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General Guidelines for a Manual on Drug Procurement and Distribution Appropriate for Developing Countries



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GENERAL GUIDELINES FOR A MANUAL ON DRUG
PROCUREMENT AND DISTRIBUTION APPROPRIATE
FOR DEVELOPING COUNTRIES

by

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CONTENTS

	<u>page</u>
1. Introduction	16
2. Background	17
3. Some options for centralized procurement and distribution systems	18
3.1 General considerations	18
3.1.1 Legal requirements	18
3.1.2 Establishment of procurement and distribution facilities	18
3.2 Procurement systems	19
3.2.1 Budgetary provisions	19
3.2.2 Bases for purchase	20
3.2.3 Procurement procedures	21
3.2.3.1 Overseas "brokers"	21
3.2.3.2 National procurement	21
3.2.3.3 Ethics of procurement	23
3.2.4 Contracts	23
3.2.5 Market intelligence	24
3.3 Distribution system	24
3.3.1 Organization	24
3.3.2 Layout and structure of stores	24
3.3.3 Storage	25
3.3.4 Store procedures	25
3.3.5 Inventory control	27
3.3.6 Security and accountability	27
3.4 Manpower resources	30
Appendices I to VIII	31

1. Introduction

1.1 The establishment of a special programme on essential drugs was a direct consequence of a WHA resolution in 1978 (WHA31.32) in which WHO was requested to cooperate with Member States in formulating drug policies and management programmes relevant to the health needs of populations, aimed at ensuring access by the whole population to essential drugs at a cost countries can afford.

Clear cut national drug policies have first to be formulated, since no drug management system is workable in the absence of such policies. In developing drug management systems or improving on existing ones, four problem areas have been identified, namely:

- 1) Selection and determination of requirements of essential drugs;
- 2) Procurement;
- 3) Distribution;
- 4) Utilization.

While the first problem area has received much attention and generated much activity, leading to the concept of an essential drugs list and its acceptance and implementation in many countries thus testifying to its usefulness, the second and third problem areas have retarded the efforts of some countries to improve curative services and to provide Primary health care in rural areas - peripheral areas have been termed the front-line areas in a country's health system. In any country situation, it is necessary that the selection of essential drugs and the requirements be determined as the first step to considering systems of procurement and distribution.

1.2 This paper seeks to focus on guidelines for the establishment and strengthening of national programmes relating to the above-mentioned two areas of concern by summarizing current prevailing systems being practised, by indicating some major advantages and disadvantages of alternative approaches and by detailing the main requirements in terms of facilities, procedures, and manpower resources to implement and operate these suggested systems.

1.3 To be of practical use, these guidelines would require reactions and opinions from relevant staff, e.g., pharmacists, in the health care field who are involved in these activities. Such reactions and opinions could be reviewed prior to finalization of the guidelines.

2. Background

2.1 Procurement and distribution systems now practised by developing countries can be grouped into five main types, viz:

1) Centralized procurement by a monopolistic state agency for distribution through separate public and private logistic infrastructure. This has been practised in view of the need to optimize expenditure on drugs and to conserve foreign exchange. It has been shown to restrict very severely the activities of the national pharmaceutical industry and can only be sustained in countries with centrally planned economies where price control of drugs in the country is required by the government.

2) Centralized procurement by a single government agency for distribution in the whole public sector, whilst the private sector has its own separate system. In such cases, although the private sector operates freely, it is subject to control in respect of the types of drugs that may be imported and sold. There is also a variation on this system where the agency is an autonomous one set up by the government but operating in competition with the private sector.

3) Centralized procurement by a single government agency for distribution to a majority of public sector institutions, whilst the private sector has its own separate system. Control may be placed over the private sector in respect of the types of drugs that may be imported and sold. In such cases, there are other public sector agencies which make their own arrangements.

4) Decentralized procurement by both public and private sector institutions from the private sector, supply being made through the private sector infrastructure. The countries are those where there has been no centralized procurement by the government. However, the expansion of health services into the rural areas will be hampered if the private sector deems it unprofitable to operate in the periphery.

5) Partial centralized procurement by government agencies in urban areas for distribution to urban institutions. The rural areas where there are some private outlets may be covered by decentralized procurement from such outlets. No service is possible in the absence of such outlets.

2.2 The above-mentioned variations on the theme go to prove the influence of past colonial rule and present political leadership in this important area of drug management. In many cases, rural health infrastructures were, in the past, completely lacking as importance was placed on the exploitation of natural resources by the colonial masters and coverage in health care was in the urban areas and in those rural areas where large organized plantation or mining activities were carried out.

2.3 In formulating a national drug management policy in developing countries, it is increasingly appreciated that centralized multi-sources procurement and distribution in the public sector are important to ensure sufficient supplies of drugs throughout the country and economies in drug prices. In countries where supply to government institutions is decentralized, it is increasingly appreciated that centralized purchase would lead to better prices and centralized distribution would ensure sufficiency of stocks. In such countries, centralized purchase is arranged for private sector distribution to government institutions as a first step to a complete centralized procurement and distribution system. However, in cases where private sector supply to public institutions is to be replaced by a government system, feasibility in terms of resources, both financial and managerial, should be established prior to instituting changes.

2.4 Planning cannot be done from zero base or in a vacuum as existing situations have to be considered in the expansion of health care facilities. Planning of procurement and distribution systems must be done within the context of overall health planning and the development of procurement and distribution infrastructures could be developed together with development of curative and preventive infrastructures throughout the country. Such development should not take second place but have equal, if not higher, priority than building of hospitals and health centres. Another possibility in planning such systems is to make use of the existing infrastructure, e.g., rural hospitals, and to build the necessary facilities around these institutions. Each country situation will be different and, therefore, the implementation of plans would have to be different. This paper can only attempt to establish guidelines which may be applied in plans for implementation.

2.5 While major consideration is given to drug management, it should be noted that experience in some countries has shown the desirability and feasibility of including other medical supplies such as surgical dressings and surgical instruments into the scheme as well as local formulation capabilities.

3. Some options for centralized procurement and distribution systems

3.1 General considerations

3.1.1 Legal requirements. In the context of individual countries, it has to be confirmed whether or not legal provisions are necessary for operation of a procurement and distribution system. This is particularly important if policy planners decide to cover both public and private sectors in their schemes.

3.1.2 Establishment of procurement and distribution facilities. These will have to be determined on the basis of:

- i) The area, the population and the existing institutions, e.g., health centres or hospitals to be served;
- ii) The type of procurement and distribution system to be used, viz:
 - a) whether there will be one main central procurement and distribution point at national level, sub-distribution points at state level and receiving points at district and rural levels; or
 - b) whether there will be one main central procurement and distribution point at national level, other subsidiary regional procurement and sub-distribution points at regional level and receiving points at district and rural levels; or

- c) whether there is another level of sub-distribution at the hospital level in the system as in b).

The three systems are summarized in Appendix 1.

- iii) The size of such facilities will depend on the workload, on whether there will be a local formulation facility to be developed at the same time and on whether medical supplies should be included in the scheme. Drugs can be purchased, stored and supplied in many forms, e.g., in powder form, liquid form or packed dosage form, and the floor space requirements would not be the same. Moreover, if medical supplies are included, items such as plastic dispensing containers and bottles would be items which could not be stacked high and which would occupy space. The circulation area (which has been estimated at 40 per cent of the storage area) has to be considered and this will vary if mechanical aids are used in moving and storing materials. If the flow of material movement is not smooth, then the area used for circulation will be even greater.
- iv) The choice of an entry point in a country, where the central procurement and distribution facility would be located, should be governed by:
 - a) local availability of essential utilities and services;
 - b) entry point with good security arrangements; and
 - c) rapid clearance procedures.

The last two factors are important as pharmaceuticals are a class of very "attractive" items with high demand. To avoid losses from theft, pilferage and deterioration at entry points, it may be considered necessary to have special storage and clearance procedures. The location of other points in the distribution system will also be dependent on factors such as utility infrastructure, road, rail and air connexions, proximity to other health facilities, etc.

3.2 Procurement systems

3.2.1 Budgetary provisions. There are two possible ways of budgeting for the drugs that are to be procured and later distributed. Under the "allocated store" system (allocated stores being those charged to a particular budgetary item) the annual (or two-yearly) budget for drugs is used in procuring supplies, which are then issued out without charge. There is no requirement to cost the drugs on receipt. This means that procurement action is initiated after the budget is approved and has to be completed by the close of the financial year; any carry over of stocks undelivered at the close of accounts would have to be accounted for in the following year's budget. Restriction of budget will not permit purchase of drugs over the budget allocation. In the "unallocated store" system (these are stores not immediately chargeable to any particular budgetary item), the drugs bought are charged to a revolving trust fund created for the purpose by the legislature and are held in an "unallocated store". When the drugs are issued, a particular budgetary item or provision is debited and the trust fund credited. Although this system involves more financial transactions and procedures, purchase under the revolving trust fund will enable year-round, and therefore more effective, purchasing action. It will also enable a higher level of purchase to be achieved provided the turnover of the stores is good. Longer term contracts can be entered into and in that way prices could be maintained for longer periods. However, for small systems, this method may not be feasible from the cost/benefit point of view. If policy requires charges to be levied for drugs in the health care system, then the unallocated stores system, which requires drugs to be costed before they are taken on charge or issued, is more appropriate. Depending on a particular government policy, overhead costs for operations of the store may be added as an "on-cost" charge and the quantum will also depend on the prevailing government financial procedures. Basically, there are three options for costing of these stores, as follows:

- i) The cost of the new supply is averaged with the remainder of the stock at the old price.

- ii) The cost is taken in at a standard cost of the item, this standard cost being determined and operative for a specified period. Any excesses or shortages arising from this type of costing procedure are put into a price variation account.
- iii) The cost of the new supply is only averaged with the old stock if it is less than or exceeds 10 per cent. Otherwise, any differences are treated as in ii) above.

If there is a formulation unit operating jointly, then raw materials issued for jobs will be debited to a manufacturing account and a flat rate on cost may be added according to government financial procedures. However, for purposes of price comparison and to determine whether an item should be purchased or produced, more accurate costings may be made which should include costs for:

- i) Raw material and packing material;
- ii) Direct labour;
- iii) Factory overheads, viz:
 - a) Indirect labour, e.g. quality control, maintenance staff;
 - b) Plant maintenance;
 - c) Utilities, e.g., water, power, rents;
 - d) Depreciation of plant;
 - e) Uniforms.

3.2.2 Bases for purchase. The main bases on which purchases may be made at varying prices are as follows:

i) Net delivered basis

The price paid (normally in the national currency) includes delivery to specified point(s) and payment is made after satisfactory delivery and acceptance of the material. In many instances, financial procedures used in the public sector may require payment after receipt of goods and this basis of purchase will be in line. However, the price paid will also include insurance and freight charges, duties and clearing charges at point of clearance and transport to the delivery point. It could be considered for organizations which are starting purchasing operations and may not have the capacity or ability to clear goods at the point of entry. It is also a simpler system because payment is only made for material received and there is no involvement in claims procedures with the insurers.

ii) F.O.B. basis (free on board)

The supplier is paid after the goods are proven to be loaded on board the vessel at the port of loading, the payment being effected through letters of credit which the purchaser must establish after an order is placed and before arrangements are initiated for supply. Shipping and insurance arrangements are the responsibility of the purchaser and, in some cases, the purchasing countries appoint forwarding agents to handle this. They may also operate their own insurance fund. Variance in actual prices paid may arise due to this type of payment made in currencies other than the national currency. This form of purchasing is normally used for large volume, high price purchases, e.g., tanks, vehicles, etc., and for those countries that operate shipping lines which they would require the supplier to use. Pharmaceuticals should be shipped on first available vessels to avoid undue storage at ports.

iii) C.I.F. (cost, insurance, freight)

The supplier may be paid after documents are handed over to show the shipment of goods on a vessel due at the port of discharge. The clearance procedures are the responsibility of the purchaser and the price will be lower than the net delivered price. Claims procedures will normally be the responsibility of the purchaser.

iv) C and F basis (cost and freight)

The supplier may be paid after documents are handed over to show the shipment of goods on a vessel due at the port of discharge, and the purchaser is responsible for clearance from port. In such cases, the government operates its own insurance fund and therefore claims are made by the purchasing agency under the claims procedures laid down by government. A certificate of indemnity against total or partial loss may be issued on request from suppliers or shippers. The purchasing agency however has to pay, to the Government Insurance Fund, an agreed premium which may or may not be higher than the commercial insurance rates, based on value of the order.

3.2.3 Procurement procedures

3.2.3.1 Overseas "brokers"

Purchases can be undertaken by some overseas organizations. After the country has determined the specifications and quantity of drugs required to be purchased, the task is passed on to the overseas "broker". Examples of such organizations are:

i) Purchasing offices

There are cases where the country establishes a purchasing in the country of the ex-colonial master. This development might arise due to the wider expertise available and the wider access to world markets of an overseas office. Purchase would normally be on a CIF basis.

ii) International organizations

Organizations such as WHO and UNICEF also perform limited purchasing services for some countries. WHO has a scheme for emergency purchases (not exceeding the value of US\$ 25,000) of essential supplies and equipment required to combat an unforeseen, serious and immediate threat to public health. For non-emergency reimbursable purchases, before WHO can make a commitment to a supplier on behalf of any country, funds equal to the total cost estimated by WHO have to be deposited to the credit of the Organization. UNICEF also operates non-emergency purchases on the same lines. In both cases, a scale of commission charges (up to 3%) is levied on the purchase, together with a contingency charge of 10%. Funds are normally required to be made available in convertible currencies and adjustments are made after purchasing action is completed.

iii) Others

Other organizations include Crown Agents which service overseas governments in many fields, including purchasing. A scale of commission charges is levied on purchases depending on the value. It operates its own Marine Insurance Fund and payment is effected on shipment of goods against the purchasers' accounts with the organization in London. Purchases are normally on CIF basis. There are also bodies, like the International Dispensary Association (IDA) in the Netherlands and ECHO (Equipment to Charity Hospitals Overseas) run by the Joint Mission Hospital Equipment Board Limited in the United Kingdom, which operate purchasing and supply schemes for charity hospitals and clinics overseas.

3.2.3.2 National procurement

The first requirement for a centralized procurement system is that it be based on a definite standard list of drugs. In the absence of such a list and the approximate requirements over a certain period of time, it would not be feasible to try to operate such a system efficiently and economically. It is also important to establish correct and explicit specifications that would not exclude any adequate brand and which should be sufficiently general to permit the choice based on cost. Inclusion of a requirement for

the supplier to furnish product certificates under the WHO Certification Scheme would be a step in ensuring the quality of imported drugs. Some countries are establishing their own quality control laboratories or are cooperating in establishing regional laboratories.

In considering the setting up of a national central procurement unit, due cognizance must be taken of the fiscal and administrative policies and procedures of the government to ensure that suggested operations and their procedures do not conflict. As an example, the financial procedures relating to purchases may be classified as follows:

- i) Casual purchases up to an annual aggregate expenditure of US\$ 2,000. Authority is given to certain classe of officers to purchase.
- ii) Local quotation purchases up to an annual aggregate expenditure of US\$ 10,000. These quotations may be requested from not less than five suppliers with the following requirements:
 - a) Standard forms, indicating all the details of requirements, are used by all tenders;
 - b) The tenders must be marked in a standard manner to enable identification;
 - c) Submission to be prior to a stated date and deposited into a tender box;
 - d) Standard procedures are followed in opening, marking and scheduling the quotations for consideration by an appointed Quotations' Committee.
- iii) Purchases by tender where annual aggregate expenditure is more than US\$ 10,000.

Requirements for forms, marking of tender bids, closing dates, submission and standard procedures in opening, marking and scheduling etc., as stated for local quotation procedures, are also followed in the case of Tender Purchases.

Tenders may be invited at national level for participation of local firms (or agents) and also may be invited, at the same time, from overseas firms who wish to supply (in such cases, the form and terms of payment might be different and will have to be taken into consideration). Such direct supply from overseas will also have to conform with national legislation covering importation of poisons, narcotic drugs etc. The local bids may, in accordance with national policy, be given a degree of preference. There may be a scheme for registration of tenders whereby their financial capability, their "track records" are known and "open" tenders are for all registered tenders to participate in. Another type is the "restricted tender" where, since only one or two suppliers are able to supply, so the tender is restricted to these tenders. Membership of the Tender Board would normally include:

- a) Administrative officer in charge of financial matters;
- b) Technical head of service;
- c) Representative from the Treasury and Ministry of Industry

and the Board is advised by relevant officers or subcommittees that may be set up. There would be detailed financial procedures laid down which may or may not limit the Board's authority, e.g., if the total value exceeds US\$ 2 million, specific recommendations may have to be cleared with Treasury. Similarly, in cases between US\$ 900,000 and US\$ 2 million, the Board's decisions may have to be cleared by another special committee within the same Ministry. Provision may be made to require that approval be sought from Treasury where there was no consensus in the Board's decision on a particular item, regardless of cost. All these financial procedures will contribute to the time required to purchase the drugs. Tender bids are normally required to be held valid for a period of time, e.g., three months, in order that these procedures may be completed. The main procedures between determination of the quantity and type to purchase and placement of the order would be:

- 1) Quantity and specifications of requirements determined;
- 2) Tenders called;
- 3) Tenders closed;
- 4) Bids received and studied and valid ones scheduled;
- 5) Schedules (without prices) sent for evaluation from technical aspect;
- 6) Schedules (with prices) evaluated from financial and "track record" aspects;
- 7) Schedules and evaluation reports considered by Tender Board;
- 8) Depending on value, Tender Board's decisions are forwarded for necessary higher approval, e.g., Treasury;
- 9) Approval received;
- 10) Letters of offer or rejection sent to tenders;
- 11) After receiving necessary financial bonds, contracts are signed (different value contracts may require different levels of officers authorized to sign according to financial procedure);
- 12) Copies of contracts sent to purchasing unit;
- 13) Purchase orders issued.

iv) Purchase may also be possible through negotiation which will be conducted by the Treasury. This would be for items where there is only one source of supply.

3.2.3.3 Ethics of procurement

Procurement implies management in purchasing and the main tenets of ethics in purchasing are:

- i) Loyalty to the service;
- ii) Justice to those with whom the officer deals.

While it is important to have checks and counterbalances within a procurement system to eliminate any possibility of undue influence, they should not lead to a complicated, inflexible, bureaucratic and time-consuming system which may be counter-productive to the objectives of centralized procurement. It is equally important to have persons of integrity as managers of such programmes.

3.2.4 Contracts

Contracts that are signed between the supplier and the government procurement agencies can either be period contracts (where an approximate quantity can be purchased over the contract period), or be quantity contracts (for purchase of a specified quantity). In general, period contracts are more advantageous to the purchaser in that the supplier is obligated to supply at contract prices over a period of time and also the procedures of finalization of a contract do not have to be repeated frequently. Also, there are the means to order in sufficient quantities for use without having to tie up space and capital in storage. The other essential details of a contract are:

- i) The specifications of the material and approximate quantity;
- ii) The contract price, e.g., whether CIF, net delivered, etc.
- iii) The delivery period;
- iv) Removal by supplier of rejected goods;
- v) Power of buyer to purchase in default;
- vi) Inferior quality of drugs and liquidated damages;
- vii) Prohibition of transfer of contract or sub-letting;
- viii) Terms of payment by buyer;
- ix) Service of notice;
- x) Gifts;
- xi) Indemnity cover for workmen's compensation, damage to buildings or patents;
- xii) Bankruptcy of supplier;
- xiii) Price escalation clause;
- xiv) Force majeure clauses are often included which may operate to excuse a party from a contract due to an unexpected and disruptive event.

It is important in any procurement set-up that there is feedback from the receiving sections and the end user concerning the performance of the supplier from the point of view of adherence to contract conditions, whether they be quality, delivery or any specifications. This will assist the Tender Board in its deliberations and will ensure an efficient procurement system.

3.2.5 Market intelligence

This is an important tool for efficient procurement. As already mentioned, there should be evaluation from financial as well as technical aspects. Market intelligence is required for both these aspects and may be obtained mainly by continuing survey and analysis of:

- i) Producers, their manufacturing practices and production capacities;
- ii) Price trends;
- iii) Reliability of quality;
- iv) New drug information;
- v) Information on product efficacy;
- vi) Information on adverse drug reactions or toxicity.

3.3 Distribution systems

3.3.1 Organization. A possible organization for the central store is suggested in Appendix II. The responsibilities of the various sections are self explanatory but the workload of some would depend on decisions taken on the alternative posed in previous paragraphs, namely:

- i) The Finance/Accounts section would have to be larger if the unallocated stores system is operated with its costing, price adjustment and charging functions;
- ii) The Clearance and Collection section would have to be larger if the goods are not bought on a net delivered basis;
- iii) The Packing and Despatch Section would have a bigger workload if supplies had to be delivered to regional/state stores instead of these being collected;
- iv) If medical supplies are included in the scheme and if there is formulation activity carried out, then there will be a need for different sections to cater for issue/receipt of these items as well as a need for extra staff for costing purposes for the formulation unit (the administration of the unit can be slotted under the Head).

For the smaller stores, due to decreased workload, some of the sections could be combined, but basically the same functional organization could be applied.

3.3.2 Layout and structure of stores. Stores layout should be planned bearing in mind that the movement of materials is to be as free flowing as possible. Ideally, the flow of material all on the same floor should be unidirectional with receiving and checking at one end, then storage and distribution and packing and despatch at the other end. This may not be feasible for small size stores and Appendix III describes three possible layouts for stores that can be considered. In the second type, the office is located in a mezzanine floor on top of the packing/despatch and receiving/checking areas but this office overlooks the entire store area. Small private offices' type of layout should be avoided and strong wire mesh frames can be used for the partitioning of store areas. There will need to be special sections which have to be accommodated within the layout, viz:

- i) Cold Room for vaccines (3°C - 6°C);
- ii) Cool Room for antibiotics etc. (15°C - 18°C);
- iii) Freezers for certain vaccines, e.g., polio, measles (-20°C);
- iv) Narcotics strong room.

The critical nature of temperature requirements and maximum storage times especially for vaccines is shown by the table (from the Expanded Programme on Immunization) Manual Bk 1) in Appendix IV.

Separate buildings are necessary for corrosive liquids like phenols etc., and inflammable stores for storage of spirits and alcohol. A small inflammable store can be a simple, very well ventilated shed on a concrete base or a large building which automatically operate at raised temperatures. The store buildings should be well ventilated throughout, well lit and well secured and be in a compound with only one gate. For ease of loading and unloading, the particular receiving and despatch areas should be on the same level as the height of a lorry floor.

For security purposes, the fence should be 7 to 8 feet high and its lower edge embedded in concrete. There should be flood lighting around the perimeter. All lock keys used in the store can be in duplicate and kept as follows:

- i) One set in the office safe of the Head;
- ii) One set in the key cupboard in the office of the Head where storekeepers can take them out for the day and replace them at the end of the day.

Depending on the procedures adopted, there can be master keys for the various sections of the store, to be kept by the Head for emergency use only.

Fire extinguishers should be available at strategic points throughout the store and should also include powder type extinguishers for oil fires. Fire Services requirements have to be sought and followed in all cases.

3.3.3 Storage: Mention has been made of the optimum conditions which should be striven for. Physical storage location of the supplies within the store should be fixed in that each item should be stored at a definite location (identified by code, e.g., Area 1A, 2A, 3A etc., according to the columns of the store building etc.) and such locations should appear in the store records. Which items should be at which location is governed by factors such as:

- i) Difficulties in handling, e.g., bulky, heavy;
- ii) Frequency of receipts and issues;
- iii) Normal total quantity in stock;
- iv) Fragility.

Except in the case of bulk stores where stocks may be kept and stacked on wooden pallets themselves or on pallet racking using fork lift trucks, other areas of the store need shelving which has the following advantages:

- i) Gives free access to stocks;
- ii) Protects stock;
- iii) Aids stock control;
- iv) Aids stock rotation.

Special sections of the store, e.g., cold room, cool room, narcotics strong room, would have to be provided in the central and possibly the regional store, but would not be necessary for the smaller stores in hospitals, clinics etc.

3.3.4 Stores procedures. Procedures used should ensure that a complete record of all receipts and issues is maintained and, arising from these transactions, that the charges for items received are paid for and, if the unallocated store system is being operated, the items received are duly costed and those supplied are charged to the receiver. Procedures adopted should be such that accountability and verification should be possible on the records at all levels of the distribution chain. Code numbers can be used for identification in stores procedures and to facilitate issues, receipts, costing and other accounting procedures. Simple coding can be used utilizing seven digits as follows:

<u>Section Code</u>	<u>Article Code</u>	<u>Packing Code</u>
01	001	01

Different section codes can be used for different groups, e.g., tablets, injections, biological products, narcotics, etc.

The following are basic forms that are used:

- i) Receipt vouchers showing:
 - a) Item number;
 - b) Name of article;
 - c) Code number;
 - d) Quantity received;
 - e) Unit;
 - f) Supplier;
 - g) Supporting documents, e.g. invoices, bills of lading etc.;
 - h) Receiving officer.

- ii) Issue vouchers showing:
 - a) Item number;
 - b) Name of article;
 - c) Code number;
 - d) Quantity issued;
 - e) Unit;
 - f) Recipient;
 - g) Budgetary item and provision for supply to be charged;
 - e) Issuing officer.

- iii) Requisition voucher - this is submitted at regular intervals, e.g., every quarter, and would have all the details as in the issue voucher together with details of the quantity which had been used during the period concerned as well as the stock balance at the time of requisition. In some cases, it might be necessary to have a periodic statement with details of use of the drugs and the balance to be attached to the requisition voucher. This may be used to determine the quantity to be issued and also may be used in stock taking procedures at the end of the year. In many cases, the issue and requisition voucher can be combined. However, both vouchers must be duly authorized by designated officers.

- iv) Stores Ledger - particulars which could be kept in loose leaf books, card index files or visible card system - would be:
 - a) Name of article;
 - b) Code number;
 - c) Unit;
 - d) Cost;
 - e) Maximum stock;
 - f) Minimum stock;
 - g) Re-order point;
 - h) Date;
 - i) Receipt voucher or Issue voucher;
 - j) Name of supplier or indenter;
 - k) Quantity - Received
 - Issued
 - Balance
 - l) Officer making the entry;
 - m) Stock on order;
 - n) Stock issued in past quarter(s) and year(s);
 - o) Stock received against orders in past quarter(s) and year(s);
 - p) Economical order quantity.

In large stores where the ledger is maintained in the Finance/Accounts section and where the officer responsible for inventory control is located within the store, a separation of the records necessary for inventory control and purchasing from the ledger records is made. In this case, card records are kept showing receipts, issues as well as stock movement over the past quarter(s) and year(s). A record is also kept on suppliers in these cards as well as the batch numbers of the drugs supplied and also their prices. Here also other data such as re-order quantity, periodical demand, as well as the reserve or buffer quantity are maintained.

- v) Claim Forms. These accompany receipt vouchers in cases where claims have to be made by the Finance Section on suppliers, insurance fund, shippers etc. for damaged supplies, short packing or unacceptable supply. It is normal that the complete supply is taken on charge so that costing is done on the total supply and the portion of the supply under claim is charged out to a claims or suspense account. If a claim for damaged supply will be met by a supplementary supply by the original supplier, then the stores receipt voucher may be delayed until complete supply is received.
- vi) Bin card or Tally card. These cards are used only when:
 - a) The store records are not being kept in the store itself, or
 - b) In big stores where the store-keeper is not responsible for both the store records and the stores themselves, or
 - c) In sections of stores which receive, store and issue in bulk in complete cases, cartons etc.

The necessary details are:

- a) Name of article
- b) Code number
- c) Date
- d) Receipt
- e) Issue
- f) Balance
- g) Officer receiving or issuing.

All the above procedures are basic to any distribution system. However, all the levels indicated in Appendix 1 would not be operating the whole gamut of what has been described in this sub-paragraph. If an unallocated store system is being operated, costing is only at central level. At state level there is no costing as such but the cost of supplies made has to be known. No costing is necessary below this level unless the budget is operated based on programmes where the curative and preventive services are two separate programmes with separate budgets. At the user level, e.g., at the hospital pharmacy, the health centre dispensary or the clinic level, there cannot be this accountability right down to actual numbers of tablets. Here, issue might be tracked in units of 100 for dispensing purposes and only in the case of expensive drugs or narcotics is there recording for each individual tablet received and issued. It has been stated that 100% accurate inventory in such user level does not confer any cost benefit.

Flow charts showing basic procedures for purchasing, receiving and issuing are shown in Appendices V, VI and VII. As indicated in previous paragraphs, these procedures have to be dovetailed into, or amended so as to be consistent with, national financial or audit procedures that are mandatory in such operations. Therefore only basic steps are indicated in the charts.

3.3.5 Inventory control. Inventory covers the range and volume of material held in any area and inventory control involves all aspects of movement and storage of these materials whether drugs, medical supplies etc. The system for inventory control is a very important and integral part of the procurement and distribution system in that it must be able to monitor stock levels, rate of utilization at the end point, and utilization trends or patterns. Operational or procedural changes and advances in chemotherapy must also be

borne in mind. All these factors together with the "lead time" are relevant for adjustment of stock levels to enable the supply organization to have the right quantity of the right material at the right place in the right time.

An analysis of the value of annual turnover (cost of purchases plus cost of issues) of the items on the inventory will show that only a relatively small percentage of items account for a large proportion of the annual expenditure.

All drugs should be classified so as to enable the stock controller to identify those "expensive" items which normally form a small proportion of the inventory. The stock controller can then decide, bearing in mind the organization capacity and the resources available, to monitor more closely certain "critical" groups of items as shown from the analysis.

Control data used in inventory control are:

- i) Minimum stock level - the lowest level of stock to avoid nil stock;
- ii) Maximum stock level - the highest level to avoid overstocking;
- iii) Re-order level - the level of stock at which fresh orders have to be placed;
- iv) Re-order quantity - the quantity to be ordered;
- v) Buffer quantity - the quantity that must be kept in stock to avoid stock shortages due to usage or lead time variations. The quantity to be kept at hospital or other lower levels may be influenced by weather conditions, e.g., distribution may be only possible during the dry season (6 months) of the year.
- vi) Lead time - the sum total of time taken for the following:
 - a) Administrative procedures;
 - b) Production;
 - c) Shipping;
 - d) Receipt and checking;
 - e) Storage ready for issue.

A basic and theoretical control system is shown in Figure A in Appendix VIII where the stock levels are maintained such that when supply against a new order is received, the stock is just exhausted. Here fixed orders are placed at the time of re-order. Patterns of supply and demand are not always that regular for consistent and lead time is subject to variations which would upset the basic system.

Variation in lead time and usage leading to stock shortages can be avoided by maintaining a buffer stock where the re-order levels are increased. Figure B in Appendix VIII shows such a control system. It is found that high buffer stocks are necessary to give a satisfactory level of service in drug inventory control but as the maximum stock level is necessarily increased, a balance is necessary between the costs of holding stock and the costs of deteriorated or date expired stock. In some cases, an index of inventory control efficiency is derived from the annual cost of stock write off expressed as a percentage of total stock holdings or total stock turnover.

From Figures A and B in Appendix VIII, it will be appreciated that for drugs where the usage is variable and lead time is quite lengthy, there should be a continuous review system of stocks (theoretically each time there is an issue or receipt) against the re-order level; the order placed is not a fixed quantity order but a variable one based on factors such as lead time, utilization trends and patterns, utilization rates as well as advances in chemotherapy.

When a subsidiary store is indenting on a central store which would be absorbing a major part of variance in lead time and maintaining sufficient stock levels, a periodic review of stock levels for purpose of re-ordering can be used to order the difference in quantity between a pre-set maximum level of stock and the stock in hand, such order quantities being variable. In a variation of this topping up system, there is another possibility where no orders are placed if, at the time of review, the stock is above the re-order level. Although less work is involved in this method, the danger is that at the next review point in time the level may have dropped to one dangerously below the re-order level.

Special records can be kept for date expiry items where all receipts and issues are tracked, commencing 6 months prior to the expiry date, in a special register by the stock controller. As a further indication of the special status, the bin or tally cards for these items can be of a different colour to those for other items.

3.3.6 Security and accountability. Mention has been made of measures to maintain physical security against theft and fire but other relevant factors are:

- i) Every store officer must be made personally, financially responsible for the stores under his control;
- ii) There must be directives regarding defined procedures and regulations covering:
 - a) Receipt of stores, taking over of stores, issue of stores;
 - b) Authorization of receipts, payments, claims;
 - c) Authorization of write offs due to damage on receipt, on storage and date of expired items;
 - d) Maintenance of stores ledgers;
 - e) Maintenance of bin cards;
 - f) Claims procedures;
 - g) Returning of unused stores;
 - h) Determination of overhead costs;
 - i) Maintenance of stock accounts and financial accounts;
 - j) Reconciliation of stock;
 - k) Issue rate;
 - l) Surpluses and deficiencies;
 - m) Annual tabular summary;
 - n) Write off and disposal procedures;
 - o) Stock verification:
 - Appointment of stock verifiers;
 - Responsibilities of stock verifiers;
 - Inspection reports;
 - Action on inspection reports
- iii) The area of responsibility of store-keepers in stores should be defined e.g., in a particular section of a store, the store-keeper in charge is entirely responsible for his section;
- iv) Duties and responsibilities of each grade of officer within the store organization should be laid down. As an example, those for store-keepers basic grade would be:
 - a) Job title - store-keeper, basic grade;
 - b) Supervising officer - store-keeper, senior grade;
 - c) Job summary - to carry out all receiving storage and issuing as directed in accordance with policies and procedures defined;
 - d) List of duties:
 - Receive
 - Check the quantity and the condition
 - Date item on receipt
 - Put into store
 - Record
 - Issue on first out basis and record
 - Deliver supplies
 - Cleaning and dusting
 - Control and direct store staff under his control
 - Keep records of attendance of such staff
 - Any other duties
- v) Accountability is also fixed through the system of record keeping throughout the various levels of the distribution chain. However, as an additional safeguard against "security breaches" of pilferage and/or theft, requirements may be placed on suppliers to supply tablets specially embossed to indicate Government property. Any local Government-produced pharmaceuticals can also bear such a mark which can be registered as trade mark. Although the same requirements may be put

down for capsules, this condition may be difficult for tentative suppliers to adhere to. Two factors of additional cost and possible delay in delivery for such marked items being purchased have to be balanced with the need for such markings and its deterrent effect. In the case of the Government production facility, such markings are as integral a part of the product as the means of production e.g., the tablet punch, would have been purchased bearing such embossment without much additional cost.

- vi) Additional security against suppliers supplying sub-standard goods is provided by requiring that the suppliers formally certify on the copy of the purchase order that the quality of the goods supplied is according to the contract. In such cases, this is additional to the contract which has been signed for supply of items of a particular quality.

3.4 Manpower resources

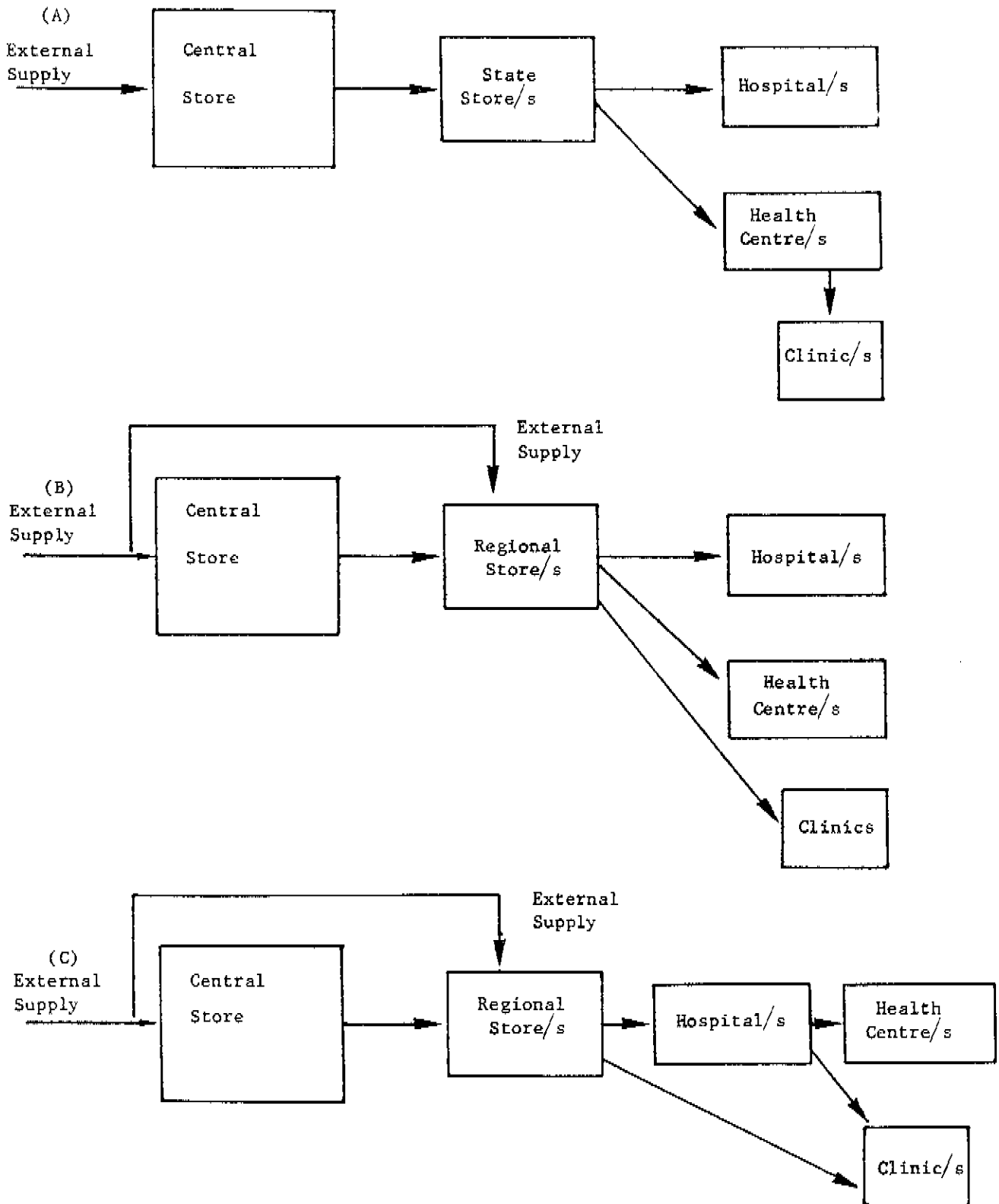
In a hospital setting, it is generally acknowledged for drug supply management that the pharmacy is a department in which there is considerable variation from the general scheme of supply organization as the "goods" handled are largely of a nature which makes accurate inventory at that point difficult; and purchasing and inventory control requires special knowledge of drugs, their manufacture and utilization. It therefore follows that in any procurement and distribution system, the appropriate responsible officer could be the professionally trained pharmacist. He could be an officer who graduated from the "school of hard knocks" or be one who has received short formal training in supply management. Financial procedures for casual purchases and local quotation purchases may be delegated to the Head of the store organization in charge of procurement and distribution but the Tender Boards are normally located outside the store organization with their own secretariat. Some stages of work in processing of tenders are handled by this secretariat as these tasks only require administrative expertise. Based on particular organizational set ups, such secretariat services could, with advantage to the efficiency and effectiveness of the procurement and distribution system, be supervised by the pharmacist in charge of the store organization. In such cases, requirements are determined by the Inventory Control section and thereafter processed by the sections serving as secretariat to the Tender Board until the final contracts are signed (see paragraph 3.2.3.2 (iii)). Total responsibility for both procurement and distribution under one management would eliminate overlap of responsibilities by two separate agencies or two individual officers within the same responsible national agency. Training in supply management is offered on payment basis by such organizations as Crown Agents whose Supplies and Materials Management Course covers all the activities of supply and aims to equip middle and senior management personnel to be able to develop existing supply procedures, plan new supply systems and integrate existing but diversified activities.

Basic store-keeping functions could be undertaken by personnel with secondary school background who could be given short basic in-service training in store keeping and store accounting procedures prior to starting work. The scheme of service could be so structured that these officers are required to pass further departmental examinations on store-keeping and store accounting prior to movements to higher grades or prior to consideration for promotion. There can be various grades e.g., senior grade store-keepers who can perform supervisory duties as an assistant to the Head or Superintendent.

However, it may not be feasible for every level at which drugs are managed to have store-keepers, as the workload at these levels would not be required to be handled by a separate grade of staff like the storekeeper. In countries where there is the para-medical grade of dispenser or pharmacy technician (who has undergone local training courses), such officers are available at all levels of the health care system to dispense drugs and, at the peripheral small clinics and centres, they could undertake store-keeping duties which will account for only a small proportion of their working time. In such cases, store-keeping and store accounting should also be subjects in their training curriculum.

Appendix I

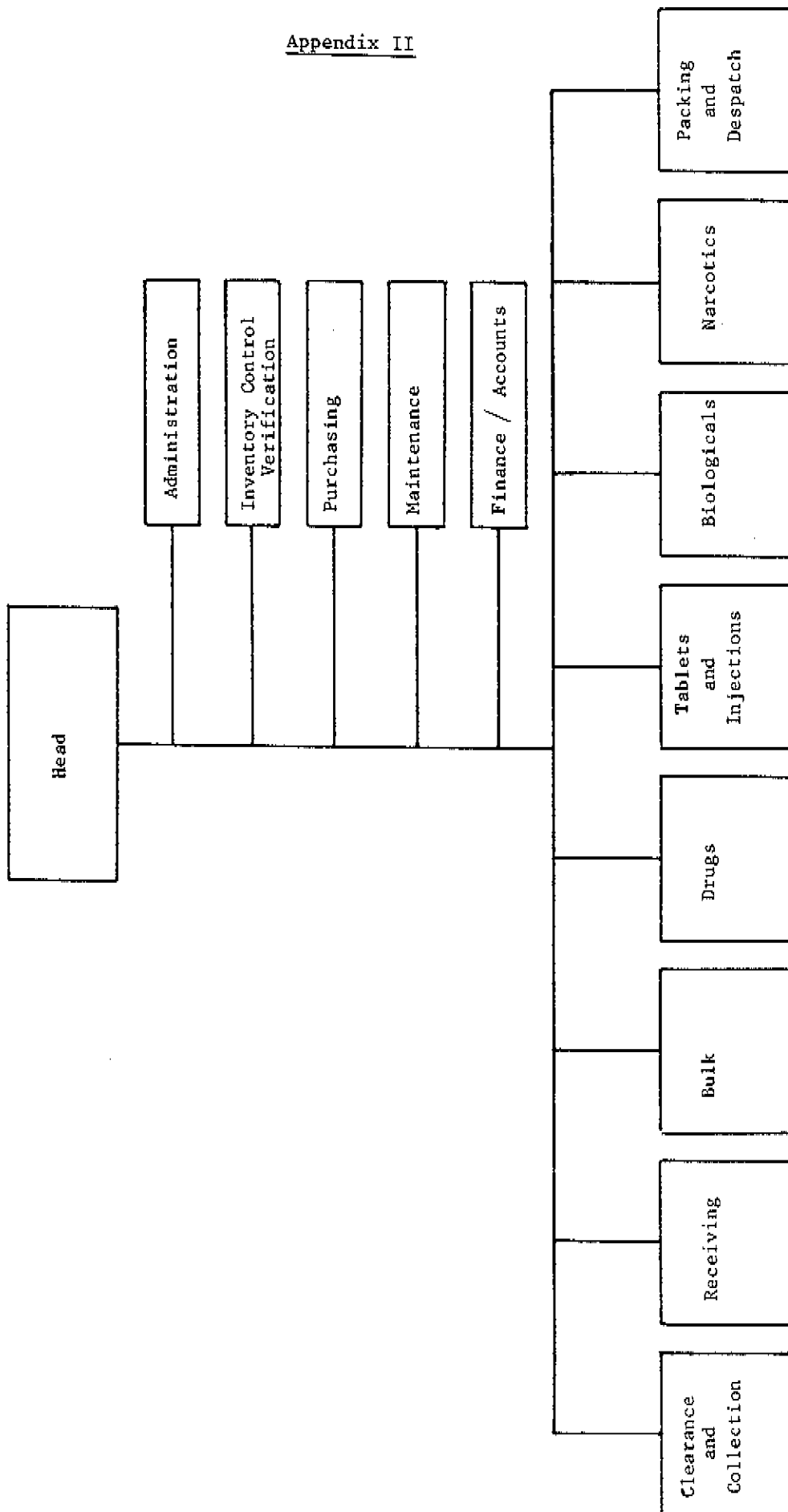
TYPES OF PROCUREMENT AND DISTRIBUTION SYSTEMS



Appendix II

DISTRIBUTION SYSTEM

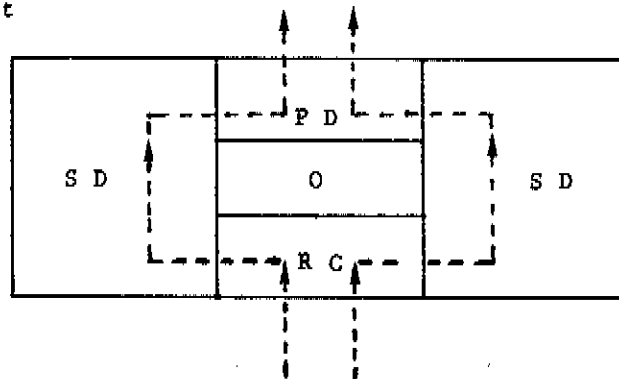
Functional Organization of Central Stores



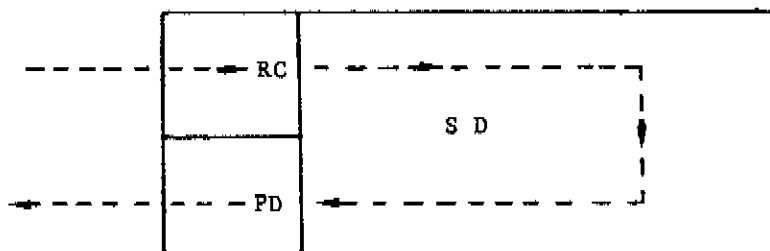
Appendix III

POSSIBLE LAYOUT OF STORES

(A) One Floor layout

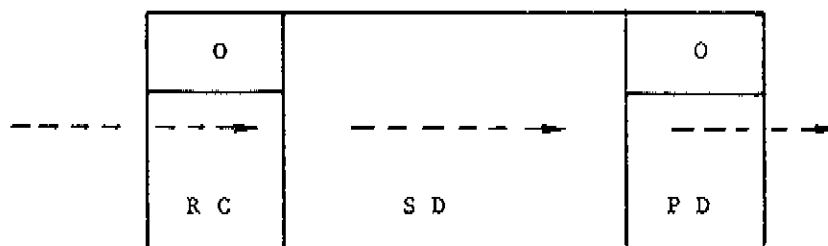


(B) Two Floor layout



On top of the RC and PD sections is the mezzanine floor of the office which overlooks the whole store area.

(C) One Floor layout



Note:

Arrows indicate flow of supplies

Key:

- O = Office
- RC = Receiving and Checking Section
- PD = Packing and Despatch Section
- SD = Storage and Distribution Section

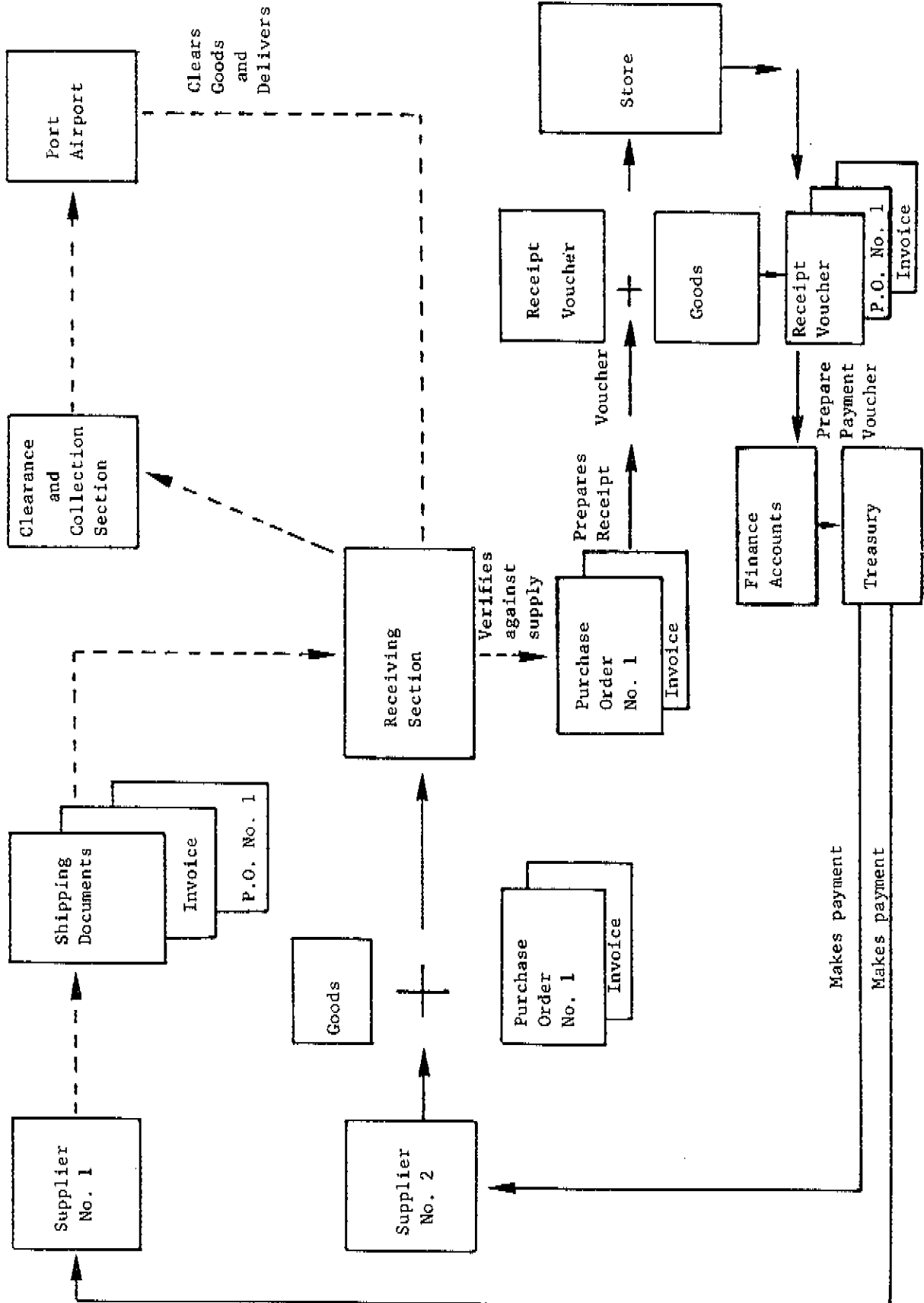
Appendix IV

TEMPERATURE REQUIREMENTS AND MAXIMUM STORAGE TIMES

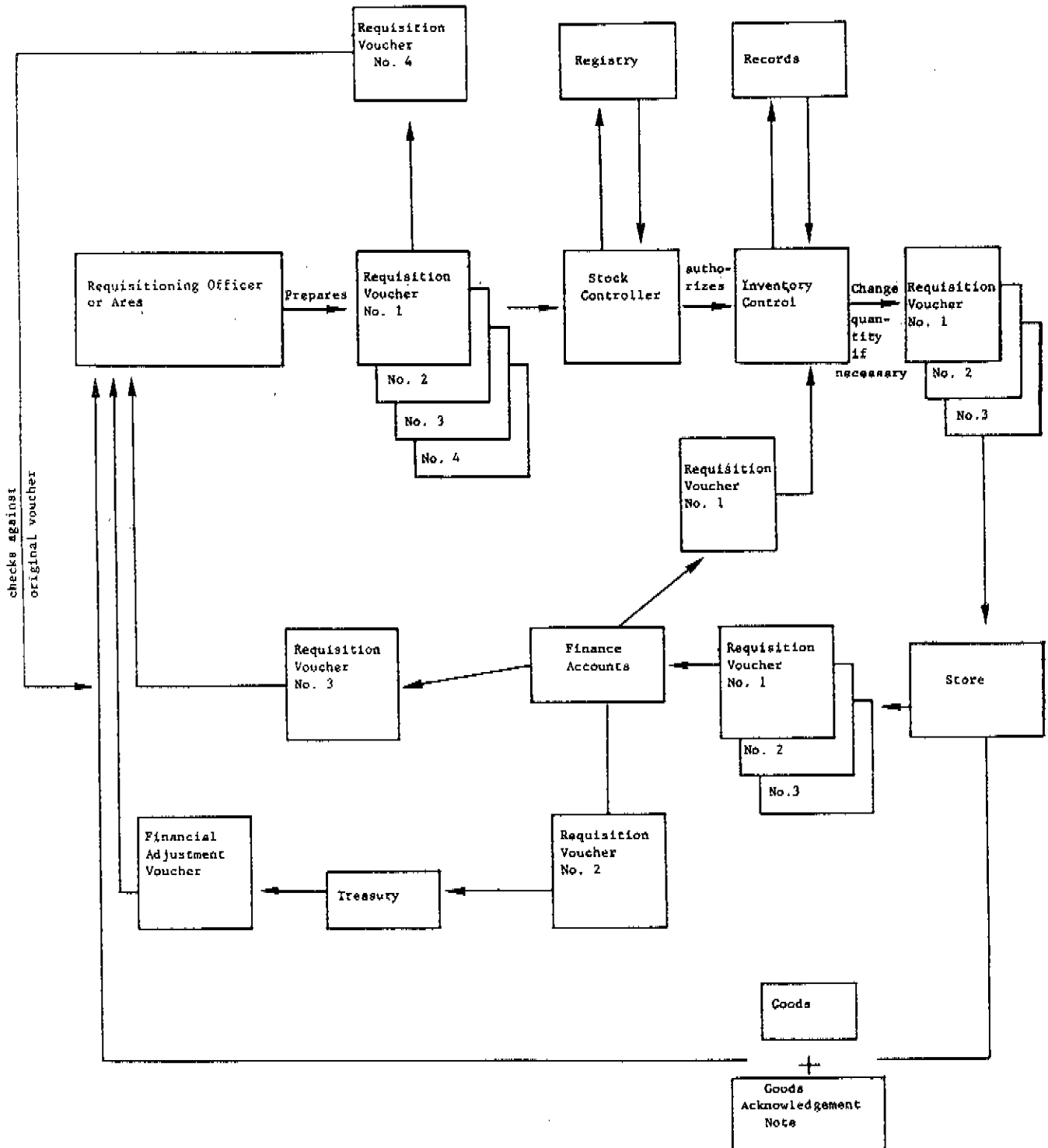
	Central Store	Transport to Region	Regional Store	Transport to District	Static Unit	Mobile Team
Yellow Fever	8 months at -20°C	-20° to +8° C	3 months at -20°C	-20° to +8°C	1 month at +4° to +8°C	1 week at +4° to +8°C
Measles	2 years at -20°C	-20° to +8° C	3 months at -20°C	-20° to +8°C	1 month at +4° to +8°C	1 week at +4° to +8°C
Polio (oral)	2 years at -20°C	-20° to +8° C	3 months at -20°C	-20° to +8°C	1 week at +4° to +8°C	1 week at +4° to +8°C
BCG	8 months at +4° to +8°C	+4° to +8° C	3 months at +4° to +8°C	+4° to +8°C	1 month at +4° to +8°C	1 week at +4° to +8°C
DPT	1.5 years at +4° to +8°C	+4° to +8° C	3 months at +4° to +8°C	+4° to +8°C	1 month at +4° to +8°C	1 week at +4° to +8°C
Tetanus	1.5 years at +4° to +8°C	+4° to +8° C	3 months at +4° to +8°C	+4° to +8°C	1 month at +4° to +8°C	1 week at +4° to +8°C

Appendix VI

RECEIVING FLOW CHART

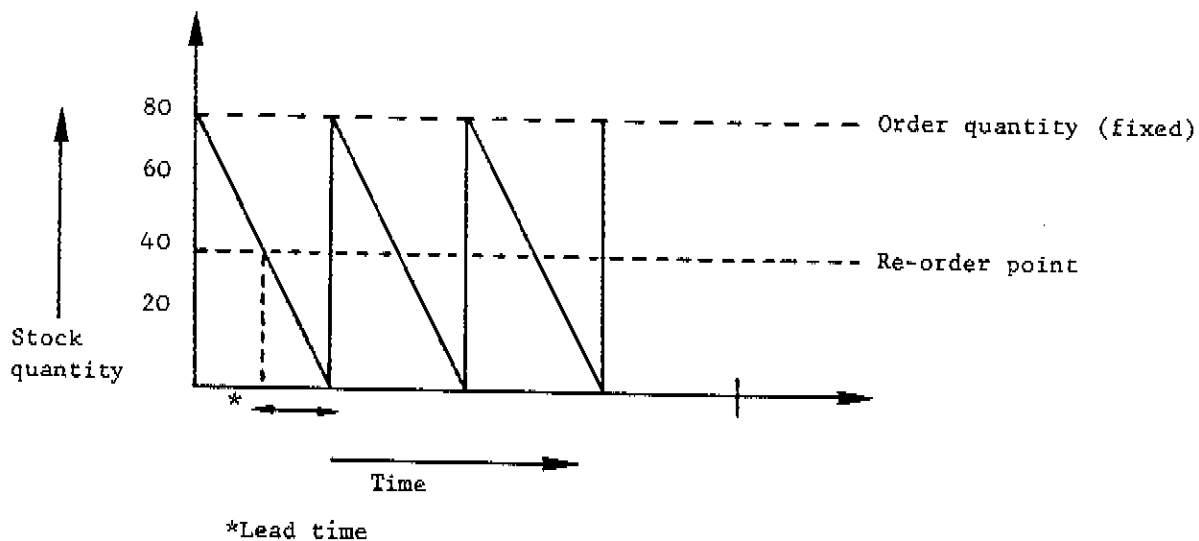


Appendix VII
ISSUING - FLOW CHART

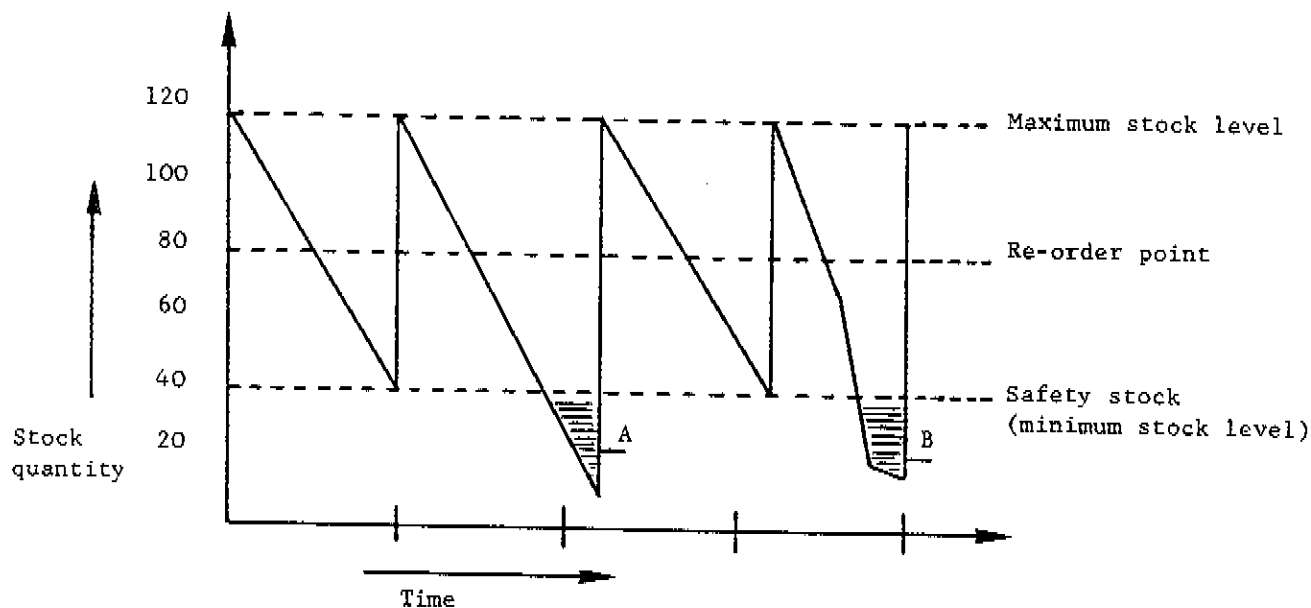


Appendix VIII
INVENTORY CONTROL

(A) Basic system



(B) Basic system incorporating Safety stock (Buffer quantity to prevent shortages)



A = Variation in Lead Time (Delay)
causing stock to fall below minimum stock level

B = Heavy usage causing stock to fall
below minimum level