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**ASSESSMENT OF JAMAICAN
PUBLIC SECTOR PHARMACEUTICAL SYSTEM**

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GLOSSARY

NOTE: The words *pharmaceuticals* and *drugs* are used interchangeably throughout this report.

AID	Agency for International Development
BDS	Barbados Drug Service
CARICOM	Caribbean Community
CAST	College of Arts, Science, and Technology
CDPU	Central Data Processing Unit
CIF	Cost, insurance, and freight
CRDTL	Caribbean Regional Drug Testing Lab
DPS	Director of Pharmacy Services
EC	Eastern Caribbean
ECDS	Eastern Caribbean Drug Service
GOJ	Government of Jamaica
HMIP	Health Management Improvement Project
IBRD	International Bank for Reconstruction and Development
JCTC	Jamaica Commodity Trading Company
JSI	John Snow International
KPH	Kingston Public Hospital
MOF	Ministry of Finance
MOH	Ministry of Health
MSH	Management Sciences for Health
NFPB	National Family Planning Board
OECS	Organisation of Eastern Caribbean States
OHNP	Office of Health, Nutrition & Population
OTC	Over the counter (drugs)
PAHO	Pan American Health Organization
PC	Primary Care
PHC	Primary Health Care
PIOJ	Planning Institute of Jamaica
PSOJ	Private Sector Organization of Jamaica
STD	Sexually Transmitted Diseases
USAID	United States Agency for International Development
UWI	University of the West Indies
VEN	Vital, Essential, Necessary

CURRENCY: All figures are presented in Jamaican dollars, unless otherwise noted. Figures related to the current fiscal year (89-90) are converted at a rate of \$6.5J=\$1US, the most recent government devaluation announced during November, 1989. Trends impacted by the devaluation of the Jamaican dollar have not been presented in this report. EC dollars are valued at \$2.7EC=\$1US and Barbados dollars are converted at \$2B=\$1US; since most comparative figures for these countries are for the most recent period, they have been converted to Jamaican dollars at the 6.5 rate.

POPULATION: Where per capita figures are calculated, it is assumed that Jamaica has a population of 2.5 million; Barbados has a population of 270 thousand; and the ECDS serves a population of 500 thousand in the OECS region.

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SCOPE OF WORK

Following is the scope of work for the two person team, as revised during their visit to Jamaica from October 30 through November 15, 1989.

The overall purpose of this consultancy was to assess the current system of drug procurement and distribution for the Jamaican Public Sector, and to make recommendations for systematic improvements.

Specifically the consultant team will:

A. Assess the current system of drug selection, procurement and distribution in Jamaica's public sector and analyze its effectiveness.

B. Determine the feasibility of Jamaica replicating aspects of models provided by other drug service agencies in the English-speaking Caribbean, particularly the Barbados Drug Service (BDS) and the Eastern Caribbean Drug Service (ECDS).

C. Where time permits and information is available, identify where improvements can be made in the areas of financial management and planning; human resource management and manpower planning; public tendering; procurement and procurement planning; inventory control; distribution; other aspects of logistics; pricing, marketing, and cost recovery; prescribing patterns and compliance.

D. Provide recommendations to USAID and the MOH on alternative courses of action to achieve greater cost-effectiveness in the selection, procurement, warehousing, distribution, and utilization of pharmaceuticals in Jamaica.

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This report presents an overall assessment of selection, procurement, and distribution of pharmaceuticals in Jamaica's public sector. The assessment identifies numerous problems in the supply system that are well known to those working in that system, and the information presented here is based on discussions with those individuals or upon reports provided to us. There was a dearth of dependable quantifiable data on the performance of the supply system, which is itself a major problem in the system. We all recognize that the pharmaceutical supply system has had to contend with two major underlying constraints: inadequate funding and inadequate human resources. Many of the problems identified here are a result, at least in part, of these two major constraints.

Jamaica's public sector pharmaceutical system can be divided into three separate segments that operate with relative independence: the University Hospital, the National Family Planning Board (NFPB), and the Ministry of Health (MOH) through Island Medical Stores (IMS). Although we will briefly describe and contrast the University Hospital and NFPB systems, our focus is on the MOH/IMS system where most of the money is spent and most of the problems exist.

As a two-person consultant team, we were selected because of our experience with essential drug programs and the establishment of drug services in the Caribbean. Although we have worked with drug supply systems in other Caribbean countries, both the MOH and USAID had a particular interest in learning about our experience with two other agencies: the Barbados Drug Service (BDS) and the Eastern Caribbean Drug Service (ECDS). One team member was primarily responsible for the establishment of the BDS which serves Barbados public sector and, to a lesser extent, its private sector; the other team member was primarily responsible for the establishment of the ECDS which serves the Ministries of Health (MOH) in seven of the member countries of the Organisation of Eastern Caribbean States (OECS).

Because of the interest in the BDS and the ECDS, we have attempted to draw comparisons and contrasts throughout this report between these two agencies and the situation in Jamaica. In some cases the comparisons are designed to illustrate situational differences that make replication of effective elements of another system infeasible here in Jamaica. In other cases they are intended to illustrate what might be a viable alternative for Jamaica, given the experience at BDS or ECDS. Where elements of the other systems have not seemed relevant to the Jamaican situation, we have not discussed them; however a paper that was presented in Trinidad comparing these two agencies with the Jamaican situation is attached here as an annex. Another paper comparing ECDS with a semi-autonomous agency of the MOH in Haiti, providing essential

drugs to the public and non-profit sectors, is available through USAID/Jamaica.

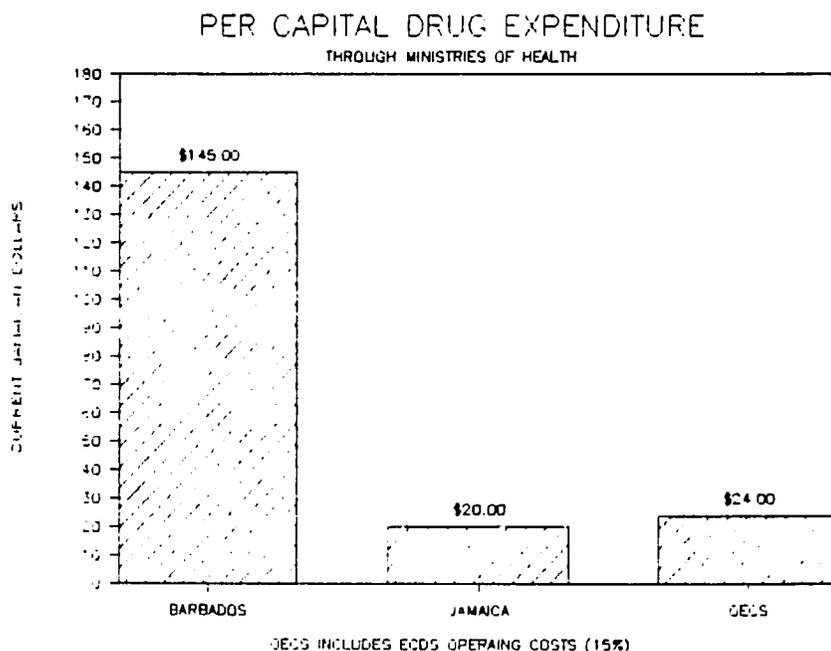
However there are some major differences between the Jamaican situation and the systems in Barbados and the OECS region which warrant discussion here.

First, there are major differences between per capita drug expenditure in the three systems, particularly between Barbados and the other two systems. The OECS region figures include the operating costs for ECDS (i.e. 15% over drug costs), so they are in fact comparable to the Jamaican per capita expenditure. (See figure 1.)

Second, neither the BDS nor the ECDS do any warehousing and distribution, which is a major problem area in the Jamaican system. BDS pays suppliers an addition 32% over CIF prices to provide this service in Barbados. The MOH could consider the possibility of contracting out the IMS to the private sector which might be considered an adaptation of the Barbados model.

Third, BDS also provides a Special Benefits Service (SBS) under which the Barbados government pays the private sector costs plus profit margins to provide contracted formulary drugs free of charge to the eligible population in private pharmacies; the elimination of the co-payment element of SBS is the major reason for the rapid rise in drug costs through BDS/MOH in Barbados, and replication of this scheme in its current form is not advisable in Jamaica. The SBS, as it was originally intended to operate in Barbados, might be considered for Jamaica in the future, but the recommendations made below are higher priorities.

FIGURE 3



In addition to recommendations based on the models presented by BDS and ECDS, we have made other recommendations that in some cases have almost become cliches in drug supply management generally. Many of these recommendations have been made before both by those working inside the system and others who have been invited to assist the MOH. Nevertheless, these recommendations warrant repeating: implementation of such things as better inventory management systems will not be a simple task, but it should be the basic skeleton of a supply management system. These are areas where long-proven technical solutions to supply management problems exist, and it is essential that adequate management control and planning systems for the procurement and redistribution of drugs be implemented immediately. Otherwise, the MOH may find that five years from now the World Bank loan funds slated to cover the capital costs of filling the drug pipeline (i.e. built up reserve stocks) will have disappeared in the form of funding for the MOH's annual recurrent costs in drug supply. National debt will increase, but the same problems will exist once the drugs purchased with loan funds have passed through the supply system.

While the recommendations given here are based upon our own analysis and conclusions, they should also frequently reflect the opinions of some of the managers working in the system. Where they do not, or where there is no consensus of opinion among those working in the supply system, we suggest that these recommendations be used to generate debate about these or alternative solutions that MOH managers identify. In some cases the recommendations may be controversial: we hope that any controversy will ultimately result in constructive changes for the MOH supply system.

Following is a summary of major findings and priority recommendations:

1. The major increase in the drug budget over the past fiscal year (i.e. from \$38,000,000J to \$56,000,000J) indicates significant political will to improve the service level provided through the MOH. *Political will is an essential ingredient for the success, as proven with BDS, ECDS, and essential drug programs elsewhere.*
2. While Jamaica still has a relatively low per capita budget for public sector drug supply (i.e. \$20J per capita) compared with averages in Barbados and the OECS countries, *Jamaica's current per capita level of expenditure has been shown to be adequate for the provision of essential drugs in some of the best-managed MOH systems in the English-speaking Caribbean.*
3. *User fee policies must be revised.* Potential changes include: charge higher fees to private patients; charge higher fees to insured patients; eliminate all exemptions for private and/or insured patients; include the comprehensive health

centers in the fee schedules; include all Primary Health Centers (PHCs) - for curative treatments only; increase hours of collection, and; raise drug fees equal to CIF costs. Patients are apt to be more willing to pay for drugs since they are a tangible commodity, and, if the medication has some monetary value for the patient, compliance may be improved.

4. *Budgeting and Accounting should gradually be extended to the facility level, perhaps with an intermediate stage at the regional/parish level. Budgeting and cost controls need to be active at the "spigots" of the supply system. This future possibility, however, is currently limited by the state of information support and costing systems at IMS. Dominica in the OECS region has found that this type of system can increase efficiency significantly.*

5. *The full course-of-therapy or unit costs of drugs provided through the MOH system should be published in lists that are distributed through the MOH health system. This can increase cost sensitivity in providers and users, and reduce public resistance to increases in user fees. Currently neither patients nor providers know the costs of prescribed therapies.*

6. Other ideas for periodic reviews that can enhance financial management and accomplish systematic cost reduction are discussed throughout the body of the report.

7. *JCTC should reconsider its current pharmaceutical fee pricing for the private sector. The pricing policy for private sector pharmaceuticals is an 8% mark-up for generics and 4% for brand names. This supports neither public health policies nor public equity issues, and the fee mark-ups should either be equal or the differential should be reversed.*

8. *The human resource shortage in terms of both quality and quantity in the current Jamaican system is a greater constraint than the financial limitations. Although the human resource shortage is largely a result of the financial limitations, there are some steps that can be taken to improve the situation. This situation must be improved if the supply system is to be improved, because staff that have remained in the system are demoralized and the current situation offers no incentives for them to attempt to make constructive changes in current work routines. It appears that fringe benefits (e.g. eligibility for leave days) are probably costing the MOH a significant amount (when the real cost of a working day is calculated) but are providing limited attraction to individual workers since leave days and other benefits have no effect on their real earnings. Since this issue is relevant for the entire public sector, we assume that initiatives such as the Administrative Reform project are currently assessing future policy options to reduce the human resource problems in the GJ civil service.*

9. The exodus from the civil service over the past decade has frequently left those managers who have remained in the MOH system with an excess of responsibilities. *The key manager in the public sector pharmaceutical system, the Director of Pharmaceutical Services (DPS), appears to have more responsibilities than any one person could be expected to fulfill, particularly at the operational level.* Over time, this position could be developed so that key responsibilities are at the policy level, and the management of day-to-day operations are delegated to other positions.

10. *In order to attract and/or motivate managers who can operate successfully in key positions, the MOH may need to consider taking certain positions out of the civil service, or contracting out a designated set of activities to the private sector. A candidate for such consideration would be the Island Medical Stores (IMS) operations at both locations.* IMS has overall responsibility for the purchase planning, inventory management, and distribution of commodities that represent 12% of the MOH budget for this fiscal year. In addition to these MOH budget funds, the IMS will be responsible for management of drugs purchased with World Bank loan funds during the next few years.

11. The Jamaican public sector suffers from a serious shortage of pharmacists and pharmacy auxiliary personnel, i.e. pharmacy technicians. *The current vacancy rate for pharmacists in the public sector is approximately 60%. Consideration should be given to: a) upgrading pharmacists' pay categories (see 9 above); b) joint public-private employment of a pharmacist in a relevant community location; c) contracting out pharmacy services to the private sector in appropriate facilities/locations; d) requiring newly-registered pharmacist to practice at least one year in the government system (beyond internship); and, e) renewing the training program for pharmacy technicians.*

13. A new edition of the Jamaican National Formulary has been at the government printery for an extended period of time; the last edition is dated 1980. While this formulary will undoubtedly prove useful to drug therapy generally, it has no specificity to the public sector program or the rationalization of its objectives. *The auxiliary "Vital, Essential, and Necessary" (VEN) list, specific to government supplies, requires renewed attention, subsequent publication in a convenient-to-use format, and broad distribution to prescribers and other providers in the MOH system.* Both BDS and ECDS publish formularies annually that are intended to rationalize demand in the public sectors by informing prescribers about what is available through the government system; these formularies offer additional prescribing information, including cost comparisons of alternative therapies.

14. There is an unnecessary number of organizations playing a role in the public sector pharmaceutical system. The number

of institutions involved complicates decision-making, slows down procedures and processing time, creates duplication of work, unnecessary red tape, and communication problems - all of which create addition costs to the system and reduce its effectiveness. The number of institutions involved also increases the number of individuals involved in decision-making, or operation tasks. Committees do not function well. There is frequently a lack of consensus and, therefore, action, which further de-motivates staff members from putting energy into constructive changes.

The GOJ/MOH should consider rationalizing the public sector pharmaceutical system by eliminating one or more institutions (or departments and offices) from the existing arrangement. Although each institution is making some marginal contribution, the same contributions could be better made by a lesser number of institutions. This kind of change will be difficult to make, but policy-makers need to carefully consider current institutional capability, the contribution made to the supply system by each institution, and the real or hidden costs it incurs.

15. *While local wholesalers and manufacturers in Jamaica may warrant preferential treatment during the procurement process, they may currently enjoy this to excess. Also the existence of two separate procurement mechanisms (one more directly to local suppliers, and one through JCTC) complicates supply system procedures and does not encourage price sensitivity in purchasing practices. The GOJ/MOH should consider changing JCTC's public tendering system for pharmaceuticals so that it embraces both Jamaica's private sector suppliers and manufacturers and the foreign suppliers. Since local suppliers and manufacturers may warrant preferential treatment over foreign suppliers, the GOJ/MOH should either appoint a special body (or request that an existing body) consider how standards for the preferential treatment of local tenders can be established to guide the decision-making process of the tenders adjudication committee. BDS operates on this type of basis.*

16. *The JCTC and the MOH should consider tendering for 12 rather than 18 month contracts with pharmaceutical suppliers. Since both the Jamaican dollar and major foreign currencies (i.e. the American dollar) have been shifting during the past few years, suppliers are apt to quote higher for a longer period of time given the down-side risk in the international monetary market. If the period of time is reduced the potential risk will be reduced for both sides, JCTC and its suppliers. Also, a twelve month period that matches planning periods for the MOH/IMS would probably make the planning process more manageable for the MOH/IMS. Full year contracts are generally the traditional approach in this type of pharmaceutical tendering-contracting, and both BDS and ECDS use one year contracts. Both BDS and ECDS operate on 12 month contracts.*

17. *JCTC should compare CIF prices that it is currently obtaining with those obtained by similar agencies in the Caribbean, i.e. ECDS and BDS. If there are significant differences, it should reconsider its tenders committee's adjudication decision-making criteria in respect to choice of brand names, convenience packaging, shorter lead times, and payment options offered by suppliers.*

18. *The GOJ should analyze costs associated with delays in customs clearance, especially costs such as storage and demurrage that are directly related to customs processing delays. If this analysis shows that costs to the MOH could be reduced by contracting out customs clearance to a private sector agency that would facilitate the process more rapidly, then this alternative should be considered. Naturally, in the longer term, the efficiency of the customs process needs to be examined.*

19. *The MOF Supply Division still charges the MOH 5% for foreign purchases, although JCTC has taken over virtually all of the role it previously played in such procurements, except for customs clearance and transport from customs to IMS. It also charges the MOH 2.5% for local procurements, although any competitive shopping that takes place is done by IMS; there is no local tendering for pharmaceuticals done by the MOF Supply Division for MOH drugs, and all transportation is provided by the local suppliers. According to the information given, the MOH is currently funding approximately one-quarter of the fees that support the Supply Division's annual budget. Reconsider the fee levels that MOF Supply Division charges to the MOH/IMS for services provided, and its role in the supply system.*

20. *Island Medical stores needs to have functional information systems that support purchasing decisions (i.e. what to buy, when, in what quantities, and from what source of supply). These systems should track quantities and values of specific inventories on hand, quantities and values of shipments to facilities in the MOH system, quantities of back orders requested by the facilities, and quantities and values of shipments on order through the procurement system. Problems related to the lack of systems and procedures at IMS have been documented in previous reports, and systems have been designed and recommended for implementation. A *Supply Management Procedures for Drugs and Medical Supplies* has also been in various stages of development for at least two years, but it has not yet been officially released. Computer systems have only been partially developed. Data cannot be processed or printed out at IMS, and the Central Data Processing Unit (CDPU) takes several months to return reports to IMS.*

Much of the effort to improve planning and management methods at IMS has come through assistance from the Health Management Improvement Project (HMIP), and an MIS expert is available through that project to assist with the computerization of IMS. This activity should move forward immediately and be

completed before IMS starts to purchase drugs with World Bank loan funding. IMS salaries for computer operators must be sufficient to retain those who are trained during the computerization process, or these positions should be contracted out. Other activities described above should also move forward. A manager within the MOH should be made responsible for the implementation of the manual systems and procedures that have been recommended for IMS and the facilities in the MOH system that receive drugs and medical supplies. Staff will need to be trained as systems are implemented; an in-service program would probably be most effective.

The reasons for IMS not having implemented the recommended changes previously are probably related to the underlying human resource constraint, or lack of clear lines of authority and responsibility for the implementation of new systems and procedures. MOH managers should discuss these issues, and consider how the situation can be changed. (See 10 above.)

21. The MOH should initiate activities to assess prescribing and compliance patterns in the MOH system. This could be done cooperatively with UWI faculty and researchers, although rigorous research is not essential to providing the MOH with information that might allow it to modify provider and patient behavior patterns through workshops and other health education mechanisms. Both BDS and ECDS provide therapeutics workshops designed to have a positive impact on prescribing habits and patient compliance.

The MOH could begin by doing an ABC Analysis¹ of products purchased through IMS. The A class drugs could be compared with their VEN rating and the relative importance of the diseases they treat in Jamaica. (These A class items should also be the focus of managerial attention in procurement planning and inventory control systems.)

¹An ABC Analysis is a technique whereby the quantity of each product, procured during a given period, is multiplied by the product's price to calculate each product's significance in terms of total costs. Products are then ranked in terms of total costs. As a rule of thumb, the top twenty percent of the products -- the A Class items -- normally account for approximately eighty percent of total inventory investment.

OVERVIEW OF THE
JAMAICAN HEALTH CARE SYSTEM

I. OVERVIEW OF THE JAMAICAN HEALTH CARE SYSTEM

As is true of other islands in the English-speaking Caribbean, Jamaica's health statistics and major health problems are more similar to developed than developing countries. Life expectancy at birth is approximately 70 years, and infant mortality is approximately 27 per 1000. Traumas (especially traffic accidents), hypertension, diabetes, respiratory tract infections, and sexually transmitted diseases (STD) account for approximately 50% of all curative visits to health centers in Jamaica.

Despite these relatively good health statistics and the absence of disease patterns that are more typically prevalent in developing countries, the Government of Jamaica (GOJ) is unable to provide an adequate public health system. The pharmaceutical supply system is certainly no exception to this, and, since the absence of adequate supplies of drugs in the Ministry of Health (MOH) system erodes the confidence of the population at large and demoralizes the health care professionals who work in the MOH system, difficulties in the pharmaceutical supply system have increasingly become, not only a public health problem, but a political problem for the MOH and the GOJ.

The GOJ is operating under severe economic constraints: falling GDP, rising population, high levels of debt servicing, an unfavorable trade balance, and the steady devaluation of the Jamaican dollar have all been chronic during the past decade. Despite the economic stagnation, the number of health centers was doubled during the 1970s and general hospital beds increased by 20%; staffing levels also increased significantly. Naturally this created substantial demands for recurrent financing when the GOJ was least able to meet those demands, and the GOJ is now attempting to *rationalize* the system by reclassifying facilities to better reflect the services that they are actually able to provide. Currently capital expenditure in the health sector is largely limited to repairs, and the recurrent costs of the existing system are severely underfinanced.

Given the economic conditions under which the GOJ is operating, the MOH, along with other ministries, is unable to pay salaries that are sufficient to recruit and retain most classes of health care professionals, or to provide performance incentives for those who do stay in the government system. Pharmacists are currently experiencing a vacancy rate of approximately 60% in the MOH system. The human resource constraint is pervasive throughout government systems.

Therefore, the MOH is operating under two major constraints: first, inadequate financing; second, inadequate human resources in terms of both quality and quantity. Most of the multiple problems observed in the public health care system,

and its drug supply system, are complications resulting from these two underlying constraints.

The MOH primary care (PC) system of approximately 375 Primary Health Centers (PHC) is organized and administered geographically according to Jamaica's 14 parishes, with each parish being divided into health districts. (See Exhibit I.) The PHCs are classified as Type I, II, III, IV, or V depending on their staffing and coverage. (See Table 1.) Most type I or II PHCs report administratively to a Type III PHC that is the District Headquarters. The supply link for drugs and medical stores is between Island Medical Stores (IMS) and the Type III PHCs who in turn supply Types II and I. There are only a few Types IV and V, and they also link directly with IMS. Although the intention is for IMS to distribute directly to the PHCs that are higher level or administrative headquarters, in practice about one-third of the orders are picked up at IMS by the PHCs.

Secondary and tertiary care, on the other hand, are organized geographically according to 10 regions that do not correspond to the parishes. There are 22 MOH hospitals, with the largest hospital in each of the 10 regions carrying some administrative responsibility for the other hospitals in its catchment area. These hospitals are classified as Type A, B, C, or "Other" depending on staffing and coverage. (See Table 1.) The University (Teaching) Hospital has a subvention in the MOH budget (in addition to other funding) and is a relatively independent administrative unit in relation to the MOH system, although there is naturally an active professional exchange between it and the rest of the MOH system. The IMS supplies all hospitals (except University Hospital) directly regardless of their type classification. Although these hospitals do sometimes come to IMS for smaller quantities of drugs and medical supplies, for the most part their orders are too large and must be transported on IMS ten ton trucks.

Since in the past there has been only marginal integration of primary and secondary health care administration at the parish and regional levels, the MOH is restructuring its organization as well as *rationalizing* the system. To a certain extent, some parishes have been already been grouped by region for some administrative activities, such as budgeting for pharmaceuticals.

For most Jamaicans, and especially those from the lower socio-economic classes, the MOH system is their health system. Jamaica's private sector health care system includes 6 private hospitals and over 200 pharmacies in addition to the private clinics and doctor's offices. The hospitals have apparently been experiencing severe financial difficulties during recent years. Pharmacies, on the other hand, seem to be flourishing since their numbers have increased by 25-30% during the past few years. This is probably a result of the public sector's inability to provide adequate supplies of drugs to MOH facili-

ties. (In 1986 the IMS is estimated to have provided a service level of 20% to the MOH system.) MOH pharmacists can practice part-time as pharmacists in the private sector to supplement their government salaries. As is common practice throughout the English-speaking Caribbean and elsewhere, government doctors can also have private practices, and private clinics or doctor's offices create the largest and most active segment of private sector health care in Jamaica.

Table 1

Distribution, Number, Personnel, Catchment Area, and Service Provided at All Levels of the Public Health Care System

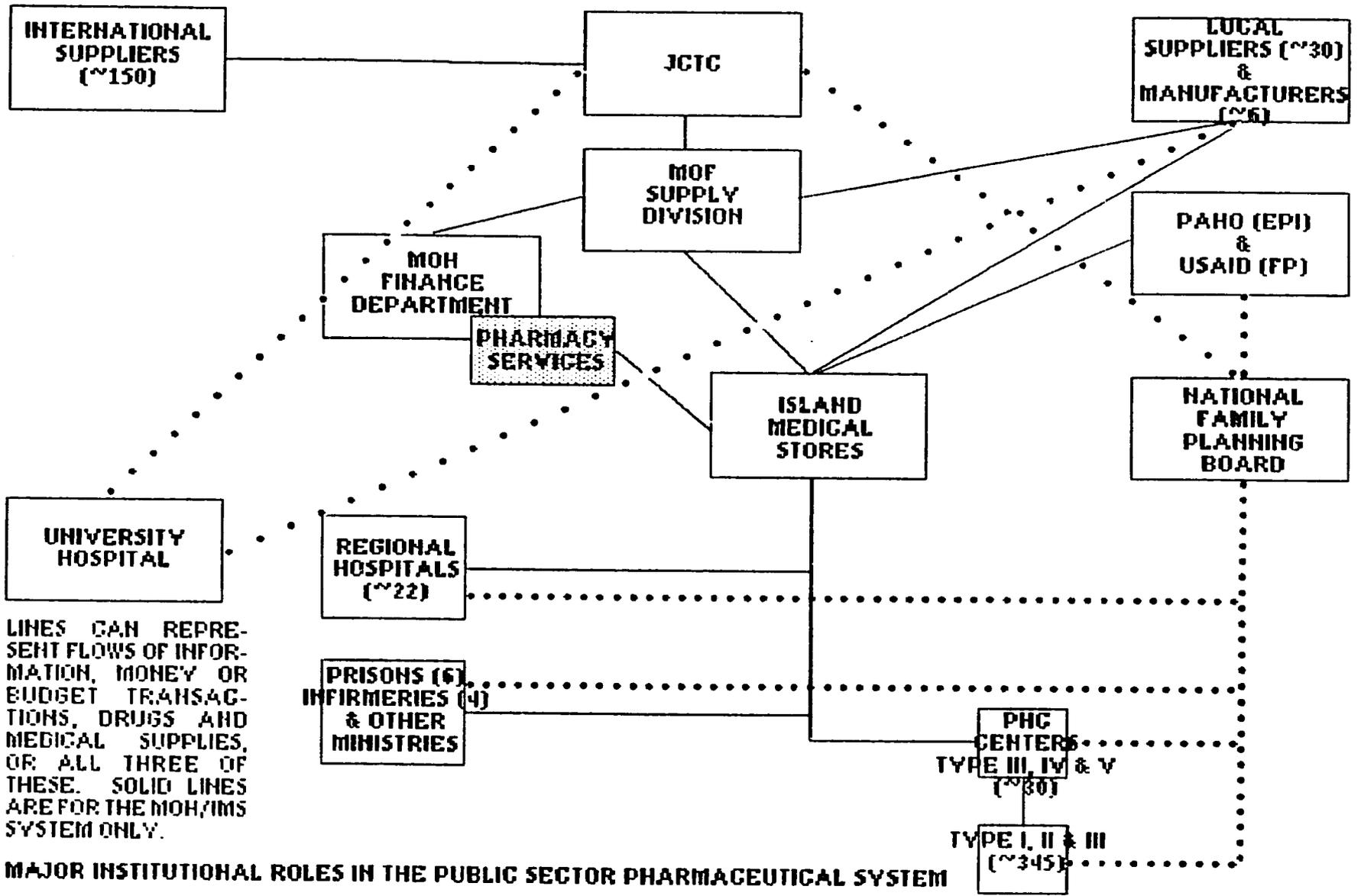
Health Center/ Hospital Level	Number	Level of Personnel	Location/ Immediate Catchment Area	Services Provided
Type I	203	Midwife, 2 CHW ^a	4,000-5,000 population	MCH home visits
Type II	89	Public health nurse, public health inspector; RN, MD and dentist visit	10,000-12,000 population	Curative, pre- ventive and promotive
Type III	78 ^b	MD, nurse practitioner & dentist (who also serve Type II centers)	Parish center	Curative and pre- ventive at more sophisticated level
Type IV	b	Combination of Type III center and the parish office	Parish center	Curative and pre- ventive at more sophisticated level
Type V	2	MD, some specialists, nursing care, dentist	Undefined	Specialty out- patient care & PHC
Type C Hospital	11	Basic, district hospital with x-ray & lab. Surgeon for emergency; 2-3 MDs	Parish center	Inpatient and out- patient care in medicine & MCH
Type B Hospitals	4	MD specialists	Urban centers	Inpatient and out- patient, specialist service at least in surgery, inter- nal medicine, OB/GYN & pediatrics
Type A Hospitals	5 ^c	MD specialists	Kingston, Montego Bay	Full range of secondary and tertiary care
Other Hospitals	4 ^d	MD specialists	Kingston	Chronic or specialized care

Source: PHC Unit, MOH, 1986.

- a. CHW = community health workers.
- b. Includes Type III and IV together.
- c. Includes University of the West Indies Hospital.
- d. Maternity, Children's, Psychiatric, and Chest hospitals.

INSTITUTIONAL ROLES
IN THE PHARMACEUTICAL SYSTEM

EXHIBIT II



LINES CAN REPRESENT FLOWS OF INFORMATION, MONEY OR BUDGET TRANSACTIONS, DRUGS AND MEDICAL SUPPLIES, OR ALL THREE OF THESE. SOLID LINES ARE FOR THE MOH/IMS SYSTEM ONLY.

MAJOR INSTITUTIONAL ROLES IN THE PUBLIC SECTOR PHARMACEUTICAL SYSTEM

II. INSTITUTIONAL ROLES IN THE SYSTEM

Exhibit II presents a flow chart diagram of the major institutions that play a role in Jamaica's public sector pharmaceutical system. As noted in the Executive Summary, Jamaica's public sector pharmaceutical system can be divided into three separate segments that operate with relative independence: the University Hospital, the National Family Planning Board (NFPB), and the MOH/IMS system. Since our focus is on the MOH/IMS system where most of the money is spent and most of the problems exist, the lines indicating relationships for this system are solid. The lines for the other two systems are dotted, and we will describe and contrast these two systems much more briefly. In all cases both dotted and solid lines can indicate flows of information, money or paper budget transactions, drugs and medical supplies, or all three of these as well as reporting relationships. More specific descriptions of these flows are given here in the text or in sections IV and V.

The Jamaica Trading Commodity Company (JCTC):

The Jamaica Commodity Trading Corporation (JCTC) is operated as a private company with the GOJ owning 100% of its shares. The Pharmaceutical Section of JCTC provides for all MOH foreign purchases and about 17% of the private sector's needs. JCTC has a restricted international tendering system, and, for those products that it awards contracts, it has a monopoly in both the public and private sector's for foreign purchases. (The international tendering system is discussed further under Section IV.) Drug products purchased directly from foreign suppliers by the University Hospital, the NFPB, or the MOH/IMS are purchased through JCTC and under JCTC's 18 month contracts. JCTC places the order on behalf of these institutions, as well as private sector organizations, and is responsible for monitoring the progress of a shipment up until the time of its arrival in Jamaica. In special cases, e.g. immunizations, it also provides customs clearance for the MOH. JCTC does not warehouse or distribute drugs.

JCTC charges an 8% fee for its pharmaceuticals division's services to the MOH. For the private sector, JCTC charges an 8% fee for generics and 4% for brand names. (This private sector fee policy is discussed further in the final section of this report.) No fees are charged in either sector for insulin. These fees generally allow the pharmaceutical division to break-even.

The procurement of pharmaceuticals is only a small part of JCTC's operations. It has been one of the most profitable of the government-owned companies, and has been able to pay the government dividends regularly in the past. However, as a powerful influence in the Jamaican economy, JCTC is the subject of public criticism particularly for the role it has

played in cross-subsidization and the apparent inefficiencies or perverse effects that some of the subsidies have had in respect to equitable redistribution of income in Jamaica. A World Bank study commented on these, and the Private Sector Organization of Jamaica (PSOJ) was circulating an opinion paper criticizing JCTC's role in the economy during our visit to Jamaica.

However, JCTC's pharmaceutical division has generally been an exception in these controversies. There is a need for an institution with JCTC's organizational capacity to provide a public tendering service for Jamaica's public sector pharmaceutical system. Since JCTC does not need to conform to GOJ salary and benefit structures, the Pharmaceutical Division is fully staffed. Although much of the data available at JCTC is considered confidential, it is clear that the Pharmaceutical Division's access to computer technology and expertise within JCTC is far superior to anything else available in the public sector pharmaceutical supply system. Since computer expertise is a high demand and, therefore, costly skill for an organization to attract, JCTC is much better positioned to maintain this institutional capacity than other public sector organizations in the supply system.

Local Suppliers:

Other sources of supply include approximately 30 local suppliers and 6 manufacturers, the PAHO EPI program for MOH immunizations, and USAID for NFPB family planning supplies. Some of the local suppliers, especially manufacturers, are very small, and a number of the people with whom we spoke didn't realize that they were manufacturers. Real competition among local suppliers and manufacturers is considered minimal: approximately 70% of all local MOH purchases are estimated to come from the one local supplier who is also the most sophisticated manufacturer of pharmaceuticals in Jamaica. In general, if a drug product is manufactured in Jamaica, it cannot be purchased from a foreign supplier.

Both University Hospital and the NFPB can procure directly from JCTC, local suppliers, and PAHO or USAID. However, the MOH/IMS system is more complicated and, therefore, cumbersome.

The Ministry of Finance (MOF) Supply Division:

Under Financial Administration and Audit Law 34 of 1959, the Ministry of Finance (MOF) Supply Division acts as the central purchasing agency for the public sector. This Division of the MOF is responsible for most policy-making decisions related to government procurement. Through the Board of Service Audit, they also monitor the performance of government warehouses through annual stock checks and periodic spot checks of all major government warehouses. The MOF Supply Division receives drug orders from the MOH Finance Department, along with a check to pay for these orders. The MOF Supply Division checks

the orders over and forwards them and the accompanying check to either JCTC or the appropriate local suppliers. Each order is assigned an indent number which is intended to act as a control or cross-reference in the government system. Although different sources quote different periods of time, processing through the Supply Division is estimated at approximately 1 month. The Supply Division's role as a procurement agency for the local pharmaceutical suppliers will be discussed further in Section IV.

When the drugs are received through JCTC, the MOF Supply Division is responsible both for customs clearance and for transportation to IMS. Local suppliers will deliver directly to IMS. Costs associated with customs clearance can be very high. They include: wharfage charges (e.g. fork lifting), storage charges, stripping costs (i.e. opening containers), demurrage charge (\$17US/day for over 7 days), and the cost of staff time spent completing customs entries and following up on the processing. This issue is discussed further in the final section of this report.

The MOF Supply Division is plagued by the same personnel problems as the rest of the government system. The current vacancy rate is 40% according to managers.

The Supply Division, like IMS, is in the process of computerizing its inventory control systems and other operations. This process is considered to be in an "embryonic stage."

Although this Division of the MOF is responsible for all government procurement, drugs and medical supplies for the MOH represented 26% of the monetary value of all goods that flowed through the system during calendar year 1988. Because of the nature of the commodity, Supply Division managers estimate that roughly 30% of the Division's efforts are directed toward the management and processing of drugs and medical supplies, although they are not warehoused there.

The MOF Supply Division charges a 5% fee for foreign purchases (i.e. through JCTC) and a 2.5% fee for local purchases. In addition, it charges 5% of actual transportation costs. These fees are paid by check from the MOH Finance Department to the MOF Supply Division when an order is placed. Although all fees go back to the GOJ consolidated fund, the Supply Division's budget has always been based on anticipated fee revenues and it always covers its actual costs through fee revenues. Clearly, since 26% of the value of goods flowing through the MOF Supply Division are MOH drugs, the MOH is a major contributor to fee revenues earned by the Division.

The MOH Finance Department and Pharmaceutical Services:

The MOH Finance Department works with the Director of Pharmaceutical Services (DPS) and his staff to develop the budget for drugs and medical supplies, cash flow projections on an

annual and monthly basis, and to process individual drug requisitions received from the IMS. Although for other commodities procured by the MOH there is a Supply Management Officer who reports to the Director of Administration, we understand that drugs and medical supplies are exclusively the responsibility of the Director of Pharmaceutical Services. He works with the Director of Finance to develop the budget, cash flow projections, and verify the levels of cash that will actually come available during given months.

The office of Pharmaceutical Services is responsible for checking the accuracy and appropriateness of the requisitions, from both a technical and financial perspective. Delays in this phase of order processing can be lengthy when there are internal cash flow problems because the MOH cannot forward an order to the MOF Supply Division without a check to pay for the order. Although there is disagreement about how long this process can actually take, the best estimate is that it is 2-3 weeks when there are no cash flow problems, and 2-3 months when there are cash flow problems.

The Office of Pharmaceutical Services, and particularly the DPS, are involved with many other activities. Some of those activities related directly to the supply system are discussed elsewhere in this report. Since the DPS position carries a large burden of responsibility, this position is discussed under human resources in Section VIII.

Island Medical Stores (IMS):

Island Medical Stores (IMS) is responsible for the purchase planning, inventory management, and distribution of pharmaceuticals throughout the MOH system. IMS, under the direction of the DPS, is the hub of the MOH supply system; it plays a complex role in the supply system, and there are multiple problems in its current operations. Its role in the supply system is described and analyzed in Sections IV and V.

The IMS distributes directly to the 22 hospitals, 6 prisons, 4 infirmaries, and the PHCs that act as district headquarters. For the most part IMS transports the drugs and medical supplies to the facilities, although many of the PHC send vehicles to pick up their orders from IMS.

The National Family Planning Board (NFPB):

The NFPB's procurement system is more stream-lined than that of the IMS/MOH. It receives significant financial assistance from USAID, and, with a larger vehicle fleet than IMS and less commodities to handle, it delivers directly to all PHCs and the hospitals that have family planning clinics. The NFPB's supply system is generally felt to be operating effectively.

University Hospital:

University Hospital, like the MOH system, has problems related to financial and human resource constraints as well as the controlled management of the drug stocks it maintains. However, its procurement system, like that of the NFPB, is more stream-lined than the IMS/MOH system. Also, the University Hospital has no external distribution network, like the NFPB and IMS/MOH.

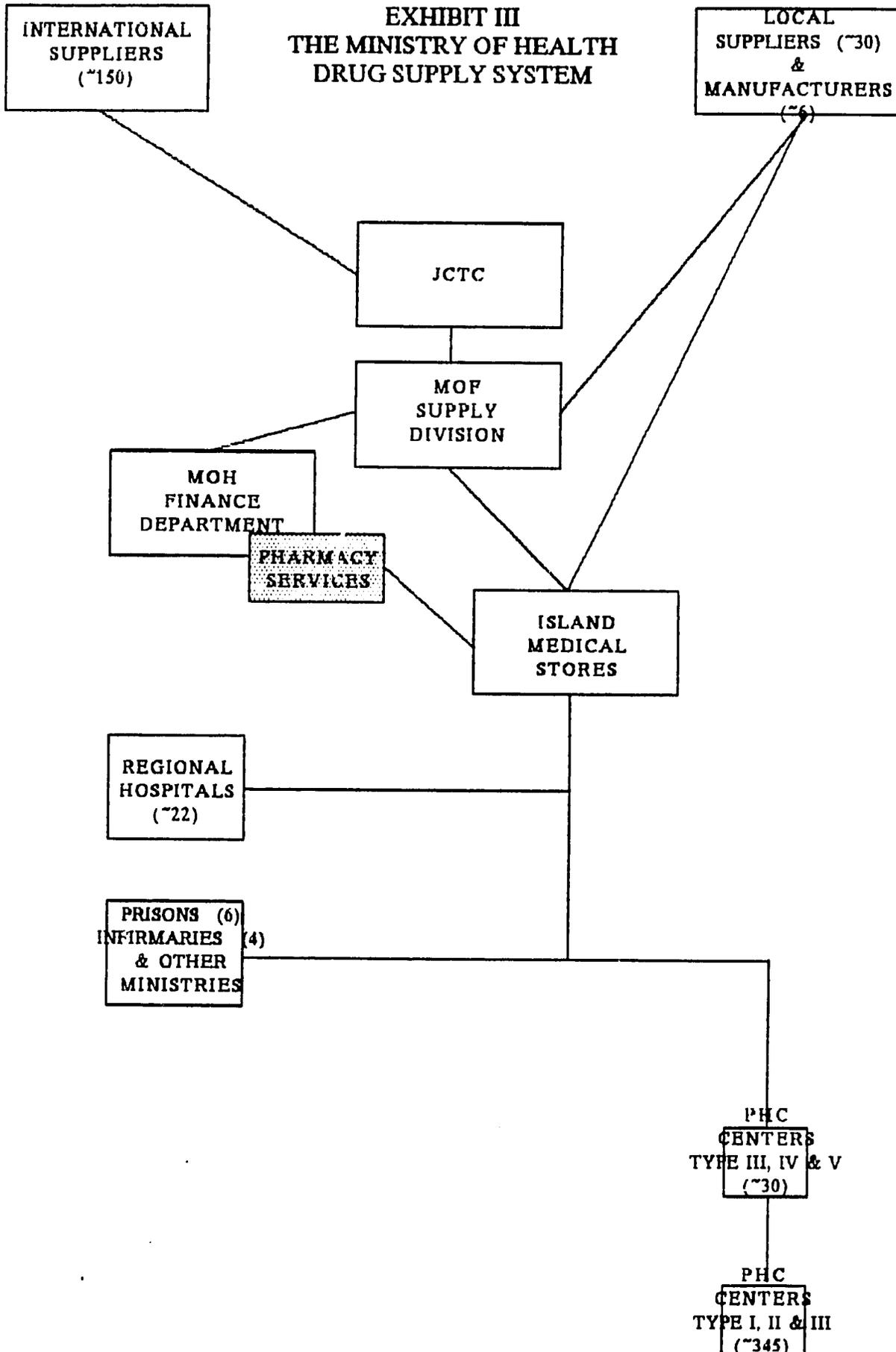
The MOH/IMS System:

There are an unnecessary number of organizations playing a role in the public sector pharmaceutical system as it relates to the MOH/IMS. The number of institutions involved -- and therefore individuals -- complicates decision-making, slows down procedures and processing time, creates duplication of work, unnecessary red tape, and communication problems -- all of which create additional costs to the system and reduce its effectiveness. (See recommendation in Executive Summary.)

It is interesting to compare the indirect costs of supporting the institutions in the supply network. JCTC charges (and covers its costs with the fees) 8% of the direct costs of drugs that flow through it. The MOF Supplies Division charges a fee of 5% for JCTC drug purchases and 2.5% of local drug purchases; their budget is developed to match expected fees. IMS's operating budget is 3.3% of total direct costs of drugs and medical supplies. Separate costing for aspects of the MOH, such as Pharmaceutical Services, were not available.

By contrast the operating costs of BDS are ~19% of total drug costs, and those of ECDS are 15%. These two organizations provide services similar to JCTC in combination with some of the activities of the office of Pharmaceutical Services, such as formulary process support. BDS pays suppliers 32% over the CIF cost of drugs to provide services similar to those provided by MOF Supply Division and IMS, i.e. customs clearance, warehousing, and distribution.

EXHIBIT III
THE MINISTRY OF HEALTH
DRUG SUPPLY SYSTEM



SELECTION
DRUG REGISTRATION &
THE FORMULARY PROCESS

III. SELECTION - DRUG REGISTRATION & THE FORMULARY PROCESS

Registration of pharmaceuticals acceptable to the GOJ is carried out under the Food and Drugs Act (August, 1975) under the office of the DPS. It is usually based on WHO Certification form received by the DPS from the regulatory authority of the product's country of origin. The DPS is also an Advisor to the Director General of WHO on matters related to the WHO Essential Drugs Program.

The DPS, whose staff includes four inspectors (2 on registrations and 2 on enforcement matters), issues the permits required for every drug product importation as well as the items coming under the Pesticides Authority. The DPS is also a member of the Medical Committee of the NFPB and of the Pharmaceuticals Committee of the Trades Board; and he serves as Jamaica's Representative on the Board of the Caribbean Regional Drug Testing Laboratory (CRDTL), a CARICOM agency.

Of the half dozen or more local manufacturers, Federated Pharmaceuticals of Lascelles Labs Inc. is the largest and most sophisticated in terms of production methods. Among the others are: Windsor, Bunny, Mac's, Ampec, Bennett, and Barry. For quality assurance testing and for purposes of re-registration requirements, a minimum sample of two batches must be submitted each year to the Government Chemist, who is also the Director of the CRDTL. From time-to-time, the DPS seeks the services of the CRDTL respecting new registrations and the items sampled by Inspectors from MOH Dispensaries and from private sector pharmacies.

Guidelines for a Essential Drugs Management and Services Programs emphasize the importance of a viable formulary process as the foundation of a successful program.

The *formulary process* requires the guidance of a stable, non-political, expert committee that meets regularly and frequently, and consults non-committee persons of recognized expertise to select and re-select -- amend, delete, add -- effective drugs in efficacious and economical pharmaceutical formats for the treatment of prevalent illnesses. The formulary process requires constant management, and the participation and commitment of informed and influential health care providers. Both BDS and ECDS have formulary committees with clearly designated membership and a annually programmed schedule of activities.

The *formulary list* itself can be 'open' and contain a wide range of items generally available, or it can be 'closed' and contain only those items carefully chosen for the needs of a particular program within the economic parameters of its provider, i.e. a responsible and responsive public sector program through a MOH. A closed formulary list is meant to guide doctors' prescribing within the boundaries of the health

care program; it tells them what is available (or should be) through the supply system. A closed formulary is also the "shopping list" for those responsible for procurement in a public sector supply system. Both BDS and ECDS have closed formularies.

The formulary manual can take several forms, both in the information it contains and in its physical presentation. It can merely be a listing of drug preparations, possibly organized by therapeutic or pharmacological classifications; or, an extensive compilation of essential information to guide prescribing and rational, safe use by level-of-care, including cost information to inform the prescribers choice of products. It can be a large, heavy compilation, or a handy pocket-sized book to be carried with the practitioner. Both BDS and ECDS produce, annually, formulary manuals that are extensive compilations of prescribing information published in a book small enough to fit into a shirt-jack pocket. (Example pages from the ECDS Regional Formulary and Therapeutics Manual are shown in Exhibit IV.)

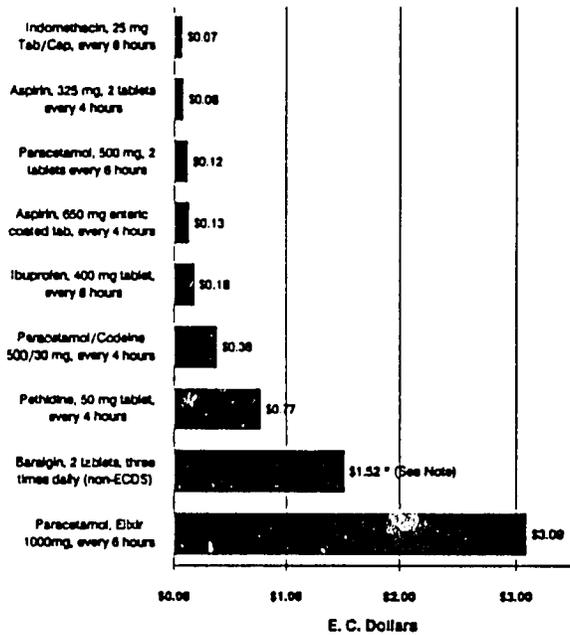
Jamaica's formulary activities differ significantly from those of BDS and ECDS.

Jamaica's latest edition of the Jamaica National Formulary, compiled some time ago and having the input of a very large committee, is expected to be available in the near future. Apparently it has been ready for the printer for nearly two years. Currently the 1980 Edition, published in 1982, is still available. This Formulary does not relate to the GOJ public sector health care program but, that, endeavors to briefly describe the multitudinous drugs and formulations thereof to which a health care practitioner in Jamaica may be exposed; apparently this was the request of medical practitioners. The physical dimensions of the printed manual are expected to approximate those of the British National Formulary (BNF), 13 x 21.5 cm..

For public sector doctors and supplies personnel, a VEN List (i.e. Vital-Essential-Necessary classifications) of essential drugs was compiled in therapeutic categories and computer-printed in July, 1986. However, it has not yet been widely disseminated throughout the MOH system, and it appears that IMS does not necessarily adhere to it when purchasing. However, it successfully reduced the previous unwieldy and expensive list of over 2000 items down to 523 drug preparations: 219 listed as Vital, 158 as Essential, 147 Necessary, plus 101 required bulk galenicals and 99 non-drug items (12 X-ray; 87 medical sundry). While the need to officially update the VEN list is acknowledged, there are no current plans to revise and publish it in a format convenient to busy doctors and other health care practitioners working in MOH facilities. (See recommendation in Executive Summary.)

EXHIBIT IV

Comparative Daily Cost of Analgesic/Antipyretic Agents



NOTE: Baralgin® is not included in the ECDs Regional Formulary. Baralgin contains Meclozolin (Cyprine) which has been banned in many countries because of the risk of agranulocytosis. Alternative analgesic/antipyretic agents should be used.

If an antiparasitic is needed, see Helminths or Protozoa (Class 1208).

ACETYSALICYLIC ACID (ASPIRIN) (ASA)

Indications: Mild-moderate pain, fever, and inflammatory conditions such as rheumatoid arthritis. Also used for anti-platelet action, e.g. transient ischemic attacks related to platelet emboli.

Cautions:

Contraindications: Gastric-ulceration, bleeding disorders, anticoagulant therapy, children with suspected viral illness (risk group for Reye's syndrome)

Precautions: Patients with asthma, impaired renal(*) or hepatic function

Adverse reactions: Tinnitus, nausea, ulceration, Reye's syndrome (children), hypersensitivities

Drug Interactions: Aspirin has anti-platelet actions, enhances the effects of oral anticoagulants, and increases the risk of bleeding with anticoagulant therapy. It may enhance the effects of hypoglycemic agents and methotrexate. Aspirin with alcohol ingestion increases the risk of Gastric-ulceration.

Use during Pregnancy/Lactation: Potential fetal and maternal risk. Excreted in breast milk but no adverse effects to infants reported.

Advice to the Patient

with food, milk, or a full glass of water.

Dosage and Administration

Adults

SPECTRUM OF ANTHELMINTIC ACTIVITY

Anthelmintic	Trichuris Trichura (Whipworm)	Ascaris Lumbricoides (Roundworm)	Enterobius Vermicularis (Pinworm)	Hecator Americus (Hookworm)	Strongyloides Stercoralis (Threadworm)
Albendazole	50 - 90 %	30 - 40 %	Probably High	5 - 10 %	Less than 1 %
Mebendazole					
Thiabendazole					
Levamisole					

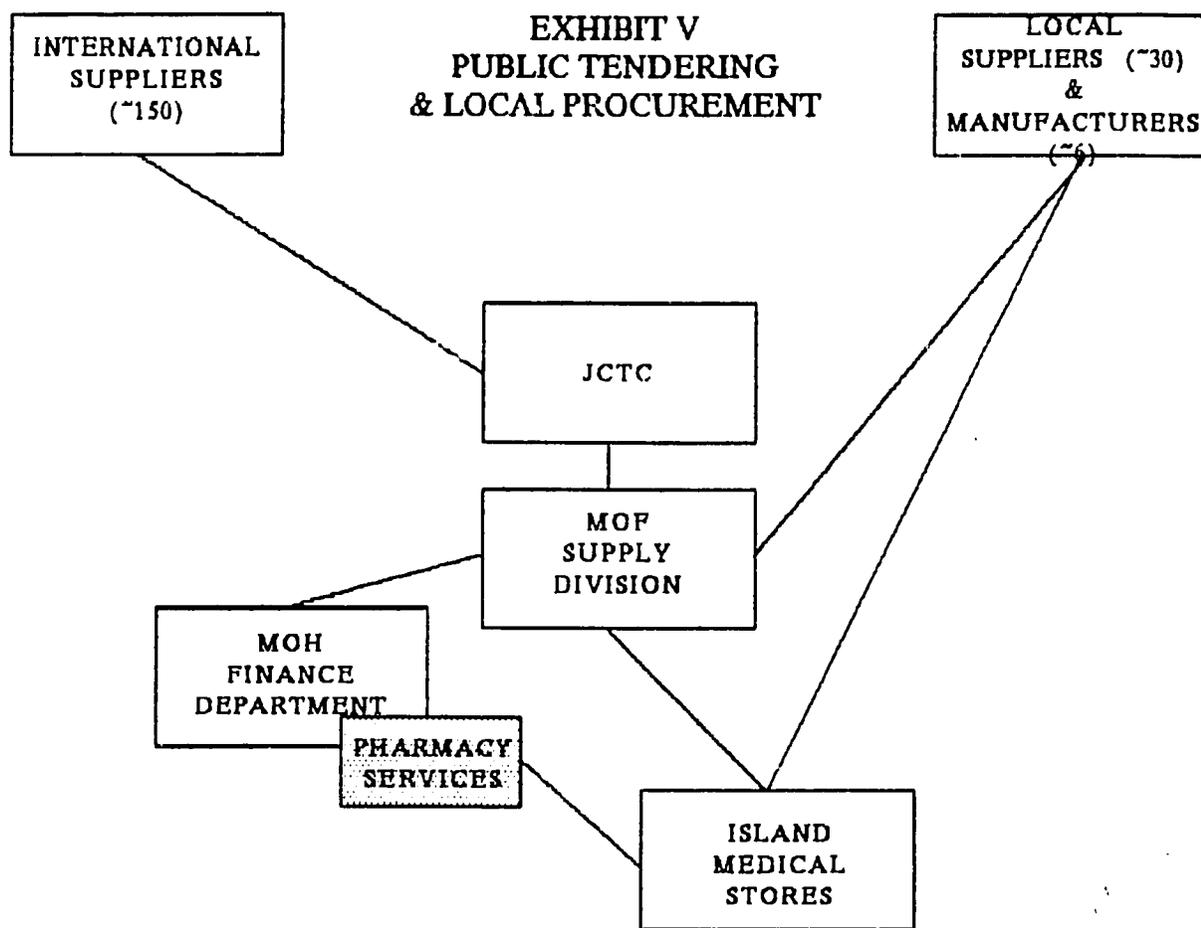
(Thiabendazole is considered the drug of choice for Strongyloides. Albendazole is also an effective alternative.)

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PUBLIC TENDERING &
LOCAL PROCUREMENT

EXHIBIT V PUBLIC TENDERING & LOCAL PROCUREMENT



How other Purchasing Methods Compare With Restricted Tender

Purchasing Method	Brief Description	Effect on Price	Delivery Times	Workload on the Procurement Unit	Need for a Merit Rating of Suppliers	Conditions Favoring Use
OPEN TENDER	Bids are accepted from all interested suppliers.	Very Favorable	Long	Very High	Very High	<ul style="list-style-type: none"> Many reputable suppliers are available May be necessary at beginning of program to open supply channels
RESTRICTED TENDER	Suppliers bid against each other for the contract, but participation of suppliers is limited to those who have registered with the government or who have met established prerequisites.	Favorable	Moderate	Moderate	Moderate	<ul style="list-style-type: none"> Where only a low number of reputable suppliers are available Products where bioequivalence, sterility, precise formulation is important Large volume, standard items for which all reliable suppliers are known
NEGOTIATED PROCUREMENT	The buyer approaches a small number of selected potential suppliers and bargains with them for specific price or service arrangements.	Moderately Favorable	Short	High initially, later low	Only initially	<ul style="list-style-type: none"> Bulk buying of single-source drugs Special terms or specifications are required by the buyer
DIRECT PROCUREMENT	Purchase is made directly from a single supplier at his quoted price.	Unfavorable	Very Short	Very Low	No Need	<ul style="list-style-type: none"> Low price, small volume items Emergency items where negotiation not possible Items from international nonprofit groups (e.g., UNICEF, ECHO, IDA)



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IV. PUBLIC TENDERING & LOCAL PROCUREMENT

MOH procurement of drugs is either through JCTC or through the local suppliers and manufacturers.

JCTC:

JCTC's role as the public tendering agency for foreign suppliers is similar to that played by BDS in the Barbados and ECDS in the OECS region. All three agencies use a restricted tendering system. See Exhibit U, lower portion. A report comparing the three agencies public tendering systems in more detail is attached here as the Annex.

Based on estimates of demand developed by the relative public and private sector institutions, JCTC invites approximately 150 foreign suppliers to tender prices on 800-900 different dosage forms. Its first international restricted tender was in 1980, and, on average, prices were reduced by from 20-30%. With the exception of two non-manufacturers who are used for emergency orders, only manufacturers are invited to tender. Both ECDS and BDS invite both manufacturers and wholesalers, although wholesalers must be screened more carefully if they use multiple manufacturers.

Suppliers are not guaranteed minimum quantities; they only receive the estimates. BDS does guarantee quantities, while ECDS does not. It is not clear that there is any distinct advantage of one over the other, although introductory years can be an exception for a new procurement agency.

Contracts are issued for an 18 month period; both BDS and ECDS issue 12 month contracts which is the more common practice. (See final section of report on Problems and Potential Solutions.)

The staff of JCTC makes recommendations for awards, but decisions are taken by a multi-disciplinary committee of approximately ten representatives from both the private and public sectors: e.g. Director of Pharmacy Services, MOH; a representative from the Medical Association, retail pharmacies, the Chamber of Commerce, and the University Hospital. This committee is chaired by the Managing Director of JCTC's Pharmaceutical Division, and JCTC has only one vote. Both BDS and ECDS have an external committee with most of the authority during the adjudication process. However JCTC's is more similar to BDS's than ECDS's in that there is no private sector participation through ECDS. It is possible that this is a contributing factor to ECDS having selected a much larger proportion of generic names than either JCTC or BDS.

JCTC invites tenders by generic name only; however approximately 50% of its awards are made to branded products. BDS awards ~75% to branded products, while ECDS awards only ~25%.

A small sample of drugs that are high demand items in the English-speaking Caribbean was used to compare prices obtained by BDS, ECDS, and JCTC in a paper presented in Trinidad last year. This sample was too small to draw even tentative conclusions, but it does suggest some questions that the JCTC adjudication committee should consider as it reflects upon its decision-making criteria. For this small sample, ECDS's prices were generally lower than either BDS's or JCTC's, even though the low volume and high transportation costs in the small OECS islands would normally result in higher prices. (See recommendation in Executive Summary.) However, since that contract period ECDS has tended to select higher priced suppliers in favor of shorter lead times.

JCTC gives suppliers payment options: either letter of credit or sight draft with varied amounts of time applicable. Since neither ECDS nor BDS have such an option, this adds an additional complication to the JCTC decision-making criteria which does not come into play for the other two agencies. It may be useful to note here that the guarantee of prompt payment was considered to be a major contributing factor to the dramatic decrease in prices that ECDS achieved during its first tenders cycle, i.e. a weighted average of 44% for the six countries that participated initially. Those countries that experienced the largest reduction in prices were usually the MOHs with the poorest repayment track records with suppliers.

JCTC does not publish information on which suppliers were awarded contracts at what prices; BDS does, and ECDS does not. The pros and cons of this policy are a matter of debate, both for this consultant team and others who work with public tendering systems for pharmaceuticals. Because of this policy we needed to make an official request through the Planning Institute of Jamaica to receive a copy of JCTC's prices; given time constraints, we were therefore unable to do a more comprehensive comparison of prices. It would be useful for JCTC or the MOH to conduct a comprehensive comparison.

JCTC assures quality in much the same ways as BDS and ECDS: screening and monitoring suppliers (including establishing performance norms); enforcing JCTC contracts; and testing at the CRDTL.

Perhaps the biggest difference between JCTC and either BDS or ECDS is that -- despite the public controversy about JCTC's influence and power -- it has a much smaller share of its public sector market than either of the other two agencies do in theirs. BDS has a 100% share of the Barbados public sector. ECDS has ~85% share of the public sector markets in the seven countries it serves; through a sole source commitment from the Ministers of Health, MOHs cannot purchase brand name or generic equivalents of any products contracted by ECDS. This is not the case in Jamaica, where the JCTC may have less than half of the public sector drug market.

Local Suppliers:

Under normal circumstances it is a requirement that MOF Supply Division tender for all GOJ procurements. However, this never happens for locally procured pharmaceuticals for two reasons. First, there is considered to be almost no real competition between local suppliers according to many of those with whom we discussed the issue. One local manufacturer (i.e. Federated and its name affiliates), who according to all sources receives approximately 70% of all MOH orders, is the only manufacturer for many products, or the only manufacturer who can produce in sufficient quantities. Second, the Supply Division's tendering mechanism is time consuming (as are most) and virtually all IMS local orders are emergencies, or at least urgent. Local tendering for individual orders from the IMS would not be a practical process.

Therefore, decisions about whom to order what from locally are made at the IMS level. In making its selections, IMS uses price lists or solicits quotations over the telephone and negotiates informally. For the most part, only the price lists are used because only one source of supply may be available. We conducted an informal review of purchase quantities and prices recently obtained by the MOH in Belize compared with the prices paid by the MOH to a local supplier in Jamaica. This informal review indicated that the Jamaica could have doubled its purchasing power by using the same procurement methods as the MOH in Belize. (See recommendation in Executive Summary.)

The MOH JCTC/Local Market Share:

This apparent problem in the local market prices becomes more critical when one considers two other factors. First, the local suppliers' share of the MOH market. Second, the incentives that are operating on behalf of local suppliers in the current public sector procurement system.

Interviews with managers and earlier reports on the supply system suggested that 60%-70% of the drugs for the MOH were purchased through JCTC, and 30%-40% were purchased through local distributors and manufacturers. However, the expenditure data that we received from IMS indicated that the split was closer to 50%:50% with local suppliers receiving a slightly larger share of the MOH market during the past three years. Figure 2 and Table 2 illustrate the trends captured by the IMS accounting records.

The figures and trends presented here were received from IMS. Figures received from JCTC differed significantly from these. For example, according to JCTC's summary figures for 87-88, \$7,921,255J of orders were placed for the MOH, and \$6,478,794J were received. In 88-89, \$10,388,596J of orders were placed, and \$9,689,448J were received. Since there is a lag time between orders being placed by IMS and orders being placed by

JCTC, we would expect a discrepancy between IMS and JCTC figures for the same reason that there is a discrepancy between orders placed and received each year for JCTC's own figures. However IMS figures are consistently higher which may suggest a major weakness in the accounting system, or that some orders intended for JCTC procurement are made locally in order to respond to an emergency. If the JCTC figures are more accurate than the IMS figures, then less than half of the MOH's drug supply is being procured through JCTC.

The local suppliers' ability to respond rapidly to MOH drug supply needs is probably a contributing factor to this trend. Local suppliers will deliver drugs to IMS almost immediately, or within a few days without receiving cash in advance. When orders are placed to JCTC, the current system can take three months to issue a check to JCTC and the supplier lead time adds another three months. See Exhibit VI.

TABLE 2

ISLAND MEDICAL STORES - SUMMARY OF DRUG PURCHASES			
FISCAL YEAR	FOREIGN DRUGS	LOCAL DRUGS	TOTAL
1986-87	\$10,912,196.63	\$12,290,656.41	\$23,202,853.04
1987-88	\$11,731,091.81	\$11,265,697.88	\$22,996,789.69
1988-89	\$14,841,570.27	\$16,060,597.16	\$30,902,167.43

FIGURE 2

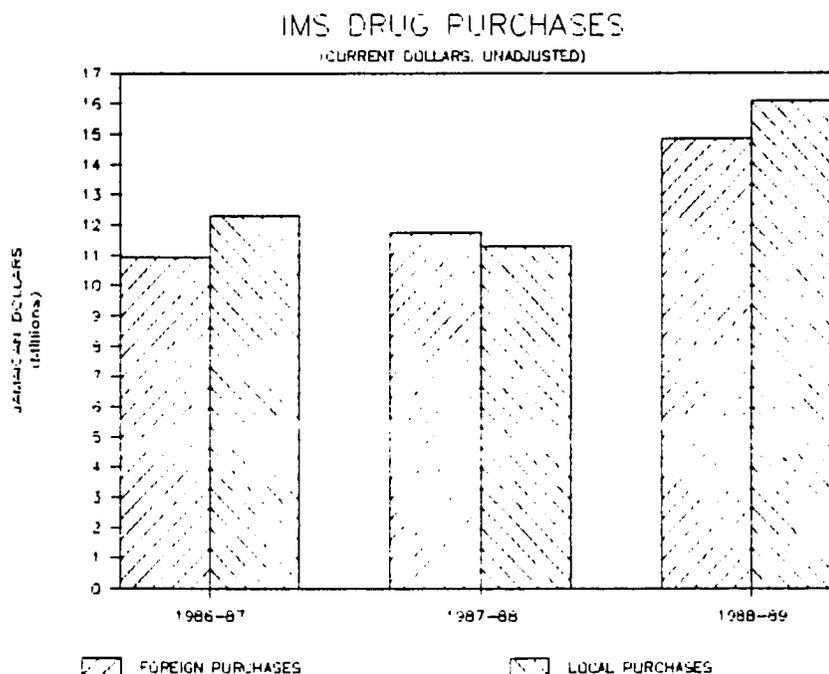
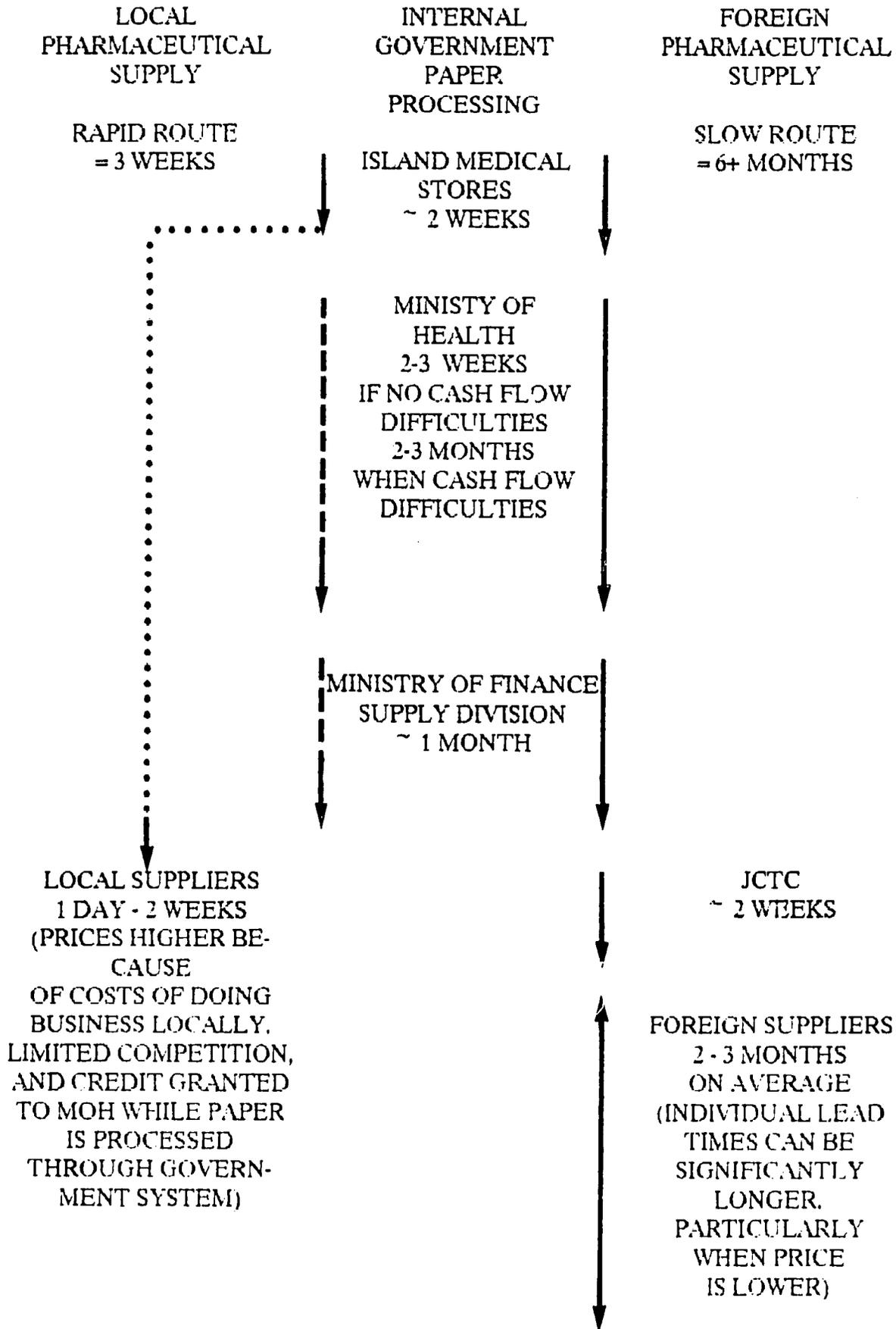


EXHIBIT VI - DRUG ORDER LEAD TIMES

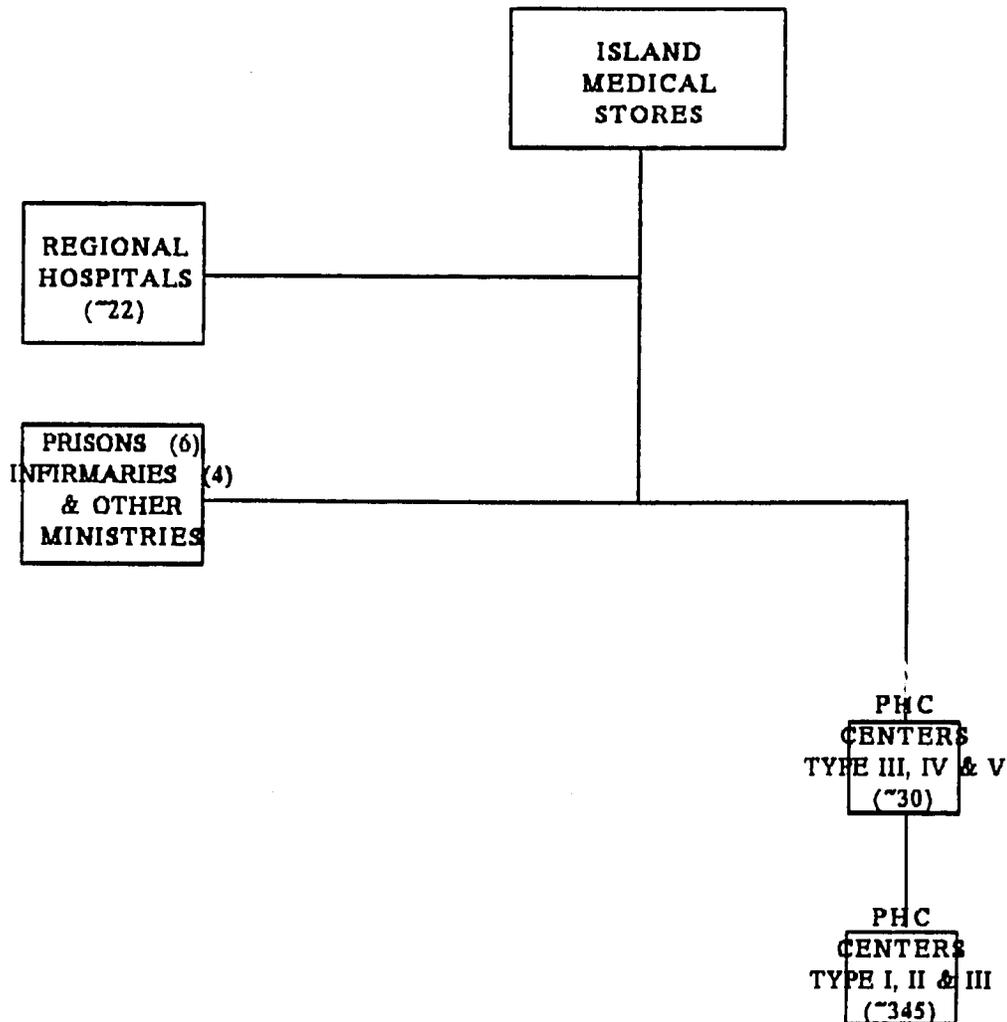


PROCUREMENT PLANNING,
WAREHOUSING & DISTRIBUTION

U. PROCUREMENT PLANNING, WAREHOUSING & DISTRIBUTION

Procurement planning (or purchasing), warehousing, and distribution are perhaps the weakest elements of the public sector pharmaceutical system. The frequent stock-outs and shortages that were cited in reports five years ago have continued to plague the system. During 1986, IMS provided a service level of 20% according to the current government estimates book. The ordering process is not based on routine procedures and accurate, timely information systems that support procurement decision-making, although these are all areas where the MOH/USAID Health Management Improvement Project (HMIP) has invested much effort.

EXHIBIT VII
THE MINISTRY OF HEALTH
DRUG DISTRIBUTION SYSTEM



4/87

Under the HMIP an advisor was provided to IMS for approximately 18 months; the same advisor had previously been working with IMS as a UNDP Consultant. Plans for systems and procedures were developed, recommended for implementation, and, in some cases, partially implemented.

IMS warehousing was totally re-organized, with stocks arranged by therapeutic categories. IMS has two warehouses. The Marcus Garvey location is the administrative headquarters, and all drugs are stored in this warehouse. The Bell Road facility is used to store the overflow of bulk medical supplies. Air conditioning was installed at IMS under the HMIP; however, the air conditioners are not currently working, apparently because of poor maintenance and servicing.

Leakage from the supply system through pilferage was identified as a major problem. Improved security of the physical facilities, particularly at IMS's two warehouses, was provided by the HMIP. However, IMS staff were apparently responsible for much of the pilferage, so improvement of physical security had little impact. The MOH and IMS have been able to remove suspected staff members, and security at the IMS level has apparently seen substantial improvement. However, it is not clear how much pilferage has continued in hospitals and PHCs.

"Emergency" or urgent orders were identified as a problem; estimates in 1985 were ~25% of all local orders. Emergency orders are still a problem, although it was not possible to quantify the magnitude of the problem.

As part of a series of policy, procedures and technical manuals produced by the Ministry of Health, a manual on *Supply Management Procedures for Drugs and Medical Supplies* has been developed under the HMIP. Although dated as issued in 1989, the manual has not yet been officially approved or released by the MOH and MOF Supply Division, and it considered to have been in its "final stages" for the past two years. The three-ring binders intended to house the loose-leaf manuals have been stacked up in the HMIP offices throughout that period.

The apparent intention of this manual is to improve compliance with already agreed upon procedures at all levels of the supply system. However, systems are still weak or non-existent at all levels of the supply system.

Computerized information systems were developed for IMS under the HMIP project. However, these systems only allowed staff at IMS to input data; processing and printing had to be done at the government's Central Data Processing Unit (CDPU). It could take more than three months to get reports back from CDPU, and there were many inaccuracies in the information. This situation has persisted until the present time, and IMS has basically abandoned using most aspects of the computerized information system. There are plans for the HMIP to provide an MIS expert who can rectify these technological problems.

IMS has four vehicles: two 10-ton trucks and two vans, one refrigerated. By contrast, the NFPB, with less commodities to deliver, currently has 5-6 vehicles, and will get 2-3 new vehicles under the Health Sector Initiatives project which is slated as a follow-on to the HMIP.

Facilities are supposed to requisition on a quarterly basis, but they are allowed to place intermediate orders and frequently do. The normal expectation is that IMS will take approximately 4 weeks to deliver after an order is received, but IMS is currently 4 weeks behind this intended schedule: the current delivery period is 8 weeks.

There is a schedule for hospital deliveries. Although hospitals will occasionally send ambulances and other vehicles to IMS to pick up orders, most orders are too large for the hospitals to pick up themselves. Vehicles that come to IMS, including ambulances, are generally coming to Kingston on other business rather than making a special trip to IMS. However, the PHCs often do come to IMS to pick up their orders, since the quantities are smaller. Approximately one-third of the PHC orders are picked up from IMS rather than delivered from IMS. The majority of PHCs (Types I, II, and some IIIs) are supposed to receive their drugs from the District Headquarters PHC, although they can receive directly from IMS if they are conveniently located on the delivery route or if they come to IMS to pick up their orders. The NFPB, on the other hand, delivers directly to all PHCs and hospitals with FP clinics.

See recommendations in Executive Summary. Also, for a fuller description of some of IMS's problems in these areas, documents cited in the introductory section of this report by Ira Robinson (et al) and Arthur Walton provide detailed descriptions.

USE
PRESCRIBING PATTERNS & COMPLIANCE

VI. USE - PRESCRIBING PATTERNS & COMPLIANCE

The University Hospital's Drug Committee, which meets every two months, provides therapeutic updates for prescribers. Based on statistics that the Pharmacy Department collects, this Committee also periodically conducts reviews of drug use and trends. These reviews can be global, by department, or peer reviews of individual practitioners.

Manpower shortages and weak record keeping systems contribute to the absence of statistics on prescribing patterns and drug use patterns in the MOH system facilities. Although there is currently no quantifiable data on prescribing patterns or use in the MOH system, it is well known that doctors tend to over-prescribe. The tendency to poly-prescribe is a natural reaction to the lack of dependable lab and other testing techniques that would confirm a diagnosis, as well as poor prescribing habits. Placebos like Paracetamol and Vitamin B are frequently prescribed in Jamaica. There is a tendency to prescribe brand names (although this may be changing) or even to write "purchase in the U.S." on a prescription slip. An analysis of 12 different non-steroidal, anti-inflammatory agents showed that the highest number of prescriptions in any one sample was the most expensive. Although all of these patterns create wastage in the system, the common over-prescribing of antibiotics (or sale without prescriptions) is more troubling because of the emergence of resistant strains of infection, particularly for STDs.

If the UEN list is revised, published, and both circulated and promoted to prescribers, it may improve prescribing patterns and encourage record keeping. Therapeutics workshops, and the circulation of printed therapeutic updates and price information can also impact use patterns. There are also relatively simple techniques that can be used to collect global use data that might direct more specific studies. (See recommendation in Executive Summary.)

FINANCIAL RESOURCES,
PLANNING & MANAGEMENT

VII. FINANCIAL RESOURCES, PLANNING & MANAGEMENT

Government Resources:

Given the severe economic conditions in Jamaica -- falling GDP, rising population, high levels of debt servicing, an unfavorable trade balance, and the devaluation of the Jamaican dollar during the past decade -- capital expenditure in the health sector is largely limited to repairs of existing buildings. The Government of Jamaica (GOJ) has been trying to *rationalize* the health infrastructure by converting and reclassifying facilities to the level-of-service that they are capable of providing. This is certainly appropriate as the recurrent costs of the existing system are severely underfinanced.

Recurrent costs of the Ministry of Health (MOH) are almost entirely financed by the Ministry of Finance (MOF). The *Government of Jamaica Estimates of Expenditure* for the fiscal year ending March 31, 1990 includes \$478,895,000J for the Ministry of Health (MOH) net of "appropriations in aid", or 8.7% of the estimate for the total recurrent costs in the government sector, including debt servicing. When debt servicing is subtracted from the government's recurrent budget, the MOH accounts for 13.3% of the government sector. These percentages are high for an MOH by world-wide standards in both low- and middle-income countries, but quite typical in the English-speaking islands of the Caribbean.

However, government expenditures per capita in Jamaica are significantly lower than they are in the smaller English-speaking islands. Current estimates for the MOH will amount to an expenditure of approximately \$200J per capita in fiscal 1990. This compares with an average of approximately \$450J per capita for fiscal years 1988 or 1989 in the nine LDCs of the Eastern Caribbean; and approximately \$1300J in 1988-89 for Barbados, as the small English-speaking MDC in the Eastern Caribbean.

Despite apparent private/public salary differentials of 2:1 and vacancy rates of approximately 50% or more in officially designated MOH positions, particularly for professionals including pharmacists, the Jamaican MOH spends approximately half of its budget on personnel.

The MOH budget includes \$56,000,000J for the purchase of drugs and medical supplies, or approximately 12% of the MOH budget. This ten percent share is typical for the English-speaking Caribbean, although drugs and medical supplies can claim a much larger share of developing country MOH budgets world-wide. During fiscal year 1988-89 approximately 75% of the budget for drugs and medical supplies was used to purchase drugs. Since this percentage corresponds with current estimates according to MOH managers, we can assume that approxi-

mately \$42,000,000J will be spent on drugs during fiscal year 1989-90. The \$42,000,000J is augmented by the value of drugs and medical supplies that are consumed at University Hospital which has a separate subvention in the government estimates and no line item for drugs. For fiscal year 1989-90 the University Hospital's drug expenditures are estimated at \$9,000,000J, bringing total drug expenditure through the GOJ to \$51,000,000J. Jamaica's per capita expenditure on drugs during 1989-90 would therefore be approximately \$20J per capita, compared with approximately \$24J per capita in the OECS countries and \$145J per capita in Barbados. The OECS countries spend over five million EC dollars per year (generally excluding FP supplies but including the operating costs of the ECDS) and Barbados spends approximately twelve million Barbados dollars (excluding the costs of operating BDS which add an addition ~19% to the drug costs).

The MOH drug budget for Jamaica was even more constrained earlier in this decade, and this year's GOJ estimates book notes that during 1986 IMS provided a service level of 20%. However there is no real gap between Jamaica (\$20J per capita) and the OECS region (\$24J per capita) because OECS figures include a 15% fee paid to cover the operating costs of ECDS. Also, the OECS average per capita figure masks major variations between the OECS member states. Dominica, for example, spends far less per capita than some of the other OECS member states.

Although it spends less per capita than Jamaica and is perhaps the least developed country in the OECS, Dominica is considered by many to have the most effective and efficient drug supply system in the OECS islands. Its formulary is very tight, and the MOH enforces rigid adherence to the national formulary. Purchase prices through the ECDS are low. Drugs are budgeted for at the facility level, and cost accounting systems are used to charge the facilities and monitor their performance against the budget. Periodic analysis are done of drug expenditure, per facility by drug type which allows the identification of major discrepancies in use patterns or expenditure per patient. Price lists for course-of-therapy treatments are circulated to prescribers to increase their cost sensitivity. The Dominica system seems to illustrate the possibility of providing adequate pharmaceutical services without high per capita expenditures.

User Fees:

Beginning in fiscal year 1985-86, the MOH was allowed to retain revenue from user fee charges rather than returning all fees directly to the GOJ's consolidated fund. Facilities return fees collected to the MOH but are allowed to receive 50% (or more in special cases) of the fees collected back again once they submit a budget request for the use of the fees. This change in policy had a significant influence on the motivation to collect officially established fees at the

facility level, and for the few facilities with baseline data from the 1983-84 period the increase was dramatic, from over 500% to nearly 1500%. User fees per patient also increased significantly. In 1986-87, fee revenues accounted for from 5.6% to 27.4% of operating costs for the 10 regions. However, these operating costs are for the hospitals only, and total user fees for the MOH are currently estimated to cover only about 1.5% of the cost of all services. The GOJ estimates for 1989-90 includes 3 million Jamaican dollars as "appropriations in aid" that are the estimates for user fees that will cover that portion of the costs.

In general user fees, including those for drugs, are only collected at the hospital level, and not at the health care centers. The hospitals that have been recently *rationalized* to Type IV or U facilities have continued to collect fees, and apparently these facilities with a lesser range of services are particularly dependent on fees for drugs, followed by maternity fees. (Larger hospitals benefit most from admission fees.)

The fee for drugs is \$5 per item on a prescription slip. An analysis of sources of user fees for 23 hospitals in 1985-86 showed that a weighted average of 20.6% of all user fees came from drug fees. Patterns for collection are not closely related to expenditure patterns for user fee revenues. An analysis of expenditure of user fees for 16 hospitals in 1986-87 showed that they spent an average of 4.9% of their user fee revenues on drugs. However, this average was raised by one hospital that spent 27.2% on drugs, as most hospitals purchased no drugs with the user fees.

Exemptions and exceptions (impacting drug fees) include: all visits for family planning or immunization; food aid recipients; women with high-risk pregnancies; and dental treatment for children. Those with chronic conditions (diabetes, hypertension, arthritis, mental patients) pay a \$5 registration fee annually plus a \$5 prescription fee per visit (not per item).

These rules hold for the MOH system in general. The University Hospital has apparently been able to institute some modifications, including charging private patients and insured patients at higher rates.

Estimates of the proportion of patients who pay fees range from 10-75% depending on the institution and whether all patients or out-patients only are being considered.

Jamaican MOH user fee policies compare very favorably with the smaller countries of the Eastern Caribbean. Through the Special Benefits Service (SBS), the BDS is reimbursing the private sector pharmacies for the cost plus a profit margin of formulary drugs. The identical drugs (same brand, same packaging) are provided free of charge through the MOH system where they only cost the government the base price. Many of

the OECs countries have an official schedule of user fees for drugs and other services; however, categories of exemption are so broad (e.g. under 15 years, over 60, all chronic diseases, all pregnant women, police, nurses, etc.) that in a country like St. Lucia, the potential for collection is estimated at approximately 7% of all health care system users. This potential is never realized because there is little motivation to collect at the facility level, at least partly because all fees go back to the general consolidated fund.

Although Jamaica's MOH user fee policies have proven successful, particularly in increasing the motivation to collect at the facility level, there is a need to revise the policies. (See final section in report on Problems & Potential Solutions.)

The Private Sector Alternative to User Fees:

In reconsidering its pricing policies on user fees, it is important that the MOH consider the private sector alternative presented to health care users, as well as cost recovery issues and ability/willingness to pay.

In general there is a 15% customs duty, a 5% consumption tax, and a 2% handling charge for private sector pharmaceuticals. There is not normally duty on government purchases. For most pharmaceuticals products, prices are controlled in the private sector. For ethical drugs, wholesalers can charge a maximum of 20% and retailers can charge an additional 30%. For over the counter (OTC) products, the maximum wholesaler margin is 20% and the retail is 25%. In both cases a "professional fee" or dispensing fee of \$4J per item is also allowed at the retail level.

External Assistance:

The Social Sectors Development Project, funded by the World Bank, includes a budget of approximately fifteen million US dollars for the procurement of pharmaceuticals. The intention is that these funds will be used as a capital investment to fill up the supply pipeline or "top up the stock levels" and allow the MOH and IMS to move out of a crisis management mode so that good procurement planning and inventory control techniques can be implemented. The down-side risk here is obviously that these funds can easily be inadvertently used to fund the MOH's recurrent costs for drugs over several years, rather than build up and maintain a capital investment in stock levels. The danger of this occurring is particularly acute for a commodity like drugs where few managers can or do make a distinction between capital and recurrent costs for the commodity. The distinction between the two is much more blurred than it would be for construction and repair of buildings or the purchase of vehicles, for example. The greatest risk here is that, five years from now, the GOJ could find itself with additional debt for a World Bank loan used to fund

its own MOH operating costs through the drug supply system.

The World Bank project document also calls for revision of user fee policies.

Financial Planning & Management:

The pharmaceutical and medical supply line item in the GOJ estimates for the MOH operates at two levels: first, a global drug budget for IMS, \$56,000,000 this fiscal year; second 18 budgets organized around a) tertiary and secondary care for the regions, and b) primary care organized by geographical definitions. The aggregate of these budgets is \$55,000,000 this fiscal year, and the one million dollar difference is attributed to stock values at IMS. The first level budget/cost center is the responsibility the Director of Pharmaceutical Services; when drugs for IMS are paid for by the MOH, the payments are debited to this account. The 18 budgets represent the MOH's current cost centers: 10 by region for the regional hospitals, and 6 for primary care. All but 6 of the parishes have now been organized collectively by region for accounting purposes; the other 6 are slated for the same organization in the future. When drugs are distributed to the regional hospitals or the PHCs, IMS's global account is credited for the value of the drugs and the cost center for the regional hospital (or PHCs) is debited.

It appears that costing systems between IMS and the facility level have slide backwards during recent years. Hospitals in the Cornwall region are now operating with the computerized cost systems (developed by PAHO and the MOH) in their second financial year, and the same system is being implemented in the Kingston Public Hospital (KPH). The only costs that the Cornwall region hospitals are unable to capture are related to drugs and medical supplies, although they apparently received this information several years ago. This problem is, at least in part, the result of IMS's problems with computerization and information systems as described under Section V. Since the costing information from the computerized systems was both relatively inaccurate and six months late, IMS is no longer processing and sending reports to the facilities.

This is unfortunate because the MOH Finance Department does periodic performance reviews of the health care system where it is possible to develop performance indicators, e.g. meal costs per patient bed day, drug costs per out-patient visit, per patient bed-day, or comparatively for service population and facility type could be used both as a measurement of a facility's comparative efficiency and as a basic planning unit during the budget process. However, at the present time the MOH Finance Department cannot even compare actual costs per facility with an original budget. First, the individual facilities have no budget/costing system for drugs. Second, any information that could be made available has consistently been six months late and not very accurate.

HUMAN RESOURCES
& MANPOWER PLANNING

VIII. HUMAN RESOURCES & MANPOWER PLANNING

Given salary levels, career opportunities, and working conditions, the GOJ civil service is experiencing extreme difficulty in attracting and maintaining qualified staff. The MOH is no exception. Vacancy rates in professional positions can be over 50%.

Managers:

The exodus from the civil service over the past decade has frequently left those managers who have remained in the MOH system with an excess of responsibilities. As the key manager in the public sector pharmaceutical system, the DPS appears to be an example of this.

As DPS he is technically, administratively, and financially responsible for the procurement, management, and distribution of drugs, medical supplies, x-ray, lab supplies, blood bank, and dental supplies for the MOH. Every pharmacist in the MOH reports to the DPS. The Chief Dangerous Drugs Inspector, the Principal Pharmacist, four Drug Inspectors, and two Auditors report to him. He is Jamaica's Representative on the CRDTL, a member of the Pesticide Authority, a member of the Medical Committee of the NFPB, Chairman of the Formulary Committee, a member of the Trade Board Committee on Pharmaceuticals, a member of the JCTC Tenders Committee, and Chief Administrator for the Food and Drugs Act.

In addition to these multiple responsibilities, most of which are either policy-level activities or should require only oversight of mid-level managers, the DPS is essential as a facilitator of day-to-day operations in the MOH's supply system.

It has probably been particularly difficult to develop and retain good mid-level managers in the MOH system, since the civil service offers little to young, aspiring managers. The MOH system does offer some very liberal fringe benefits (see below) but, while they increase costs to the MOH, they do little to overcome the low salaries, limited career options, and difficult working conditions. (See recommendations in Executive Summary.)

Pharmacists and Pharmacy Technicians/Assistants:

The overall vacancy rate for pharmacists is over 60%. Of the 152 pharmacist posts, 62 are filled, including 15 retirees who have continued under contract. Eleven of the hospitals are without a pharmacist. Only half of the pharmacy posts are filled at University Hospital, IMS, and MOH Supply Division. Of the 95 pharmacy assistant posts, 95 are filled, and many of the assistants are acting in pharmacists' posts.

In the private sector, pharmacists practice in ~200 pharmacies, 6 private hospitals, and wholesale outlets. Private sector salaries are often more than twice those received in the government sector, and the private sector has attracted many pharmacists away from the MOH system. Some government pharmacists supplement their income through part-time employment in a retail pharmacy.

It would appear that the MOH offers a package of fringe benefits that creates significant costs for the government, but offers limited attraction to pharmacists. For example, MOH pharmacists are eligible for 35 days of vacation, 14 days of departmental leave, 10 national holidays, and 15 sick days (with a medical certificate) for a total of 74 leave days. This means nearly 30% of the 260 total possible working days in a year can be leave days. In addition, there are two months paid for maternity leave and an additional unpaid month is optional. While these benefits do not increase the annual earnings of the individual pharmacist and therefore do little to make practicing the profession in the public sector more attractive, they do substantially increase the per working day costs of having a pharmacist's services in an MOH facility.

The College of Arts, Science and Technology (CAST) offers a three-year diploma course in pharmacy. In terms of manpower planning, the numbers of students graduating each year should be adequate to provide for Jamaica's needs -- if the current shortages were not so dramatic. There are currently 132 students enrolled in the CAST program and only a few of these are from outside Jamaica. The MOH is responsible for a technician training program that consists of four months of formal training and eight of on-the-job training. However, this training has not been offered for six years. The Jamaica Pharmaceutical Society is concerned about the number of pharmacy technicians who are acting in place of qualified dispensers, but it is not clear that the MOH has any short term recourse from this option.

Since the GOJ and the MOH have been experimenting successfully with certain kinds of divestment, such as contracting out hospital laundry services, it could be useful to contract out pharmacy services on an experimental basis. (See other recommendations in Executive Summary.)

ANNEX

*M. Huff-Rousselle
(marked copy)*

*marks reflect
connections/comment
from ICTC staff w.
TCM members*

PUBLIC TENDERING FOR PHARMACEUTICALS
In the
ENGLISH-SPEAKING CARIBBEAN

BARBADOS, JAMAICA, and the OECS COUNTRIES

Prepared for the ,

Essential Drugs Policy Programme Seminar

Sponsored by

**Ministry of Health, Government of Trinidad
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**Port-of-Spain, Trinidad
December 2, 1988**

Maggie Huff-Rousselle, M.A., M.B.A.

**Management Sciences for Health
St. Lucia, West Indies
December, 1988**

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PUBLIC TENDERING FOR PHARMACEUTICALS
in the
ENGLISH-SPEAKING CARIBBEAN

BARBADOS, JAMAICA, and the OECS COUNTRIES

During the past decade three public tendering systems for the procurement of pharmaceuticals have been established in the English-speaking Caribbean: the Barbados Drug Service (BDS), the pharmaceutical division of the Jamaica Commodity Trading Company (JCTC) Ltd., and the Eastern Caribbean Drug Service (ECDS).

All three agencies have introduced a restricted international tender, but each agency has developed a tendering-procurement model with its own unique attributes. BDS, JCTC and ECDS have all succeeded in increasing the level of health services provided to the populations they serve while simultaneously reducing the purchase price of pharmaceuticals. The authority provided to the three agencies and the introduction of restricted tendering systems have made this possible because:

- *Reduced prices extend purchasing power, providing a larger volume of available pharmaceuticals to the population.*
- *Public tendering and contracting provides more control over suppliers, increasing quality assurance.*
- *These agencies have a combination of social goals, statutory powers and resources that enhance their benefit to the health care system in a variety of ways.*

Perhaps the greatest benefit that BDS, JCTC and ECDS have provided to the region is economic: the unit price reduction of pharmaceuticals has stretched public (and private) sector budgets, allowing cost reductions or, more commonly, a more regular supply of pharmaceuticals in the Ministry of Health (MOH) systems. The bar charts interspersed throughout this paper illustrate CIF prices currently paid by BDS, JCTC and ECDS for seven of the products most commonly used in the English-speaking Caribbean.

AUTHOR'S ACKNOWLEDGEMENT: *This paper was made possible by information provided during telephone conversations with: Lennox Prescott, Director of the Barbados Drug Service (BDS); John Turnbull, former Director of BDS; Maureen Graham, Managing Director of the pharmaceutical section of the Jamaica Commodity Trading Company (JCTC) Ltd.; and Paul Ellis, former Managing Director of JCTC as well as its pharmaceutical section. Given time constraints, these individuals have not yet been able to review the content of this paper. A revised version that has been reviewed by them will be made available on request.*

The bargraphs comparing unit prices and other graphic illustrations dispersed throughout the paper were completed with the assistance of Francis Burnett, Assistant Director of the Eastern Caribbean Drug Service (ECDS); Jim Rankin, Pharmacy Director of Presbyterian Medical Services (PMS); and Sonjette Rodrigues and Peter Huff-Rousselle of Management Sciences for Health (MSH). An annex provides detailed explanations of the price comparisons.

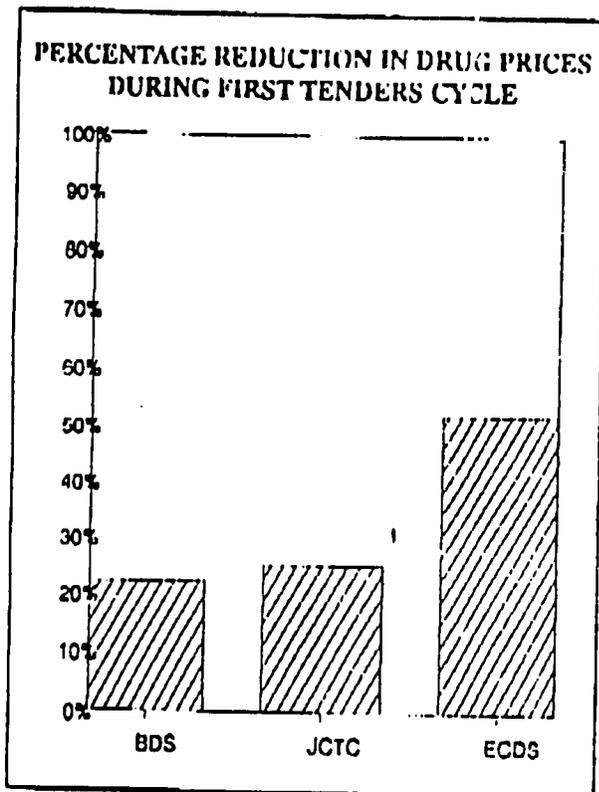
PUBLIC TENDERING FOR PHARMACEUTICALS in the ENGLISH-SPEAKING CARIBBEAN

How other Purchasing Methods Compare With Restricted Tender

Purchasing Method	Brief Description	Effect on Price	Delivery Times	Workload on the Procurement Unit	Need for a Merit Rating of Suppliers	Conditions Favoring Use
OPEN TENDER	Bids are accepted from all interested suppliers.	Very Favorable	Long	Very High	Very High	<ul style="list-style-type: none"> • Many reputable suppliers are available • May be necessary at beginning of program to open supply channels
RESTRICTED TENDER	Suppliers bid against each other for the contract, but participation of suppliers is limited to those who have registered with the government or who have met established prerequisites.	Favorable	Moderate	Moderate	Moderate	<ul style="list-style-type: none"> • Where only a few reputable suppliers are available • Products where bioequivalence, sterility, precise formulation is important • Large volume, standard items for which all reliable suppliers are known
NEGOTIATED PROCUREMENT	The buyer approaches a small number of selected potential suppliers and bargains with them for specific price or service arrangements.	Moderately Favorable	Short	High initially, later low	Only initially	<ul style="list-style-type: none"> • Bulk buying of single-source drugs • Special terms or specifications are required by the buyer
DIRECT PROCUREMENT	Purchase is made directly from a single supplier at his quoted price.	Unfavorable	Very Short	Very Low	No Need	<ul style="list-style-type: none"> • Low price, small volume items • Emergency items where negotiation not possible • Items from international nonprofit groups (e.g., UNICEF, ECHO, IDA)



From: "Managing Drug Supply" MSII



BARBADOS DRUG SERVICE

The Barbados Drug Service (BDS) is a department of the Barbados Ministry of Health; it serves the population of two hundred and fifty thousand through both the private and public sectors. All drugs for both sectors are channeled through BDS. Initially BDS funding came from government revenues and a loan from the Caribbean Development Bank (CDB); Kaiser Foundation assisted with studies prior to BDS start-up, and PAHO provided assistance in the development of computerized information systems provided through a separate company.

BDS's first invitation to tender was in 1980. The first contracts were for a shorter period of time, but BDS contracts are now for a full year. The initial price reduction was twenty-two percent.

Currently BDS is tendering for one thousand and fifty different products. The total value of drugs procured during the 87-88 cycle was just under six million U.S. dollars; approximately thirty percent of these purchases

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PUBLIC TENDERING FOR PHARMACEUTICALS in the ENGLISH-SPEAKING CARIBBEAN

were for the private sector. Approximately two hundred suppliers are invited to participate in the restricted tender. Both manufacturers representatives and wholesalers based in Barbados are invited. In addition to other selection criteria, all suppliers must have a Barbados-based agent, and tenders documents are distributed to these agents.

Aside from being Barbados-based, suppliers must submit a form to the Director of BDS. Information on the firm's technical competence, quality assurance procedures and standards, financial viability, and other relevant screening information is solicited and considered before a new supplier is invited to tender.

Quality assurance in Barbados has improved through screening of suppliers, monitoring of supplier performance, enforcement of BDS contracts, and testing at the Caribbean Regional Drug Testing Laboratory (CRDTL) in Jamaica. Testing is relatively limited because changes in products and/or suppliers are infrequent.

BDS does no warehousing or distribution except for small emergencies, or as a result of carry-overs when minimum guarantees were not met by existing demand. These activities are the responsibility of the Barbados-based suppliers who are aré paid an addition thirty-two percent over CIF prices for these services. The thirty-two percent has risen from twenty-eight, and it is intended to recompense suppliers for other sundry administrative costs related to these services. The average lead time between order and delivery is three to seven days.

BDS guarantees minimum quantities to suppliers. This caused problems during the early years with excess stocks, because accurate estimates were difficult to make. Although the system is predicatable enough now to have limited such problems, it is not clear whether or not the guarantees have any impact on suppliers quotations since suppliers must now have confidence in BDS estimates.

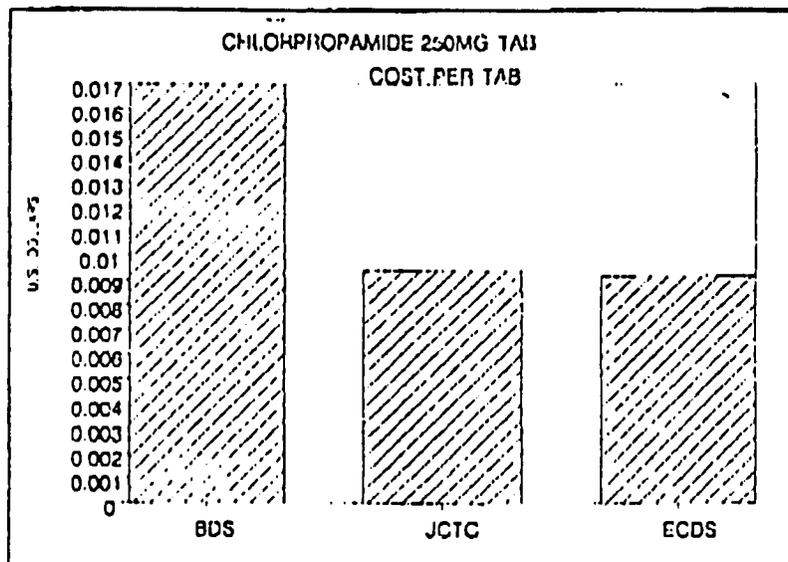
Tenders invitations are listed by generic name only, although BDS awards approximately seventy-five percent of its contracts for brand name products.

The tenders awards are adjudicated by the Tenders Committee, composed of physicians, pharmacists, and BDS staff. The Director of BDS is the Chairper-

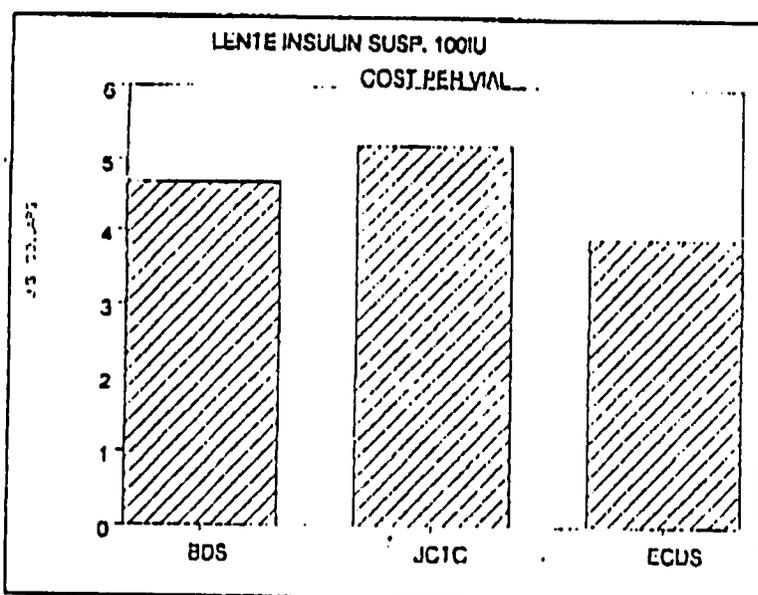
son and an Assistant Director is the Deputy Chairperson. The Committee makes recommendations to the Minister of Health who has never overruled their recommendations. BDS publishes all tenders quotations and awards and distributes these documents throughout the CARICOM region.

BDS makes direct payments to suppliers in Barbados dollars, usually within two to four weeks of receipt of orders.

BDS is probably the strongest drug service in the english-speaking Caribbean. It is also the most expensive. Initially, BDS met with "considerable resistance" from both physicians and suppliers. Now BDS has an excellent relationship with both health professionals and suppliers. It is a WHO information centre, providing everything from BDS formulary manuals, newsletters, and price lists to all CARICOM Ministries of Health. It is also a PAHO Training Centre, and has less formal collaborating relationships with national health organizations beyond the Caribbean. At the same time per capita drug expenditures in Barbados are comparable to some developed countries and probably the highest in the Caribbean. Total costs of the BDS doubled during a recent three year period. This is the result of changes in the special benefits program in the private sector and, possibly the influence of a teaching hospital in a relatively small nation. Certainly BDS has become a centre for the exchange of professional information. Lennox Prescod, Director of BDS, is confident that the "openness" of BDS as an organization and its ability to communicate with health professionals are key reasons for its success. He says, "Most health professionals in Barbados would say, 'Money spent on the drug service is the best money we've ever spent.'"



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JAMAICA COMMODITY TRADING COMPANY, PHARMACEUTICAL SECTION

The Jamaica Commodity Trading Company (JCTC) Ltd. is operated as a private company with the Government of Jamaica owning one hundred percent of its shares. It was established with government funding, and is one of the most profitable of the government-owned corporations. JCTC is able to pay the government dividends regularly.

The Pharmaceutical Section of JCTC provides for the public sector and a segment of the private sector for the two point two million people living in Jamaica. It purchases approximately seventeen percent of the private sector's ethical drug needs and has a monopoly on that segment of the sector.

JCTC does not warehouse or distribute drugs, although management is currently considering a minor role in these activities.

Its first restricted tender invitation was in 1980, and, on average, prices were reduced by from twenty to thirty percent. JCTC is currently purchasing between five and six million U.S. dollars of pharmaceuticals annually. Approximately fifty suppliers in thirty different countries are invited to tender on from eight to nine hundred different products. Only two non-manufacturers are invited; these are used for emergency orders. The tenders cycle runs for eighteen months.

JCTC selects suppliers on the basis of technical compe-

tence, quality assurance procedures and standards, financial viability and other relevant screening information. With a few exceptions, there is no importation of products that are produced inside Jamaica. Initially, known suppliers were included and others were encouraged to participate to increase competition; in earlier cycles over one hundred suppliers were invited. Suppliers are not guaranteed minimum quantities; they are provided with estimates.

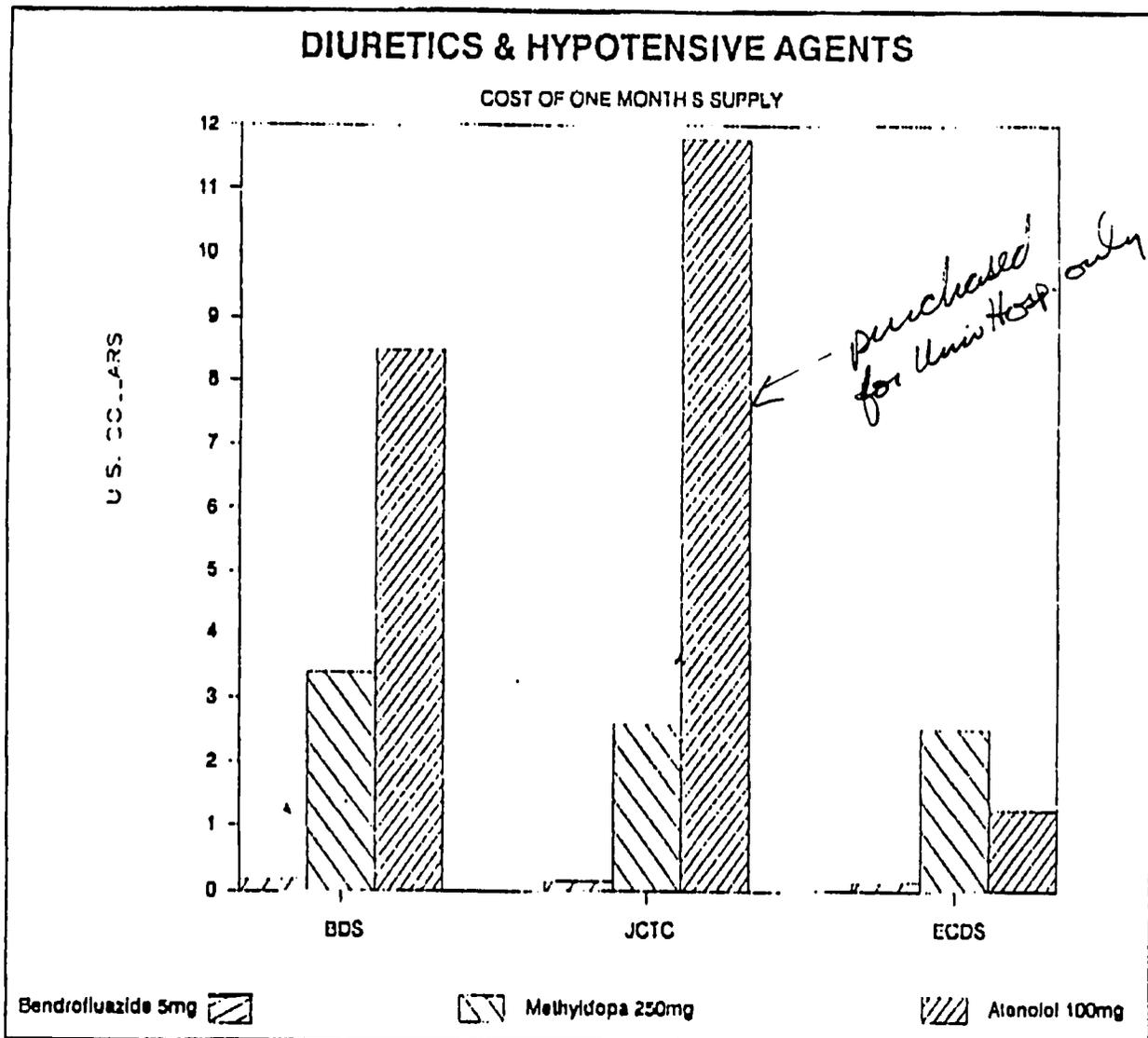
JCTC invites tenders by generic name only. Currently fifty-six percent of their product awards are to brand names; this statistic has been declining, and JCTC is making efforts to reduce it further.

The staff of JCTC makes recommendations for awards, but decisions are taken by a multi-disciplinary committee of approximately ten representatives from both the private and public sectors: e.g. Director of Pharmacy Services, MOH; a representative from the Medical Association, retail pharmacies, the Chambre of Commerce, and the University Hospital. This committee is chaired by the Managing Director of JCTC's Pharmaceutical Division, and JCTC has only one vote. JCTC does not provide public information on which suppliers received awards at what prices. Paul Ellis, former Managing Director of JCTC, believes that it is not sound economic practice because there is no evidence that this will encourage a further reduction of prices; in fact, it could encourage price fixing.

Lead times for delivery of products vary from three weeks to four months or more, with an average of about two months. Customs clearance procedures have been cumbersome and time consuming, although there have been recent efforts to alleviate this problem.

JCTC gives suppliers payment options: either letter of credit or sight draft with varied amounts of time applicable. JCTC generally makes payment for sight drafts through the Bank of Jamaica and for letters of credit through the commercial banking system. Access to foreign exchange has been a chronic problem, although it is less of a problem currently. In the past the supplier's selection of payment method and, particularly the time applicable (up to 180 days) was a key determinate in adjudicating awards; now, with cash flow less of an issue, it is less important.

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JCTC assures quality in much the same ways as BDS: screening and monitoring suppliers (including establishing performance norms); enforcing JCTC contracts; and testing at the CRDTL in Jamaica as well as other labs. JCTC has recently stepped-up testing activities.

As one of Jamaica's most profitable government-owned companies, JCTC purchases far more than pharmaceuticals. Vehicles and grains are its largest imports. This means the organization is far more complex than BDS or ECDS; it also has a much broader sphere of influence. Although the pharmaceutical section sometimes makes a small profit, it can also run an annual deficit that will be covered by the surplus from other sections. The pharmaceutical section supports itself through a retail margin of four to eight percent on products. It has the power to regulate retail prices, and has subsidized some drugs by increasing the margin on others. JCTC

provides other services with surpluses, e.g. scholarships and other training support.

Like other state-owned companies, JCTC was initially seen as a threat by the private sector, but such resistance to change is largely behind the organization now. Foreign exchange has been a chronic problem but is a less significant hurdle now. JCTC clients have been weak in providing accurate estimates for tenders invitations, and JCTC has recently introduced trend analysis to alleviate this problem. JCTC has also been working more closely with health professionals recently, soliciting feed-back and promoting the organization's services. "We're launching a marketing program this year," says Maureen Graham, Managing Director of the Pharmaceutical Section. "Representatives go out to visit professionals in their clinical settings and work with professional associations."

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EASTERN CARIBBEAN DRUG SERVICE

The Eastern Caribbean Drug Service (ECDS) was established in 1986 as an agency of the Organisation of Eastern Caribbean States (OECS). It provides a restricted tendering and procurement system to a population of half a million in the six participating countries: Dominica, Grenada, Montserrat, St. Kitts & Nevis, St. Lucia, and St. Vincent and the Grenadines. The British Virgin Islands and Antigua are expected to join in 1989.

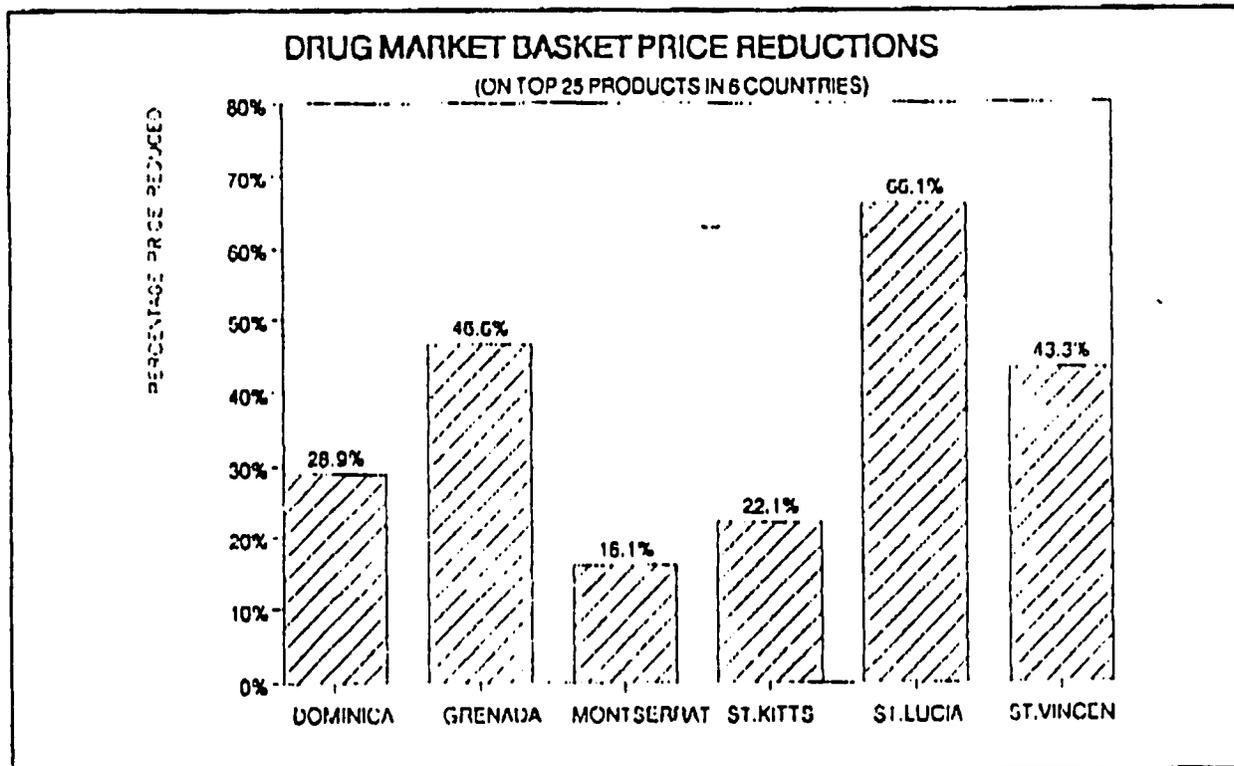
Through a grant to the OECS, USAID provided funds under the Regional Pharmaceuticals Management Project (RPM) for equipment, training, and technical assistance (TA) through Management Sciences for Health (MSH), a Boston-based non-profit. The start-up and operating costs of ECDS are also funded through mid-1990 when the agency is expected to become financially self-sufficient. The mechanism for self-financing is a fifteen percent administrative fee added to the CIF prices paid by the participating countries. During its first contract cycle ECDS covered approximately seventy percent of its operating costs; this is being retained to create a fund balance for the period when no outside funding will be available. *

No funding was provided for the purchase of drugs. Each country established a special account with the

Eastern Caribbean Central Bank (ECCB) in St. Kitts, the monetary authority for the Eastern Caribbean dollar. Suppliers receive payment in U.S. dollars or their national currencies within forty-two days of delivery of shipments. This system reduces banking costs, eliminates foreign exchange problems and guarantees prompt payment to suppliers.

The ECDS currently purchases over one and a half million U.S. dollars worth of pharmaceuticals annually. It serves only the public sector, through the MOHs, and does no warehousing or distribution. Orders are shipped directly to the Central Medical Store (CMS) in the country that ordered them.

The first restricted tender occurred in 1987, and the overall price reduction on the top twenty five products was fifty-two percent. After paying the fifteen percent administrative fee to ECDS, participating governments realized a price reduction of forty-four percent. The price reduction in individual countries ranged from sixteen to sixty-six percent. In addition to the stimulation of competition created by the restricted tender, these major price reductions were possible for several reasons. First, the MOHs made a sole source commitment to ECDS, greatly increasing bargaining power; suppliers officers had been unable to do competitive shopping in the past. Second, the ECCB accounts guaranteed prompt payment, and several countries had poor payment reputations with suppliers. Third,



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the ECDS selected quality generic products from a restricted regional formulary of essential drugs.

The ECDS invites approximately one hundred suppliers in fifteen different countries to tender on three hundred and twenty products. Contracts are issued for a one year period. Less than ten percent of the suppliers are non-manufacturers, although through the first two cycles, they have been awarded more than ten percent of the products. Quantities are not guaranteed, and tendering and award pricing information is not published outside the system. Tenders are solicited with generic names and only about ten percent of products are awarded as brand names.

Adjudication and award of contracts is conducted by a Tenders Sub-committee composed of the Supplies Officers who represent the participating countries, and the ECDS Managing Director and Assistant Director. ECDS staff have no voting rights although their advice can influence decision-making. The Chairperson is rotated annually, alphabetically through country representatives, which helps to maintain a balance of power and influence on the Sub-committee. With transportation difficulties in the small islands, supplier lead times range from two to three months; lead time can be an important decision-criteria during adjudication.

Supplier selection and quality assurance at ECDS is similar to BDS and JCTC: screening and monitoring of suppliers (establishment of performance norms is in a nascent stage); enforcement of ECDS contracts; and testing at the CRDTL in Jamaica as well as other labs. Like JCTC, ECDS has recently stepped-up testing activities. Supplier experience in the OECS subregion, particularly the personal experiences of the six supplies officers, is also an important criteria for supplier selection. ECDS solicits feedback on supplier performance and quality assurance through frequent regional meetings, site visits, and forms designed to capture relevant information.

Perhaps ECDS's most salient contribution is that it is a model of functional cooperation in the OECS subregion that provides clearly measurable economic benefits to the participating countries. "If we can show, with each example, such as this project, that the method of coordination works," says Dr. Vaughn Lewis, Director General of OECS, "it gives [us] greater confidence to proceed in this manner for the benefit of the people of the region."

Like JCTC, procurement planning weaknesses in the ECDS client countries have been a system weakness: estimates can be inaccurate and orders are often poorly

timed so that 'emergencies orders' are routine. ECDS has provided computers and training to all of the CMSs to try to strengthen their inventory management and procurement planning. The low volume of drugs purchased in the sub-region has meant that ECDS's financial viability, based on the fifteen percent administrative fee, has been considered tenuous; however, with Antigua and the British Virgin Islands joining the alliance, financial self-sufficiency should be attainable.

Like BDS, ECDS has also worked to create professional networks. The Ministers of Health, assisted by their Permanent Secretaries, sit on the Policy Board of the ECDS; senior physicians, frequently the Chief Medical Officers (CMO), sit on the Formulary and Therapeutics Sub-committee which has recently published the first F&T reference manual for the OECS grouping. The Supplies Officers sit together for at least two annual meetings. Regional training programs and country-level workshops are frequent. "We at ECDS," says Sherita Gregoire, Managing Director, "have given the professionals in the OECS countries an opportunity to talk with one another."

LESSONS TO PONDER

BDS, JCTC and ECDS have proven that such agencies can make significant contributions to regional health care systems. Their success illustrates important lessons and raises several questions.

In all three cases, there has been the political will to create, support, and empower the agencies. Without this support, none of these agencies would have been able to contend with the initial resistance to change encountered from both health care professionals and private sector suppliers.

These agencies have shown that financial commitment must accompany the political will. The guarantee of prompt payment to suppliers is a major contributing factor to unit price reductions. Although poor past shopping habits may also be a contributing factor, it is no coincidence that the OECS countries that experienced the largest price reductions were also the countries with the weakest history for prompt payment to the suppliers who served them.

The price comparisons shown here for the three agencies should make us ask: how important is "bulk" procurement? Price comparisons suggest that increased bargaining power and the supplier/brand selection contributes more to price reduction than "bulk" pur-

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chase. The OECS countries have the lowest volume of demand, and their periodic ordering patterns have not been adjusted to bulk annual or semi-annual purchases, although this could be an additional benefit to them. They purchase a higher percentage of generics than the other agencies.

It is useful to consider other contrasting procurement strategies selected by the three agencies. BDS gives minimum guarantees, and publishes competitive pricing information throughout the CARICOM region. The pricing information should be useful to other CARICOM countries who have continued to use negotiated procurement as a purchasing method. However, it is not clear that minimum guarantees or the publication of competitive pricing data has helped BDS to reduce its own purchase prices. Barbados-based suppliers may recognize when they have achieved an informal sole source based on regular repeat awards for specific products. Barbados-based suppliers also often provide financial support for continuing education to health professionals through BDS.

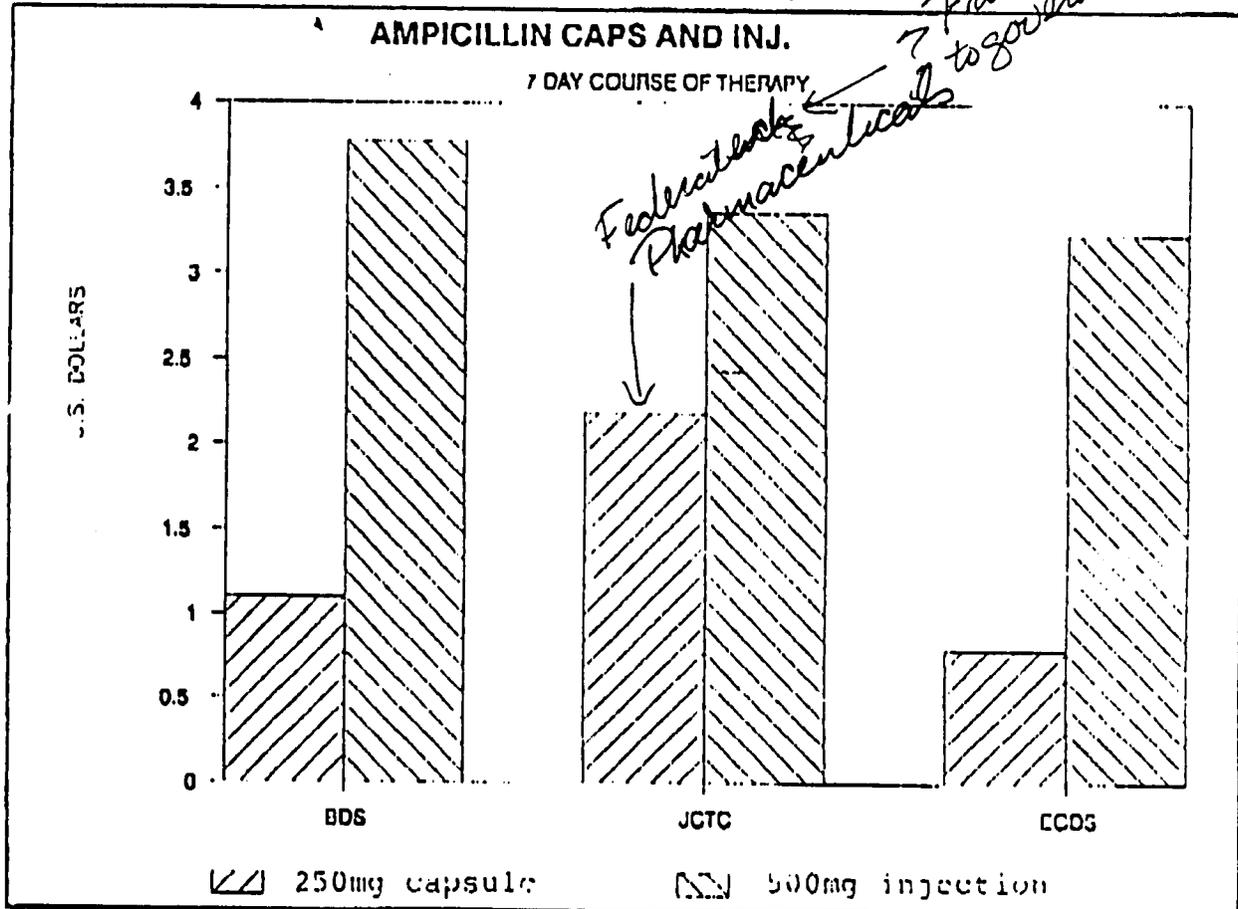
Increased bargaining power creates more than price reductions. The selection and monitoring of suppliers is the best preventive medicine for quality assurance.

Through contract enforcement and de-listing of suppliers, these agencies can completely choke off a major market for a supplier who has not provided quality products under agreed upon conditions to the agencies' clients.

These agencies have mandates and formal or informal influence that allow them to better serve the public. BDS has influence over both public and private sectors; it attempts to influence prescribing patterns, and retail pricing can be controlled. JCTC can use retail pricing to serve public health goals.

Finally, these three agencies are models that have proven their value in a Caribbean setting. Any similar initiatives should look to them for guidance. The procurement strategies they have chosen should be examined closely by health care professionals and others working in the region. The mistakes made, the problems encountered, and the achievements attained all contain lessons that we should learn from and build upon.

Summary tables comparing aspects of tendering and procurement at BDS, JCTC and ECDS appear on the following pages.



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QUESTION	EDS	JCTC	ECDS
FIRST YEAR TENDERS WERE INVITED	1980	1980	1987
PRICE REDUCTION ACHIEVED FIRST YEAR	22%	~20-30%	52%
POPULATION SERVICED BY AGENCY	250,000	2,200,000	500,000
ANNUAL VALUE OF DRUGS PROCURED (U.S \$)	\$5,000,000	\$5,000,000 - 6,000,000	\$1,500,000
WHAT IS INSTITUTIONAL AFFILIATION/FORM?	DEPARTMENT OF BARBADOS MOH	PRIVATE CORPORATION; JAMAICA GOVERNMENT OWNS 100% OF SHARES	AGENCY OF CECS
WAS OUTSIDE ASSISTANCE AVAILABLE? IN WHAT FORM, FROM WHAT AGENCY?	LIMITED AMOUNT. LOAN FROM CDB & TA FROM PAED	NONE	AMPLE AMOUNT. GRANT FROM USAID COVERING ALL COSTS EXCEPT DRUGS
HOW ARE INSTITUTIONAL OPERATING COSTS FUNDED?	BARBADOS GOVERNMENT BUDGET ALLOCATION	SELF-FINANCING; PAYS GOVERNMENT DIVIDENDS	NOW USAID. EXPECTED TO BE SELF-SUFFICIENT BY EARLY 1990S
DOES AGENCY SERVE THE PRIVATE SECTOR?	YES, COMPLETELY	YES, TO A LIMITED EXTENT	NO
DOES AGENCY WAREHOUSE DRUGS? DISTRIBUTE DRUGS?	NO, PAY SUPPLIERS 32% MARGIN TO PROVIDE SERVICES	NO	NO, DRUGS SHIPPED DIRECTLY TO PARTICIPATING COUNTRIES
HOW MANY DIFFERENT DRUG PRODUCTS ARE PROCURED?	1,050	800 - 900	320
HOW MANY SUPPLIERS ARE INVITED TO TENDER?	200	50-150 1989 only manufacturers not for actual awards to General	100

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QUESTION	BDS	JTC	ECDS
HOW ARE SUPPLIERS SELECTED FOR INVITATIONS?	TECHNICAL COMPETENCE, QUALITY ASSURANCE, PERFORMANCE, FINANCIAL VIABILITY & MUST BE BARBADOS-BASED	TECHNICAL COMPETENCE, QUALITY ASSURANCE, PERFORMANCE, FINANCIAL VIABILITY; LOCALLY PRODUCED PRODUCTS NOT NORMALLY IMPORTED <i>if able to meet demand & finances</i>	TECHNICAL COMPETENCE, QUALITY ASSURANCE, PERFORMANCE, FINANCIAL VIABILITY & EXPERIENCE IN REGION
ARE SUPPLIERS OTHER THAN MANUFACTURERS INCLUDED?	YES	ONLY \S FOR EMERGENCIES	YES, ~10% ARE SUPPLIERS ONLY
HOW MANY DIFFERENT COUNTRIES ARE MAILED INVITATIONS?	1	30	15
ARE TENDER INVITATIONS BY GENERIC NAME ONLY?	YES	YES	YES
ARE QUANTITIES GUARANTEED TO SUPPLIERS?	YES	NO	NO
WHO ADJUDICATES THE AWARD OF CONTRACTS?	TENDERS COMMITTEE (DOCTORS, - PHARMACISTS & BDS STAFF)	JTC ADVICES; INTERDISCIPLINARY COMMITTEE DECIDES	REGIONAL TENDERS COMMITTEE (ECDS NO VOTING RIGHTS)
WHAT PERCENTAGE OF THE SELECTIONS ARE BRAND NAMES?	~75%	55% <i>60% brands 39% generic by value</i>	~10%
WHAT ARE AVERAGE LEAD TIMES FROM ORDER TO DELIVERY?	3-7 DAYS	~2 MONTHS	2-3 MONTHS
HOW IS PAYMENT FACILITATED? BY WHOM? IN WHAT CURRENCY?	BARBADOS DOLLARS, BY BDS	JTC THROUGH BANK OF JAMAICA OR COMMERCIAL BANKS, USUALLY IN U.S. DOLLARS	ECCB, IN ANY FOREIGN CURRENCY (QUOTES IN U.S.)
WHAT IS THE PAYMENT LEAD TIME, FROM DELIVERY TO SUPPLIER PAYMENT?	2-4 WEEKS	60-90 DAYS <i>60 days or less slow down usually better paper work</i>	< 42 DAYS

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QUESTION	EDS	JTC	ECDS
<p>HOW IS QUALITY ASSURED?</p> <p>WHAT SPECIAL ATTRIBUTES DOES THE SYSTEM HAVE?</p> <p>WHAT PROBLEMS HAS THE SYSTEM EXPERIENCED?</p>	<p>SUPPLIER SELECTION AND MONITORING, CONTRACT ENFORCEMENT, & CRDTL</p> <p>NO GOVERNMENT CENTRAL WAREHOUSING AND DISTRIBUTION; WHO INFO CENTRE; PAHO TRAINING CENTRE; HUB OF PROFESSIONAL NETWORK FOR EASTERN CARIBBEAN</p> <p>INITIAL RESISTANCE FROM SUPPLIERS AND PHYSICIANS; INITIAL PROBLEMS WITH GUARANTEES; TOTAL SYSTEM COSTS ARE RISING RAPIDLY</p>	<p>SUPPLIER SELECTION AND MONITORING, CONTRACT ENFORCEMENT, & CRDTL</p> <p>JTC IS ONE OF THE MOST PROFITABLE GOVERNMENT-OWNED COMPANIES; CAN REGULATE RETAIL PRICES AND SUBSIDIZE SELECTED PRODUCTS; OTHER SERVICES PROVIDED</p> <p>INITIALLY SEEN AS THREAT BY PRIVATE SECTOR. CHRONIC PROBLEMS WITH CUSTOMS CLEARANCE AND FOREIGN EXCHANGE HAVE BEEN LESSENING</p> <p><i>sig</i> <i>Case</i></p>	<p>SUPPLIER SELECTION AND MONITORING, CONTRACT ENFORCEMENT, & CRDTL</p> <p>EXPECTED TO BE FINANCIALLY SELF-SUFFICIENT; PRACTICAL EXAMPLE OF OECS FUNCTIONAL COOPERATION; CREATES PROFESSIONAL NETWORKS AND OTHER SERVICES</p> <p>PROCUREMENT PLANNING AT COUNTRY-LEVEL STILL WEAK. VOLUME IN THE OECS LOW AND INTER-ISLAND COMMUNICATION/TRANSPORTATION EXPENSIVE</p>

ANNEX
NOTES OF EXPLANATION ON PRICE COMPARISONS

Information for this comparison was obtained from several sources:

Barbados National Drug Formulary 88/89
ECDS's Contract Adjudication Document 88/89
Conversations with the Director of the Pharmaceutical Department of JCTC

Seven drugs covering three common areas of therapy (anti-diabetic, anti-hypertensive and anti-bacterial) are included.

1. **WEIGHTED AVERAGES** have been used to calculate purchase prices, in the case of split suppliers or optional air/sea prices. An example of this is demonstrated where JCTC imports LENTE INSULIN from two different suppliers in ratios of 60% and 40%. The same applies to ECDS's importation of AMPICILLIN CAPSULES, 50% by sea and 50% by air.
2. **UNIT PRICE CALCULATIONS AND CURRENCY CONVERSIONS:** BDS's prices, quoted in their Formulary Manual in BDS\$, are divided by 2 to convert to US\$; then multiplied by the no. of units per course of therapy or per month. Both JCTC's and ECDS's prices are derived by dividing pack price by pack size then multiplying by the number of units per month or course of therapy where indicated. Ampicillin capsules and ~~injection~~ manufactured locally in Jamaica were converted to US\$ at a rate of J\$5.5 = US\$1.
3. **PACKSIZES** can create price variations. As an extreme example, JCTC purchases atenolol in blister packs of 28, and ECDS purchases in pack sizes of 500.
4. **BDS does not** stock ampicillin capsules, but uses AMOXICILLIN instead. The dosage for this drug is 3 tabs/day compared to 4 tabs/day for ampicillin. In order to equate this we multiplied ampicillin capsules by 4 a day x 7 days and amoxicillin was multiplied by 3 a day x 7 days.

ACRONYMS

BDS	Barbados Drug Service
CARICOM	Caribbean Community
CDB	Caribbean Development Bank
CIF	Cost, Insurance and Freight
CMO	Chief Medical Officer
CMS	Central Medical Stores
CRDTL	Caribbean Regional Drug Testing Laboratory
ECCB	Eastern Caribbean Central Bank
ECDS	Eastern Caribbean Drug Service
F & T	Formulary and Therapeutics
JCTC	Jamaica Commodity Trading Company Limited
MOH	Ministry of Health
MSH	Management Sciences for Health
PAHO	Pan American Health Organization
PMS	Presbyterian Medical Services
RPMP	Regional Pharmaceuticals Management Project
USAID	United States Agency for International Development
WHO	World Health Organization