%	61%
Essential drugs list	Yes	Yes
Population with access to essential drugs 1986-1987	30-60%	30-60%

The Ugandan context

Uganda is a country badly hit by a deterioration in health services and the disastrous effects of the AIDS epidemic, which have affected injection use and preference considerably. During the 1970s and 1980s, a precipitous decline in the country's economy led to a decrease in government expenditure on health, and to a breakdown of the health care system. Medicine supplies became irregular and many health professionals left the country. Immunization programmes broke down;

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[17]   Sources: *The State of the World's Children.* New York: UNICEF, 1989b; *The World Drug Situation.* Geneva: WHO, 1988; *Investing in Health. World Development Report.* New York: World Bank, 1993.

only the mission health facilities continued functioning reasonably. The scanty and nearly non-functional health care system gave rise to a number of new local solutions. There was a proliferation of private profit-oriented health care providers, such as unlicensed private clinics, drug shops and home providers (Ministry of Health 1987; Whyte 1991). Injection technology and equipment also diffused from the established health care system to the informal system. Recently, this process has been accentuated by educational messages on AIDS which have undermined confidence in injections administered in government facilities (Birungi and Whyte 1993; Birungi 1994a/b). Presently, Uganda's health care system can best be described as having two sectors, the formal and the informal, which are closely articulated, exhibiting symbiotic relationships in terms of drug supplies, equipment and human resources (Whyte 1991).

It is estimated that 72% of the country's population lives over 6 km from a government health centre (UNICEF 1989a). A study conducted in 1990 indicates that the government only provides 21% of all out-patient modern curative services, while the private sector accounts for 66% (NGO facilities, private clinics and others). There also exist regional disparities in the location of health facilities, with over 50% of the hospitals situated in urban areas, while the majority of health centres are situated near trading centres leaving rural areas with limited access. Apart from the deficit in coverage, the content of health care is largely curative, and almost all forms of treatment involve the use of medicines (World Bank 1992).

Country morbidity and mortality figures for 1991, based on records from both in- and out-patients of 20 government and NGO hospitals, indicate that malaria is the number one cause of death, with AIDS coming second, followed by diarrhoea, pneumonia, and anaemia (World Bank 1992). Children under five account for 54% of all hospital deaths from malaria with pneumonia, diarrhoea, and malnutrition causing 55% of the under-five mortality. AIDS is the primary cause of mortality among adults, accounting for 17% of all hospital deaths, followed by tuberculosis, malaria, meningitis, and diarrhoea.

Studies undertaken in the field of drug use invariably underline the popularity of injections among both users and providers (UEDMP 1990; Glenthøj 1991; Whyte 1991; Birungi and Whyte 1993). The studies also mention the high degree of misuse of drugs and injections; this includes under-dosage as well as overuse or inappropriate use (Mburu 1984; Kalyesubula and Minde 1989; Glenthøj 1991; UEDMP 1990, 1992). In Uganda, injectables, needles and syringes can be easily obtained without prescription or legal order, although the Pharmacy and Drug Act of 1970 limits this activity to licensed individuals. The present study reveals that injectionists and individual users buy their injectables and

equipment at pharmacies. Within the household, possession of injection equipment is common. This practice is encouraged and facilitated by some medical practitioners and informal providers.

The Indonesian context

A widespread network of public hospitals in towns, health centres (*puskesmas*) in the villages and smaller towns, and under-five health clinics (*posyandu*) in the hamlets is operative in the Indonesian archipelago. The system covers a large part of the population, perhaps the only exception being very remote areas. As a consequence, the modern public sector is predominant in Indonesia. While a large informal sector has developed in other South-East Asian countries, this is not the case in Indonesia. However, the private sector is important. Most doctors and midwives employed in the government health facilities also have their own private practices where they see patients. Although this is illegal, many nurses also operate private practices from their homes where they treat patients and administer injections.

Officially, the lower levels of the health care system, including the health centres, are supposed to devote most attention to preventive programmes in accordance with Primary Health Care principles. In reality, most patients come to the government health centres for curative treatment. In the health centres, doctors play a managing role and rarely see patients. It is the nurses who have the primary responsibility for the examination and treatment of patients (Sciortino 1992, 1993). During research carried out in several *puskesmas* in Central Java, Sciortino observed that patient's treatment basically consisted of the administering of an injection and the prescribing of several pills. About eighty to ninety percent of the patients leave the clinic with a new fluid in their bodies. Hygienic practices are often unsatisfactory.

The generous administering of injections in the *puskesmas* and *posyandu* is a widespread practice in many parts of Indonesia. An analysis of health centre prescribing patterns for 4060 patients treated at 18 health centres in East Java and West Kalimantan (MSH 1988) revealed that nearly 50% of infants and children and 75% of patients of five years and over received one or more injections. The highest use of injections was for skin diseases, musculoskeletal complaints, and nutritional and vitamin deficiencies - conditions which, while sometimes quite serious, are generally not medical emergencies nor urgencies which require intravenous or intramuscular therapy. In addition, over 80% of patients with diarrhoeal diseases and acute respiratory illnesses were treated with antibiotics, many of them in injectable form. Non-doctors (i.e. nurses) prescribed injections more frequently than did doctors.

In Indonesia, it is the formal public health sector, and its biomedically-trained personnel in private practices, who administer the bulk of the injections. The informal sector is almost absent. For example, in contrast

to other traditional healers in Sri Lanka and India, the Javanese *dukun* apparently does not provide injections. Injections are considered the domain of biomedically trained practitioners. They are not found in markets, nor do they form part of self-care in Java (Hagenbeek 1994).

4.2 Prevalence of injection use at the household level

The results of the study reveal high rates of injection use during a two week recall period as calculated with **Indicator Ia**:

$$
\text{(Ia)} \quad \frac{\text{Number of households (HHs) in which at least one family member was administered an injection in the past two weeks}}{\text{Total number of HHs}}
$$

Uganda

In Uganda, injection prevalence was recorded twice. During the first visit the household respondents were asked who in the household had last received an injection and when. If this was within the past two weeks, the data was used to analyze the prevalence rate. The second follow-up visit was planned two weeks after the first. Respondents were asked if any member of the household had received an injection in this confined two weeks recall period. The rates of injection use prevalence for both recordings differ considerably; especially in Busoga. The confined two week recall period indicates lower and presumably more valid rates.

During the initial visit, 43% of households (154/360) in Busoga and 31% of households (113/360) in Ankole indicated to have received an injection during the past two weeks. In the confined two weeks recall period, 25% of households in Busoga and 30% of households in Ankole received an injection (Figure 2). For the initial visit, injection rates are significantly higher in Busoga (**p=0.001), but for the follow-up visit the differences are not significant (p=0.05).

Indonesia

In Indonesia, prevalence rates of injections were very high[18]. In Lebak 42% (172/407) and in Lombok 45% of the households (182/409) reported having had at least one household member injected in the past two weeks (Figure 3). Differences between Lebak and Lombok are not statistically significant (p=0.05).

In the Indonesian household survey, detailed information was also collected on the total research population (i.e. all members belonging to the households in the study). In Lebak, a total of 234 injections were recorded in a total research population of 2330 subjects (10%); in Lombok, 239 injections were recorded in 2061 subjects (12%). This implies that in both study populations in Indonesia **one in ten** inhabitants received an injection in the past fortnight.

A survey of all 209 households in a rural village in *Thailand* revealed that in 55 households one or more members of the household had received at least one injection (or infusion) during a two week recall period; this amounts to 26% of all households (WHO/DAP/94.8: 40).

Urban-rural differences

The studies also aimed to assess differences between urban and rural settings in injection use. In Busoga, *Uganda*, injection use prevalence is

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[18]   Unlike in Uganda, no follow-up visit was conducted in Indonesia. Hence, data on injection prevalence in a confined two week period are not available.

significantly higher in the semi-rural and urban areas as compared to remote areas (*p=0.01). In Ankole, differences are not significant (p=0.05). Injection rates per area are presented in Figure 4.

In *Indonesia*, in both districts the differences between the urban, suburban and rural settings are not statistically significant (p=0.05) (Figure 5).

Figure 2

Injection use in households
Household survey - Uganda

Percentage receiving one or more injections in past two weeks
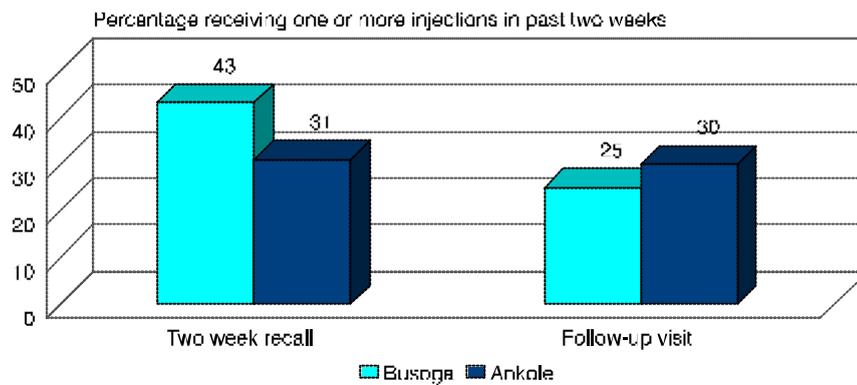
N=all households
Busoga n=360; Ankole n=360

Figure 3

Injection use in households
Household survey - Indonesia

Percentage receiving one or more injections in past two weeks
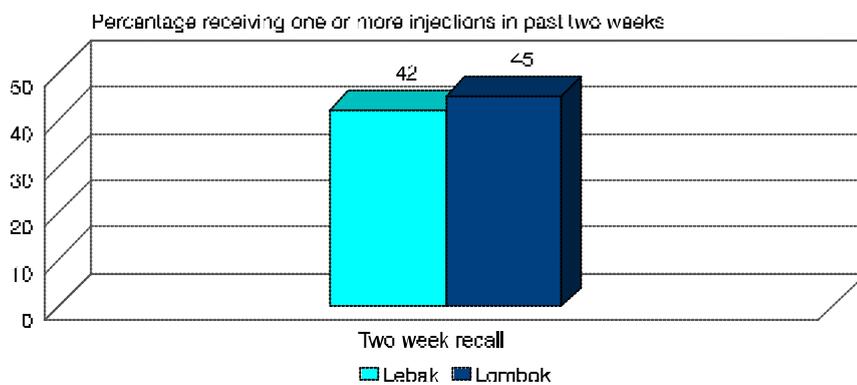
N=all households
Lebak n=407; Lombok n=409

Figure 4

Injection use and urban-rural differences
Household survey - Uganda

Percentage receiving one or more injections in past two weeks
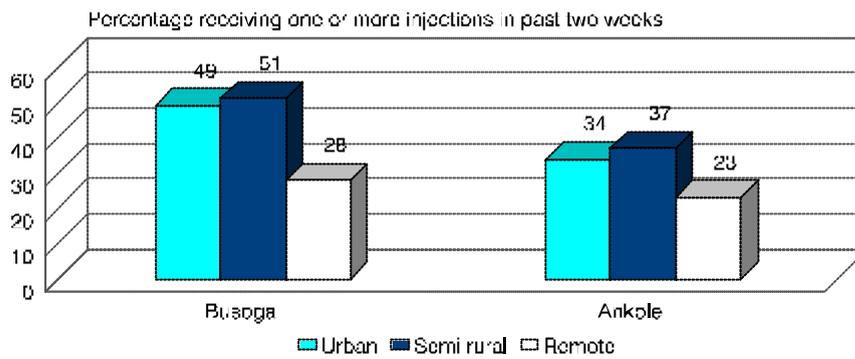
N=all households
Urban: Busoga n=120; Ankole n=120. Semi rural: Busoga n=120; Ankole n=120
Remote: Busoga n=120; Ankole n=120

Figure 5

Injection use and urban-rural differences
Household survey - Indonesia

Percentage receiving one or more injections in past two weeks
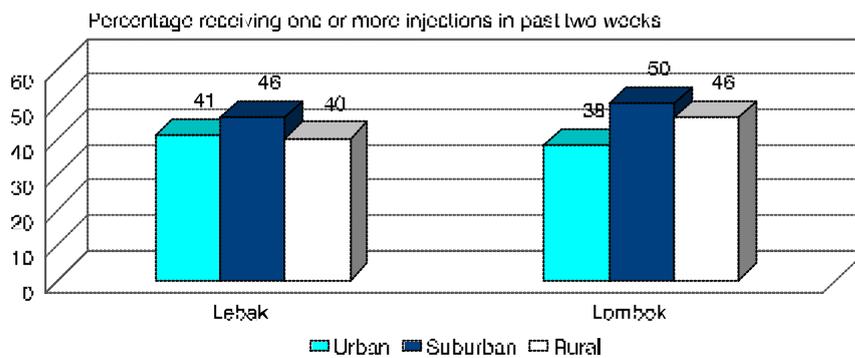
N=all households
Urban: Lebak n=133; Lombok n=149. Suburban: Lebak n=136; Lombok n=125
Rural: Lebak n=135; Lombok n=135

4.3 Illness-related injection use at the household level

The above figures are rough measures for injection prevalence. More meaningful is to assess to which extent illnesses, occurring in the research population, are being treated with injections. In both countries, one or more cases of illness were reported in some 70% of the households over the past two weeks. Injection rates, however, varied from some 40% of households with a report of illness (Uganda) to some 60% in Indonesia.

In *Uganda*, cases of illness which had occurred in the household in the past two weeks were recorded during the follow-up visit. In Busoga, 239 of 360 households (66%) and in Ankole 252 out of 360 households (70%) reported an illness case. There are no statistical differences in illness rates between the region (p=0.05). In Busoga, out of these 239 households with one or more ill subjects, 93 reported to have used injections (39%). In Ankole the injection rate in households with ill subjects is slightly higher: 43% (108/252), but this difference is not statistically significant (p=0.05).

In *Indonesia*, more households in Lebak (324 out of 407 households; 80%) reported illness in the past two weeks than in Lombok (287 of 409 households; 70%). The reported illness rates in Lebak are significantly higher than in Lombok (*p=0.01). This can be explained by the fact that households in Lebak have a larger number of members than in Lombok (*p=0.01), thereby increasing the chance of having one or more sick members in the household[19].

Injection rates in the ill population are significantly higher in Lombok than in Lebak. In Lebak, 172 out of 324 households with illness cases reported injection use (53%) and in Lombok 182/287 (63%) (*p=0.01). How can this be explained? More refined analysis of the Indonesian data reveals that when ill, people in Lombok attend health facilities more frequently, and that injection rates in these health facilities are significantly higher than in Lebak.

4.4 Type of injections

The vast majority of all injections given in the households in both countries were therapeutic injections, as calculated with **Indicator Ib**:

	Number of households which received a specific type injection in the past two weeks
(Ib)	Total number of HHs where in the past two weeks an injection

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[19]   When the illness rates of the *total* research population in both regions were compared, no statistical differences could be found. The illness rates in Lebak is 24% of all household members; in Lombok 21% (p=0.05).

was given

The following categories of types of injections were identified:

- therapeutic injections
- infusions (large volumes)
- contraceptives
- immunizations

In *Uganda*, no infusions, contraceptive injections or immunizations were recorded to have been received in the households, the vast majority being therapeutic injections (Figure 6). Of the households in Busoga where one or more injections were received in the confined two week period, in 94% of the cases (87/93) the injections were of a therapeutic nature. In Ankole, data is only available for the first visit: 85% of these households (96/113) had received a therapeutic injection. In Ankole more immunizations (17/113; 15%) were reported than in Busoga (6/93; 6%) (p=0.05).

In *Indonesia*, data is available for all injections received in the households visited (Figure 7). In Lebak, 172 households reported 234 injections in the past two weeks. In Lombok, in 182 households a total of 240[20] injections were recorded. Over 90% of these injections were of a therapeutic nature, followed by some 3 to 4% of immunizations. Some infusions and contraceptive injections were also reported. There are no differences between the districts.

In *Thailand*, therapeutic injections also formed the majority of injections reported in the households (WHO/DAP/94.8:41). Interestingly, intravenous infusions were quite popular in the Thai village: in 12 of 63 households infusions (19%) were received. Many of the people who received IV fluid also received injections, either separately or together with the IV fluid.

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[20]   One patient was given two different types of injections. Therefore the number of patients injected in Lombok is 239, while the number of injections amounts to 240.

Figure 6

Type of injections
Percentage of injections received by type
Household study - Uganda

Busoga

■ Therapeutic

Ankole

☐ Immunizations
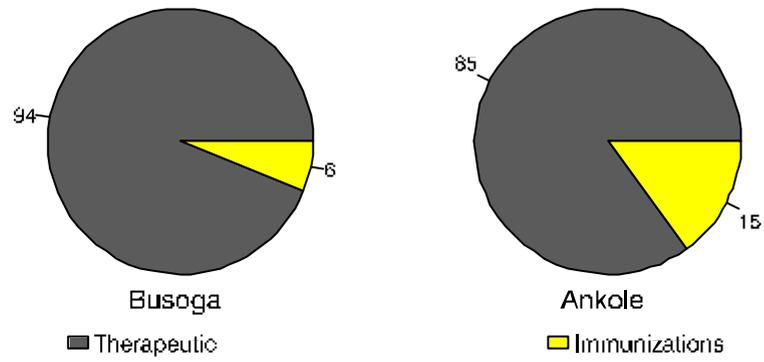
N=all households which received injections in past two weeks
Busoga n=93; Ankole n=113

Figure 7

Type of injections
Percentage of injections received by type
Household survey - Indonesia
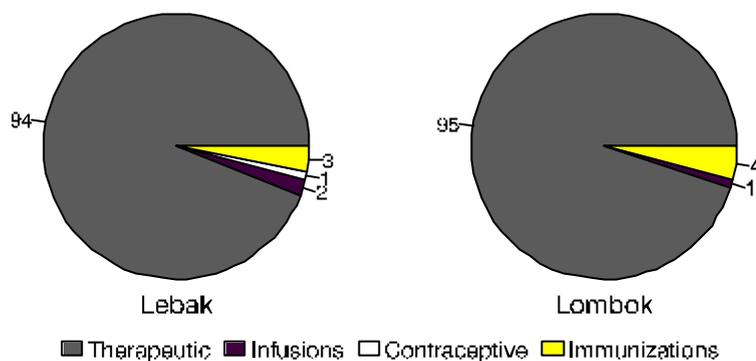
N=all injections received in households in past two weeks
Lebak n=234; Lombok n=240

4.5 Injection use by age and sex

In the study design only households with children below the age of five were sampled with the intention of focusing on the specific risks for young children of being injected. **Indicator Ic** aimed at establishing **age categories** in the research population (defined as all members of all households included in the study) at risk for receiving injections. This indicator was expressed as:

(Ic)

$$\frac{\text{Number of people in a specific age category of the research population who have received at least one injection in the past two weeks}}{\text{Total number of people in specific age category of the research population}}$$

As age categories the following were used:

- 0 - 4 years of age
- 5 - 14 years of age
- 15 years and above.

Unfortunately, in *Uganda* the age and sex distribution of the total research population was not recorded, so relative frequencies (Indicator Ic and Id) cannot be calculated.

In *Indonesia*, the data suggests that young children particularly are at high risk of being given an injection (Figure 8). Since only very few immunizations were recorded, most of these injections in young children were probably given for therapeutic reasons. In the past two weeks, the percentage of young children injected was 18% (Lebak) and 22% (Lombok) of the total population of under-fives. Differences between the age categories in both districts are highly significant (**p=0.001). Differences in age distribution of injected patients between Lebak and Lombok are not statistically significant (p=0.05). The injection rates of young children are twice as high as the average rate of the total research population.

In *Thailand*, the percentage of young children who received at least one injection was 9% (10/114). Overall the injection rate was 6% (58/994). Of all children who sought treatment, some 40% were injected as part of their treatment. No children under the age of one received therapeutic injections of IV fluid (WHO/DAP/94.8: 41-42).

Indicator Id aimed at establishing differences between the **sexes** and injection use: the percentage of females and of males in the research population who received at least one injection in the past two weeks is calculated in the same way as in (Ic).

This indicator can only be calculated in *Indonesia*. The distribution of males and females in the research population in both regions is almost even with a slightly higher percentage of females in both regions, around 51%. The data of injected persons shows that there are no major sex differences in injection use (Figure 9). There are also no differences between Lebak and Lombok (p=0.05).

In *Thailand*, there were also slightly more females in the research population (52%). Remarkably, here the injection rates for females were much higher than for males: 7% of the female population received an injection or IV fluid in the past two weeks compared to 4% of the male research population (WHO/DAP/94.8:42). This may be related to the sex of the health centre staff: men said they were embarrassed to receive injections from a woman as most injections were given in the buttocks (WHO/DAP/94.8:45).

Figure 8

Injection use in age categories
Household survey - Indonesia

Percentage in age category receiving one or more injections
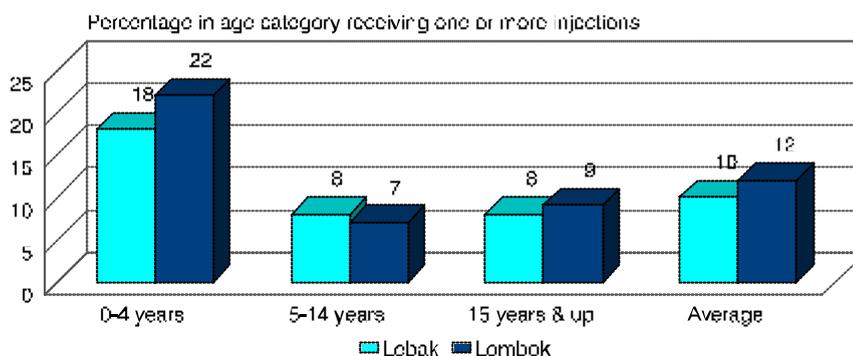
N=total research population (all household members)
0-4 years: Lebak n=496; Lombok n=510. 5-14 years: Lebak n=623; Lombok n=541
15 years & up: Lebak n=1211; Lombok n=1010

Figure 9

Injection use in sex categories
Household survey - Indonesia

Percentage of males and females receiving one or more injections
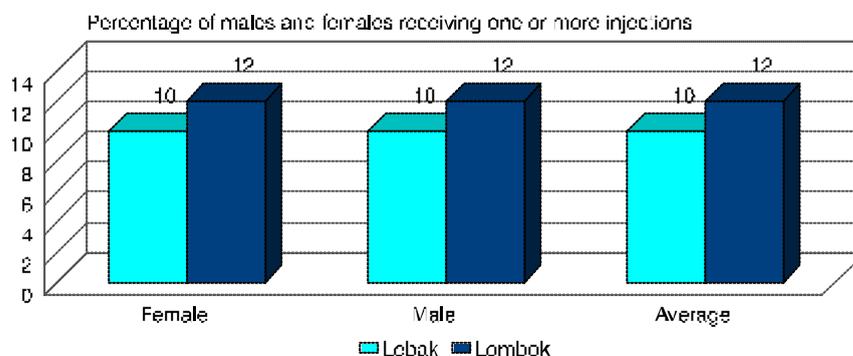
N=total research population (all household members)
Female: Lebak n=1191; Lombok n=1056
Male: Lebak n=1139; Lombok n=1005

4.6 Source of injections

Indicator Ie aimed at providing insight into the source of the injections received at household level. It can be calculated in various ways.

(Ie)   Frequency of injection administration per health facility.

In the *Ugandan* questionnaire it was asked where the **last** injection in the household had been given. In Busoga there was one and in Ankole there were two households where an injection had never been administered. These households are excluded for the calculation of this indicator. In analyzing the source of injections, a distinction was made between formal and non-formal facilities. The formal health care system comprises public facilities (including hospitals and health centres) and private facilities (including NGO units and registered private clinics). Non-formal facilities include drugshops and unregistered 'clinics'. Injections may also be given at home by a family member, neighbour or informal provider.

Based on findings for the source of the last injection received, it can be concluded that the private and informal sector are important providers of injections in Uganda (Figure 10). In both regions non-formal providers had administered some 30% of the last injections, most of these were given 'at home'. With respect to the importance of the public versus the private health sector, there are significant differences between both regions. In Busoga, 35% of households (127/359) received their last injection at a government facility and 36% (130/359) at a private facility. In Ankole 47% households (169/358) received their last injection at a private facility, and only 23% (81/358) at a government facility (*p=0.01).

In *Indonesia*, based on the data collected on health-seeking behaviour of all household members who reported illness in the past two weeks, it can be calculated **where** these injections had been given (Figure 11). Both in Lombok and Lebak most injections originated in the public sector, particularly in the health centres (*puskesmas*). With respect to the other sources, differences were found. In Lombok, relatively speaking, more injections originated from private practices of doctors, while in Lebak more injections were received from informal sources. Almost a quarter of all injections in Lebak came from nurses in their (illegal) private practices. The differences between the two regions are highly statistically significant (**p=0.001).

Who administered the injections? According to the respondents in the household questionnaire, most injections in public and private facilities had been administered by nurses and/or midwives. Administration by doctors came second, and interestingly enough, seven respondents in Lombok and one in Lebak reported that the injection had been given by 'other personnel' (including drivers).

Figure 10

Source of last injection
Percentage of last injection received according to source
Household survey - Uganda

Busoga

Ankole

■ Government ☐ Private ☐ Non-formal ■ At home

N =all households where injection was ever received
Busoga n=359; Ankole n=358

Figure 11

Source of injection received in past two weeks
Percentage of injections received in the last two weeks according to source
Household survey - Indonesia

Lebak

Lombok

■ Government ☐ Private ☐ Non-formal ■ At home

N=total number of injections received
(Some patients received more than one injection)
Lebak n=244; Lombok n=260

4.7 Injection rates at health facilities

Apart from measuring the injection prevalence at household level, the study also intended to investigate injection use at health facilities. **Indicator If**, aimed at establishing injection rates, could be calculated in different ways, depending upon the method which had been chosen to investigate the problem in health facilities, for example, the percentage of prescriptions at a certain health facility that list at least one injection, expressed as:

(If) $\dfrac{\text{Number of prescriptions written in a certain observation period containing at least one injection}}{\text{Total number of prescriptions written in the given observation}}$

period

To establish the percentage of patients receiving an injection when visiting a medical facility, a prescription analysis at the various established medical facilities was performed in *Uganda*[21]. Prescription analysis for the non-formal providers is not included here since many of these specialize in injections and their injection rates approach 100%. The researchers recorded the diagnosis and treatment of the first 30 patients that visited the provider. This method reveals a high prevalence of injections at all formal health facilities for both regions (Table 3). In 14 formal health facilities visited in Busoga the average prevalence of injection prescription was 68% - this implies that for every ten treatments given, almost seven included an injection. In Ankole, the overall injection prescription rate in 12 provider facilities was 60% - showing that, in every ten treatments given approximately six included an injection. Although injection prescription prevalence for Ankole is lower than that of Busoga (**p=0.001), the overall rates for both regions depict a high prevalence of injection prescription.

In *Indonesia*, **Indicator If** may be calculated in two different ways, using either data from the household survey, or from the exit interviews of patients at health facilities (Lebak n=383, Lombok n=391). Indicator If measures here the percentage of patients at a certain health facility who received at least one injection, expressed as:

(If) $$\frac{\text{Number of patients receiving at least one injection during a predetermined observation period}}{\text{Total number of patients interviewed in the health facility during the observation period}}$$

The vast majority of patients were interviewed in government health facilities, therefore the results should be considered representative of practices in the public sector only (Table 4). In Lebak, 71% of the patients interviewed received an injection. In Lombok, the mean injection rate in all health facilities was even higher: 87%. This difference between Lebak and Lombok is highly statistically significant (**p=0.001).

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[21]   A list of the number of the various types of health providers that were included in the Ugandan study is given in Table 12, Appendix 2.B.

Table 3:   Injection use in health facilities - Prescription analysis - Uganda[22]
                  Percentage of prescriptions containing at least one injection

	Uganda Busoga n=420	Uganda Ankole n=360
Public facilities: Government hospital	90% (27/30)	38% (23/60)
Health centre	66% (79/120)	no data
NGO health centre	63% (57/90)	no data
Private facilities	69% (124/180)	64% (192/300)
Mean % of injection prescription in all health facilities	68% (287/420)	60% (215/360)

Table 4:   Injection use in health facilities - Exit interviews - Indonesia[23]
                  Percentage of patients who received at least one injection

	Indonesia Lebak n=378	Indonesia Lombok n=391
Public health centre & Sub health centre	71% (260/368)	88% (301/342)
Private practice doctor	50% (5/10)	82% (40/49)
Mean injection rate	70% (265/378)	87% (341/391)

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[22]   N=total number of prescriptions reviewed.

[23]   N=all patients interviewed at health facilities. In Lebak, five patients were interviewed in private practices of nurses and midwifes. Because of their small number, this data is excluded here.

4.8 The distribution channels of injections

The injection practices research also aimed at establishing the sources of injections for the providers. Where do the institutions and practitioners obtain the injections that they administer to patients? Do they obtain the injections from a government source, or from the commercial private sector?

Uganda imports virtually all drugs and injecting equipment and the country is largely dependent upon the support of donors. Medical supplies are distributed directly through the Ministry of Health (MOH) and Ministry of Local Government (MOLG). At the national level, the procurement and distribution of drugs - including injectables, needles and syringes, is supported by the Danish Red Cross, through the Uganda Essential Drugs Management Programme (UEDMP), which was created by the MOH and MOLG with assistance from the donor community. By March 1992, the UEDMP was supplying pre-packed drug kits to 1153 health units, of which 1070 were rural health units (78% government and 22% NGO) and 83 hospital out-patient departments (60% government and 40% NGO). Each drug kit contains six injectables - chloroquine, epinephrine, ergometrine maleate, lidocaine, benzyl penicillin, procaine benzylpenicillin, and water for injections. The kits also include reusable needles and syringes. The Uganda Expanded Programme of Immunization (UNEPI), supported by UNICEF, provides immunization services to over 2,000 sites throughout the country, and distributes needles, reusable syringes, sterilization equipment, vaccines, refrigerators and vehicles.

Another important source is the Joint Medical Stores Bureau (JMS), a Catholic and Protestant organization which imports medical supplies and receives donations of drugs, disposable syringes and needles from abroad. The JMS distributes to over 200 member units and during the period 1983-1987, their drug kits contained over 12 injectables. Additionally, some hospitals also receive direct donations of drugs, disposable syringes and needles especially through the special AIDS-programme.

A parastatal institution such as Uganda Pharmaceutical Limited (UPL) also imports and distributes drugs all over the country and undertakes the bulk purchasing for the private sector. In addition, private pharmacies in Uganda supply large quantities of unregistered drugs that circulate in the country (UEDMP 1992). In 1987, approximately 15-20 private pharmacies were importing and distributing drugs and disposable needles and syringes. It is presumed that UPL and private pharmacies are by far the largest importers and distributors of disposable equipment (UEDMP 1992).

The system of distributing pharmaceuticals and medical equipment through the UEDMP, UNEPI, JMS, and established importers does not permit access to equipment by informal health care providers, since a majority of them do not

fulfill the requirements. The general trend is characterized by dissemination of injection equipment and injectables from formal providers to informal providers. In Uganda, injectables, needles and syringes can be easily obtained without prescription, although the Pharmacy and Drug Act of 1970 limits this activity to licensed people. Injectionists and individual users buy their injectables and equipment at pharmacies. Despite the newly introduced district drug inspectors, up to the present day, purchase of equipment is easily done over the counter, without prescription and by any person.

In *Indonesia*, the majority of health providers interviewed in Lebak were employed in the public health service. Most of the providers used disposable syringes (in Lebak 26/27; in Lombok 10/15), the rest a combination of glass and disposable syringes. A large part of the disposable syringes originated from the government supplies, but the health providers also purchased them from pharmacies and wholesalers, as the supplies were not big enough to meet demand.

Sciortino (1994: 33) has observed that the habitual administration of injections during each consultation leads to a continual shortage, both financial and in terms of equipment and injectables. The health centre is forced to supplement the limited supply received from the national authorities at the nearest drug store with the health centre's income. In order to do this the staff has to illegally raise the official fee of 300 *rupiah* (about $ 0.16) by an additional 100 *rupiah*. Financial considerations also play a role in the scant attention devoted to the sterility of the needles and the reuse of injection equipment (see Chapter 6.2.1).

4.9 Conclusion

Prevalence of injection use at the household level

The study confirms that injections are very popular in both countries. Prevalence of injection use in the past two weeks is quite high in all of the areas studied in the two countries under consideration. The highest two week prevalence rate is found in Lombok (*Indonesia*) where 45% of the households report that at least one member of the household has received an injection in the past two weeks; in Lebak this is 42%. Taking the total research population as the denominator, it could be established that in Lebak 10% of all household members had been injected in the past two weeks, and in Lombok 12%. In *Uganda*, the rates for injection use at the household level were somewhat lower than in Indonesia. Here, during the confined two week period, 30% of the households in Ankole and 25% in Busoga report having received at least one injection. During the initial visit, the reported injection use in the past two weeks was somewhat higher in both areas, especially in Busoga.

Most injections are given for therapeutic reasons. Intravenous drips are not very common. Immunizations do not account for the bulk of the injections in children, in fact, they are not reported very frequently (accounting for 6 to 15% of the households who had received an injection in *Uganda* and 3 to 4% of individuals receiving an injection in *Indonesia*). Contraceptive injections are only reported in Lebak (1%).

In *Indonesia*, it could be established that the very young constitute a high risk group for receiving injections. In Lebak, 18% of the total research population of children under five received an injection in the past two weeks, in Lombok this percentage is even higher: 22%. The percentage of children under five injected is twice as high as the average injection rate (between 10 (Lebak) and 12% (Lombok)). Since most immunizations occur in this age group, the data should be corrected for this factor. However, only a slight percentage of all injections are immunizations in both districts. The data of injected persons in Indonesia indicates that there is no sex difference in injection use.

With regard to injection prevalence rates between the urban, suburban and rural areas, no differences could be established in *Indonesia* between the various communities. This may be explained by the fact that public health services are widespread, even in the rural areas. In Busoga, *Uganda*, injection use prevalence is highest in the semi-rural and urban areas and lowest in the remote areas. Since most of the injections were given by private or non-formal providers or at home, this is probably not related to the availability of public health services. In Ankole, no urban-rural differences were found.

The bulk of the injections received at the household level in *Indonesia* originate from the public sector. Over half of the injected persons receive their injections in the so called *puskesmas* (health centre). The share of the private health services (both formal and informal) is much smaller. In Lebak, 10% of all injections were received in doctor's private practices and 19% in a nurse's private practice. In Lombok, private practices of doctors are more popular: 20% of all injections had been given there, while only 1% of the injections come from a nurse operating a private practice. Only a small number of injections in Indonesia is given at home and by non-medically trained personnel. It can be concluded that, as most nurses with an (illegal) private practice also work in the *puskesmas*, injection use in Indonesia is very much a part of the official, government health care system. The injection equipment used in the *puskesmas* originates partly from the Ministry of Health supplies, and is supplemented by purchases from pharmacies and wholesalers.

In *Uganda*, the picture that emerges from the data of the study is totally different. Only a minority of the injections is given in the government

health facilities: 35% in Busoga and 23% in Ankole. Private medical practices are far more popular. They are responsible for the bulk of all injections given: in Busoga 36% and in Ankole even 47% of all injections are received there. Most striking, however, is the fact that many injections are given by non-formal providers or at home (by family members). In Busoga, 11% of the injections have been received at a non-formal facility (in Ankole this percentage is 15%) and 17% at home (in Ankole 16%). This reflects the fact that in Uganda public facilities are often mistrusted and held responsible for the spread of the AIDS-epidemic. The distribution channels for the injection equipment reflect this situation: injectionists and customers buy their syringes and needles over the counter from pharmacies. The government and NGO clinics largely depend upon foreign donations distributed through the UEDMP-kits and other institutions.

In both countries, households report a high burden of illness. In *Uganda*, some 70% of households in both regions have had one or more sick members in the past two weeks. In *Indonesia*, prevalence of illness ranges from 80 (Lebak) to 70% (Lombok). Over one fifth of all subjects in Lebak and Lombok claimed to have suffered an illness episode in the past two weeks. While there are no differences between illness rates in Lebak than in Lombok, the level of health seeking behaviour and the injection rates of the household members are higher in Lombok. Help is more often sought and more patients who seek medical attention are being injected (62 against 59% in Lebak). Injection rates per health facility, especially in Lombok, are very high. It can be calculated from the household survey that in Lebak, of all visits to formal health facilities, between 40 to 56% end in one or more injections; in Lombok these percentages are between 70 and 83%.

Prevalence of injection use at the level of health facilities

The study also investigated injection use at the level of health facilities. In *Uganda* prescriptions of 30 consecutive patients in formal health facilities (14 in Busoga, 12 in Ankole) were recorded. Injection rates are fairly high in both regions: between six to seven out of every ten patients received an injection. In Busoga, 68% of the prescriptions contained at least one injection against 60% in Ankole.

In *Indonesia*, patients - mainly in public health facilities - were interviewed about their complaints and about treatment given. In Lebak, 71% of the patients interviewed in public health centres had been injected. Therefore, of every ten patients treated seven received an injection. In Lombok, the mean injection rate in public health facilities is even higher: 87%. Almost nine out of ten visits here end with one or more injections being given.

5. The popularity of injections in Uganda and Indonesia

Some sociological and anthropological explanations for the striking popularity of injections were presented in the literature review. It was not the aim of the research in Uganda and Indonesia to conduct an in-depth anthropological enquiry, but the researchers have attempted to find out why users and providers like injections so much. Some indicative findings per country are given below.

5.1 Explaining the popularity of injections

Popularity of injections in Uganda

The popularity of injections in Uganda was investigated through interviews with key informants in the research communities and informal conversations with health providers. In Busoga, the study formed part of a larger year-long ethnographic study of the use of injections (Birungi 1994b). As a result, there is more contextual data from that area.

The reasons why providers like injections in Uganda
In both regions it is evident that many providers, particularly private ones, besides providing a service, are strongly motivated by a desire to make money. In order to attract their clientele an injection has to be provided, because most patients who visit the private and other providers feel they only get their money's worth if an injection is included in the treatment. The provider survey findings reveal that the provider's profit motive favours injections which yield more than oral therapy. For instance, comparing malaria treatment at the various health facilities in Busoga, the study findings indicate that 84% of the antimalarial prescriptions at the profit-oriented health facilities are injections as compared to 66% at the non-profit oriented facilities. At one of the private clinics in an urban area, a full treatment course of chloroquine tablets earns a profit of 240 Ugandan shillings as contrasted with 2000 shillings from injection treatment; over 20% of the profits gained from injection treatment are obtained from the sale of needles and syringes.

In Busoga, some of the providers justify the prescription of injections in that it gives them greater control over the treatment and limits patient non-compliance. Unlike tablets or oral medications which are often

administered by the patient, the injection is administered by a health specialist. Providers claim that the majority of patients do not observe times to take medicines and that many skip doses. According to them, there is also a danger of overdosage. This has become the justification of providers to prescribe an injection as a rule of medical practice in many communities.

The reasons why users like injections in Uganda

Although most sick Ugandans normally start their treatment by self-medicating with oral therapy, they believe strongly in the efficacy of injections. This conviction is based on local ideas of illness and the efficacy of various treatment options. Patients believe that medicine injected into the blood stream does not leave the body as quickly as it does when administered orally. Oral medicine is often compared to food which enters the digestive system and eventually leaves the body through defecation. For diseases that are transmitted through the blood system, the administration of the treatment into the blood stream is believed to attack the disease directly at the source. In the case of (suspected) malaria, injections are also preferred to chloroquine oral treatment because of the perceived side-effects of the latter form of medication. Chloroquine tablets are said to cause nausea and itching. The tablets are bitter and unpalatable and are therefore particularly difficult to administer to children. Other patients who had recurrent malarial attacks claimed that these do not respond to tablets. As a result, Ugandan patients often tend to solicit injections from providers. However, due to the fear of HIV transmission, it is common practice that many patients carry a personal needle and syringe, even on index visit[24] to a provider facility.

Popularity of injections in Indonesia

The belief in injections: health providers in Indonesia

Sciortino (1993:35-37) sees three reasons for the generous administering of injections in Indonesia:

- The providers themselves strongly believe in injections as the most effective way of treatment. In addition, the compliance of the patient is guaranteed with an injection, not with oral drugs.

- Health providers derive a certain status and power from administering injections. The essence of medical practice in their eyes is to supply treatment in the form of drugs. Their 'secret' knowledge of drugs distinguishes the professional from the lay person and increases the status of the administrator in the eyes of the receiver. Injections are even more effective than oral drugs to express this difference in knowledge and status. Health providers have control over them. Oral drugs are available in the drug-store but injections can only be obtained in the *puskesmas* or in the private practices.

- It is believed that injections are preferred by the patients and that patients would be disappointed if they did not receive an injection. They see it 'as a matter of suggestion'. Furthermore, the private interests of the nurses are involved. If they refused

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[24]   The index visit is the first time a health facility is visited for the present illness.

injections, then their private practices would not be visited any more either. Injections give popularity to the prescriber.

The injection practices research, although limited in scope and amount of providers interviewed[25], confirms that many Indonesian health providers believe in the injection as a superior and indispensable treatment. Injections are routinely prescribed. Some 30-40% of all providers interviewed in the provider's survey believe that injections provide a more rapid cure. On the other hand, many health workers are also aware of the fact that the effect of injections is often the same as of oral medicine (30% in Lebak; 60% in Lombok). When asked what their reasons are for giving injections, the vast majority refers to patient demand as the driving force behind their action: *"the patient would not be satisfied if not injected"*, and because of *"the request of the family or patient"*. Some 50% of providers interviewed in Lebak claim that injections are *"the most appropriate therapy"*. *"Poor compliance"* of patients is mentioned as a reason for giving injections by 15-20%.

The belief in injections: the patients in Indonesia

A great majority of Indonesians believe in the benefits of injections, found Sciortino (1993:37-39), although the younger generation and mothers with small children are building some resistance to this kind of treatment.

- Supporters of injections believe that injections work faster and that serious diseases can only be permanently cured with an injection. Temporary relief can be found in pills and syrups, but to eliminate disease, an injection is needed. Thus after home treatment with traditional and modern remedies has failed, patients will go to the health centre for an injection.

- Public image of biomedicine further strengthens this idea: rapid results of neosalvarsan injections in Dutch colonial times in the combat of *framboesia tropica* have made people believe that an injection was crucial for all diseases. Biomedicine was 'injected' into the villages. Images in advertisements further strengthen this association as does the behaviour of health centre staff.

- It is the health providers who decide on the therapy and the role of the patient is to follow the advice of the specialist.

Objectors to injections are basically motivated by fear, according to Sciortino (1993:38). Besides fear of pain, people are frightened that if the medicine does not agree with them (*tidak cocok*: does not suit the body), the possibility of an allergic reaction arises. This fear is even greater concerning young children, who are less strong and thus believed to have less resistance against such an allergy (Sciortino 1993:39). This

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[25]   In Lebak 27 and in Lombok 15 providers were interviewed. In Lebak the majority worked in public health services; in Lombok all providers interviewed were engaged in private practice. No informal providers were included in the research. See Table 13, Appendix 2.B.

belief is partly shared by the health workers, but possible doubts by patients or health workers are often not expressed. Patients, in their role of passive receivers, hardly ever refuse injections.

During the focus group discussions organized in Lebak, the participants - all women with children under five years of age - discussed, among other things, the treatment of common health problems. There was general agreement among the mothers that injections are not usually the first resort for treatment. Drugs bought from local shops or home remedies are first given and if this does not achieve the desired effect, children are taken to the *puskesmas*' nurses and doctors. The mothers explained that whether injections are actually given or not is decided by the providers who are usually nurses in health centres. Although the participants generally like injections, mothers are sometimes reluctant to have their children injected. One participant of a focus group discussion mentioned that one of her children was taken to a doctor who did not inject the child. Since the condition did not improve, she brought her child to a nurse's private practice. The mother was in doubt whether to allow the child to be injected, but the nurse said that injections were all right.

Request for injections

Respondents in the Indonesian household questionnaire were asked whether the injection had been given on request of the patients or their family. The results show that popular demand for injections is enormous, especially in Lebak (the difference between the two regions is statistically significant (*p=0.01). Over half of the injections were given on explicit request of the patient or the family (Figure 12).

When asked why this request for injections had been made, over sixty percent of respondents stated that they preferred an injection because of its *"fast action"* and that it is *"customary"* to receive injections. This was followed by reasons such as *"injections are more appropriate"*; *"they are cheaper"* and *"more effective"* and *"I forget to take medicine"*.

The fact that injections are frequently given on request of the patient was also confirmed in the study in health facilities. The majority of injections had been given on request in Lebak, while the reverse is true for Lombok (Figure 13). This difference is highly statistically significant (**p=0.001).

The question why injections are desired was also asked in exit interviews in health facilities in Indonesia. About a third of patients indicated that these provide *"faster cure"*. Another important reason stated by some 10% of patients interviewed is that injections are *"customary"*. In Lebak quite a few patients mention they like injections for family planning, a reason not stated in Lombok.

The research confirms that injections are very popular in Indonesia. Both providers and users of injections believe in them and have a strong preference for this form of treatment. The providers claim that they give most injections because of the demand of patients in the conviction that patients will not be satisfied if not injected. Indeed, data from the household questionnaire reveals that in about 50% of the cases in which injections were received, the patient did request this mode of treatment. However, in the focus group discussions, mothers claim that they usually have no say in deciding which therapy is chosen. This vicious circle (health workers give injections because they think patients expect them; patients want injections because health workers give them) keeps the practice of routine administration of injections going. The lack of communication between health worker and patient in many encounters in the health centre is demonstrated by the research finding that in Lebak 50% of all patients interviewed in the health facilities had received **no** explanation from the injection provider (in most cases a nurse) as to the rationale of this treatment. In Lombok, this percentage was even higher: 89% received no explanation (**p=0.001).

Figure 12

Request for injections
Percentage of patients who received an injection on request
Household survey – Indonesia
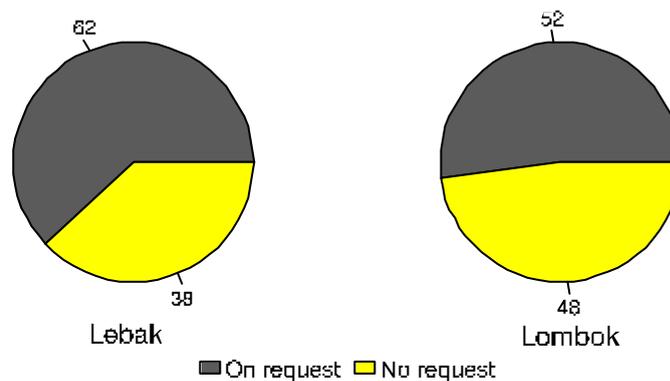
N = all patients in the households who received injections
Lebak n=234, Lombok n=239

Figure 13

Request for injections
Percentage of patients who received an injection on request
Exit interviews – Indonesia
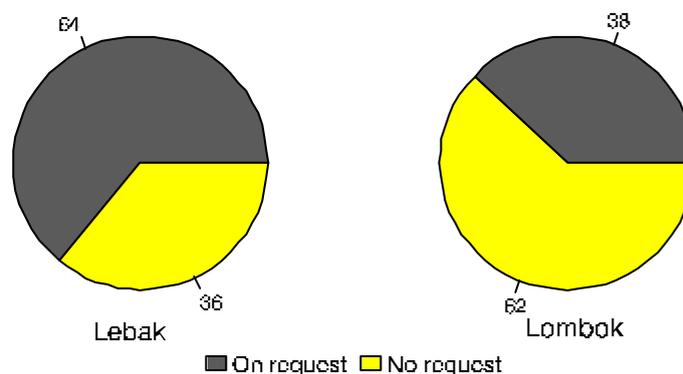
5.2 Conclusion

When ill, *Ugandans* usually self-medicate with oral therapy first. When this brings no relief, or when a fast cure is desired, patients tend to solicit injections from providers. This preference for injections is guided by local ideas and beliefs of illness and concepts of efficacy of various treatment options. Injections are believed to go directly into the blood stream, unlike oral medications which have to pass the digestive system. Therefore, for diseases that are transmitted through the blood system such as malaria, the administration of injections is preferred. How strongly Ugandans are oriented towards injection use, is demonstrated by the fact that a majority of the households visited in Uganda kept a syringe and needle for injection at home and carry this equipment when visiting a provider, even on index visit (see Chapter 6.2.1). This set of preferences of the general population is strengthened by the profit motive, particularly among private providers. Injections bring in more money, but providers often justify their choice for injectables as a way to limit patient non-compliance in oral therapy.

Popular demand for injections is also enormous in *Indonesia*, although they are not a first resort. In the household survey it was found that most injections were given on request of the patients or their families (62% of all injected patients in Lebak and 52% in Lombok). Apart from injections, most patients were given oral medication as well. Furthermore, in the exit interviews at health facilities it was shown that the majority of injections had been given on request in Lebak, while the reverse was true for Lombok. The majority of users, when asked why this request for injections had been made, stated that injections were preferred because of their *"fast action"*. The second most stated reason was that it was *"customary"* to receive injections, followed by reasons such as *"injections are more appropriate"*; *"they are cheaper"* and *"more effective"* and *"I forget to take medicine"*. Not all injections are given on request - they are also part of a routine treatment procedure in health facilities over which customers have little say. In fact, in focus group discussions, mothers explained that it is usually the nurses who decide whether the children are injected or not. When the providers are asked why they give injections, they usually claim that this is because of patient demand. This vicious circle (health workers give injections because they think patients expect them; patients want injections because health workers give them) and the lack of communication between both parties, also demonstrated in this research, keeps the practice of routine administration of injections going.

6. The appropriateness of injection use in Uganda and Indonesia

As the data in Chapter 4 clearly show, injection use is very prevalent in the countries involved in the study. Now we turn to the question of whether these injections were an appropriate form of treatment, and whether they were administered under adequate hygienic conditions. The appropriate use of injections is defined here as:

- the use of injection as part of a treatment only when it is deemed necessary from a biomedical point of view (referred to as medical appropriateness of injections; 6.1);

- the provision of safe and clean injections, i.e. in accordance with the international standards of hygiene (hygienic appropriateness; 6.2).

For a continuation of the discussion of the study results, we will follow the indicators presented in Chapter 2.2. When appropriate, we will also refer to the results of a study in Thailand (WHO/DAP/94.8) where similar indicators were used.

6.1 Medical appropriateness of injection use

To investigate whether the reasons for giving injections were medically sound, several indicators were formulated. Here, two levels of analysis are used: actual injection use and hypothetical preferences for injection therapy in tracer conditions[26], for which - from a medical rationale - injections are not an appropriate form of therapy. The same tracer conditions were used in the study of **actual** illness episodes and in **hypothetical** cases. Data was gathered in household surveys, in-depth interviews (Uganda) or focus group discussions (Indonesia). In Chapter 6.1.1, the results will be presented of injection use in **actual** illness episodes in which tracer conditions were present. Results from the focus group discussions and the interviews regarding injection preferences in tracer conditions will be discussed in Chapter 6.1.2. Chapter 6.1.3 discusses the popularity of specific medicines in the selected tracer conditions.

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[26]   The selection of the tracer conditions, the strengths and limitations of this method, and the problems encountered during the analysis of the data, are discussed in Chapter 2.4. For an overview of the selected tracer conditions, see Table 1.

6.1.1 Injection use in actual tracer conditions

Indicator IIa aimed at establishing the percentage of injection use in **actual** illness cases recorded in the households. This was expressed as:

(IIa)

$$\frac{\text{Number of times that a certain tracer condition was treated with an injection in the research population}}{\text{Total number of times that the tracer condition was reported in the two week recalls in the given research population}}$$

In *Uganda*, the respondents were questioned on actual illness episodes which had occurred during the confined two week recall period. In Busoga 358 and in Ankole 397 illness episodes were recorded. During the analysis these illness episodes were then classified according to the identified tracer conditions (see also Chapter 2.4). In the majority of cases in Busoga, symptoms appeared in combination. Only 99 of these 358 households in Busoga (28%) presented with single tracer conditions, in the majority of illness episodes combinations of symptoms were recorded (Table 5). In Ankole, however, the majority of illness episodes (252/397) presented with single tracer conditions (63%).

Table 5:   Injection use in tracer conditions - Household survey - Uganda[27]

	Uganda Busoga		Uganda Ankole	
	Injections/ illness episodes	Percentage of injection use	Injections/ illness episodes	Percentage of injection use
Fever only	12/39	31%	58/137	42%
Cough & common cold only	0/46	0%	5/89	6%
Acute diarrhoea only	0/8	0%	0/5	0%
Vomiting only	0/3	0%	2/6	33%
Intestinal worms only	1/3	33%	2/15	13%
Combination of cough & fever	7/28	25%	11/38	29%
Combination of diarrhoea & fever	7/12	58%	2/6	33%
Combination of vomiting	10/13	77%	7/12	58%

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[27]   N=all illness episodes in households in past two weeks, in which tracer conditions were reported. Injection use: either alone or in combination with oral therapy.

& fever				
Combination of diarrhoea & vomiting	5/12	42%	2/3	67%
Other combinations and other symptoms	61/194	31%	18/86	21%
Total	**103/358**	**29%**	**107/397**	**27%**

Data for both regions show that fever was the most common condition diagnosed and that, whenever fever was present, it was most often treated with injections. Injection rates for fever, alone or in combination with other symptoms, range from 25 to 77%. The data further show that when cough & common cold or diarrhoea occur *without* fever, the condition is usually **not** treated with injections. When cough, diarrhoea or vomiting is accompanied by fever, the injection rates increase.

In *Indonesia*, actual illness episodes were recorded both in the household questionnaires (Table 6 and Figure 14) and in the exit interviews at health facilities (Table 7 and Figure 15). When one or more of the identified tracer conditions were present, this was recorded[28]. In most tracer conditions, injections are given in more than half of the cases. Comparing the two regions, the results again indicate that the overuse of injections is especially prevalent in Lombok. In Lombok, 55% of all cases with tracer conditions were treated with injections. In Lebak this rate was 41% (**p=0.001). The findings suggest that there is a gross overuse of injections in common, self-limiting conditions in Indonesia. The high injection rates in the treatment of skin diseases, already reported in the MSH study (1988), are confirmed in our study.

Table 6:   **Injection use in tracer conditions - Household survey - Indonesia**

	Indonesia Lebak		Indonesia Lombok	
	Injections/ illness episodes	Percentage of injection use	Injections/ illness episodes	Percentage of injection use
Fever	84/210	40%	132/235	56%
Cough & common cold	82/245	34%	102/188	54%
Diarrhoea	42/84	50%	30/57	53%
Skin diseases	44/78	56%	23/38	61%
Total	**252/617**	**41%**	**287/518**	**55%**

In the interviews of patients visiting a health facility, the presence of tracer conditions was also recorded. The data confirm that injection overuse in Indonesia is very much a problem of the public sector. In Lombok, injection

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[28]   This implies that when a combination of two tracer conditions occurred, it was counted twice. In Lebak, 553 sick individuals reported 617 tracer conditions; in Lombok, in 441 patients 518 tracer conditions were present. As a consequence, in Table 6 the total number of injections in illness episodes with tracer condition *exceeds* the actual number of injections received in the households.

rates in the tracer conditions are again consistently higher than in Lebak (**p=0.001).

Table 7: **Injection use in tracer conditions - Exit interviews - Indonesia**

	Indonesia Lebak		Indonesia Lombok	
	Injections/ illness episodes	Percentage of injection use	Injections/ illness episodes	Percentage of injection use
Fever	49/85	58%	112/124	90%
Cough & common cold	48/77	62%	100/120	83%
Diarrhoea	37/54	69%	49/60	82%
Skin diseases	32/42	76%	25/31	81%
Total	**166/258**	**64%**	**286/335**	**85%**

A comparison of the data gathered in the household questionnaire and the exit interviews at health facilities indicates that anyone presenting one or more tracer conditions at a health centre in Indonesia will have a high chance of being injected, even though, in the majority of cases, there is no medical justification for such a mode of treatment.

Figure 14

Injection use in tracer conditions
Household survey - Indonesia
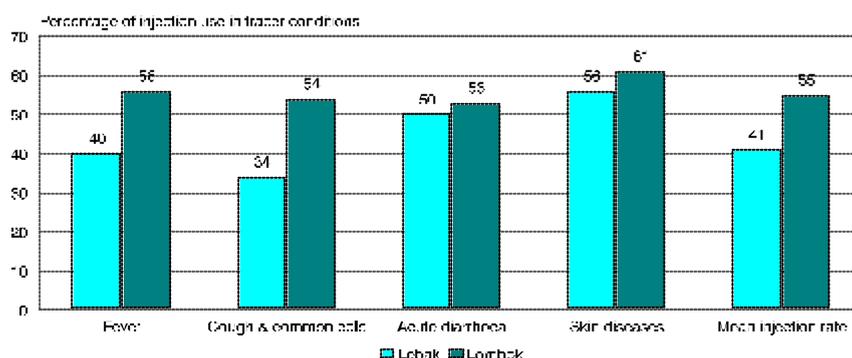
N=all illness episodes with tracer conditions in households in past two weeks
Lebak n=617; Lombok n=518
one patient may report more than one tracer condition

✷   The figure is based on the data for Table 6. It has been included to facilitate comparison with Figure 15.

Figure 15

Injection use in tracer conditions
Patient survey - Indonesia
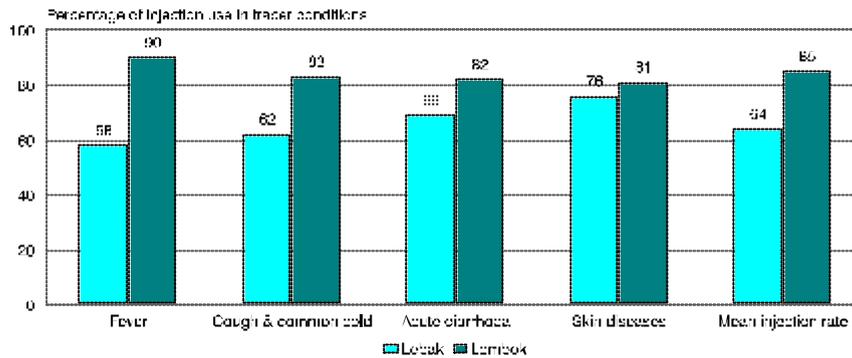
N=all illness episodes with tracer condition recorded in health facilities
Lebek n=258; Lombok n=335
one patient may report more than one tracer condition

6.1.2 Preferences for injections in tracer conditions

Respondents in the household questionnaires were asked which treatment they would prefer if the tracer condition occurred.

Uganda

From the results of the household survey it can be inferred that a significant proportion of the respondents would use injections and/or an indicated combination of injection and oral therapy should a tracer condition occur. Comparing the results for both regions, fever was the condition for which injections were most commonly mentioned while they were mentioned least for intestinal worms.

In-depth interviews with a limited number of households in Busoga from both remote and urban settings indicated that it is rather intricate to use the idea of **a scale of illness** to evaluate the appropriateness of injection use. The medical construction of what constituted a mild and serious illness was not coherent with the lay people's perception. At the local level, most of the illnesses were regarded as mild or serious depending on the length of time the illness took to be cured, the response to oral therapy, and the role adopted by the sick person - admitting himself to hospital, taking to his bed at home or failing to perform normal duties. Informants indicated that any illness which persists, with or without treatment, is serious enough to justify the use of injection therapy, including a cough and common cold. Although mild in nature, a common cold was never taken for granted, as it is believed to be a prelude to a more serious disease such as malaria. Other informants expressed the view that nearly every illness appeared mild

at its onset, hence no illness should be ignored. The people therefore justified the use of injection as a preventive measure.

Lay people also perceived serious illnesses as those which could cause anaemia and dehydration. They were also perceived to be those diseases that get to the bones. These diseases might render the patient restless, lead to a rise in body temperature, loss of strength, loss of appetite and general body weakness. Meanwhile all tracer conditions which were symptomatic of measles (there was an outbreak of measles in at least three communities in Busoga during the study) - such as diarrhoea in children, vomiting, unproductive cough and fever - were therefore also regarded as serious.

The study treated various tracer conditions as single disease entities. However, often people complain of a **combination of symptoms**. An injection is not always given to one isolated tracer condition, but sometimes to a patient with several symptoms. This poses complexities in applying hypothetical tracer conditions to evaluate the appropriateness of injection use.

Indonesia

The questions on hypothetical illness cases in the household survey confirm the overwhelming preference for injections. In Lombok, the respondents state a clear preference for a combination of injections and oral therapy in **all** tracer conditions. Second most popular is 'oral therapy alone' in a case of a cough & common cold; and 'other therapies' (notably ointments) are mentioned in a third of the households as the best therapy for skin diseases. In Lebak, treatment preference for injections is not as outspoken as in Lombok: some 60% of the respondents prefer 'oral medication only' for fever and almost 50% also prefer this for a cough and common cold. Remarkable is the strong preference in the Lebak area for injectable therapy in case of skin diseases. With diarrhoea, in both regions some 50% of respondents state that a combination of oral and injection therapy is best. In Indonesia, all four tracer conditions can be seen as priority targets for health education campaigns aiming at reducing injection use.

During the focus group discussions, organized in Lebak, the participants - all women with children under five years of age - discussed the treatment of the tracer conditions. For most tracer conditions there is no clear cut agreement among participants on whether injections are required to effect a cure. For example: **fever** is treated at home (with application of compresses, herbs and self-medication), before the patient is taken to the *puskesmas*. Injections should not be administered during high fever, some participants remarked, but others are convinced that fever should be treated by injections. **Cough & common cold** (*masuk angin*) is not primarily treated

with injections. Only if the condition does not remit within a week or so are injections deemed necessary. In addition, the combination of fever and cough & cold is an indication of the degree of seriousness. There is no consistent pattern in the answers on whether cough & common cold without fever requires injection treatment. Participants are acquainted with tuberculosis, a condition which in their opinion should be treated with injections. **Diarrhoea** is another tracer condition for which in the early stages other treatments are applied (such as herbs, self-medication with Western medicines and oral rehydration drinks). If the diarrhoea continues and cannot be halted, injections should be given. The only tracer condition for which all mothers agree that injections are required for faster cure is **skin disease**, but other treatments are also applied (such as ointments and herbs). Other indications for which injections are often used include headache, abdominal pains, toothache, convulsions and snakebites. Vitamin injections (*"for the liver"*) are also popular for pregnant women and after childbirth.

The results of the focus group discussions in Lebak concur with other ethnographic research conducted in Java. Hagenbeek (1994) reports that the majority of his respondents consider diarrhoea, dysentery, influenza, vomiting and diarrhoea, skin diseases, and typhus to be disorders which should be taken seriously and need to be treated by an injection. On the other hand, there are also illnesses for which injections are not indicated: worms, many supernatural and mental disorders (such as possession), convulsions as well as measles (*gabagen*). According to many respondents, the cause of measles is quite obscure. It is thought to be caused by spirits or by a hot-cold imbalance. There are various traditional remedies, but injections are considered dangerous because the injection would not allow the spots to 'come out' and lock the heat or the spirit inside the body.

In *Thailand*, the relationship between injection use and self-limiting illnesses such as common cold, diarrhoea and tiredness was also studied (WHO/DAP/94.8: 43). Although the numbers were small, it can be concluded that injections are often used for trivial complaints.

6.1.3 Popularity of specific medicines in tracer conditions

One limitation of the use of data from household questionnaires and exit interviews is that respondents are often unable to specify which medicines they were provided with. To evaluate medical appropriateness this data is indispensable. Therefore, it was suggested that a review of medical charts also be included in research, as was done in Indonesia. This resulted in the following indicators:

(IIc)   If prescription patterns of providers are monitored, then the percentage of injection prescription in the specified tracer conditions can also be calculated.

(IId)   Frequency distribution of types of injections given per tracer condition. The injections can be categorized both by generic and by brand name.

Uganda

During the prescription analysis in the health facilities in the two regions of Uganda, a high prevalence of a few specific injectables was noted. In both regions, over 95% of all injections prescribed were Chloroquine, Penicillin Procaine Fortified (PPF) and Crystalline Penicillin. Fever is invariably treated as malaria. In Ankole, out of 132 bouts of fever reported in the household questionnaire as having been given injections in the past two weeks, 127 (96%) had received a chloroquine injection. In Busoga, providers often prescribe more than one drug in injectable form for patients who present with fever and cough. The combination given is invariably PPF and chloroquine. Some studies undertaken in Uganda in the recent years already pointed to the immense popularity and widespread use of certain drugs like Penicillin Procaine Fortified (PPF) and chloroquine. Kinuka et al.(1985) found that, in an out-patient facility on the outskirts of Kampala, sixty-five percent of all children received penicillin injections and fifty percent were given chloroquine injections. Christensen and Anokbongo (1990) report that forty percent of the patients at rural health units receive injections, almost exclusively of PPF and chloroquine.

The popularity of this combination is basically the result of poor diagnostic capacity: fever is treated as malaria and cough as a bacterial infection without laboratory confirmation. This is corroborated by the finding in Busoga that combined injection prescription constituted 20% of all injection prescriptions written in both remote and semi-rural communities, whereas the proportion was only 11% in the urban areas. The lower prevalence of combined injection prescriptions in the urban communities may be explained by the use of laboratory tests to confirm the diagnosis of malaria. In the remote and semi-rural areas these services are absent.

One disturbing finding of the Ugandan study concerns observed practices of **drug reconstitution**. In some health facilities, chloroquine (in solution) is used to reconstitute PPF or crystalline penicillin which is presented in powder. Some patients even request this cocktail and indicate to the providers that their fever can only be cured by this kind of mixture. The net effect of forming a hypertonic solution may predispose to injection abscesses.

Indonesia

Several types of data were collected in relation to the patients interviewed in health facilities. Many patient records were reviewed[29] and the diagnosis/patient complaints plus the prescribed treatment were noted on the questionnaire (Appendix 3.E). In this way, not only injection rates in tracer conditions (**Indicator IIc**) could be calculated, but also the type of treatment (**Indicator IId**), thus providing interesting information on the popularity of certain injectables. Permission for the review of patient records could only be obtained in government health facilities.

The review of patient records confirms the finding that the vast majority of tracer conditions presented in government health facilities is being treated with injectable therapy. Injection rates are higher in Lombok (with an average of 87% of all tracer conditions injected) than Lebak (average injection rate 61%) (**p=0.001). Which medicines are used in the treatment of these conditions? Table 8 clearly demonstrates the extent of unessential use of certain essential medicines for the treatment of self-limiting conditions[30]. Antibiotics such as penicillin, streptomycin and oxytetracycline are generally not indicated in any of these conditions - with the exception of fast breathing in young children in combination with fever (pneumonia). Vitamins are generally not indicated in any of these cases; and the use of injectable analgesics and antihistaminics should also be regarded as irrational use from the biomedical point of view. The popularity of oxytetracycline for the treatment of all tracer conditions is remarkable. It is the most commonly used antibiotic in Lebak, and is second only to penicillin in Lombok. It has been known for some years that antibiotics, and especially tetracyclines, are exceptionally popular in Indonesia (see MSH Report *"Where does the tetracycline go"* 1988). Unfortunately, it seems that the situation has changed little since this alarming report was first published.

Table 8:   **Frequently used injectables in tracer conditions - Patient records Indonesia**

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[29]   The exact number of patient records reviewed could not be established.

[30]   Our findings are in agreement with the observation of Sciortino (1993) that the nurses in Javanese *puskesmas* generally choose from five medicaments (Terramycin, Tetracyclin, Penicillin Procaine, Trisulfa and Xilodella) and Vitamin B-complex injections.

	Indonesia Lebak	**Indonesia Lombok**
Fever	Oxytetracycline Vitamin B12	Penicillin
Cough & common cold	Naproxen (Antalgin) Vitamin K Oxytetracycline Vitamin B1, B2, B12	Penicillin Vitamin B1 Oxytetracycline Dipenhydramine Streptomycin Calcium Antalgin
Diarrhoea	Oxytetracycline Penicillin Papaverine	Oxytetracycline Penicillin Dipenhydramine Papaverine Vitamin B1
Skin diseases	Diphenhydramine Oxytetracycline	Penicillin Diphenhydramine Papaverine Antalgin Vitamin B1, B12

6.2 Hygienic appropriateness of injection use

With **Indicators IIe/f/g**, the percentage of providers who do not observe minimal hygienic measures before, during and after administration is calculated:

$$(IIe/f/g) \quad \frac{\text{Number of providers who do not follow minimal hygienic standards before (IIe)/during (IIf)/after (IIg) administration of an injection}}{\text{Total number of providers who were observed or interviewed}}$$

To assess the process of injection administration, guidelines for evaluating hygienic aspects of injections had been prepared (Appendix 1.C).

In *Uganda*, the household users of injections were questioned about their experiences with complications of unsafe injections, and about the possession of injection equipment at home. In the health facilities, data was primarily collected through observational methods - this was done in collaboration with two professionally trained medical doctors. Through a combination of

observational and informal discussions, the doctors evaluated hygienic measures undertaken before, during, and after administering injections. In Busoga, evaluation of hygienic measures was based on both WHO and country specific guidelines developed by the Ugandan Essential Drugs Management Programme (UEDMP) and the Ministry of Health (MOH) for use of injections. In Ankole, evaluation of hygienic measures was strictly based on the WHO guidelines. Data from Busoga and Ankole will be discussed separately since different guidelines were applied. An overview of various standards and indicators used to assess hygienic practices in Uganda is presented in Appendix 3.G.

In *Indonesia*, data on the appropriateness of handling syringes, and of giving injections, was evaluated by means of a questionnaire (Appendix 3.C). Observations of actual practices were not carried out. The questions in the questionnaire are roughly based on the above mentioned WHO-guidelines.

6.2.1 Hygienic practices in Uganda

A serious problem with regard to hygienic practices in Uganda is the **home possession of personal injection equipment** which is either used at home or carried to provider facilities when seeking injection treatment. Private practitioners encourage this practice not only to keep the cost of injection use as low as possible, but also to avoid any blame that may arise regarding the unhygienic administration of injections. As a consequence of the popular concern with the spread of HIV through communally shared needles and syringes in public health facilities, and the distribution of injection equipment to the users by private and non-formal providers, personal appropriation of needles and syringes is now very common in Uganda (Figure 16). In Busoga, 63% of the households (227/360) visited kept needles and syringes at home. The figure for Ankole was significantly higher, 82% of the households (297/360) owned needles and syringes (**p=0.001). Only a limited number of households were in possession of injectables at home, as a 'first aid medication': in Busoga 21% (77/360) and in Ankole 34% (121/360) (**p=0.001).

Figure 16
Home possession of injection equipment and injectables
Household survey - Uganda

Percentage households possessing equipment or injectables

N=all households
Busoga n=360; Ankole n=360
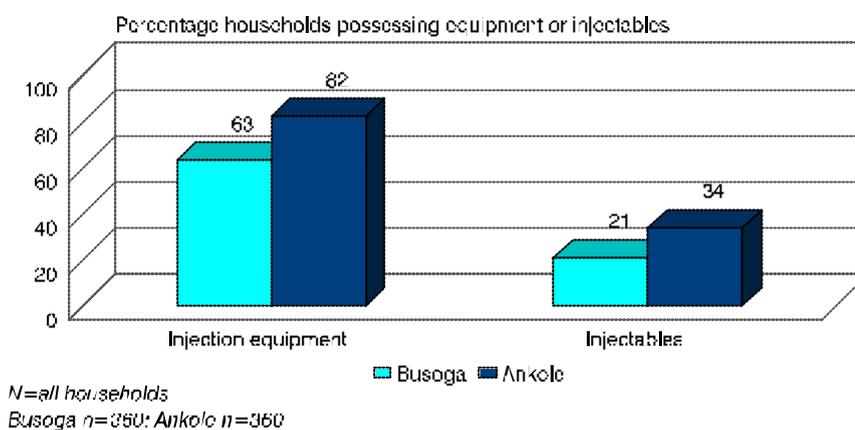
Experience with complications of injections

Administration of injections without proper sterilization procedures would lead to increased risks of transmitting a range of potentially serious pathogens, including hepatitis B, the occurrence of abscesses and the provocation of poliomyelitis. The prevalence of hepatitis B is difficult to establish in household studies, but incidence of injection abscesses may serve as an important indicator of hygienic conditions in health facilities (Soeters & Aus 1989). In Uganda it was revealed that a significant number of households had experienced complications from injections[31]. Of the 360 households visited in Busoga, 155 (43%) indicate that they experienced injection complications at some time. Of these, 133 households (37%) had experiences with injection abscesses, 14 (4%) reported cases of allergy, while 8 households (2%) reported lameness. Some of the popular ideas about cause of complications seem to diverge from the biomedical explanatory models which emphasize hygiene or inappropriate injections. If complications occur, respondents relate these not to lack of hygiene or inappropriate injectable solutions, but to personal qualities of the provider. Complications are thought to be the result of the *'bad hand'* of a provider (Birungi 1994a/b).

All providers in the Ugandan study denied witnessing any serious allergic reaction during their practice. It is difficult, however, to validate this information since the patients are normally discharged immediately after the administration of an injection, allowing no time for observation of reactions which are, in most cases, delayed. Meanwhile, patients who

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[31]   Data is only available for Busoga, not for Ankole.

experience reactions never report back to the provider; instead they would prefer consulting another provider. The major fear about injection use, however, is the contraction of AIDS. Most of the users (and providers) are

not scared, or even bothered, about infections arising out of poor methods of injection, handling, storage or the contraction of other diseases such as hepatitis.

Injection equipment in health facilities

The Ugandan government recommends the use of reusable equipment only. With the co-sponsorship of large donors such as the Danish Red Cross and UNICEF, the Ministry of Health now provides only reusable injection equipment to its units for both curative and immunization services. These are provided together with paraffin, sterilizers, training and logistics for supervision by senior health care managers. Private pharmacies and drugshops act as the significant sources of disposable injection equipment to providers and users.

The reusable equipment observed was mainly plastic. A few glass syringes were also identified both in provider facilities and in users' possession. However, the distinction between reusable and disposable equipment was not made by the majority of providers and users who treat all equipment as reusable. Some providers maintained that some disposable equipment, especially syringes, may outlive reusables. This removes the boundary between reusable and disposable.

The mistrust in the effectiveness of 'communal sterilization' is evident in both patients and health providers. It is common practice, particularly in the semi-rural and remote communities, for patients to contact the provider for the injectable and then arrange for the injection to be administered at home. In other cases, patients bring along their used equipment on an index visit to the provider. Based on observations at provider facilities, an estimated sixty percent of the patients brought their own personal equipment with them to the clinic. Nearly all provider facilities sell equipment to patients with injection prescriptions at the index visit. In one of the urban private clinics, needles were sold to patients at each subsequent visit; these would then be applied to an old syringe which the patient brought along. The rationale to this practice was that the syringe offered little chance of transferring contamination as compared to the needles. This contrasted with the semi-rural and remote government health centres which offered only needles for sale to the patient while syringes were provided by the health centre. Government health centres are sometimes provided with more needles than syringes.

In Ankole, out of the 14 provider facilities visited which administered injections at the time of the visit[32], 72% did not observe minimum

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[32]   In Ankole, sixteen providers were included in the providers study. Two did not administer injections at all during the visit of the researchers. Here, they are excluded because their hygienic practices could not be assessed. The remaining 14 provider

hygienic conditions before injection administration, while 50% and 64% respectively did not observe minimum hygienic conditions during and after injection administration (Figure 17).

The poor hygienic practices include the use of saucepans instead of sterilizers, picking up the boiled needles and syringes with bare hands, the improper disposal of needles and syringes or giving the equipment to the patient to carry home. The providers who fall below standards in the category 'before injecting' are those who use saucepans as sterilizers and encourage patients to keep and sterilize their own equipment at home. Those who fall under the category 'during injecting' pick up the needles and syringes with their hands from the sterilizers/saucepans and/or use unsterilized swabbing material to clean the injection site. Those in the 'after injecting' category did not flush needles and syringes with water after use or took a long time before putting them back into the sterilizer/saucepan and/or reused disposable equipment.

In Busoga, the observations at 21 provider facilities[33] show that 62% of the providers did not meet minimum hygienic standards before injecting, 48% did not meet minimum hygienic standards during injecting, and 81% did not meet minimum hygienic standards after injection (Figure 18).

Figure 17

Injection administration & hygiene
Percentage of providers NOT observing hygiene
Observation - Ankole, Uganda

N=all providers who provided injections
Ankole n=14
Using WHO standards (Appendix 2A)

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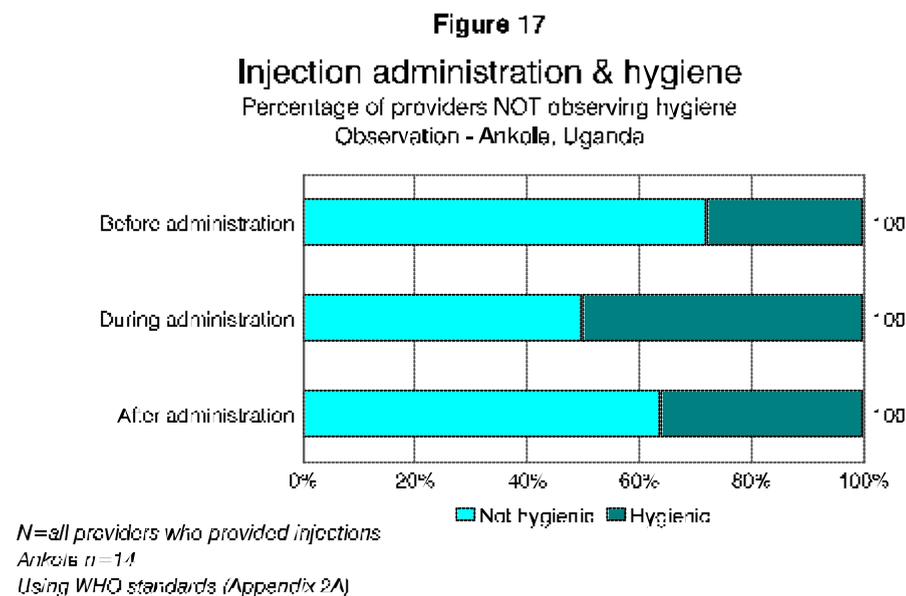
facilities in Ankole were: 2 government hospitals; 10 private clinics and 2 drug shops (informal providers). See Table 12, Appendix 2.B.

[33]   In Busoga, hygienic practices were assessed in 21 provider facilities, being 1 government hospital, 4 government health centres, 3 NGO health centres, 6 private clinics, 3 informal providers (drug shops) and 4 home providers of injections. See Table 12, Appendix 2.B.

Figure 18

Injection administration & hygiene
Percentage of providers NOT observing hygiene
Observation - Busoga, Uganda

Before administration	100
During administration	100
After administration	100

0%   20%   40%   60%   80%   100%

☐ Not hygienic ■ Hygienic
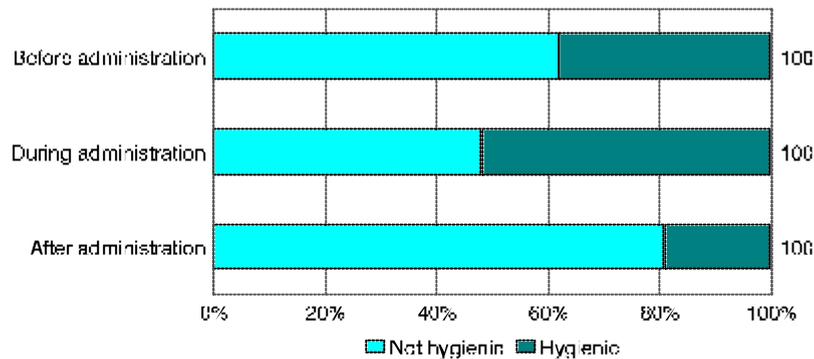
N = all providers who provided injections
Busoga n=21
Using WHO and MOH standards (Appendix 2A)

Sterilization

All providers flush the injection equipment before sterilization using sterile or non sterile water. Sterilization through *boiling* was used by all providers. In the semi-rural and remote provider facilities, and in households, cooking pans were used for boiling the equipment. Providers instruct patients to boil the equipment prior to visiting their facilities. However, interviews with patients at the provider facilities indicate that boiling was not actually done by many patients. This fact was known to the providers but they continued using the equipment. Reusable injection equipment should be boiling for at least 20 minutes. Often, this time period is not observed. One itinerant injectionist in a remote community did not even allow the equipment to remain in boiling water for more than one minute before he reused it.

The frequency of boiling of equipment varies from facility to facility. However, the majority of established provider facilities boil their instruments once a day before patients start reporting in the morning. The same equipment is used on multiple patients, especially in the remote provider facilities. In the urban and semi-rural provider facilities where over 60% of the patients bring their own syringes and needles, quite a lot of equipment remains unused. These are sterilized again for use the following day. The busy provider facilities such as the hospital, NGO facilities and urban private clinics keep their boilers on throughout the busy hours (10 am - 2 pm). The used needles and syringes are flushed and immersed in the boiling water. Here, it is difficult to

distinguish between the equipment that had just been immersed in the water and that which had been boiling for the last 20 minutes.

Steam sterilization is employed only in those provider facilities offering immunization services. Portable steam sterilizers issued by UNICEF are utilized. The method is properly applied by the responsible units. From the users' point of view this sterilizing procedure is more acceptable than other methods employed in public health services - they witness the opening of the sterilizer.

Chemical sterilization was observed in one private clinic in an urban area. Hypochlorite 10% solution was used. The provider learnt from a medical review that it is effective against HIV and this was the major reason for applying it. Patient-owned equipment is flushed with the solution before washing with water. The facility-owned equipment is immersed in the solution for hours before boiling. This double sterilization, he says, has not failed the unit in preventing injection abscesses.

Before injecting

Although providers are often aware of the importance of washing their hands before administering an injection, none of the providers actually did so. Water and soap are not readily available in many facilities.

Drug reconstitution often presents a problem in the semi-rural and remote provider facilities. Sterile injection water needed for dissolving powder PPF or crystalline penicillin is in short supply. In some informal units and private units water sterilized by boiling is utilized. Since this is mainly underground water, it contains many dissolved ions rendering it unsuitable for this purpose. Another practice which was already mentioned involves the use of chloroquine to reconstitute PPF or crystalline penicillin. Some providers keep the reconstituted drugs beyond the recommended duration because they inject too few patients to empty the vials within a day. The alteration in the chemical structures and solubility may precipitate some particles which when injected form a nucleus for injection abscesses.

Cleaning of the injection site is done only at a few provider facilities. In the units where the injection site is cleaned, solutions used were not sterile - in most cases plain water is used, even in units provided with antiseptic solutions such as chlorhexidine. Patients are therefore at a high risk of contamination through the skin punctured wound. Disinfection of drug vial necks or rubber tops is not done at any of the provider facilities. In units using 500 ml bottles of injection water the bottles last for three to five weeks. Without disinfection this may serve as a source of contamination for many patients served from this bottle.

Some providers, especially the informal ones, are in the habit of moistening the needle before injection administration with the aid of water-soaked cotton wool. This provides a possibility of transferring germs from the unsterile water and fingers to the needle. Some of those providers who moisten needles before use claim that it assists to remove the dirt which the wrapping material from home may have imparted on the needle. A majority of providers, however, avoided touching the needle.

During injecting

Biomedically trained providers do not apply their fingers to guide the needle into the skin, but this practice is very common among the non-biomedically trained providers who claim that many of the needles are blunt and could easily break if not guided with the assistance of their index finger. Since most of the needles used are brought along by patients, providers could only discover that the equipment is blocked during injection or when adjusting the volume of drug prescribed.

Use of the same equipment on multiple patients was observed in over 50% of the health facilities. The practice is most common among providers in government health units, informal facilities and home providers, especially in the semi-rural and remote communities. Here, the number of patients sometimes overwhelms the available syringes, needles, and fuel for sterilization. One of the aid posts in a remote community had only three syringes to treat an average of 15 patients daily and sterilization was carried out once daily only.

After injecting

After withdrawal of the needle the injection site is always massaged with a cotton swab or by using bare fingers. In some of the established facilities the equipment is dismantled and placed in water in a kidney dish. In facilities where multidosing prevails, the piston and syringe are put in a separate container from that of the needles. The majority of needles presented by patients at provider facilities are uncapped. In all provider facilities visited used needles and syringes are left littered on the floors and tables of the injection rooms. Only a few health units have waste bins. The urban provider facilities dump this waste into communal skips where rubbish is scavenged by town destitutes. Since the needles are usually disposed uncapped, they pose a potential health hazard. In the semi-rural and remote provider facilities, final dumping was in the banana garden or a placenta pit where available. But in most instances used needles and syringes are never disposed; instead the providers give them to the users to carry home.

Summary

It is rather impossible to meet optimum hygienic standards in Uganda, due mainly to the personalization of injection equipment. This process fundamentally breaks the sterile chain as patients often present their personal, reused, disposable sets of needles and syringes at the provider facilities. There are also indications of use of the same equipment on multiple patients, poor disposal and inadequate sterilization both at home and at provider facilities. As a consequence, a high percentage of provider facilities in both regions do not meet the required minimum standards of hygiene at each stage of injection administration.

Following hygienic standards in injecting is **not** related to the level of training or to the discipline of the health worker. On the whole, NGO health facilities meet the highest hygienic standards. These units have cleaner environments than other provider facilities. Although drug and other supply inputs are essentially the same for the NGO and government facilities, the equipment, including fuel for sterilization, is better managed at NGO facilities.

6.2.2 Hygienic practices in Indonesia

In Lebak, 27 injection providers were included in the study of self-reported hygienic procedures in injection administration, in Lombok 15[34]. Most often, the injections were administered by nurses. In Lebak, where some government health centres were included in the survey, six providers (22%) charged an extra fee for the administration of injections. This practice is said to be common in many Indonesian health centres (Sciortino 1993).

Most of the providers used disposable syringes (in Lebak 26/27; in Lombok 10/15), the rest a combination of glass and disposable syringes. Incorrect handling of injection equipment is rampant, considering that the only correct way to handle disposable syringes and needles is to discard them immediately after use. Only a small minority of all providers actually admitted doing so (Figure 19). The majority of providers thus reused disposable syringes, 'sterilizing' them by a variety of methods. This practice is largely economically motivated. The majority of the providers interviewed explained that they reuse

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[34]   Initially the researchers had planned to study a wide variety of providers, but consent could not be obtained, especially not from doctors in private practice. The research was therefore limited to those willing to participate. In *Lebak*, 27 providers were interviewed (Table 13, Appendix 2.B). Of these, 6 were medical doctors (5 working in government health centres, 1 in private practice); the remainder were nurses and/or midwives (12 working in government health centres, 9 in private practices at the time of the interview). In *Lombok* there were 15 providers included in the study. All six medical doctors and nine nurses/midwives were interviewed in their private practices.

disposables for economic reasons. They explained that syringes are expensive and in limited supply. It seems a waste to discard syringes that are not defective. More than half of the syringes are not washed before sterilization, only a few are stored in alcohol before reuse. Boiling in water is the method of sterilization most frequently reported, in a minority of cases more than 20 minutes (2/27 of providers in Lebak, 3/15 in Lombok). Only 3 providers in Lombok reported using steam sterilization.

Hogeboom van Buggenum et al.(1993) studied the method of injecting in five health centres (hospitals and *puskesmas*) in Java and North East Sumatra. Their observations confirm the findings of our self-reported behaviour study. In four of the five health centres the hygienic practices are very unsatisfactory. For cleaning of the injection site, they observed that a piece of cotton wool, which is used for all patients, is soaked in alcohol only at the beginning of the consultation hour. Disposable needles and syringes are reused without sterilization, sometimes over fifty times. In one *puskesmas* used needles were lying on the table with medication for direct reuse. Although most doctors and nurses are convinced that single use is best, they believe that it is also good enough to rinse the needles with distilled water and to wipe the outside with a piece of wadding soaked in alcohol.

Figure 19

Handling of syringes and needles after use
Percentage of providers who use hygienic practices
Provider survey - Indonesia

◼ Change needle, sterilize syringe ☐ Sterilize both ☐ Discard both ◼ Not applicable*

N = all providers interviewed
Lebak n=27; Lombok n=15
*Not applicable: these providers only used reusable glass syringes
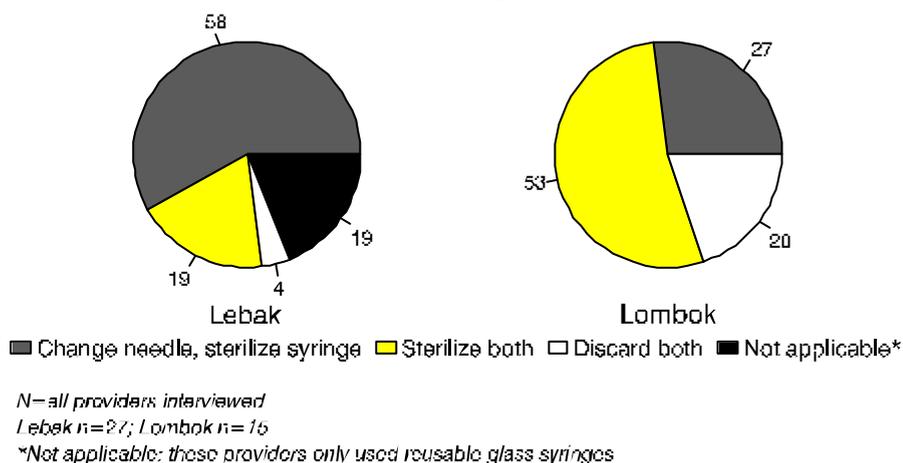
6.3 Conclusion

The results of the injection practices research indicate that the high prevalence of injection use in the two countries included in the research cannot be

biomedically justified, neither are these injections often provided in a safe, hygienic way.

Medical appropriateness of injection use

The medical appropriateness of injection use was researched by means of investigating actual and preferred practices in a few selected tracer conditions, representing uncomplicated, non-severe and self-limiting illnesses. In both countries, high rates of injection use were revealed. Most often injections were combined with oral medication. The presence of actual tracer conditions was recorded in the household questionnaires and in exit interviews at health facilities (*Indonesia)*. Hypothetical illness cases were presented in the household questionnaires, and in focus group discussions (*Indonesia*) and in-depth interviews (*Uganda*).

In **Uganda** the most common tracer condition was fever. This condition was most often treated with injections - especially when the fever was accompanied by the presence of other symptoms. The percentages of tracer conditions treated in Busoga with injections (either alone or with oral medication) ranged from 0% (cough & common cold alone) to 77% (combination of fever and vomiting). In Ankole, injection use was highest in the case of fever (34%) and lowest in a cough & common cold (13%). With respect to the treatment prescribed, it is noteworthy that in both regions over 95% of all injections prescribed were chloroquine, Penicillin Procaine Fortified (PPF) and Crystalline Penicillin. Fever is invariably treated as malaria, resulting in chloroquine prescription in over 95% of the cases. Many providers prescribe a special combination of injectables (PPF and chloroquine) especially for patients with fever and cough. The popularity of this combination is basically the result of poor diagnostic capacity. In some health facilities, chloroquine is even used to reconstitute PPF or crystalline penicillin, resulting in a potentially dangerous, hypertonic solution.

When asked which treatment is preferred should one of the mentioned tracer conditions occur in the household, the answers of the respondents reflect the tendencies described for actual use of injections. Fever should be treated with injections according to 50-75% of the respondents, while 25% view injections as the preferred mode of treatment for vomiting. For acute diarrhoea and cough & common cold the injection preferences range from 17 to 38%. Therefore it can be concluded that in Uganda, fever, cough & common cold, vomiting and acute diarrhoea are priority conditions for health education campaigns aiming at reducing injection use. However, tracer conditions do not always appear as single disease entities. An injection may not be given to one isolated tracer condition, but could appear indicated for a patient with a combination of symptoms.

In **_Indonesia_**, actual use of injections was recorded both in the household questionnaire and in an exit interview at health facilities. In the tracer conditions recorded in the households injections are given in over half of the cases. Comparing the two regions, the results again indicate that the overuse of injections is especially prevalent in Lombok. High injection rates in the treatment of skin diseases are particularly noteworthy (some 60% in both areas), in particular for _pityriasis versicolour_ which is the most common skin disease in Indonesia. This is actually a fungal infection which is best treated by locally applied ointments. In the other tracer conditions, injection use varies from 33 to 56%.

Rates are even higher in the exit interviews at health facilities. The majority of the health facilities included in the Indonesian study belong to the formal government health services, confirming that injection overuse in Indonesia is very much a problem of the public sector. In Lombok injection rates are again consistently higher than in Lebak (an average of 85% of all patients with tracer conditions injected at the health facility in Lombok, while this is 64% in Lebak). A further breakdown of the rates in urban, suburban and rural facilities indicates that in Lebak, injection rates are highest in the suburban health facilities. A review of patient records at health facilities revealed that the most commonly used injectables include antibiotics, vitamins, analgesics and antihistamines. The popularity of oxytetracycline for the treatment of _all_ tracer conditions is particularly striking. It is the most commonly used antibiotic in Lebak, and it comes second to penicillin in Lombok.

The immense popularity of injections, both with Indonesian providers and the public, is demonstrated clearly by the hypothetical case method. When asked which treatment is preferred should a tracer condition occur in the household, the respondents in Lombok state a clear preference for a combination of injections and oral therapy in **all** tracer conditions. In Lebak, this preference for injections is not as outspoken as in Lombok: some 60% of the respondents prefer 'oral medication only' for fever and almost 50% also prefer this for a cough and common cold. On the other hand, the Lebak respondents have a strong preference for injectable therapy in case skin diseases are present. In the case of diarrhoea, in both regions some 50% of respondents state that a combination of oral and injection therapy is best. In Indonesia, all four selected tracer conditions can be seen as priority targets for health education campaigns aiming at reducing injection use. However, in focus group discussions there was no clear cut agreement between participants as to whether injections are required to effect a cure for most tracer conditions. Mothers explained that injections are usually not the first resort of treatment. Drugs bought from bcal shops or home remedies are given first. Only if this does not achieve the desired effect, children are taken to the _puskesmas_' nurses and doctors. The only tracer

condition for which all mothers agreed that injections are required for faster cure is skin disease, although other treatments are also applied.

It can be safely concluded that the indications for which injections are deemed necessary are seriously overestimated in both countries, both by the public and by the health providers. As a result, injection use in common, self-limiting conditions is very high. At the same time it is important to realize that popular conceptions of what constitutes a serious illness or a self-limiting disease may diverge from biomedical ideas. In-depth interviews in Busoga (*Uganda*) revealed that perceived seriousness is of great importance in the evaluation of the appropriateness of injection use. Prior to visiting a health provider, most patients have already attempted self-medication with tablets. Since tablets proved ineffective, they want an injection. This was also stated by the participants of the focus group discussions in Lebak (*Indonesia*). Here too, it is believed that any simple illness can turn into a serious disorder and therefore needs to be taken seriously.

Hygienic appropriateness of injection use

Hygienic conditions under which injections are administered were surveyed by means of a combination of observation and interviews in *Uganda* and through a questionnaire with providers in *Indonesia*. In both countries the research demonstrates that injections are often unsafe since the minimum hygienic requirements are not met.

With respect to sterilization, the ***Ugandan*** situation is rather unique. The Ugandan government recommends the use of reusable equipment only (mainly plastic). Sterilization of reusable equipment, however, is not confined to established biomedical institutions; instead the provider facilities normally require the users to sterilize their equipment at home before and after visiting the provider facility. Lay persons' standards of sterilization diverge from those stipulated by biomedical experts. Besides the general lack of concepts of hygiene and sterilization, many households, especially those in the remote and semi-rural areas, consider family control over the needles and syringes and personal knowledge of the users to be a more significant and determining factor in the safety of injection than actual sterilization procedures. In fact, it is understood that the locus of contamination is outside the household. As a consequence of the popular concern with the spread of HIV through communally shared needles and syringes in public health facilities, and the distribution of injection equipment to the users by private and non-formal providers, personal appropriation of needles and syringes is now very common in Uganda. In the health facilities it was observed that some 60% of the patients bring along their own syringe and needle. This finding is confirmed by data in the household questionnaire. In Busoga 63% and in Ankole 83% of all households keep needles and syringes at

home. Only a limited number of households were in possession of injectables.

Complications of injections are well-known in Ugandan households. In Busoga, 43% of the households visited indicate that they experienced injection complications at some time, particularly injection abscesses (37%). Popular explanations of the causes of such complications do not blame the lack of hygiene or inappropriate injectable solutions, but rather the personal qualities (*'bad hand'*) of the provider.

As a result of the widespread practice of keeping injection equipment at home it is rather impossible to meet optimum hygienic standards in Uganda. The domestication of injection technology breaks the sterile chain. At the same time, the results of the study also indicate that a high percentage of provider facilities in both regions do not meet the required minimum standards of hygiene at each stage of injection administration. In Ankole, out of the 14 provider facilities visited which administered injections at the time of the visit, 72% did not observe minimum hygienic conditions before injection administration, while 50% and 64% respectively did not observe minimum hygienic conditions during and after injection administration. In Busoga, the observations at 21 provider facilities show that 62% of the providers did not meet minimum hygienic standards before injecting, 48% did not meet minimum hygienic standards during injecting, while 81% did not meet minimum hygienic standards after injection. The poor hygienic practices include inadequate sterilization both at home and provider facilities, picking up the boiled syringes and touching the needles with bare hands, improper disposal of needles and syringes or giving the equipment to the patient to carry home. Furthermore, the same equipment is used on multiple patients, and the injection site is often not cleaned before injecting. It was noted in Uganda that a higher level of training of the health worker was not related to the provision of safer injections. Yet on the whole, NGO health facilities meet the highest hygienic standards.

In **Indonesia**, the majority of providers interviewed only used disposable syringes (in Lebak 26/27; in Lombok 10/15). Most disposable syringes are not discarded immediately after use. The majority of providers thus reuse disposable equipment, 'sterilizing' it by a variety of methods. With respect to the sterilization methods applied, more than half of the syringes are not washed before sterilization, only a few are stored in alcohol before reuse. Most injection providers then boil the equipment, but usually less than 20 minutes. There are also indications that the same equipment is sometimes used for more than one patient without sterilization.

7. Conclusions and recommendations

The results of the injection practices research confirm the high popularity of injections as a route for administering medicines in the two countries under study. A high prevalence of injection use both at the household level and at health facilities was found. The results further indicate that this high prevalence of injection use cannot be biomedically justified, nor are most of these injections often provided in a safe, hygienic way. A mixture of educational, regulatory and managerial interventions has been proposed by the research teams.

7.1 Summary of conclusions of the injection practices research

The injection practices research aimed to estimate the extent to which injections are used as a route for the administration of medications (prevalence of injection use); to determine the type and degree of improper and unsafe practices in the process of administration of injections (the medical and hygienical appropriateness) and to gain insight into the question of why injections are so popular. The last objective of the research was to develop a simple and rapid survey methodology for future assessments of inappropriate injection use.

The extent of injection use

The **prevalence of injection use** was established by household surveys focusing on injection prevalence in households with pre-school children in urban, rural and semi-rural communities in two different districts of the two countries. In both countries, the percentage of households receiving one or more injection in the past two weeks was high, ranging from around four in ten households in Indonesia, to about three in ten in Uganda. Taking the total research population as the denominator, it could be established that, in the Indonesia sample, 10% of all household members in Lebak had been injected in the past two weeks, and in Lombok 12%.

Differentials between the districts, and between **urban and rural areas** have also been studied. There are no differences in prevalence between the districts in both countries. In Busoga, *Uganda*, injection use prevalence is significantly higher in the semi-rural and urban areas and lowest in the remote areas, but in Ankole no differences were found. In both districts in *Indonesia*, no differences between the injection rates of the urban, suburban and rural households could be established.

The differences in prevalence rates between Indonesia and Uganda can have many explanations. For example, disease patterns and family size can differ from one country to another. For this reason, the plan was to also describe injection prevalence for the general population by age category using individuals as the unit of analysis; and to assess the proportion of injection use in specific tracer conditions. The relative frequencies on the type of injections received (i.e. immunizations, therapeutic injections or contraceptives) were also to be described.

The injection prevalence in the population based on **age** and **sex** could only be calculated in Indonesia. There are no major differences in injection use in Indonesia based on sex, but the very young constitute a high risk group for receiving injections. Some 20% of the under-fives in the households had received one or more injections in the past two weeks. Since most immunizations occur in this age group, the data should be adjusted for this factor. However, in both districts only a slight percentage of all injections are immunizations (less than 5%). The percentage of children under five receiving an injection is twice as high as the average injection rate for the research population.

Type of injections: the great majority of the injections reported in the two-weeks recall period in both countries had been given for therapeutic reasons (80-90%). Intravenous drips are not very common in the countries under study. Immunizations are infrequently reported (accounting for just 6 to 15% of the households who had received an injection in *Uganda* and 3 to 4% of household members receiving an injection in *Indonesia*). Contraceptive injections were only reported in Lebak (1%).

The study also investigated **illness-related injection use** in the households. The burden of illness is quite high. In both countries, some 70% of households reported having had one or more sick members in the past two weeks. In *Uganda*, some 40% of the households with ill subjects reported having used injections in the past fortnight. There were no differences between Busoga and Ankole. For *Indonesia*, data are available on illness episodes and health seeking behaviour of all research subjects. Over one-fifth of all subjects in Lebak and Lombok claimed to have suffered an illness episode in the past two weeks. While illness rates are similar in both districts, the percentage of individuals seeking medical attention is significantly higher in Lombok. In addition, more patients who seek help in health facilities are being injected in Lombok (62% against 59% in Lebak). It can be calculated from the household survey that in Lebak, of all visits to formal health facilities, between 40 to 56% end in one or more injections; in Lombok these percentages are much higher: between 70 and 83%.

There is a marked difference between the two countries with respect to the **source of the injections** received in the households. The bulk of the injections received in the *Indonesian* household survey originate from the public sector. Over half of the injected persons receive their injections in the so-called *puskesmas* (public health centre). The share of the private health services (both formal and informal) is much smaller, but there are differences between the two districts. In Lebak, private practices of nurses accounted for 20% of the injections received, in Lombok this was only 1%. Here, doctor's private practices are a far more important source of injections (20%) than in Lebak (10%). Only a small number of injections in Indonesia is given both at home and by non-medically trained personnel. Providers receive their supplies of injection equipment from the government, but they also supplement their stock through purchases from pharmacies and wholesalers. For this, higher injection fees are often demanded from customers.

In contrast, in *Uganda* only a minority of the last injection to be received in the household was given in the government health facilities: 35% in Busoga and 23% in Ankole. Private medical practices are far more popular. Most striking, however, is the fact that many injections are given by non-formal providers or at home (by family members). In Busoga, 11% of the last injections were given at a non-formal facility (in Ankole this percentage is 15%) and 17% at home (in Ankole 16%). This reflects the trend of informalization in Uganda where public facilities are often mistrusted and held responsible for the spread of the AIDS epidemic. The domestication of injections is demonstrated by the fact that in Uganda, the majority of households keep injection equipment at home. In the public and NGO sector, the injection equipment usually originates from official (donor) sources. The informal providers and many of their customers buy their equipment over the counter in pharmacies.

The study also investigated injection use at the level of **health facilities**. In *Uganda*, prescriptions of 30 consecutive patients in formal health facilities were recorded. Injection rates are fairly high in both regions: an injection is given in between six to seven out of ten treatments. In *Indonesia*, patients - mainly in public health facilities - were interviewed about their complaints and the treatment given. Of every ten patients treated in Lebak, seven received an injection. In Lombok, the mean injection rate in public health facilities is even higher: almost nine out of ten visits here end with one or more injections being given. Injection rates in Lombok are significantly higher than in Lebak.

The medical and hygienic appropriateness

The **medical appropriateness** of injection use was researched by means of investigating actual and preferred practices in a few selected tracer conditions, representing uncomplicated, non-severe and self-limiting illnesses. In both countries, high rates of injection use were revealed.

Most often injections were combined with oral medication. The presence of actual tracer conditions was recorded in the household questionnaires in both countries and in exit interviews at health facilities (*Indonesia*). Hypothetical illness cases were presented in the household questionnaires, in focus group discussions (*Indonesia*) and during in-depth interviews (*Uganda*).

In *Uganda* the most common tracer condition is fever. This condition was most often treated with injections - especially when the fever was accompanied by the presence of other symptoms. In both regions over 95% of all injections prescribed were chloroquine, Penicillin Procaine Fortified (PPF) and crystalline penicillin. Many providers prescribe a special combination of injectables (PPF and chloroquine) especially for patients with fever and cough. The popularity of this combination is basically the result of poor diagnostic capacity. In some health facilities, chloroquine is even used to reconstitute PPF or crystalline penicillin, resulting in a potentially dangerous, hypertonic solution. When asked which treatment is preferred should one of the tracer conditions mentioned occur in the household, the replies of the respondents reflect the tendencies described for actual use of injections.

In *Indonesia*, injections are given in over half of the illness cases in the households in which the tracer conditions were recorded. The highest injection rates in both areas were found in the treatment of skin diseases (some 60%). In the other tracer conditions, injection use varies from 33 to 56%. Injection rates are even higher in the exit interviews at health facilities. In Lombok injection rates are again consistently higher than in Lebak (an average of 85% of all patients with tracer conditions injected at the health facility in Lombok and 64% in Lebak). A review of patient records at health facilities revealed that the most commonly used injectables include antibiotics, vitamins, analgesics and antihistamines. Particularly striking is the popularity of oxytetracycline for the treatment of all tracer conditions. It is the most commonly used antibiotic in Lebak, and it is second only to penicillin in Lombok. When asked which treatment is preferred should a tracer condition occur in the household, the respondents in Lombok state a clear preference for a combination of injections and oral therapy in **all** tracer conditions. However, in focus group discussions conducted in Lebak, there was no clear cut agreement between participants as to whether injections are always required to effect a cure for most tracer conditions. The only tracer condition for which all mothers agreed that injections are required for a more rapid cure is skin disease.

Hygienic appropriateness of the conditions under which injections are administered was surveyed by means of a combination of observation and interviews in *Uganda*, and through a questionnaire completed by providers in *Indonesia*. In both countries the research demonstrates that

injections are often unsafe since the minimum hygienic requirements are not being met.

With respect to sterilization, the *Ugandan* situation is rather unique. Lay person's standards of sterilization diverge from those stipulated by biomedical experts. Besides the general lack of understanding of the concepts of hygiene and sterilization, many households, especially those in the remote and semi-rural areas, consider family control over the needles and syringes and personal knowledge of the users to be a more significant and determining factor in the safety of injection than actual sterilization procedures. Due to the AIDS epidemic the public has come to mistrust communal sterilization procedures and shared needles and syringes, especially in the public health facilities. Personal appropriation of needles and syringes is now very common in Uganda. In the health facilities it was observed that some 60% of the patients bring along their own syringe and needle.

As a result of the widespread practice of keeping injection equipment at home it is rather difficult to meet optimum hygienic standards in Uganda. At the same time, the results of the study also indicate that a high percentage of provider facilities in both regions do not meet the required minimum standards of hygiene at each stage of injection administration. The poor hygienic practices include inadequate sterilization both at home and at provider facilities, picking up the boiled syringes and touching the needles with bare hands, improper disposal of needles and syringes or giving the equipment to the patient to carry home. Moreover, the same equipment is used on multiple patients and the injection site is often not cleaned before injecting. A higher level of training of the health worker was not related to the provision of safer injections. On the whole, NGO health facilities meet the highest hygienic standards.

In *Indonesia*, the majority of providers interviewed used disposable syringes. However, most disposable syringes are not discarded immediately after use. The majority of providers thus reuse disposable equipment, 'sterilizing' it by a variety of methods. Most injection providers boil the equipment, but usually for less than 20 minutes. There are also signs that the same equipment is sometimes used for more than one patient without first being sterilized although actual practices were not observed in the Indonesian study.

Explaining the popularity of injections

When ill, *Ugandans* first usually self-medicate with oral therapy. If this brings no relief, or when a fast cure is desired, patients tend to solicit providers for an injection. This preference for injections is guided by local ideas and beliefs of illness and concepts of efficacy of various treatment options. Injections are believed to go directly into the blood

stream, unlike oral medications which have to pass the digestive system. Therefore, for diseases that are transmitted through the blood system such as malaria, the administration of injections is preferred. This set of preferences of the general population is strengthened by the profit motive of private providers. Providers often justify their choice for injectables as a way to limit patient non-compliance in oral therapy. The combination of patient beliefs/preferences, and the profit interests of providers results in injections being a therapy which is too frequently administered.

Popular demand for injections is also enormous in *Indonesia*. In the households and health facilities it was found that over half of all injections had been given on request of the patients or their families. Most patients were given oral medication as well. The majority of users, when asked why this request for injections had been made, stated that injections are preferred because of their *"fast action"*, and also because it is *"customary"* to receive injections. However, not all injections are given on request. They are also part of a routine treatment procedure in health facilities over which customers have little say. In fact, in focus group discussions, mothers explained that it is usually the nurses who decide whether the children are injected or not. When the providers are asked why they give injections, they usually claim that this is because of patient demand. This vicious circle (health workers give injections because they think patients expect them; patients want injections because health workers give them) and the lack of communication between both parties serves to continue the practice of routine administration of injections. The research confirms that communication between health workers and patients is unsatisfactory. Over half of the patients had not received any explanation from the health worker with regard to their treatment.

The development of a simple and rapid methodology

The two most important strengths of this research project's methodology were the combination of qualitative and quantitative data collection methods; and the flexible research design which allowed for modifications according to local conditions. Formulation of common injection practices **indicators** and two universal tracer conditions helped to provide cross-country comparable data. All indicators developed in this research, with the exception of the hypothetical tracer conditions, may be considered feasible. For the determination of injection prevalence at the household level, households were visited with a standard questionnaire. It is important that questionnaire design be flexible, as opposed to a blue print design, as this has the advantage of allowing specific questions relevant to the local situation to be included. The two-week recall period to determine injection prevalence proved a good method. All households were selected by means of cluster sampling. There were no problems with non-response.

The research aimed at researching injection prevalence and preference among users and providers. Obtaining consent and collaboration from injection providers, particularly from those in private and illegal practices proved very difficult. In both countries an attempt was made to research a relatively large sample of different providers, using questionnaires, patient record reviews and more qualitative research methods (such as observation) - but the data in both countries are only representative of the formal, public sector.

To measure for which common health problems injections are preferred and used, both universal and local **tracer conditions** were formulated. Through tracer conditions the medical appropriateness of injection use and treatment preferences can be inferred. The inclusion of country specific tracer conditions has the advantage of covering the most relevant diseases in that country. However, it proved to be rather difficult to find tracer conditions which meet the criteria (a self-limiting ailment for which other forms of treatment are appropriate). For example, for symptoms such as fever or severe vomiting, injections could, in some cases, be medically justified. Therefore it seems necessary to include the degree of severity in the definition of the tracer conditions. For this reason, using tracer conditions in hypothetical illness case presentations in questionnaires proved quite difficult. Another problem encountered in applying the tracer condition method relates to the fact that the selected symptoms often occur in tandem (diarrhoea and vomiting or fever and cough, for example). This makes it necessary that the researchers record all symptoms. Despite some difficulties in applying the method, the defined tracer conditions proved very useful in the injection practices research for the recording of injection use in *actual* illness cases and for determining the medical appropriateness of the therapy. They seem less suitable for hypothetical illness case presentations in questionnaires.

7.2 Recommendations for interventions

This research report synthesizes the results of two country studies on a specific problem, the use of injections, about which very little was known at the start of the research. The research was therefore designed to obtain basic knowledge; as a consequence it was not designed as an intervention or action-oriented research. However, based on the results of the studies, the research teams suggested managerial, educational, and regulatory interventions. They are given in the table below:

Table 9: **Regulatory, managerial and educational interventions proposed by the country research teams**

Type of intervention proposed	Uganda	Indonesia
Regulatory	Improve control at the national level of the import, sale and use of injecting equipment Enforce the rules	Establish clear rules and regulations for the use of injections in medical practice Institute coercive measures and sanctions toward providers
Managerial	Supply disposables Improve supervision of health facilities Create incentives for providers with good practices	Supply disposables
Educational: Training of providers	Carry out clean injection programme for providers, including in-service training, refresher courses, and guidelines	Make health personnel aware of the negative impact of their injection practice on the spread of HIV and hepatitis
Educational: Training of the public	Train non-formal providers who operate from their homes Carry out clean injection programme for users, including information, education and communication (IEC) about the need for hygienic practices, and posters	Undertake massive and intensive educational programme, sensitive to the meaning people ascribe to injections

Both teams see the need for special emphasis on the promotion of clean injection practices towards providers, and public education on the dangers of injection. In Uganda, the researchers recommend the training of the informal providers.

The research team in *Thailand* (WHO/DAP/94.8: 58-9) recommends that health care planners take people's own explanatory models as a starting point in consumer health education campaigns. Health education on the appropriate use of drugs and injections should be carried out on different levels by different agents: both health workers and consumers should be informed using locally adapted means of communication. Another recommendation is to target health education directly at the mothers, as the research showed that parents were

more important as sources of health education than the mass media or the health centre. Differences in local preferences and urban-rural differences should also be taken into account.

7.2.1   Discussion of the recommendations for interventions

During the Final Workshop of the injection practices research (1993) these recommendations were critically assessed and discussed. It was mentioned that such interventions will only be successful if they consider the underlying reasons for injection misuse. Injections are often preferred in the treatment of disorders for which they are not needed according to biomedical standards. This popularity may be explained by a variety of reasons. To providers injections are attractive because they give them status, higher profits, and they enhance patient compliance. Users prefer injections because they are perceived to work fast, they are considered good value for money and they represent quality care. Patient demand reinforces the provider preference for injections and vice versa. This vicious circle ensures that the practice continues.

However, Sciortino (1993:40) thinks that the belief in injections is not static as is often assumed. This belief is maintained by images created from above and through reciprocal assumptions of health workers and patients. These assumptions could be challenged. Health workers should be the initiators of a new discourse. This could start, for example, by reinforcing existing concerns of users. Some consciousness of the risks of injections is already present among the general population, for example the supposed perils of using 'strong' injections on 'weak' children. Awareness of this risk could be enhanced by information. It will not be easy to differentiate between vaccines and injections, although this would be necessary (Wyatt 1992). It should be stressed that injected vaccines are safe for children in good health, but injections may harm children when used for therapeutic reasons: sick children primarily need oral rehydration, not needles. To limit the consumption of irrational injections while retaining a positive attitude towards vaccinations is one of the major challenges for appropriate drug use campaigns.

Another discussion during the Final Workshop concerned the channels along which injections run: these are many and complex. Injections consist of three separate components: syringes, needles, and the medicine itself. Each of these components can come from a different source. These components are provided by a variety of health workers and drug providers in the formal or informal health sectors. The supply of disposable injections, as recommended by both teams, will not necessarily improve the hygienic administration of injections. The study has shown that these are often reused. Preferable are the disposables which disintegrate after use. However, the destruction of this material can become a very complex problem.

While training of health providers is necessary and worthwhile, it does not ensure correct use of injections and drugs in general. The recommendations of the research teams do not account for the limitations of the 'information and education' approach. Clearly, doctors should be informed on the correct use of injections, but in practice injections are often administered by less-educated health workers and informal providers such as 'injectionists'. In addition, higher training of health workers does not always ensure correct use of injections. The research in Thailand found that private doctors provided high numbers of injections and that doctors in general educated their patients less than other types of health workers. It also concluded that health workers were well aware of the irrationality of administering most injections but that they did so anyway for social or financial reasons (Reeler & Hematorn 1994).

Furthermore, the participants of the Final Workshop felt that training in the appropriate injection administration should be directed to **all** the actors involved in the provision and use. The Ugandan team has proposed the training of informal practitioners, but it is questionable if this is really feasible. Ministries of Health would be concerned that to encourage training in the use of injections would be interpreted as tacit approval of injection practices by these non-trained personnel.

Perhaps the most important problem facing those who wish to place some form of constraint upon the use of injections is their nature, where they not only become interwoven with existing local notions on illness and therapy, but also serve to reinforce these notions. In many contexts it is no longer possible to eliminate injections from the arsenal of treatments available. The (partial) removal of this option would be met with both incomprehension and opposition from both providers and patients. Therefore, any policy to be adopted must take into account the cultural meaning of injections, their place in medical practices, and their influence upon human relations.

7.2.2 Next steps

Actions have already taken place and will continue at two levels:

- **Local level:** in the two countries the researchers presented their results to the health personnel and authorities and have discussed ways to improve the situation.

- **Global level:** results of the research will be used to define strategies for dealing with the complex problem of injections. The outcome could be a WHO policy/strategy paper on the subject of injections in developing countries.

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Appendix 1: Indicators for injection use and for assessment of hygienic practices

During the first workshop of the Injection Practices Research (1990), the following research questions were formulated:

Concerning the **types of health care providers** administering injections:

1a-   Which health care institutions and which practitioners are administering injections in a certain region?

1b-   Which institutions and practitioners - both formal and informal - are most often visited by people for injections?

Concerning the **distribution channels** of injections:

2a-   Where do the institutions and practitioners obtain the injections that they administer to patients? Do they obtain the injections from a government source, or from the commercial private sector?

Concerning the **indications** for which injections are generally used:

3a-   What are the main indications for which the health care providers are administering injections?

3b-   What are the disorders for which people seek injection treatment?

3c-   Why are injections chosen for these indications?

Concerning the **appropriateness of injection use**:

4a-   To what extent do people use injections to treat tracer conditions, defined as:
- cough and common cold in any age
- acute diarrhoea, less than five watery stools per day, in children under five and an additional three indications identified by the country teams, which do not warrant injection treatment?

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[35]   Injection practices research, WHO/DAP/92. 9: 9-11.

4b- Why are injections administered in the above five tracer conditions, while their use is not medically justified?

4c- Which types of injections are used in the treatment of the five tracer conditions?

4d- To what extent are injections administered in sub-standard hygienic conditions?

Concerning the **reputed efficacy** of injection use:

5a- What is the expected effect/or experienced effect of the injectable medication?

If appropriate:

5b- Why did the provider choose an injection instead of an oral medication?

5c- Why did the user prefer an injection instead of an oral medication?

5d- Why are injections administered in an unhygienic manner? Do people lack training? Do they lack resources?

Appendix 1.B   Indicators[36]

During the first and second workshops of the Injection Practices Research (1990 and 1991), the following indicators were agreed upon to measure the prevalence and to evaluate the medical appropriateness of injection use:

I.   Prevalence of injection use

(Ia)   The percentage of households (HHs) in which one or more injections were given in the past two weeks. *Expressed as:*

Number of HHs in which at least one family member
was administered an injection in the past two weeks
-- **X 100**
Total number of HHs

(Ib)   The percentage of HHs that received a specific type of injection in the past two weeks.

This can be calculated as above (a) with as numerator "the number of households in which at least one family member was administered a **specific** type of injection in the past two weeks". As specific types of injections the group identified the following categories:
- therapeutic injections
- infusions (large volumes)
- contraceptives
- immunizations

(Ic)   The percentage of people in a certain age category of the research population who have received at least one injection in the past two weeks. *Expressed as:*

Number of people in a specific age category of the study
population who have received at least one injection
in the past two weeks
-- **X 100**
Total number of people in specific age category
of the research population

As age categories the researchers decided to use the following:
- 0 - 4 years of age
- 5 - 14 years of age

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[36]   Injection practices research, WHO/DAP/92. 9: 21-25.

- 15 years and up.

(Id)   The percentage of females and the percentage of males in the research population who received at least one injection in the past two weeks. This is calculated as in (c).

(Ie)   Frequency of injection administration per health facility. A simple frequency distribution can be made listing how often certain health facilities are reported as source of the injections in the research population. Health facilities can be categorized into:
- government facilities
- private facilities
- non-formal facilities
- homes

This calculation can be done for the injections reported in the two-week recalls, and for the injections reported in the additional questions "when was the last time that you received an injection".

(If)   Percentage of patients at a certain health facility who received at least one injection. *Expressed as:*

Number of patients receiving at least one injection
during a predetermined observation period
--- **X 100**
Total number of patients visiting the health facility
during the observation period

Or, if the team decides not to interview patients at health facilities, a similar measure can be made based on an analysis of prescriptions: percentage of prescriptions at a certain health facility that list at least one injection, expressed as:

Number of prescriptions written in a certain
observation period containing at least one injection
--- **X 100**
Total number of prescriptions
written in the given observation period

II.   Evaluation of the appropriateness of injection use

(IIa)   Percentage of injection use in certain tracer conditions. *Expressed as:*

Number of times that a certain tracer condition
was treated with an injection in the research population
--- **X 100**
Total number of times that the tracer condition
was reported in the two week recalls

in the given research population

This measure can be calculated for the following types of medication:
- injection only
- oral medication only
- injection and oral medication
- other medication

in order to contrast the percentage of injection use, with that of oral and other medications.

(IIb) Percentage of injection use in hypothetical tracer conditions. In addition to the calculation of injection use prevalence based on the two week recalls, it is advisable to present mothers with hypothetical cases (covering the identified tracer conditions), and ask them what they **would** do if this condition occurred. *The measure is then expressed as:*

**Number of times an injection was reported as therapy
for the hypothetical illness case**
--- **X 100**
**Total number of respondents that participated
in the interview**

As was pointed out in IIa, this measure can be calculated for the following types of medication:
- injection only
- oral medication only
- injection and oral medication
- other medication

in order to contrast the percentage of injection use, with that of oral and other medications.

(IIc) If prescription patterns of providers are monitored, then the percentage of injection prescription in the specified tracer conditions can also be calculated.

(IId) Frequency distribution of types of injections given per tracer condition. The injections can be categorized by generic and by brand name.

(IIe) Percentage of providers who do not observe minimal hygienic standards before administering an injection. *Expressed as:*

**Number of providers who do not
follow minimal hygienic standards**
--- **X 100**

Total number of providers who were observed

(IIf)   Percentage of providers who do not observe minimal hygienic standards **during** administration of an injection.

This can be calculated as in (IIe).

(IIg)   Percentage of providers who do not observe minimal hygienic measures **after** administration.

The measures IIe-g can be calculated for the various types of injection providers.

The following categories of providers were identified:
- trained physicians
- nurse/midwife/allied health professional
- person with no formal training

Appendix 1.C   Revised/simplified WHO-Guidelines for evaluating the hygienic aspects of injection administration[37]

The indicators to evaluate the hygienic aspects of injection administration (Indicator IIe-IIg) were developed in consultation with staff of the Expanded Programme on Immunization (EPI) of the World Health Organization (WHO).

1. **What injection equipment is used?**

    a.   If disposable equipment is used, is it still in its original sterile pack?

    b.   If sterilizable glass syringe and needle is used, are these taken from sterile containers?

2. **Are correct techniques used to successfully sterilize or disinfect the equipment?**

    a.   Are syringes and needles flushed with water after use and before sterilization?

    b.   Are both needles and syringes sterilized?

    c.   If steam sterilization is used, is the temperature correct (121°C), and the time long enough (15 minutes)?

    d.   If the equipment is boiled, is there at least 20 minutes from the time the last piece of contaminated equipment is placed in the boiling water?

    e.   If neither steam sterilization nor boiling is used, is then another form of sterilization used. Please describe.

3. **Is the injection administered hygienically:**

    a.   Can anything not in an aseptic condition contaminate the injection fluid?

    b.   Does the person injecting touch the needle with his/her fingers?

    c.   Does the needle come in contact with any other non aseptic surface before being used?

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[37]   Injection practices research, WHO/DAP/92. 9: 58 .

d. Are several patients injected with the same needle?

e. Are several patients injected with the same syringe (even if the needle is changed)?

4.   **Is the injection equipment stored appropriately after use**:

a.   Are disposable syringes and needles placed into a final disposal container?

b.   Are disposable needles recapped before disposal?

c.   Are disposable syringes and needles disposed of (and not re-used)?

d.   Are sterilizable syringes and needles flushed with water after use?

Appendix 2: Methods applied in the injection practices research

Appendix 2.A	Overview and assessment of user-oriented methods

A review and assessment

Table 10: Overview of user-oriented methods used in country studies

Study type	Uganda Busoga	Uganda Ankole	Indonesia Lebak	Indonesia Lombok
In-depth interviews with key informants on provision and use of injections	yes	yes	no	no
Household questionnaire (random sampling) Using a two week recall period	yes n=360	yes n=360	yes n=407	yes n=409
Follow-up visit after two weeks	yes n=360	yes n=360	no	no
Focus group discussions on health, illness and injection use	no	no	yes n=6	no

a.   Interviews with key informants

Initial interviews with a selective group of key informants, in order to gain insight into local conditions, were conducted in Uganda both at the national and regional level. At the national level, interviews were held with representatives of the Ministry of Health, the Ministry of Local Government, the Uganda Essential Drugs Management Programme, the AIDS Control Programme and the Uganda Red Cross. Local key informants in the community were members of the Local Resistance Council, the District Medical Officer and hospital/provider facility administrators. Some interviewees also raised objections to the research design. Some informants, for example, questioned the - in their view - limited scope of the study (only into injection practices) and the sampling frame, which excluded families who did not have children under the age of five.

The qualitative, intensive character of an interview with key informants adds to the understanding of the motivations for injection use, and of the context in which such use takes place. Therefore, this technique seems to fit the descriptive and exploratory nature of this research perfectly well.

b.   Household questionnaire design and flow of questions

The questionnaires used in Uganda and Indonesia are presented in Appendices 4.A and 4.B respectively. They show some marked differences. In *Indonesia*, the focus of the questionnaire was on the treatment of ill people in the households. Individuals who were healthy but had received an injection (for example, for vaccination) were subsequently left out of the research. This type of questioning yielded a large amount of data on illnesses of individuals and their treatment.

The *Ugandan* questionnaire did not start from illness incidence, but from actual injection use. The questionnaire began by asking: "Who was the last person to get an injection and when was this injection received?" Here, the focus was the injection use and the symptoms for which the injection had been sought. Also, the Ugandan questionnaire focused specifically on informal injection use, equipment at home etc.

> *Differences in focus and questionnaire design of course limit the comparability of the results. This could have been avoided by a comparison of the questionnaires during the Second Workshop, and by agreement on the best design to be followed.*

c.   Focus group discussions

Six focus group discussions were conducted in three villages in Lebak, *Indonesia*. In Lombok these sessions were not conducted due to language constraints. The participants were chosen from subjects in the household survey who were willing to participate voluntarily, and who are able to talk easily in Bahasa Indonesian or the local language, Sundanese. Each group consisted of 6 to 12 participants, all of them women with children under five. During the focus group meetings, three major topics were discussed: the presence of illnesses in the region; the conditions which require, in the view of the participants, an injection as treatment and the treatment of the four tracer conditions identified by the Indonesian team. In *Uganda*, no focus group discussions were organized.

> *Focus group discussions conducted in Indonesia yielded insight into the local ideas about illnesses and their treatment. Preferences for injection therapy could thus be understood in their proper context. This method seems useful for researchers who want to gain a quick understanding of local ideas and who desire more insight into the context of injection use in their setting.*

Appendix 2.B   Overview and assessment of provider-oriented methods

Table 11:   Overview of the provider-oriented methods used in country studies

Study type	Uganda Busoga	Uganda Ankole	Indonesia Lebak	Indonesia Lombok
Questionnaire for health providers on indications for injection use and administration of injections	no	no	yes n=27	yes n=15
Observation of injection procedures before/during/after injection administration	yes n=21	yes n=16[38]	no	no
Exit interviews of patients at health facilities	no	no	yes n=378[39]	yes n=391
Review of prescriptions (Uganda)/Chart review (Indonesia)	yes n=420	yes n=360	yes n=n.a.[40]	yes n=n.a.

In both country studies providers were included in the research design. The survey was mainly aimed at establishing the prevalence of injection use at various provider facilities, evaluating the medical and hygienic appropriateness of injection use, and determining the source and type of equipment used. In *Uganda*, the provider study was strategically scheduled two months after the completion of the household survey to guide the identification of injection providers within the study communities. Based on the question in the household survey *"Where was the last injection administered?"*, the team was able to identify a variety of injection providers. In the urban communities, more categories of health providers could be identified than in the rural areas where health resources are restricted.

Problems encountered in studying doctors and other providers of injections were many. Both country teams report problems with sampling, non-response or refusal to cooperate. For example, in *Uganda* the original idea was to make a

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[38]   At the time of the observation, two of these providers did not administer any injections.

[39]   N=all patients interviewed at health facilities. In Lebak, a total of five patients were interviewed in private practices of nurses and midwifes. Because of their small number, this data is excluded here.

[40]   Total number of patient records included in the Indonesian study is not available.

random selection of providers. Often, only those who were willing to cooperate could actually be surveyed. In *Indonesia*, it was reported that doctors in private practice were especially unwilling to cooperate. In both countries under-representation of (certain) private and non-formal or untrained providers is therefore a serious limitation.

a. *Structured interviews with providers*

In *Uganda* a total of 37 health facilities were included in the research. The variety of facilities included: government health units, private clinics, drugshops, itinerant injectionists, and home providers.

Table 12: Overview of type of health facilities visited in Uganda

Health facility	Uganda Busoga	Uganda Ankole
Government hospital health centre	1 4	2
NGO health centre	3	-
Private clinic	6	10
Non-formal providers Drug shops Home providers	3 - 4	- 4[41] -
Total	**21**	**16**

Table 13: Overview of type of providers interviewed in Indonesia

Type of provider	Indonesia Lebak	Indonesia Lombok
Medical doctor government hc private practice	5 1	0 6
Nurse/midwife government hc nurse private practice midwife private practice	12 8 1	0 8 1
Untrained provider	-	-
Total	**27**	**15**

---

[41] At the time of the observation, two of these providers did not administer any injections.

In *Indonesia,* 42 providers were included in the study. The interview questions focused on their injection administration procedures, the source of their equipment and on their reasons for giving injections. In Lebak, the majority of health providers worked in the public sector, in Lombok all providers were interviewed in their private practice. Hence, the data gathered is not representative of the total health sector. In both regions non-formal, private practices of nurses were included in the study. No untrained providers were included in the study. In Indonesia, these do not seem to play an important role in the provision of injections.

> *The two country teams report problems with the cooperation of both formal and informal health care. The private sector seems particularly difficult to approach. The results of the provider study cannot therefore be taken as representative of all who administer injections in the community. The identification of injection providers through the household questionnaire, as was practised in Uganda was useful, especially to get hold of information on informal and home injectionists.*

b.   Observation of hygienic procedures

In the *Ugandan* health facilities where interviews with providers were held, data was also collected through observational methods - this was done in collaboration with two professionally trained medical doctors. Through a combination of observational and informal discussions, the doctors evaluated hygienic measures undertaken before, during, and after administering injections. In Busoga, evaluation of hygienic measures was based on both WHO and country specific guidelines developed by the Ugandan Essential Drug Management Programme (UEDMP) and the Ministry of Health for use of injections. In Ankole, evaluation of hygienic measures was strictly based on the WHO guidelines revised and simplified during the Second Workshop (see Report of the Second Informal Workshop, Appendix 2, 1992: 11). An overview of the various standards and indicators used to assess hygienic practices in Uganda is presented in Appendix 3.G. A limitation of the Ugandan approach is that the same providers who were interviewed were also subsequently observed. Of course, this could produce results that were biased as the interview could affect practices during the observation.

In *Indonesia*, data on the appropriateness of handling syringes, and of giving injections, was evaluated by means of a questionnaire (attached in Appendix 3.H). Observations of actual practices were not carried out. The questions in the questionnaire are roughly based on the revised WHO-guidelines presented in Appendix 1.C.

> *Actual observation of injection practices and hygienic procedures is an excellent method to obtain reliable, first-hand information on the extent of unsafe injections. However, consent is difficult to obtain.*

Some objections have also been raised as to whether it is ethically acceptable to observe potential dangerous practices without intervention. This problem could be circumvented if the researchers give immediate feedback to the providers after their observations.

c.   *Exit interviews of patients at health facilities*

Exit interviews were conducted in *Indonesia* (Lebak n=378, Lombok n=391). The vast majority of patients were interviewed in government health facilities (in Lebak 96% and in Lombok 88% of all interviews). The results should therefore be considered representative of practices in the public sector only.

The presence of tracer conditions and the administration of injections, as well as the reasons for liking injections, were recorded (for questionnaire see Appendix 3.F). The actual percentage of patients injected for the various tracer conditions could thus be calculated.

Exit interviews of patients at health facilities provide quick information on injection rates. It seems a good idea to complement the information given by patients with a chart review of injected patients for the diagnosis and the actual type of treatment given, as was done in Indonesia.

d.   *Review of prescriptions*

In *Uganda*, the researchers reviewed the provider's prescribing pattern; this was done on the basis of patient lists filled in by the provider in the presence of the researcher. Here, 30 consecutive cases visiting a provider facility were registered, specifying their age, sex, symptoms, forms of medication, and cost (see Appendix 3.D). Data gathered through this method was useful in establishing and understanding the nature of prescribing patterns at the various provider facilities. A problem with this method is that it took different observation periods to complete since the case load of health facilities was variable. It is difficult to establish the validity of the data (did the presence of the observers interfere with the providers' practices?) and the practical applicability of this method due to distrust and lack of cooperation of the provider (for example in private or informal practice). It may also be difficult to observe those who operate on a freelance basis from their homes since long periods of observation may be required. Compared with focus groups or interviews, where behaviour and practices are only *reported*, this method has the advantage of giving an indication of *actual* practice. A total of 420 cases were recorded in Busoga and 320 in Ankole region.

Of the patients interviewed in health facilities in *Indonesia*, a great number of patient charts were reviewed (the exact number is unknown) and the data was imported into the questionnaire (see Appendix 3.E). In this way, information could be acquired as to the appropriateness of the injection vis-à-vis the diagnosis or the patient's complaint. Injection rates in tracer conditions could

thus be calculated. In addition, the type of treatment could be determined in this way, providing interesting information on the popularity of certain injectables. Again, this data could only be collected in government health facilities.

Appendix 3: Tools used in the injection practices research

Appendix 3.A	Household survey Uganda

PART I

District   _____

RC   4   _____

RC   3   _____

RC   2   _____

RC   1   _____

Household number   _____

Respondent's name   _____

Sex   M/F   Age _____

Education level   _____

Occupation   _____

Name of supervisor   _____

Name of interviewer   _____

Date of interview   Date of check back _____

1.   Name of household head_____

2.   What is his/her principal source of income?
      0.   Unemployed
      1.   Civil servant (employed by government)
      2.   Employed by a private firm (Bank etc.)
      3.   Self-employed/business
      4.   Farming/fishing
      5.   Others specify _____

3.   Education level reached by household head (specify)

_____

4.   Number of members in the household? _____

5.   Who was the last person to get an injection in this household?
      (Which household member?)

      Name   _____

      Age:
      1.   0-4 years
      2.   5-14 years
      3.   15 and above

      Sex:
      1.   Male
      2.   Female

6.   When (time) was this injection received?

7.   For what reason was the injection given?
      1.   Therapeutic
      2.   Drip (infusion)
      3.   Contraception
      4.   Immunization

8.   If it was therapy, what symptoms were being treated?
      (Please note down the symptoms in local terms)

      _____

      _____

9.   What medicine was injected? (use local term)

      _____

      _____

10.   Where was the injection provided? (Use local categorization)

      _____

11.   Who provided the injection?

      _____

12.   Do you have any kind of relationship with the injection provider?
      1.   Yes
      2.   No

13.   If yes, what is the nature of relationship?

1.   Parent
2.   Relative
3.   Friend
4.   Neighbour
5.   Other   _____

EQUIPMENT AT HOME

14. Do you keep needles and syringes in your home?
    1.   Yes
    2.   No

15. If yes, where did you obtain them?

    _____

16. Do you keep injectables?
    1.   Yes
    2.   No

17. If yes, what type of injectables do you have?
    1.   Chloroquine
    2.   PPF
    3.   Others _____

18. Where did you obtain the injectables (1. Yes 2. No)
    1.   Government facility
    2.   Non-governmental facility
    3.   Private clinic
    4.   Pharmacy
    5.   Drug shop
    6.   Shop or market place
    7.   Drug pedlar or hawker
    8.   Friend, relative or neighbour

COMPLICATIONS

19. Has any member of family ever had any complications with injections?
    1.   Yes
    2.   No

20. If yes, what kind of injection complications (1. Yes 2. No)
    1.   Abscess
    2.   Allergy
    3.   Lameness

21. From where was that injection obtained? (find out the local categorization of facilities)
    1.   Governmental hospital
    2.   Government HC
    3.   Non-governmental HC
    4.   Private clinic

5.   Non-formal facility
6.   At home
7.   Others (specify)

_____

22.   Who provided that injection?

        _____

23.   What do you think was the cause of the complication?
        1.   Provider
        2.   Bad injectable
        3.   Bad equipment
        4.   I do not know
        5.   Others specify

                    _____

HYPOTHETICAL TRACER CONDITIONS

24.   What treatment should be given for the following illnesses? Please fill in
        Table I.

Table I: Treatment form for tracer conditions based on hypothetical questions

Tracer condition	Inject. only	Inject. & oral	Oral	Herbal med.	Non-medicin.	Nothing
Cough & cold						
Diarrhoea						
Intestinal worms						
Vomiting						
Fever/rise in body temperature						

PART II: TWO WEEKS RECALL PERIOD
(PLEASE NOTE IF THERE IS CHANGE IN THE RESPONDENT)

1.   Has anyone in this home been sick during the last two weeks?
      1.   Yes   2.   No

2.   In the last two weeks has anyone in this home received any form of injection?
      (1.   Yes   2.   No)

            1.   Therapeutic
            2.   Immunization
            3.   Drip (infusion)
            4.   Contraception
            5.   None

3.   If it was a therapeutic injection then fill in Table II.

4.   If it was an immunization then fill in Table III.

Table II: Sickness and treatment in two weeks period

Name	Age	Sex	Symptoms	Tracer condition	Treatment (form)	No. of inject.	Medicine (local term)	Source cost

Table III: Immunization record

Name	Sex	Age	No. of Injections

Appendix 3.B   Household survey Indonesia

(Form A)

Appendix 3.C   Questionnaire for providers Indonesia

(Form B 1)

No: -------

Date of interview:	Date of check:
Name of interviewer:	Name of team leader:
Signature:	Signature:

1.   Subdistrict   :------------------------------

2.   Village   :------------------------------

3.   R.T/R.W   :--------------/-----------------

4.   Provider:
    1.   Doctor (at government facility)
    2.   Nurse/midwife (at government facility)
    3.   Doctor in private practice
    4.   Nurse in private practice
    5.   Midwife in private practice
    6.   Informal healers, explain: ------------

5.   Are you giving injections?
    1.   Yes   2.   No---------->Stop

6.   What kind of syringe are you using?
    1.   Glass syringe
    2.   Disposable syringe (plastic)
    3.   Glass and disposable syringe

7.   Is your syringe:
    1.   Kept in a container with alcohol?
    2.   Sterilized after each time of use?
    3.   Only the needle is changed after use

8.   Is the syringe washed before sterilization?
    1.   Yes   2.   No

9.   If yes, do you use steam at 140 ^{0}C?
    1.   Yes   2.   No

10.   If boiling water is used for sterilization, what is the duration:
    1.   Less than 10 minutes

2. Between 10-20 minutes
3. More than 20 minutes
4. Don't know

11. If boiling is used for sterilization and the syringe is used every day, what is the frequency of boiling?
     1. Every day
     2. Once in 2 days
     3. Once in three or more days

12. Is chemical sterilization (formalin) used?
     1. Yes 2. No

13. If yes, is there a rule?
     1. Yes
     2. No
     If yes, explain:-----------------------------

14. If the syringe is kept in an apparatus with alcohol and used every day, is the alcohol changed?
     1. Every day
     2. Every 2 days
     3. Every 3 or more days

15. If the pump of the syringe is defective, what do you do?
     1. Keep using it
     2. Use it sometimes
     3. Discard the syringe

16   Do you have to be economic with disposables?
     1. Yes 2. No

17. If yes, why?
     1. Expensive
     2. Difficult to obtain
     3.   Not efficient
     4. Limited supply

18. After using a disposable syringe:
     1. You change the needle
     2. You sterilize the syringe and the needle
     3. You discard all
     4. You discard and destroy it

19. From where do you obtain injectable drugs?
     1. Dropping from headquarters
     2. Purchase

20. If you purchase, where do you purchase them?
     1. Pharmacy
     2. Pharmaceutical wholesaler

3.   Detailman
4.   Drugstore
5.   Others, explain

21.   Do you like giving injections to patients?
        1.   Yes
        2.   No

22.   What are the reasons for giving injections?
        1.   On the patient's/family's request
        2.   Patient is not satisfied if not injected
        3.   Oral drugs are too expensive
        4.   It is the most appropriate therapy
        5.   Patient's compliance is poor
        6.   Others, explain

23.   Do you charge a special fee for injections?
        1.   Yes   2.   No

24.   What is the effect of injections?
        1.   More rapid cure
        2.   The same (as oral medication)
        3.   The condition becomes worse
        4.   Others, explain

Appendix 3.D   Treatment form for providers Uganda

LIST OF PATIENTS AND THEIR DETAILS (to be filled in by the provider)

Provider   _____   Date   filled _____

Nature of facility _____   Date   checked _____

Appendix 3.E   Form for patient chart review, Indonesia

(Form D)
No. -------

Date of interview: Date of check:
Name of interviewer: Name of team leader:
Signature: Signature:

No.	Name of patient	Address of patient	# card	Diagnosis record	Name drugs and price	IV	Indication of injection

| Appendix 3.F | Questionnaire for exit interviews at health facilities, Indonesia |

Date of interview: Date of check:
Name of interviewer: Name of Team Leader:
Signature: Signature:

1.   Subdistrict   :-------------------------------

2.   Village   :-------------------------------

3.   R.T/R.W   :-------------------------------

4.   Health facility:
        1.   Health centre
        2.   Sub health centre
        3.   Doctor in private practice
        4.   Nurse in private practice
        5.   Midwife in private practice
        6.   Health cadre
        7.   Traditional practitioner

5.   Name of respondent :------------------------

6.   Who is the patient:
        1.   Respondent
        2.   Attendant   ---------------------(explain)

7.   Can I see your treatment card?

        Note down:
        Name   :--------------------------   Age   :-------------------
        Address   :--------------------------   Sex   :-------------------
        Other information: No. of card   :-----------------------------
                            Disease   :-----------------------------
                            Complaint   :-----------------------------
                                           ----

8.   What is the complaint?
        1.   Fever
        2.   Cough/cold/flu

3.   Abdominal pains/diarrhea
4.   Weakness/muscle pains
5.   Skin disease
6.   Others, explain   :--

9.   According to the health worker, what is your disease:

        ----

10.   Did you get an injection?
        1.   Yes
        2.   No -------------->stop

11.   Who gives the injection?
        1.   Doctor (in governmental facility)
        2.   Nurse/midwife (in governmental facility)
        3.   Doctor in private practice
        4.   Nurse in private practice
        5.   Midwife in private practice
        6.   Traditional practitioner, explain: --------------------------------

12   Is this injection given on your request?
        1.   Yes
        2.   No

13.   Why do you like injections?
        1.   Faster cure
        2.   Cheap
        3.   Habit/custom
        4.   Often forget to take medicine
        5.   Others, explain   :---

Appendix 3.G   Standards for hygienic assessment Uganda

Overview of various standards and indicators used to assess hygienic practices in Busoga and Ankole, Uganda

	Busoga (n=21)	Ankole (n=14)
BEFORE ADMINISTRATION		
• syringes and needles flushed with water after use and before sterilization	-	+
• both needles and syringes sterilized	+	+
• steam sterilization at correct temperature (121°C) for 15 minutes	+	+
• equipment is boiled for 20 minutes after last contaminated piece of equipment is put in boiling water	+	+
• inject only sterile solutions	+	-
• wash hands with soap	+	-
• disinfect the rubber top of the ampoules/vials	+	-
DURING ADMINISTRATION		
• can anything not in an aseptic condition contaminate the injection fluid	-	+
• does the person injecting touch the needle with his/her finger	+	+
• does the needle come in contact with any other non aseptic surface	+	+
• are several patients injected with the same needle	+	+
• are several patients treated with the same syringe	+	+
AFTER ADMINISTRATION		
• are disposable syringes and needles placed into a final disposal container	+	+
• are disposables recapped before disposal	+	+
• are disposable syringes and needles disposed of and not reused	+	+
• observe patient for about 30 minutes after injection	+	-
• are sterilizable syringes and needles flushed with water after use	+	+

water after use		

Date	No.	Patient name	Age	Relation	Symptoms	Inject. (tick)	Type & amount	Other med. type & amount	Cost
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
	11								
	12								
	13								
	14								
	15								
	..								

	30								