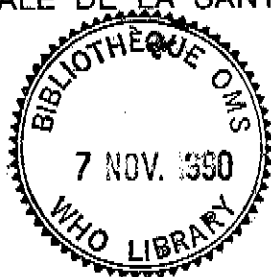




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TRAINING COURSE ON DRUG QUANTIFICATION METHODOLOGIES



BANGKOK, THAILAND

5 - 9 March 1990

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TRAINING COURSE ON DRUG QUANTIFICATION METHODOLOGIES

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1. INTRODUCTION

The training course on methodologies for quantification of essential drug supplies, attended by twenty-two participants from eight countries, was inaugurated by His Excellency Mr Marut Bunnat, Minister of Public Health, Government of Thailand.

He noted with satisfaction that the World Health Organization has made efforts to support numerous health projects with the objective of promoting better health of the world population consistent with the universal goal of Health for All. Among those in the area of essential drugs, WHO had proposed practical methods on quantification of drug needs and had developed a comprehensive manual on them which would be used in this training course. He felt that after its completion participants would be able to utilize the knowledge gained to improve estimation of drug needs in their countries and to impart practical experience in drug quantification by organizing training courses on the methodologies for other national staff.

Dr Pracha Em-amorn, Secretary-General of the Food and Drug Administration, welcomed the distinguished guests and participants on behalf of the Organizing Committee and expressed the hope that the participants would gain useful guidelines and find fruitful an exchange of views on their own country experience.

A message read on behalf of Dr. U Ko Ko, Director of the WHO Regional Office for South-East Asia (SEARO), stressed the importance of essential drugs programmes in the context of Health for All by the Year 2000. He said that analyses of national morbidity and drug consumption patterns reveal mis-matches between diseases and the availability of appropriate drugs to cure them or provide relief. The success of an essential drugs programme depends heavily on efficient administration of the supply, storage and distribution system at every point from manufacturer to end-user. He hoped that the training course would enable the participants to acquire practical knowledge for the task of estimating drug requirements.

The Deputy Permanent Secretary of Public Health provided background information on the organization of the training course. He drew attention to the use of computers in estimation of drug needs which would be demonstrated during the course.

Dr Pakdee Pothisiri, Deputy Secretary-General, Food and Drug Administration, proposed and lead a vote of thanks.

2. OBJECTIVES OF THE TRAINING COURSE

In addition to briefly introducing the WHO Action Programme on Essential Drugs (DAP) and its strategies to improve rational drug use, the objectives of the course were, inter alia:

- (a) to introduce the principles of drug management, the role of health information and the main functions of drug quantification:
 - i) to provide a sound basis for drug procurement;
 - ii) to improve perception of the importance of accurate data on morbidities and drug consumption on drug quantification;
 - iii) to continue development of a national drug list;
 - iv) to enhance cost consciousness on drugs.
- (b) to introduce the WHO manual on "Estimating Drug Requirements" and its methodologies; give examples from countries where the manual has been tested; discuss and work through the modules on the morbidity-standard treatment and the past consumption methodologies.
- (c) to introduce the concept of standard treatment norms, its application to drug quantification and its importance in the rational application of quantification results; highlight the importance of continuing education and training in standard treatment schedules as a means to influence rational drug use.
- (d) to review health problems at different levels of health facilities and techniques for data collection on morbidities.
- (e) to brief participants on the procedures of a drug quantification exercise and on the conduct of training courses on estimation of drug needs.

The five-day course consisted of three main areas: 1) presentation of the theoretical foundations of the two methodologies of estimating drug requirements (two days); 2) small group work on practical exercises using the country data of the participants (2 days); and, 3) a presentation on the final day of computer-assisted drug quantification based on the morbidity-standard treatment methodology. A part of the final day was also devoted to formulation of an action plan for a national drug quantification exercise.

3. BRIEF OVERVIEW OF DAP AT GLOBAL, REGIONAL AND COUNTRY LEVELS

A slide presentation on the Action Programme on Essential Drugs illustrated the many problems that can occur in the drug supply system and its management programme.

Two main objectives of the Action Programme are to promote availability of essential drugs and to promote the rational use of drugs; this is a global issue since irrational use of drugs is common to both developing and industrialized countries. An overview of the SEARO programme of Essential Drugs and Vaccines (EDV) highlighted WHO collaborative activities with Member States of the Southeast Asia region. It emphasized the role of Technical Cooperation between Developing Countries (TCDC), of Traditional Medicine, and of efforts in manpower development.

3.1 THAILAND ESSENTIAL DRUGS PROGRAMME

Dr Pakdee Pothisiri, in presenting a view of essential drugs activities in Thailand said that the Essential Drugs Programme is seen in the context of a country whose economy and society is rapidly advancing to the level of a newly-industrialized country (NIC). Socioeconomic aspects and concepts of social justice are brought to the area of drug distribution and the careful allocation of resources for expenditure on pharmaceutical products.

Standard treatment guidelines have been developed to promote rational use of drugs and to increase cost-effectiveness of drug treatment. Provincial and hospital Therapeutic Committees have been established or have been strengthened.

As concerns quantification of drug requirements, proposals have been made to introduce simple forms for morbidity recording, for a drug utilization review mechanism in hospitals and health centres, and to monitor and review the use of drugs selected for health centres and village cooperatives. It is also proposed to use drug consumption statistics, assembled from every province, to forecast needs and to increase the government pharmaceutical organization's production of essential drugs as well as to monitor and review the essential drug items which are appropriate and relevant to real national health needs.

4. INTRODUCTION TO TRAINING MODULES

There are two principal methods of quantifying drug requirements:

1) the morbidity-standard treatment methodology ("morbidity "morbidity method"); and, 2) the adjusted consumption methodology ("past consumption method").

In the morbidity method a list of health problems - symptoms and diagnoses - is drawn up for each level of health care facility. A standard treatment regimen is formulated for each type of illness. If an essential drugs list for each level of health care does not already exist, it can be drawn up based on these two elements. When data is added on the

frequency of the various health conditions (the "case mix") and the average dose per treatment, an estimate can be made of the quantities of drugs required.

The approach differs in the past consumption method. A very important observation here is that drug use does not always reflect drug needs.

National aggregated figures on drug use (e.g. annual drug orders by health facilities) from central medical stores can be unreliable since the amounts will be too large if over-prescribing is common or too small if frequent drug shortages (stock-outs) occur. One means to derive the necessary information for the consumption methodology is to use drug data from selected "sentinel" facilities where prescribing practices are considered to be rational, in which no serious stock-outs have occurred in the period under review, and in which good record-keeping is maintained. Drug use in the sentinel facilities can be extrapolated to all institutions of the same type in a region or province or even to a national scale.

5. ASSESSING THE NEED FOR BETTER QUANTIFICATION

Module 2 of the "Estimating Drug Requirements" manual (WHO/DAP/88.2) introduces the subject of assessing the need for better quantification and describes the characteristics ("symptoms") of poor quantification. Participants were asked to assess the characteristics operating in their own systems which indicate poor quantification practices. Irrational and ineffective prescribing was emphasized as were inequity of supply and distortion of demands.

6. FORMULATION & REVIEW OF ESSENTIAL DRUGS LIST BY TYPE OF FACILITY

Module 4 of the manual addresses the subject of the need to draw up lists of essential drugs by type or level of health care facility and to keep them under review for possible modification. In discussing this subject, the advantages, disadvantages and difficulties in collecting required data were illustrated by Dr. George Fernando from the experience of a comprehensive study on estimating drug requirements carried out in Sri Lanka. Attention was given to several procedures that might be adopted to gather information on common morbidities seen at different levels of health care, in keeping with diagnostic and prescribing capabilities of staff at these levels.

The Health Problem Listing at primary (community health worker) and middle levels (health centres) of health care was explained in detail (Table 4.2 of the manual (Appendix 1)) and a comprehensive explanation given on the selection of a drug for each of the health problems. The drugs are arranged in alphabetical order, aggregated, drug prices added and costs for each drug calculated.

7. INTRODUCTION TO THE MORBIDITY METHODOLOGY

A simple expression of the morbidity methodology can be formulated:

$$\begin{array}{l} \text{Number of} \\ \text{Treatment Episodes} \\ \text{of a health problem} \end{array} \times \begin{array}{l} \text{Quantity of drug(s)} \\ \text{specified in the} \\ \text{Standard Treatment} \end{array} = \begin{array}{l} \text{Total quantity} \\ \text{of drug(s)} \\ \text{required for the} \\ \text{health problem.} \end{array}$$

A Treatment Episode (TE) is defined as a patient contact requiring a course of treatment by a standard regimen.

The morbidity methodology requires information on total numbers of TEs of each health problem, by age. This is in contrast to the past consumption methodology which requires information on the *total number of patient contacts*. The morbidity methodology also implies the adoption of standard treatment schedules for the common health problems and that these regimens are actually used by prescribers in the health care system.

Morbidity data can be organized by the International Classification of Diseases (ICD) with the degree of detail appropriate to each level of health care (a large measure of caution must be used in introducing the ICD to assure that it will not sew confusion and inexactness in designation of health conditions, especially at PHC levels).

At the national level data may be reported by chapter heading only, (Diseases of the Respiratory System; Diseases of the Digestive System, etc.) but for the task of quantification of drug requirements their breakdown into health problem entities will be required.

Applying the agreed standard treatment schedule to the total number of treatment episodes of each health problem will give the total amount of drug(s) needed for that condition. The process is repeated for each and every health problem in order to achieve total quantities of drugs needed to be procured for the health care system. It is thus evident that information on total numbers of *each health problem* is an absolute prerequisite for the morbidity methodology of estimating drug requirements.

Since the same drug, aspirin for example, may be included in the standard treatment regimen of many health problems, the drugs will first be listed alphabetically. The quantities of the same drug used in the many standard treatment regimens will be added together (aggregated) to obtain the total quantity needed of each drug.

In the overview of the morbidity methodology some country-specific standard treatment regimens were used to demonstrate briefly how the calculations are carried out and to introduce rational drug use by the appropriateness of the standard treatment regimen for severity of disease and age group.

8. STANDARD DRUG TREATMENT SCHEDULES

One input of data requirements for the morbidity methodology, as discussed in module 5 of the manual, is that of the standard treatment schedule for each of the health problems for which care is sought in health facilities.

Dr B.B. Gaitondé expanded on this data requirement in describing the mechanism to be established at country level for guidelines for formulating standard treatment schedules. He emphasized that the drafting of tentative standard treatment schedules should be carried out by a multi-disciplinary group representing the different areas of medical practice and pharmacy and drug supply management. Standard treatment regimens for national programmes such as leprosy, tuberculosis, malaria, and others are formulated in consultation with the respective national programme managers and experts.

The tentative standard treatment schedules should be submitted for comment and review to a broad representation of health care staff who will be the users, including doctors, nurses, pharmacists, other categories of health staff such as clinical officers, health assistants, etc. Whenever possible, consideration should be given to the acceptability by consumers of the individual drugs.

Rational prescribing was discussed and the acceptance of standard treatment schedules by physicians, particularly at higher levels of health care, and referral institutions.

Several participants observed that the word "standard" may have negative connotations to the medical profession, and is seen to imply an unacceptable measure of regimentation and infringement on a doctor's prerogative to choose appropriate drugs for an individual patient.

A more acceptable word should be utilized to connote the concept of commonly-used treatment regimens. Several suggestions were made such as "best treatment schedule"; "rational treatment schedule"; "appropriate treatment schedule"; and, "essential drugs treatment schedules (or guidelines)". It was advised that this matter should be considered when revising the present edition of the manual. In addition, a review should be made of the treatment schedules currently found in Table 5.1(a) of the manual (Appendix 2).

8.1 STANDARD TREATMENT SCHEDULES: EXPERIENCE IN INDONESIA

Dr Bimo, presenting the experience in Indonesia, noted that there are national treatment guidelines (clinical guidelines) available for every health centre. These national clinical guidelines are known throughout the health care system and are commonly referred to as the "Red Book".

Taking into consideration the wide variations among different areas in Indonesia, the standard treatment schedules are developed as planning tools on a provincial basis. They are used - and further revised, if necessary - at the regency level. Since 1985, standard treatment regimens have been developed as part of a training package on "Drug Management/Planning Training" in four provinces.

The training involves regency health officers and pharmacists working as a team to develop standard treatment schedules. A small library of reference materials, including the Red Book, the WHO Model Standard Treatment Schedules, and others is made available to each working group formulating standard treatment schedules. A team of resource persons is also made available comprising clinical pharmacologists, clinicians, pharmacists, and staff with expertise in estimating drug requirements. In some provinces, doctors from health centres and hospitals also participated in the work.

This area-specific process of development of standard treatment schedules was adopted in order to obtain consensus and, as far as possible, the commitment of prescribers and programme field managers.

8.2 STANDARD TREATMENT SCHEDULES: EXPERIENCE IN BHUTAN

In presenting a brief account of the experience with standard treatment schedules in Bhutan, Ms S. Harvie noted that in order for prescribers to comply with them they must be not only be thoroughly familiar with them but must also understand them.

The preparation of a manual or guide giving prescribing information must be given high priority and should be directed at a particular level of prescriber. The level aimed at will usually not be doctors but, rather, health assistants or that category of staff responsible for the majority of prescribing at the primary health care level. Information on health conditions treated and drugs prescribed at this level of health care should be included; the manual, however, can also be distributed to other levels of prescribers for their use.

A *country-specific* manual is much more useful than one adapted from elsewhere since no two countries will have exactly the same health problem profile and essential drugs list. Every effort should be made to have the use of the manual included in the initial training of health care staff.

Bhutan has developed a comprehensive Standard Treatment Guide which includes instructions for history taking for diagnosis, flow charts, disease information and drug information. It is used in the health services and in the recruitment of all health professionals. The first edition was published in 1989.

9. MORBIDITY DATA

A second and most important input in the morbidity methodology are the data on the health problems (morbidity) occurring in the population.

In this method, each treatment of a health problem is designated as a treatment episode, i.e. a patient contact requiring a course of treatment by a standard regimen. Age and severity of the health problem are important elements dictating the formulation of the standard treatment regimen.

The issue of the accuracy of the morbidity data cannot be overemphasized both in numerical and in symptoms/diagnoses terms since the quality of the quantification of drugs required depends very heavily on it.

As concerns data collection and record-keeping, the use of retrospective data was described and discussed in detail. Such data may be from centrally assembled data in the national health information system - depending on its rigour with respect to reliability and completeness - or may be collected by sampling health facilities (with the same requirements for judging its validity).

Worksheets for collecting morbidity data included in the manual were demonstrated and the utility and problems in undertaking a prospective survey was described by Dr George Fernando who gave an overview of the study on morbidity patterns and drug requirements carried out by the Ministry of Health in Sri Lanka with its special stress on development of appropriate forms to collect the data and procedures adopted to ensure their accuracy. Model forms for recording treatment episodes at the health centre level were explained and discussed.

10. MORBIDITY METHODOLOGY CALCULATIONS

Dr Bimo took the participants through the detailed steps of the calculations to arrive at the final estimated quantities of drugs needed according to dosage strength and form, pack sizes, cost per drug, and total drug costs. Following this demonstration the participants carried out the same procedures (exercises 7A and 7B of the manual) with guidance, as required, by facilitators. The calculations use the total numbers of TEs, standard treatment schedules, aggregation of quantities of the same drug, and conversion into number of pack sizes. Information on essential drug prices was provided (e.g. UNIPAC price lists) and total drug costs were calculated. In the next session participants utilized ABC and VEN principles to achieve cost reductions in the drug budget.

11. ABC & VEN ANALYSIS

Once the total quantities of essential drugs have been estimated it is sometimes necessary to reconcile the budget required for their purchase with a lesser amount of funds which will be allocated for the procurement of drugs for the health care system. Module 7 in the morbidity methodology section of the manual deals, in part, with the questions of budget reconciliation.

Two useful tools to help with budget reconciliation are the ABC value analysis and the VEN system. Since it is well-recognized that quite a small number of drugs account for a large proportion of total drug expenditure, drugs can be classified according to their shares of the total cost: "A" drugs account for a high percentage of the cost; "B" drugs account for a medium percentage of the costs; and, "C" drugs account for a low percentage of total costs.

The categorization of the list of essential drugs into Vital (V), Essential (E), and non - or less - essential (N) can be used together with the ABC analysis to help to reconcile

estimated costs with available budget, in the case of necessity. The characterization of a list of drugs by VEN may present numbers of locally relevant problems which may require a multi-disciplinary approach.

Participants undertook an individual exercise of preparing an ABC analysis of the data figuring in Table 7.7 of the manual (Appendix 3); all participants were able to carry out the procedure and to correctly graph the results.

11.1 SYSTEMATIC COST REDUCTION

In Indonesia, ABC and VEN analyses are incorporated into the regular planning process for the annual drug orders. Dr. Bimo presented the Indonesian experience on introducing cost reduction.

Drug quantification for annual planning is done at the regency level and systematic cost reduction techniques using ABC and VEN analyses have been applied since 1985 to help decision-makers assign appropriate priorities to drugs consuming the largest proportions of the budget. A planning team is convened for this task for which the regency health officer serves as decision-maker and the pharmacist is responsible for preparation of the detailed plan. In principle, a review of the drugs should be undertaken before the detailed plan is approved and signed.

Several examples of regency-level systematic cost reduction were demonstrated and discussed. In one planning session, injectable diazepam was found in first place in the ABC analysis. On additional checking, this proved to be an error in pack/unit size illustrating the further utility of the procedure. Because of the wide variability within this large country, each regency is encouraged to develop its own regency-specific VEN system.

12. INTRODUCTION TO CONSUMPTION METHODOLOGY

The principles of the consumption methodology are found in module 8 of the manual. They include the selection of "standard" - or sentinel - facilities whose drug consumption will serve as the norm for all facilities of the same type in the area or country and the estimation of the *total numbers of patient contacts* at all facilities covered by the quantification. Average drug use per 1 000 patient contacts is established and the quantities required of each of the drugs are calculated.

Demonstration and interpretation of tally cards in the selected facilities formed an important part of the session on consumption methodology.

The problematic question was raised concerning "selection" of facilities or use of a random (larger) sample. Use of a random sample, while having statistically attractive features, includes the hazard that rational drug use and record-keeping may not be uniformly good. Thus, there is a risk that the estimates will follow drug use and not drug needs.

13. SMALL GROUP WORK ON QUANTIFICATION OF DRUG REQUIREMENTS

Participants were divided into four working groups as follows:

Group I	Nepal; Myanmar; Thailand
Group II	Bhutan; Sri Lanka
Group III	Indonesia; Philippines
Group IV	Vietnam; Thailand

At least one member in each working group had country morbidity data available and/or standard treatment schedules which could be used in group work on quantification of drug requirements using the morbidity methodology.

The following plan of work was selected:

- (1) choice of primary health care level as type of facility;
- (2) selection of at least 20 health problems;
- (3) development of a standard treatment schedule for each health problem or selection of existing national ones;
- (4) use of country morbidity data to estimate drug requirements for 1 000 treatment episodes and to apply ABC and VEN analyses;
- (5) a short presentation in plenary of the work of each group with results of the quantification calculations, problems encountered and solutions found.

Each country was also asked to prepare an outline for an Action Plan on Drug Quantification as described in module 3 of the manual.

13.1 PROBLEMS ENCOUNTERED IN GROUP WORK ON QUANTIFICATION

Each group prepared a drug procurement estimation using the morbidity methodology. The country data emanated from the primary health care level of facilities and the standard treatment regimens selected were either actual national regimens or were the model standard treatment schedules included in the manual.

Most groups used the International Classification of Diseases (from the manual) and each group's report was based on 1 000 treatment episodes for which the required quantities of drugs were calculated. Some groups had calculated costs, made ABC and VEN analyses and plotted the results graphically.

In the "Quantification of Essential Drugs for RHC/PHC" for their "new" countries - Bulanka, Thainam, Myarland and Philando - the various problems encountered were presented and solutions offered. The problems most often cited included:

- 1) lack of adequate morbidity data;
- 2) inadequate training in data collection techniques;
- 3) pack size;
- 4) irrational use of drugs (i.e. large quantities of cloxacillin used to treat furunculosis);

- 5) calculations for long-term treatments, i.e. streptomycin for TB;
- 6) reaching agreement on standard treatment schedules;
- 8) spread sheets and computations;
- 9) disease categories;
- 10) standard reporting forms;
- 11) morbidity patterns used in group work were not country-representative.

The group work was well accomplished and the presentations were of good quality. At the same time, each country presented an abbreviated Action Plan for a quantification exercise.

14. COUNTRY PRESENTATIONS

Each participant gave a brief description of the drug supply situation in their respective countries with a focus on procurement, distribution and drug quantification procedures.

BHUTAN has established a National Drug Committee and a list of essential drugs for different levels of health care facilities. Standard diagnostic guidelines have been formulated and a training programme for health workers has been completed.

Quantification of drug needs uses the morbidity methodology and is focussed mainly on basic health units (BHUs). Logistics of drug distribution is a major problem in a country with very difficult travel conditions. A system has been developed for buffer stocks at drug stores and district hospitals.

MYANMAR has initiated activities under an essential drugs programme: a national formulary has been updated, drug information sheets compiled and standard treatment schedules formulated for four levels of health care. In a pilot project area morbidity data has been collected for a quantification exercise which has been completed for four townships. The ICD has been found too cumbersome for use at the primary health care level facilities.

INDONESIA's pharmaceutical supply system was described at several points in the workshop so that the participants were given a comprehensive view of it. An adjusted consumption methodology is mainly used for drug estimation and the ABC and VEN analyses have been introduced into routine use in some regencies.

NEPAL has several problems concerning supply of essential drugs. an essential drugs list has been prepared and standard treatment schedules formulated but there has been little implementation.

PHILIPPINES has a national drug policy and has had a Generic Drugs Act since 1988. It was mentioned that 60-70% of the health budget is expended on drugs. Drugs are now prescribed and marketed under generic names. Irrational prescribing has contributed to excessive use of antibiotic and vitamin preparations. A high level of dependency on importation of drugs was noted.

A study (situation analysis) of the entire procurement system, at central and regional levels, has been carried out and a design developed for a monitoring system. Drug

quantification trials have been done and these will be further reviewed in the light of experience gained at the workshop.

THAILAND gave an overview of its drug programme with details of past and present activities and those planned for the future. Standard treatment schedules were prepared in 1986 and treatment guidelines for primary health care have been formulated and are now being implemented. Orientation seminars have been conducted and in 1990 a re-evaluation of marketed drugs will be carried out.

VIETNAM described the details of its Action Programme on Essential Drugs which has been accepted as one of the country's priority programmes. An essential drugs list has been prepared and standard treatment schedules formulated. Quantification of drug needs is being done on the basis of morbidity data collected by regional health units.

15. COMPUTER USE IN DRUG QUANTIFICATION

The excellent computer facilities, allowing demonstration directly from computer to a large screen, at the Faculty of Pharmaceutical Sciences of Chulalongkorn University were used to illustrate the utility of computerized drug quantification procedures. Dr H. Hogerzeil, DAP, and Dr Bimo, Indonesia, introduced the use of computers to the participants.

Since some of the participants had not previously worked with computers, "how" and "why" computers are used in drug quantification was briefly explained and slides were used to demonstrate the QUANTED spreadsheet programme of drug quantification, developed for the Action Programme on Essential Drugs. Small groups also had the opportunity to participate in a hands-on computer demonstration of quantification procedures using portable computers.

Dr Pavich Tongroach, Dean of the Faculty of Pharmaceutical Sciences, explained and gave a computer demonstration of their programme for inventory control developed for provincial hospitals in Thailand.

Dr Bimo demonstrated another computer programme for quantification developed by Management Sciences for Health, Boston, USA, and adapted to the Indonesia context.

All participants showed a keen interest in the use of computers for drug quantification.

16. COMPARISON OF THE CONSUMPTION AND THE MORBIDITY METHODOLOGIES

The discussions on advantages and disadvantages of the two methodologies were led by Ms S. Harvie who described the experience with using both of them in Bhutan.

Most participants expressed the view that the consumption methodology was easier in terms of data collection and calculations and is less time consuming; it is also possible to monitor drug demand. Major disadvantages are the lack of precise quantification in relation to the health problem profile and rational drug use.

On the other hand, the participants saw the morbidity methodology as having the advantage of being more "scientific" and having the potential for precision. It encourages rational drug use, through the use of standard treatment schedules, and is more cost-effective.

The morbidity methodology can also be useful to demonstrate to administrators and policy makers the real drug needs and for use as an instrument of persuasion when requesting increases in budget allocations for drug procurement. The major disadvantage is that it is more time consuming and requires a high level of cooperation among health staff especially for obtaining appropriate morbidity data and in adhering to use of the standard treatment schedules for the common health problems.

There was lively discussion on this session with all participants expressing their own views and experience. It was generally seen that, since both methods have advantages and disadvantages, it could be useful to combine both. After having done a drug quantification cycle using the morbidity methodology, at least several of the following procurement cycles can utilize the consumption methodology to be again followed by a procurement cycle using the morbidity methodology. The interval of interspersing the two methodologies must be decided by the situation analysis of the drug supply management system and its impact on the health care system.

Consumption methodology data can be used to monitor stock levels. If standard treatment schedules are introduced and adhered to, at least in the lower levels of health care facilities throughout the country, it is possible to make quite precise estimations of drug requirements using the consumption methodology.

17. FOLLOW-UP ACTION

A résumé of the guidelines for preparing a workplan for the task of quantification of drug requirements at the national level was given by Mme G. De Visscher, Short-term Consultant, EDV/SEARO, followed by a brief presentation by a participant from each country of an overview of follow-up action anticipated at a national level.

MYANMAR is weak in pharmacy human resources and must develop a curriculum for the training of this category of health staff. There will be a continuation of revision of the recently-published standard treatment regimens. Plans are underway to collect and monitor morbidity data from a pilot area in which an essential drugs programme is being implemented. Plans are also under preparation for training of township-level health care staff and for a workshop on quantification of essential drug requirements.

INDONESIA has started at the central level a research project on drug consumption patterns. They will also explore extending the study to peripheral health facilities in order to obtain a view from bottom-up as well as top-down. A plan will be made for an action programme and data will be collected on consumption and on morbidities. At an appropriate time, a training course on quantification will be carried out.

THAILAND will identify weaknesses in the essential drugs programme and the rational use of drugs. There will be a review of the morbidity collection system and morbidities will be reviewed together with the essential drugs list. Drug quantification

methodologies will be further developed and there are plans for a drug quantification exercise, including collection of morbidity data, stimulation of implementation of standard treatment schedules and a revision of the essential drugs list.

SRI LANKA plans to extend encouragement of use of standard treatment schedules for the primary health care facilities. Based on their experience with the study on morbidity and drug consumption, it was determined that nearly all (99%) of those attending outpatient departments can be treated with about 37 drugs. After a study of attitudes among doctors a list of 40 to 45 essential drugs for use at outpatient level will be drawn up for use at that level of health care. There are also plans to hold an orientation course for health care staff in each of the provinces.

BHUTAN was of the opinion that although standard treatment schedules and rational drug use have been introduced into the health care system, there is still a need to get commitment and involvement by prescribers. With the experience gained in this workshop, they plan to organize a re-orientation course during annual district, zonal and national meetings during this year.

VIETNAM will continue to apply principles of essential drug quantification at primary health care level and this is considered to be a first priority. Training in diagnosis and rational drug use will be continued and a pilot district study will be completed. This will be followed by an endeavour in five provinces emphasizing rational use of drugs and quantification of drug requirements. In future it is possible that the private sector may play a role in the drug supply system in the country.

NEPAL noted that it is very difficult to obtain information on morbidities in that country. A committee will be convened to design a new standard recording form for the district level. It will be tried out in a pilot study at the same time as training of health staff in record-keeping, especially on morbidities. It is also hoped to hold a training course on quantification of drug requirements, including cost reduction systems.

In the PHILIPPINES the Essential Drugs Programme has only recently commenced. The participants from the Philippines fully expect that the workshop will be useful for their next round of estimation of drug requirements. A research project estimating drug requirements will start with the morbidity methodology followed by the consumption methodology which, it is hoped, will give a more realistic estimate of drug requirements. The national formulary is to become a part of the teaching curriculum to help promote rational drug use. The therapeutic committee in each hospital will establish the hospital formulary, based on the national formulary. Insofar as possible, consumers (patients) will be included in the discussions of the therapeutic committees.

18. PARTICIPANTS' EVALUATION OF THE TRAINING COURSE

In brief, the evaluations by participants indicated that 1) the area of morbidity data is still problematic and needs to be dealt with in a more comprehensive way in the training course. More use of "model" recording forms throughout the training course will also be useful; 2) approaches to cost reduction - ABC and VEN - also deserve a more thorough

discussion by course facilitators; and, 3) participants would appreciate more time on computer applications to quantification of drug requirements.

Participants completed a questionnaire designed to assess their perceptions of the content of the training course with special comments sought on time allotted to specific topics; level of discussions; exercises; "Estimating Drug Requirements" manual; and the expected utility of the training course on return to their own national systems.

Participants in general felt that the length of time of the training course was sufficient. As to individual topics, some participants wanted more time given to discussions of the morbidity methodology and to data collection.

All participants felt that the time devoted to computer applications was inadequate.

While all participants found the manual generally satisfactory, some suggestions were made for improvements, e.g. simplifying its contents and making it suitable as reference material for health care workers as well as staff from the drug supply system. In a revision of the present edition the drug code number appearing in the tables can be eliminated since they are not used in the presentation of the training materials.

It would be useful in future training courses to include a case study as a training tool.

Country presentations were found useful to introduce participants to different approaches or adaptations used in other health care settings and also on problems encountered.

The small group work served its purpose of helping participants to learn the various calculations needed to quantify drug requirements as well as to perform the work as a group effort. While the exercises were found to be helpful in the learning process, some participants wished to have more detailed presentation on statistical methods.

In conclusion, the training course was considered to be a success. Participants - some of whom had previous exposure to the methodologies - kept a high level of interest throughout the entire course. The discussions were stimulating and everyone took part in posing questions and making observations on the topics being considered.

**Training Course on Drug Quantification Methodologies
Bangkok, Thailand, 5 - 9 March 1990**

PROGRAMME

Sunday, 4 March

17.00 to 18.00 Welcome Reception hosted by Government of Thailand

Monday, 5 March

08.30 - 09.30 Registration

09.30 - 10.00 Opening Session

10.00 - 10.30 Coffee/Tea

10.30 - 11.00 Course Introduction
(Dr. H. Hogerzeil, DAP/HQ)

11.00 - 11.30 Drug Management: an Overview, Practical Problems and
Experiences (DR. H. Hogerzeil, DAP/HQ)

11.30 - 12.00 WHO Regional Essential Drugs Programme
(Mme G. De Visscher, STC, EDV/SEARO)

12.00 - 12.30 Thailand Essential Drugs Programme
(Dr Pakdee Pothisiri, Deputy Sec.General, FDA)

12.30 - 14.00 Lunch Break

14.00 - 14.30 Estimating Drug Requirements: an Overview (Module 1)
(Dr. H. Hogerzeil, DAP/HQ)

14.30 - 15.00 Need for Better Quantification (Module 2)
(Dr. B.B. Gaitondé, WHO/STC)

15.00 - 16.00 Past Consumption Methodology (Model 8)
(Dr. H. Hogerzeil, DAP/HQ)

Tuesday, 6 March

08.30 - 09.15 Essential Drugs List by Type Facility (Module 4)
(Dr. George Fernando, WHO/T.A.)

09.15 - 10.30 Standard Treatment Guidelines (Module 5)
(Dr.B.B. Gaitondé,WHO/STC; Dr. Bimo, WHO/T.A.;
Ms S. Harvie, WHO/T.A.)

10.00 - 10.30 Coffee/Tea

10.30 - 12.30 Data Collection (module 6)
(Dr. G. Fernando,WHO/T.A.; Mrs R. Lunt, DAP/HQ)

- 12.30 - 14.00 Lunch Break
- 14.00 - 16.00 Calculations: Morbidity Methodology (Module 7)
(Dr. Bimo, WHO/STC)

Wednesday, 7 March

- 08.30 - 10.00 Systematic Cost Reduction (Module 7)
(Dr. H. Hogerzeil, DAP/HQ; Dr. Bimo, WHO/T.A.)
- 10.00 - 10.30 Coffee/Tea
- 10.30 - 12.30 Country Presentations
- 12.30 - 14.00 Lunch Break
- 14.00 - 16.00 Group Work
- Evening Dinner - hosted by Government of Thailand

Thursday, 8 March

- 08.30 - 10.00 Group Work (continued)
- 10.00 - 10.30 Coffee/Tea
- 10.30 - 12.30 Group Work (continued)
- 12.30 - 14.00 Lunch
- 14.00 - 15.00 Group Work (continued)
- 15.00 - 17.00 Group Presentations and Plenary Discussions

Friday, 9 March

- 08.30 - 10.00 Use of Computer in Drug Quantification
(Dr. H. Hogerzeil, DAP/HQ; Dr. Bimo, WHO/T.A.)
- 10.00 - 10.30 Coffee/Tea
- 10.30 - 12.30 Use of Computers (continued)
- 12.30 - 14.00 Lunch
- 14.00 - 14.30 Choice: Morbidity or Past Consumption?
(Ms. S. Harvie, WHO/T.A.)
- 14.30 - 15.00 Making an Action Plan
(Mme G. De Visscher, WHO/STC)
- 15.00 - 16.00 Course Evaluation

CLOSURE

Training Course on Drug Quantification Methodologies
Bangkok, Thailand, 5 - 9 March 1990

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Table 4.2

Illustrative health problem listing for surveying drug requirements for the first level (community health worker) and the middle level (health centre)

Int. Class Disease ICD code		Comm. Hlth. W. (CHW)	Middle Level (H. Centre)
X	KEY: Health problems with drug requirements	24	B1
C	Chronic health problems, if necessary with supervision from higher level	.	B
R	Repeat visit for same health problem	4	4
S	Health services provided	5	5
NEC	Not elsewhere classified		
I. INFECTIOUS AND PARASITIC DISEASES			
Bacterial infections and zoonoses			
001	Cholera		XXX
002.0	Typhoid		XXX
004	Bacillary dysentery		XXX
009.2	Acute diarrhoea	X	XXX
011	Pulmonary tuberculosis		000
030	Leprosy		0
Other bacterial infections and zoonoses			
Viral and chlamydial infections			
052	Chickenpox		XX
055	Measles		XX
076	Trachoma		X
Other viral and chlamydial infections			
084	Malaria	X	X
Malaria			
Venereal diseases			
090.7	Syphilis		X
098.0	Gonorrhoea		XX
098.4	Ophthalmia neonatorum		XX
Other venereal diseases			
Fungal infections			
110	Fungal skin infections		X
112.1	Candidiasis, vaginal		X
Other fungal infections			
Helminthic infections			
120.0	Schistosomiasis Haematobia		X
120.1	Schistosomiasis Mansoni		XX
120.2	Schistosomiasis Japonica		XX
123.3	Teniasis (tapeworm)		X
125.3	Onchocerciasis (river blindness)		XX
125	Other filaria		XX
126	Ancylostomiasis (hookworm)		XX
127.0	Ascariasis (roundworm)	X	XX
Other helminthic infections			
Other parasitic infections			
131.0	Trichomoniasis, vaginal		X
132	Pediculosis (lice)	X	XX
133.0	Scabies	X	X
Other parasitic infections			
III. ENDOCRINE, NUTRITIONAL AND METABOLIC DISORDERS			
250	Diabetes mellitus		0
260-3	Malnutrition		XX
264	Vitamin A deficiency, xerophthalmia		XX
265.0	Other vitamin deficiency		X
Other endocr. nutr. and metab. disorders			
IV. DISEASES OF BLOOD AND BLOODFORMING ORGANS			
280	Iron deficiency anaemia	X	X
282.5	Sickle cell disease		X
Other diseases of blood and blf. organs			

continued

Table 4.2 (continued)

Int. Class Disease ICD code		Comm. Hth. W. (CHW)	Middle Level (H. Centre)
V. MENTAL DISORDERS			
290-9	Psychosis		C
300.0	Anxiety neurosis		X
300.4	Depressive neurosis		X
	Other mental disorders		
VI. DISEASES OF THE NERVOUS SYSTEM AND SENSE ORGANS			
345	Epilepsy		C
372.0	Conjunctivitis	X	X
380.1	Otitis externa		X
381-2	Otitis media		X
	Other diseases of NS and sense organs		
VII. DISEASES OF THE CIRCULATORY SYSTEM			
390-8	Rheumatic heart disease		C
401-5	Hypertension		C
410-4	Ischaemic heart disease		X
455	Haemorrhoids		X
459.0	Shock		X
	Other diseases of circulatory system		
VIII. DISEASES OF THE RESPIRATORY SYSTEM			
460	Common cold	X	X
463	Tonsillitis		X
465	Acute bronchitis		X
480-9	Pneumonia		X
493	Asthma		X
	Other diseases of the respiratory system		
IX. DISEASES OF THE DIGESTIVE SYSTEM			
521.0	Caries, toothache	X	X
522.5	Dental abscess		X
528	Mouth sores		X
535-6	Gastritis, heartburn, indigestion	X	X
564.0	Constipation	X	X
	Other diseases of the digestive system		
X. DISEASES OF THE GENITO-URINARY SYSTEM			
595	Cystitis	X	X
614	Pelvic inflammatory disease		X
	Other diseases of gen.-urinary system		
XI. COMPLICATIONS OF PREGNANCY, CHILD BIRTH AND PUERPERIUM			
634-8	Abortion		X
650	Normal delivery		X
660-5	Abnormal delivery		X
668	Postpartum haemorrhage		X
670	Major puerperal infection		X
675	Mastitis, breast abscess		X
	Other complications		
XII. DISEASES OF THE SKIN AND SUBCUTANEOUS TISSUE			
680-2	Boil, abscess	X	X
684	Impetigo, bacterial skin infection	X	X
691.8	Eczema		X
692	Skin allergy		X
698	Itching		X
707.9	Chronic ulcer, tropical ulcer		C
	Other diseases of the skin		
XIII. DISEASES OF THE MUSCULOSKELETAL SYSTEM AND CONNECTIVE TISSUE			
714-6	Arthritis and ankylosis	X	X
724	Backpain, lumbago	X	X
728.0	Pyomyositis		X
	Other diseases of the MS system		

continued

ESTIMATING DRUG REQUIREMENTS

Table 4.2 (continued)

Int. Class Disease ICD code		Comm. Hlth. W. (CHW)	Middle Level (H. Centre)
XVI. SYMPTOMS, SIGNS AND ILL-DEFINED CONDITIONS			
780.3	Convulsions, febrile		X
780.5	Insomnia		X
780.6	Fever NEC	X	X
780.7	Malaise, fatigue NEC	X	X
784.0	Headache NEC	X	X
786.2	Cough NEC	X	X
787.0	Vomiting		X
788.0	Renal colic		X
789.0	Abdominal pain NEC	X	X
789.5	Ascites		
XVII. INJURY AND POISONING			
800-29	Fractures		X
830-9	Dislocations		X
840-8	Sprains and strains	X	X
850-4	Intracranial injury, concussion		X
870-90	Open wound, laceration, major cut		X
879.9	Complicated open wound, animal or human bite		X
910-19	Superficial injury, bruise, minor cut	X	X
930	Foreign body in eye		X
940-9	Burns	X	X
960-79	Poisoning		X
989.5	Snake bite, other stings and bites		X
995.0	Anaphylactic shock		X
	Other injury or poisoning		
REPEAT VISITS FOR SAME HEALTH PROBLEMS			
	Injections		
	Dressings		
	Oral medication		
	Follow-up visit		
OTHER HEALTH SERVICE CONTACTS			
V03-06	Vaccinations		
V20	Under-five preventive care		
V22-3	Antenatal care		
V25	Family planning, contraception		
V70	Medical examination, no illness		

Table 5.1A
Illustrative standard treatment for quantification of drug requirements based on average doses

ICD	INDICATION	DRUGS	DOSE	TIMES PER DAY	NO. OF DAYS	AMOUNT PER COURSE OF TREATMENT
1. INFECTIOUS AND PARASITIC DISEASES						
Bacterial infections and zoonoses						
001	Cholera					
	Adults	Tetracycline 250 mg Oral Rehydr. Salts 1 liter required	2 caps	x 4	x 3	24 caps assume 4 sachets
	Children	Sulfameth/trim 400/80 mg Oral Rehydr. Salts 1 liter required	1 tab	x 2	x 3	6 tabs assume 3 sachets
002.0	Typhoid					
	Adults	Chloramphenicol 250 mg	3 caps	x 4	x 12	144 caps
	Children	Chloramphenicol 250 mg	1.5 caps	x 4	x 12	72 caps
	NB: Cases of typhoid should be reviewed at regular intervals					
004	Bacillary dysentery					
	Adults	Sulfameth/trim 400/80 mg	2 tabs	x 2	x 5	20 tabs
	Children	Sulfameth/trim 400/80 mg	1 tab	x 2	x 5	10 tabs
006	Amoebiasis					
	Adults	Metronidazole 250 mg	3 tabs	x 3	x 5	45 tabs
	Children	Metronidazole 250 mg	1 tab	x 2	x 3	6 tabs
007	Giardiasis					
	Adults	Metronidazole 250 mg	1 tab	x 3	x 5	15 tabs
	Children	Metronidazole 250 mg	1/2 tab	x 3	x 5	7.5 tabs
009.2	Acute diarrhoea, gastroenteritis					
	Severity 1 (no dehydration)					
	Adults	Oral Rehydr. Salts 1 liter required				assume 2 sachets
	Children	Oral Rehydr. Salts 1 liter required				assume 1 sachet
	Severity 2 (some dehydration)					
	Adults	Oral Rehydr. Salts 1 liter required				assume 6 sachets
	Children	Oral Rehydr. Salts 1 liter required				assume 2 sachets
	Severity 3 (severe dehydration)					
	Adults	Ringers infusion 500 ml	as required			assume 8000 ml
	Children	Ringers infusion 500 ml	as required			assume 1500 ml
	followed by ORS as in Severity 2, depending on status of the patient					
011	Pulmonary tuberculosis					
	Adults	Streptomycin Thioacetazone/INH 150/300 mg	inj 1 gram 1 tab	x 1 x 1	x 28 x 28	28 vials 28 tabs
	Children 12-24 kg	Streptomycin 20-40 mg/kg Thioacetazone/INH 150/300 mg	assume 0.5 g 1/2 tab	x 1 x 1	x 28 x 28	17 vials 14 tabs
	NB: Streptomycin is usually continued for two months and Thioacetazone/INH for twelve months					
	NB: Where adverse reactions to Thioacetazone/INH are high, ethambutol should be substituted					
	NB: Re-treatment of patients with proven resistance to INH should be undertaken by specialised, usually centralised control services. Frequently ethambutol and rifampicin will be needed for such cases.					
030	Leprosy					
	Starting dose					
	Adults	Deposone 100 mg				1/4 tab once weekly for 4 weeks; then 1/2 tab once weekly for four weeks, then slowly increasing to maintenance dose
	Maintenance dose					
	Adults	Deposone 100 mg				1 tab daily for life (spontaneous leprosy) 1/2 tab daily for minimal five years (borderline and tuberculoid leprosy)
	NB: in severe and/or resistant cases, provision of rifampicin and/or clofazimine should be considered.					
Viral and chlamydial infections						
052	Chickenpox	Chlorpheniramine 4 mg Calamine lotion	1/2 tab as required	x 3	x 6	9 tabs assume 50 ml
055	Measles					
	Severity 1	Paracetamol 500 mg	1/2 tab	x 4	x 2	4 tabs
	Severity 2	Procaine benzylpenicillin 3 MU Phenoxymethylpenicillin 250 mg Paracetamol 500 mg	inj 0.3 MU inj IM 1/2 tab 1/2 tab	stat x 4 x 4	x 5 x 4	1/10 vial 10 tabs 8 tabs
076	Trachoma	Tetracycline eye ointment 1%	apply	x 1	x 60	2 tubes 5 g

continued

Table 5.1A (continued)

ICD	INDICATION	DRUGS	DOSE	TIMES PER DAY	NO. OF DAYS	AMOUNT PER COURSE OF TREATMENT
Malaria						
084	Malaria					
	Severity 1					
	Adults	Chloroquine 150 mg base	4 tabs stat, then 2 tabs after 6 hours, then 2 tabs	x 1	x 2	10 tabs
	Children	Chloroquine 150 mg base	1 tab stat, then 1/2 tab after 6 hours, then 1/2 tab	x 1	x 2	2.5 tabs
	NB: In many countries tablets of 150 mg (100 mg base) are used, in which case the dosage schedule should be adopted NB: In children the proper dosage should be based on body weight (25 mg/kg) NB: In areas where there is known to be a significant frequency of chloroquine resistant <i>P. falciparum</i> locally appropriate drugs should be included.					
	Severity 2					
	Adults	Quinine 300 mg/ml (as hydrochloride) Quinine 300 mg	2 ml slow IV infusion (repeat after 8 and 16 hours), then 2 tabs	x 3	x 6	6 ml 36 tabs
	Children	Quinine 300 mg/ml (as hydrochloride) Quinine 300 mg	0.5 ml slow IV infusion (repeat after 8 and 16 hours), then 1/2 tab	x 3	x 6	1.5 ml 9 tabs
Veneral diseases						
080.7	Syphilis	Benzath benzylpenicillin 2.4 MU	2.4 MU inj IM	stat		1 vial
088.0	Gonorrhoea (areas with <1% penicillin resistance)	Procaine benzylpenicillin 3 MU Probenecid 500 mg	4.5 MU inj IM 2 tabs	stat stat		1.5 vial 2 tabs
	Gonorrhoea (areas with >1% penicillin resistance)	Spectinomycin 2 gram	2 gram inj IM	stat		1 vial
	NB: Allowance should be made for drugs to treat contacts					
098.4	Ophthalmia neonatorum	Tetracycline eye ointment 1% Procaine benzylpenicillin 3 MU	apply then then 75000 IU inj IM	x 24 x 8 x 4 x 2	x 1 x 1 x 6 x 3	 2 tubes 5 g assume 1/2 vial
Fungal infections						
110	Fungal skin infections	Benzole & Salicylic acid ointm	apply	x 3	x 10	tube 40 gram
112.1	Candidiasis, vaginal	Nystatin pessary 100 000 IU	1 pess	x 1	x 14	14 pessaries
Helminthic infections						
120.0	Schistosomiasis haematobia					
	Adults	Metriconate 100 mg	4.5 tabs stat, then repeat after 2 and 4 weeks			13.5 tabs
	Children	Metriconate 100 mg	1 tab stat, then repeat after 2 and 4 weeks			3 tabs
	NB: Praziquantel may be used as an alternative, in an average dose as for <i>S. mansoni</i>					
120.1	Schistosomiasis mansoni					
	Adults	Praziquantel 600 mg	4 tabs	stat		4 tabs
	Children	Praziquantel 600 mg	1 1/2 tabs	stat		1 1/2 tabs
120.2	Schistosomiasis japonica					
	Adults	Praziquantel 600 mg	3 tabs	x 2	x 1	6 tabs
	Children	Praziquantel 600 mg	2 tabs	x 1	x 2	4 tabs
123.3	Taeniasis (tapeworm)					
	Adults	Niclosamide 500 mg	4 tabs	stat		4 tabs
	Children	Niclosamide 500 mg	2 tabs	stat		2 tabs
	or:	Praziquantel 600 mg	1 tab	stat		1 tab
	Children	Praziquantel 600 mg	0.25 tab	stat		0.25 tab
125.3	Onchocerciasis (river blindness)					
	Severity 1 (light infections without severe eye complications BA only in cases with severe itching and/or dermatitis)					
	Adults	Diethylcarbamazine 50 mg	1 tab then 2 tabs then 4 tabs	x 1 x 1 x 1	x 1 x 1 x 5	23 tabs
	Children	Diethylcarbamazine 50 mg	1/2 tab then 1 tab then 2 tabs	x 1 x 1 x 1	x 1 x 1 x 5	11.5 tabs
	Severity 2 (high risk individuals with heavy ocular microfilarial load):					
	Adults	Suramin sodium 1 gram	wk 1: 0.2 g IV inj wk 2: 0.4 g IV inj wk 3: 0.6 g IV inj wk 4: 0.8 g IV inj wk 5&6: 1 g IV inj adapted dose			6 vials assume 2 vials
	Children	Suramin sodium 1 gram	adapted dose			
	NB: Treatment with suramin should always be preceded by treatment with diethylcarbamazine NB: Treatment with suramin sodium only to be given under close medical supervision					

continued

ESTIMATING DRUG REQUIREMENTS

Table 5.1A (continued)

ICD	INDICATION	DRUGS	DOSE	TIMES PER DAY	NO. OF DAYS	AMOUNT PER COURSE OF TREATMENT
125	Other Malarial Infections Adults	Diethylcarbamazine 50 mg	1/2 tab then 1 tab then 2 tabs then 3 tabs	x 2 x 2 x 2 x 3	x 1 x 1 x 1 x 11	106 tabs
126	Hookworm NB: Many of these patients will have iron deficiency anaemia, which may need additional treatment	Mebendazole 100 mg	1 tab	x 2	x 3	6 tabs
127.0	Ascariasis (roundworm) NB: Pyrantel could be used as an alternative	Mebendazole 100 mg	1 tab	x 2	x 3	6 tabs
Other parasitic infections						
131.0	Trichomonas, vaginal	Metronidazole 250 mg	10 tabs	stat		10 tabs
132	Pediculosis (lice)	Lindane 1% lotion		apply, repeat after one week		100 ml
133.0	Scabies	Benzylnbenzoate lotion 25%		apply	x 1	x 2 60 ml
2. ENDOCRINE, NUTRITIONAL AND METABOLIC DISORDERS						
250	Diabetes Mellitus Severity 1 (non-insulin dependent) Adults	diet Glibenclamide 4 mg	1-3 tabs	x 1	x 28	assume 56 tabs
	Severity 2 (juvenile onset and/or insulin dependent) Adults	Comp Insulin Zinc Susp	20-80 IU (av.60)	x 1	x 28	4.5 vials 400 IU
	Children	Comp Insulin Zinc Susp	10-50 IU (av.30)	x 1	x 28	2.1 vials 400 IU
250.3	Malnutrition Nutritional supplements to be decided locally					
264	Vitamin A deficiency, xerophthalmia Adults & Children >1 y	Vitamin A (retinol) 200000 IU		1 capsule stat, repeat after 1 day and 2-4 weeks		3 caps
265.9	Other vitamin deficiency Food or vitamin supplements to be decided locally.					
4. DISEASES OF BLOOD AND BLOODFORMING ORGANS						
280	Iron deficiency anaemia Adults	Ferrous sulfate (60 mg iron)	1 tab	x 3	x 28	84 tabs
	Children	Ferrous sulfate (60 mg iron)	1 tab	x 1	x 28	28 tabs
	NB: Iron dextran injection could be substituted in some cases					
282.5	Sickle cell disease Adults	Folic acid 1 mg		5 tabs weekly		20 tabs
	Children 1-5 y	Folic acid 1 mg		2 tabs weekly		8 tabs
	Children <1 y	Folic acid 1 mg		1 tab weekly		4 tabs
5. MENTAL DISORDERS						
290.9	Psychosis Adults	Chlorpromazine 100 mg	1 tab	x 3	x 7	21 tabs
	Children	Chlorpromazine 100 mg	1/4 tab	x 2	x 7	3.5 tabs
300.0	Anxiety neurosis	Diazepam 5 mg	1 tab	x 3	x 7	21 tabs
300.4	Depressive neurosis NB: Treatment with antidepressant drugs should be continued for at least one month	Imipramine 25 mg	1 tab	x 3	x 7	21 tabs

continued

Table 5.1A (continued)

ICD	INDICATION	DRUGS	DOSE	TIMES PER DAY	NO. OF DAYS	AMOUNT PER COURSE OF TREATMENT
6. DISEASES OF THE NERVOUS SYSTEM AND SENSE ORGANS						
345.0	Petit-mal epilepsy					
	Adults	Phenobarbital 50 mg	1 tab	x 3	x 28	84 tabs
	Children	Phenobarbital 50 mg	5-8 mg/kg/day assume 1/2 tab	x 3	x 28	42 tabs
345.1	Grand-mal epilepsy					
	Adults	Phenobarbital 50 mg or Phenytoin 100 mg	1 tab 1/2 tab	x 3 x 3	x 28 x 28	84 tabs 42 tabs
	Children	Phenobarbital 50 mg or Phenytoin 100 mg	5-8 mg/kg/day assume 1/2 tab 5-8 mg/kg/day assume 1/4 tab	x 3 x 3	x 28 x 28	42 tabs 21 tabs
345.3	Status epilepticus	Diazepam 10 mg/2 ml	10-20 mg slow IV inj stat			
372.0	Conjunctivitis	Tetracycline eye ointment 1%	apply	x 3	x 7	1 tube 5 g
380.1	Otitis externa					
	Adults	Aluminium acetate 13% drops Acetylsalicylic acid 300 mg	3-4 drops 2 tabs	x 4 x 4	x 5 x 1	10 ml 8 tabs
	Children	Aluminium acetate 13% drops Paracetamol 500 mg	3-4 drops 1/2 tab	x 4 x 4	x 5 x 1	10 ml 2 tabs
381.2	Otitis media					
	Adults	Sulfamethoximazole 400/80 mg Paracetamol 500 mg	2 tabs 2 tabs	x 2 x 4	x 5 x 2	20 tabs 16 tabs
	Children	Sulfamethoximazole 400/80 mg Paracetamol 500 mg	1 tab 1/2 tab	x 2 x 4	x 5 x 2	10 tabs 4 tabs
7. DISEASES OF THE CIRCULATORY SYSTEM						
390.8	Rheumatic heart disease					
	Adults & Children	Benzathine benz penicillin 2.4 MU	1.2 MU inj IM		once per month	1/2 vial
		NB: Treatment to be continued till the patient is 18 years of age, or for 5 years if that is longer				
401.5	Hypertension	Saltfree diet Hydrochlorothiazide 50 mg	1-2 tabs	x 1	x 28	56 tabs
410.4	Ischaemic heart disease	Glyceryl trinitrate 0.5 mg	1/2 tab	as required		assume 4 tabs
		NB: Patients with frequent attacks that do not respond to glyceryl trinitrate should be referred.				
455	Haemorrhoids	Hydrocortisone 1% ointment	apply as required			1 tube 15 g
459	Shock	Dextran 70	as required			assume 1 ltr
8. DISEASES OF THE RESPIRATORY SYSTEM						
460	Common cold, catarrh, sore throat					
	Adults	Paracetamol 500 mg	2 tabs	x 4	x 1	8 tabs
	Children	Supportive measures including fluids and regular review Paracetamol 500 mg	1/2 tab	x 4	x 2	4 tabs
463	Tonsillitis (bacterial, with adenitis)					
	Adults	Procaine benzylpenicillin 3 MU Phenoxyethylpenicillin 250 mg Paracetamol 500 mg	1 MU inj IM 2 tabs 2 tabs	stat x 4 x 4	x 5 x 1	1/3 vial 40 tabs 8 tabs
	Children	Phenoxyethylpenicillin 250 mg Paracetamol 500 mg	1 tab 1/2 tab	x 4 x 4	x 5 x 2	20 tabs 4 tabs
465	Acute bronchitis					
	Adults	Paracetamol 500 mg	2 tabs	x 4	x 1	8 tabs
	Children	Paracetamol 500 mg	1/2 tab	x 4	x 2	4 tabs
		NB: Most cases of acute bronchitis are viral and of a mild nature; usually no antimicrobials are necessary				

continued

ESTIMATING DRUG REQUIREMENTS

Table 5.1A (continued)

ICD	INDICATION	DRUGS	DOSE	TIMES PER DAY	NO. OF DAYS	AMOUNT PER COURSE OF TREATMENT	
480-6	Pneumonia	Severity 1 (moderate lower respiratory tract infection with cough, fast breathing but no chest indrawing):					
		Adults	Procaine benzylpenicillin 3 MU Phenoxymethylpenicillin 250 mg Paracetamol 500 mg	1 MU inj IM 2 tabs 2 tabs	stat x4 x4	x5 x1 x5	1/3 vial 40 tabs 8 tabs
	Children	Sulfamethoxazole 400/80 mg Paracetamol 500 mg	1 tab 1/2 tab	x2 x4	x5 x2	10 tabs 4 tabs	
		Severity 2 (severe lower respiratory tract infection with cough, fast breathing and chest indrawing):					
	Adults	Sulfamethoxazole 400/80 mg Paracetamol 500 mg	2 tabs 2 tabs	x2 x4	x5 x1	20 tabs 8 tabs	
		Children	Benzyl penicillin 3MU or Chloramphenicol 250 mg Paracetamol 500 mg	1 cap 1/2 tab	x4 x4	x5 x2	5 vials 20 caps 4 tabs
	NB: Chloramphenicol or ampicillin could be substituted as alternatives to sulfamethoxazole						
	491-2	Chronic bronchitis and emphysema	Tetracycline 250 mg	1 tab	x4	x5	20 tabs
			Paracetamol 500 mg	2 tabs	x4	x1	8 tabs
	493	Asthma	Severity 1				
Adults			Salbutamol 4 mg	1 tab	x3	x4	12 tabs
Children		Salbutamol 4 mg	1/4 tab	x3	x4	3 tabs	
Severity 2 (acute asthmatic attack):							
Adults		Epinephrine 1 mg/ml	0.5 mg slow sc inj stat			1 amp	
Children		Epinephrine 1 mg/ml	0.25 mg slow sc inj stat			1 amp	
9. DISEASES OF THE DIGESTIVE SYSTEM							
521.0	Caries, toothache	Acetylsalicylic acid 300 mg	2 tabs	x4	x2	16 tabs	
		Paracetamol 500 mg	1/2 tab	x4	x2	4 tabs	
522.5	Dental abscess	Phenoxymethylpenicillin 250 mg	1 tab	x4	x5	20 tabs	
		Acetylsalicylic acid 300 mg	2 tabs	x4	x2	16 tabs	
		Phenoxymethylpenicillin 250 mg	1/2 tab	x4	x5	10 tabs	
		Paracetamol 500 mg	1/2 tab	x4	x2	4 tabs	
528	Mouth sores	Gardan violet paint	apply	x3	x5	assume 10 ml	
535-6	Gastritis, heartburn, indigestion	Aluminium hydroxide 500 mg	2 tabs	x4	x3	24 tabs	
564.0	Constipation	Senna 7.5 mg	2 tabs	stat		2 tabs	
		Children	Senna 7.5 mg	1/2 tab	stat		1/2 tab
10. DISEASES OF THE GENITO-URINARY SYSTEM							
595	Cystitis	Severity 1 (isolated episode in adults):					
		Adults	Sulfamethoxazole 400/80 mg Paracetamol 500 mg	4 tabs 2 tabs	stat x4	x2	4 tabs 16 tabs
	Severity 2 (recurrent or non-responsive episodes in adults; all episodes in children)						
	Adults	Sulfamethoxazole 400/80 mg Paracetamol 500 mg	2 tabs 2 tabs	x2 x4	x10 x2	40 tabs 16 tabs	
		Children	Sulfamethoxazole 400/80 mg Paracetamol 500 mg	1 tab 1/2 tab	x2 x4	x5 x2	10 tabs 4 tabs
	NB: Ampicillin or nitrofurantoin could be substituted for sulfamethoxazole in Severity 2.						
	614	Pelvic inflammatory disease	Procaine benzylpenicillin 3 MU	4.5 MU inj IM stat			1.5 vials
			Probenecid 500 mg	2 tabs stat			2 tabs
Tetracycline 250 mg			1 tab	x4	x5	20 tabs	
Metronidazole 250 mg			2 tabs	x3	x5	30 tabs	

continued

Table 5.1A (continued)

ICD	INDICATION	DRUGS	DOSE	TIMES PER DAY	NO. OF DAYS	AMOUNT PER COURSE OF TREATMENT
11. COMPLICATIONS OF PREGNANCY, CHILDBIRTH AND PUERPERIUM						
634-B	Abortion	Ergometrine 0.2 mg/ml Ergometrine 0.2 mg	0.2 mg IM inj (may be repeated) 1 tab	x 3	x 3	assume 2 amp 9 tabs
650	Normal delivery	Ergometrine 0.2 mg/ml	0.2 mg IM inj	stat		1 amp
660-5	Abnormal delivery NB: For abnormal delivery referral to a hospital will usually be necessary	Ergometrine 0.2 mg/ml	0.5 mg IM inj	stat		2.5 amp
666	Postpartum bleeding	Ergometrine 0.2 mg/ml Dextran 70 infusion	0.5 mg IM inj (repeat, if necessary) as required	stat		assume 6 amp assume 1 lr
670	Major puerperal infection	Ampicillin 250 mg	2 caps	x 4	x 6	40 caps
675	Mastitis, breast abscess	Procaine benzylpenicillin 3 MU Phenoxyethylpenicillin 250 mg Paracetamol 500 mg	1 MU inj IM 2 tabs 2 tabs	stat x 4 x 4	x 2 x 1	1/3 vial 16 tabs 8 tabs
12. DISEASES OF THE SKIN AND SUBCUTANEOUS TISSUE						
680-2	Boil, abscess					
	Adults	Procaine benzylpenicillin 3 MU Phenoxyethylpenicillin 250 mg Paracetamol 500 mg	1 MU inj IM 2 tabs 2 tabs	stat x 4 x 4	x 6 x 1	1/3 vial 40 tabs 8 tabs
	Children	Procaine benzylpenicillin 3 MU Phenoxyethylpenicillin 250 mg Paracetamol 500 mg	0.3 MU inj IM 1/2 tab 1/2 tab	stat x 4 x 4	x 6 x 1	1/10 vial 10 tabs 2 tabs
		NB: In some cases surgical opening of the abscess and/or disinfection of the skin may be necessary				
684	Bacterial skin infection	Neomycin & Bacitracin ointment	apply	x 4	x 5	1 tube 20 g
691-B	Eczema	Hydrocortisone ointment 1%	apply	x 3	x 7	1 tube 15 g
692	Skin allergy					
	Adults	Chlorpheniramine 4 mg	1 tab	x 3	x 4	12 tabs
	Children	Chlorpheniramine 4 mg	1/2 tab	x 3	x 4	6 tabs
698	Itching	Calamine lotion	as required			assume 50 ml
707.9	Chronic tropical ulcer					
	Adults	Procaine benzylpenicillin 3 MU Phenoxyethylpenicillin 250 mg Gentian violet paint	1 MU inj IM 2 tabs apply	stat x 4 x 3	x 5 x 5	1/3 vial 40 tabs assume 10 ml
13. DISEASES OF THE MUSCULOSKELETAL SYSTEM AND CONNECTIVE TISSUE						
714-6	Arthritis and arthralgia					
	Adults	Acetylsalicylic acid 300 mg	2 tabs	x 4	x 5	40 tabs
724	Backpain, lumbago					
	Adults	Acetylsalicylic acid 300 mg	2 tabs	x 4	x 5	40 tabs
728	Pyomyositis					
	Adults	Chloramphenicol 1 gram Chloramphenicol 250 mg Acetylsalicylic acid 300 mg	1 g IM inj 2 caps 2 tabs	stat x 4 x 4	x 7 x 2	1 vial 56 caps 16 caps
	Children	Chloramphenicol 1 gram Chloramphenicol 250 mg Paracetamol 500 mg	0.25 g IM inj 1 caps 1/2 tab	stat x 3 x 4	x 7 x 2	1/4 vial 21 caps 4 tabs
16. SYMPTOMS, SIGNS AND ILL-DEFINED CONDITIONS						
780.3	Convulsions, tetanic					
	Adults	Diazepam 10 mg/2 ml	10-20 mg IV inj	stat		assume 2 amp
	Children	Diazepam 10 mg/2 ml	5-10 mg IV inj	stat		assume 1 amp

continued

ESTIMATING DRUG REQUIREMENTS

Table 5.1A (continued)

ICD	INDICATION	DRUGS	DOSE	TIMES PER DAY	NO. OF DAYS	AMOUNT PER COURSE OF TREATMENT
780.5	Insomnia	Adults Diazepam 5 mg	1 tab	x 1	x 14	14 tabs
780.8	Fever NEC	Adults Paracetamol 500 mg Children Paracetamol 500 mg	2 tabs 1/2 tab	x 4 x 4	x 1 x 1	8 tabs 2 tabs
780.7	Malaise, fatigue NB: Local decisions to be taken on whether drugs are to be provided for this group of symptoms					
784.0	Headache	Adults Acetylsalicylic acid 300 mg Children Paracetamol 500 mg	2 tabs 1/2 tab	x 4 x 4	x 1 x 1	8 tabs 2 tabs
786.2	Cough NEC	Adults Chlorphenamine 4 mg Children Chlorphenamine 4 mg or: Promethazine syrup 5 mg/5 ml	1 tab 1/2 tab 5 ml	x 3 x 3 x 3	x 2 x 2 x 2	6 tabs 3 tabs 30 ml
787.0	Vomiting	Adults Promethazine 25 mg Children Promethazine syrup 5 mg/5 ml	1 tab 5 ml	x 3 x 3	x 2 x 2	6 tabs 30 ml
788.0	Renal colic	Adults Pethidine 100 mg/2 ml	100 mg IM inj	stat		1 amp
789.0	Abdominal pain NEC	Adults Acetylsalicylic acid 300 mg Children Paracetamol 500 mg	2 tabs 1/2 tab	x 4 x 4	x 1 x 1	8 tabs 2 tabs
17. INJURY AND POISONING						
800-29	Fractures	Adults Acetylsalicylic acid 300 mg Children Paracetamol 500 mg NB: Other treatment and/or referral for further treatment will usually be necessary	2 tabs 1/2 tab	x 4 x 4	x 2 x 2	16 tabs 4 tabs
830-9	Dislocations	Adults Acetylsalicylic acid 300 mg Children Paracetamol 500 mg NB: Other treatment and/or referral for further treatment will usually be necessary	2 tabs 1/2 tab	x 4 x 4	x 1 x 1	8 tabs 2 tabs
840-8	Sprains and strains	Adults Acetylsalicylic acid 300 mg Children Paracetamol 500 mg	2 tabs 1/2 tab	x 4 x 4	x 1 x 1	8 tabs 2 tabs
850-4	Intracranial injury, concussion	Adults Acetylsalicylic acid 300 mg Children Paracetamol 500 mg NB: Other supportive measures or referral will usually be necessary	2 tabs 1/2 tab	x 4 x 4	x 2 x 2	16 tabs 4 tabs
870-90	Open wound, laceration, major cut	Adults Chlorhexidine conc sol 5% Lidocaine 1% 50 ml Acetylsalicylic acid 300 mg Children Chlorhexidine conc sol 5% Lidocaine 1% 50 ml Paracetamol 500 mg NB: Allowance should be made for tetanus toxoid to be given to patients with wounds	diluted as required as required 2 tabs diluted as required as required 1/2 tab	x 4	x 2	assume 1 ml assume 10 ml 16 tabs assume 1 ml assume 5 ml 4 tabs
879.9	Complicated open wound, animal or human bite	Adults Chlorhexidine conc sol 5% Procaine benzylpenicillin 3 MU Phenoxyethylpenicillin 250 mg Acetylsalicylic acid 300 mg Children Chlorhexidine conc sol 5% Procaine benzylpenicillin 3 MU Phenoxyethylpenicillin 250 mg Paracetamol 500 mg NB: Allowance should be made for tetanus toxoid to be given to patients with animal bites	diluted as required 1 MU inj IM 2 tabs 2 tabs diluted as required 0.3 MU inj IM 1/2 tab 1/2 tab	stat x 4 x 4 x 4 x 4 x 4	x 5 x 1	assume 1 ml 1/2 vial 40 tabs 8 tabs assume 1 ml 1/10 vial 10 tabs 2 tabs

continued

Table 5.1A (continued)

ICD	INDICATION	DRUGS	DOSE	TIMES PER DAY	NO. OF DAYS	AMOUNT PER COURSE OF TREATMENT
910-19	Superficial injury, bruise, minor cut Adults and children NB: Allowance should be made for tetanus toxoid to be given to patients with wounds	Chlorhexidine conc sol 5%	diluted as required			assume 1 ml
930	Foreign body in eye for diagnosis: for treatment:	Fluorescein eye drops 1% Tetracycline eye ointment 1%	apply a one drop in the eye apply	x3	x2	1 tube 5 g
940-9	Burns, all degrees Adults Children	Chlorhexidine conc sol 5% Acetylsalicylic acid 300 mg Chlorhexidine conc sol 5% Paracetamol 500 mg	diluted as required 2 tabs diluted as required 1/2 tab	x4 x4	x1 x1	assume 1 ml 8 tabs assume 1 ml 2 tabs
960-79	Poisoning Adults Children	Ipacacuanha 0.14% syrup Ipacacuanha 0.14% syrup	30 ml stat 15 ml stat			30 ml 15 ml
969.5	Snake bite, other stings and bites Snake bite NB: Referral to a specialist center may be necessary Insect bites and stings Adults Children	Antivenom sera Chlorhexidine conc sol 5% Chlorpheniramine 4 mg Chlorhexidine conc sol 5% Chlorpheniramine 4 mg	30-100 ml slow IV inj diluted as required 1 tab diluted as required 1/2 tab	x4 x3	x2 x2	assume 50 ml assume 1 ml 8 tabs assume 1 ml 3 tabs
996.0	Anaphylactic shock Adults Children NB: This treatment may be repeated, if necessary	Epinephrine 1 mg/ml Epinephrine 1 mg/ml	0.5 mg slow sc inj 0.25 mg slow sc inj			assume 1 amp assume 1 amp
OTHER HEALTH SERVICE CONTACTS						
V03-06	Vaccinations	See Expanded Programme of Immunization (EPI)				
V20	Under-five preventive care	Drug treatment, if necessary, to be decided locally				
V22-23	Antenatal care	Ferrous sulphate 60 mg iron with Folic acid 0.25 mg	1 tab	x2	x28	56 tabs per month
V25	Family planning, contraception	See Family Planning Programme				
V70	Medical Examination, no disease	Placebo treatment, if necessary, to be decided locally				
KEY						
benzath	benzathine	benzathine				
caps	benzylpenicill	benzylpenicillin				
conc		capsule(s)				
INH		concentrate				
cintrn		isoniazid				
oral rehydr salts		ointment				
sol		oral rehydration salts, ORS				
stat		solution				
sulfameth/trim		statim, immediately				
susp		sulfamethoxazole and trimethoprim				
		suspension				

Table 7.7

Calculation sheet for total quantities of each drug, number of order packs, and cost (completed)

1 Drug code number	2 Drug generic name, dosage form and strength	3 ICD code of health problem for which indicated & severity & age group	4 Total quantity for all standard treatments (in counting units)	5 Total quantity including allowance for wastage & loss	6 Order pack size - (number of units / pack)	7 Number of packs required (rounded to the nearest whole number)	8 Price per pack (\$)	9 Total cost	10 Percent of total cost
	acetylsalicylic acid tab 300 mg	: 521.0 A : 714.6 A : 724 A : 784.0 A : 789 A : 840.8 A : 940.9 A : TOTAL	: 326400 : 192000 : 96000 : 105800 : 48000 : 28800 : 38400 : 835200 tab	: 878960	: 1000	: 877	: 0.94	: 824.38	: 2.63
	aluminium hydroxide tab 500 mg	: 535.8 A+C	: 316900 tab	: 332640	: 1000	: 333	: 1	: 333	: 1.06
	benzyl benzoate lot 25% (g)	: 133.0 A+C	: 504000 ml	: 528200	: 1000	: 529	: 1.57	: 830.53	: 2.65
	chlorhexidine sol conc 5% (ml)	: 910.19 A+C : 940.9 A : 940.9 C : TOTAL	: 14400 : 4800 : 2400 : 21600 ml	: 22680	: 100	: 227	: 0.93	: 211.11	: 0.67
	chloroquine tab 150 mg base	: 084 S1 A : 084 S1 C : TOTAL	: 655200 : 69000 : 724200 tab	: 760410	: 1000	: 760	: 5.95	: 4522	: 14.45
	chlorphenamine tab 4 mg	: 786.2 A : 786.2 C : TOTAL	: 93600 : 32400 : 126000 tab	: 132300	: 1000	: 132	: 0.88	: 116.16	: 0.37
	ferrous sulfate tab 60 mg iron	: 280 A : 280 C : TOTAL	: 201600 : 33600 : 235200 tab	: 246960	: 1000	: 247	: 0.82	: 202.54	: 0.65
	indane cream 1% 25 g	: 132 A+C	: 18000	: 18900	: 100	: 189	: 30	: 5670	: 18.12
	mebendazole tab 100 mg	: 127.0 A+C	: 763200 tab	: 801360	: 100	: 8014	: 0.61	: 4888.54	: 15.62
	neomycin/bacitracin oin (tube 20 g)	: 684 A+C	: 360 tube	: 3780	: 1	: 3780	: 0.16	: 604.8	: 1.93
	oral rehydration salts pkt (1 litre)	: 009.2 S1: A : 009.2 S1: C : 009.2 S2: A : 009.2 S2: C : TOTAL	: 50400 : 18000 : 64800 : 28800 : 162000 PKT	: 170100	: 1	: 170100	: 0.04	: 6804	: 21.75

continued

Table 7.7 continued

Drug code number	Drug generic name, dosage form and strength	ICD code of health problem for which indicated & severity & age group	Total quantity for all standard treatments (in counting units)	Total quantity including absence for wastage & loss	Order pack size = (number of units / pack)	Number of packs required (rounded to the nearest whole number)	Price per pack (\$)	Total cost	Percent of total cost
	paracetamol tab 500 mg	: 460 A : 460 C : 521.0 C : 595 S1: A : 595 S2: A : 600-2 A : 600-2 C : 780.6 A : 780.6 C : 784 C : 789.0 C : 840-8 : 940-9 C : TOTAL	: 115200 : 48000 : 28800 : 80000 : 35200 : 19200 : 2400 : 57600 : 21600 : 2400 : 4800 : 2400 : 4800 : 422400 tab	: : : : : : : : : : : : : : 443520	: : : : : : : : : : : : : : 1000	: : : : : : : : : : : : : : 444	: : : : : : : : : : : : : : : 2.6	: : : : : : : : : : : : : : : 1154.4	: : : : : : : : : : : : : : : 3.69
	phenoxymethylpenicillin tab 250 mg	: 680-2 C : 680-2 A : TOTAL	: 96000 : 12000 : 108000 tab	: : : 113400	: : : 1000	: : : 113	: : : 7.51	: : : 848.63	: : : 2.71
	procaine benzylpenicillin inj 3 MU	: 680-2 A : 680-2 C : TOTAL	: 792 : 120 : 912 vial	: : : 957.6	: : : 1	: : : 958	: : : 0.24	: : : 229.92	: : : 0.73
	senna tab 7.5 mg sennosides	: 564.0 A : 564.0 C : TOTAL	: 19200 : 2400 : 21600 tab	: : : 22680	: : : 100	: : : 227	: : : 2.55	: : : 578.85	: : : 1.85
	sulfamethoxazole & trimethoprim tab 400 mg & 80 mg	: 515 A : 515 C : TOTAL	: 19200 : 96000 : 115200 tab	: : : 120960	: : : 1000	: : : 121	: : : 17	: : : 2057	: : : 6.57
	tetracycline eye oint 1% 5 g tube	: 372.0 A+C	: 19200 tube	: 20160	: 1	: 20160	: 0.07	: 1411.2	: 4.51
TOTAL COST								: 31287.06	: 100