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Health Care Financing in Latin America and the Caribbean Research Report No. 5

Health Care Financing in St. Lucia and Costs of Victoria Hospital

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FOREWORD

This is the fifth in a series of technical reports on Health Care Financing in Latin America and the Caribbean (HCF-LAC), produced by the State University of New York at Stony Brook under contract with the United States Agency for International Development.

Study director Dr. Sharon Stanton Russell developed the design for the study in collaboration with HCF/LAC project staff, following an exploratory visit to St. Lucia in May, 1987. In the implementation of the study, which included field research in late 1987 followed by data analysis and preparation of the preliminary draft of this report, Dr. Russell was joined by Mr. Michael Trisolini of the School of Public Health, Boston University, and Dr. Gretchen Gwynne of the HCF/LAC project staff. Mr. Victor Hippolyte of the Accounts Department at Victoria Hospital, Castries, St. Lucia, participated full-time with the team during the implementation phase of the study.

In St. Lucia, overall policy guidance for the study was provided by a Steering Committee chaired by Mr. Cornelius Lubin, St. Lucian Permanent Secretary for Health. Committee members included Miss Zenith James, Deputy Director of Finance for Budgeting, Ministry of Finance; Dr. James St. Catherine, Medical Officer of Health, Ministry of Health; Mr. Adam Morris, Senior Accountant, Ministry of Health; Mrs. Sheila Nelson, Assistant Secretary, Ministry of Health; and Mr. Michael Cooke, Administrator of Victoria Hospital.

Mr. Cooke also served as Chairman of a Victoria Hospital Working Group, whose members included Mr. Egbert Andrew, Deputy Administrator and Chief of Pharmacy at the hospital; Mrs. Brunetta Willius, Head of Medical Records; Mr. Victor Hippolyte, Hospital Accountant; Matron Andreuille Parker, Head of Nursing; Miss Marie Theresa Louis, Hospital Storeskeeper; and Dr. MacDonald Chase, Consultant Obstetrician/Gynecologist. Working Group members participated in discussions of the organization and financial management of the hospital as well as in the actual data-gathering process.

Mr. Nahum Jean-Baptiste of the Statistics Department, St. Lucian Ministry of Health, helped assemble the health services and health status data presented in this report. Sister Sharee, Administrator of St. Jude Hospital, Vieux Fort, St. Lucia, escorted the study team during a site visit

to this privately-run, government-subsidized facility.

After completion of the fieldwork phase of the study, Mr. Chandra Shrestha of the Department of Economics, SUNY/Stony Brook, formatted the tables presented in this report; Miss Lillian Tarr of the Boston University Health Care Research Unit analyzed the Appropriateness Evaluation Protocol (AEP) findings; and Mr. William Stanley prepared the graphics.

During a return visit to St. Lucia in February, 1988, Dr. Russell reviewed the preliminary draft with the Honorable Romanus Lansiquot, Minister of Health, Housing, Labour, Information, and Broadcasting of St. Lucia, and Ms. Louise (Holly) Wise of the USAID/RDO/C office in Barbados. Professors David Young of Boston University and Theodore Marmor of Yale University also provided informed comments on the preliminary draft.

Finally, the preliminary draft was thoroughly reviewed at the third annual HCF/LAC Project Workshop, held in Antigua, Guatemala, in March, 1988. Participants in the St. Lucia Discussion Group at the workshop included the Chairman, Mr. Llewelyn Gill, of the St. Lucian Ministry of Health; Ms. Wise; Mr. Cooke; Mr. Andrew; Dr. Robert L. Robertson, HCF/LAC consultant; Mr. Douglas Fairweather, Permanent Secretary, Ministry of Health, Belize; Mr. Sam Dowding, USAID/Belize; Mr. Charles Clayton, Ministry of Health, Jamaica; and Mr. Theodore Weinberg, HCF/LAC Advisory Committee.

The final report was edited by Dr. Gretchen Gwynne, Research Associate to the HCF/LAC project.

Dieter K. Zschock
Director, HCF/LAC

EXECUTIVE SUMMARY

In 1987, a study team from the State University of New York at Stony Brook, working under the USAID-sponsored "Health Care Financing in Latin America and the Caribbean" (HCF/LAC) project, joined with St. Lucian health professionals to analyze the financial costs of St. Lucia's major public health facility, the 100-year-old Victoria Hospital. The antiquated facility, soon to be refurbished or replaced, was absorbing nearly 40 percent of expenditures in the Health and Medical Care Division of the country's Ministry of Health (MOH) and was severely overburdened, while the country's two smaller, newer district hospitals were operating well below capacity.

Specific goals of the study included documenting the role of Victoria Hospital within the St. Lucian health system; calculating all costs of services at the hospital (which involved calculating not only the actual but also the imputed costs for all hospital cost centers); expressing these costs in terms of units of service, such as patient days or laboratory tests; distinguishing controllable from non-controllable costs, at major levels of decision-making (national, MOH, hospital administration, hospital staff); providing examples of cost reporting feasible under the existing record-keeping system, for improved financial management at the hospital level; subjecting one high-volume diagnostic category (childbirth) to in-depth utilization review and average cost analysis, to test the utility of analysing and managing costs by diagnostic category rather than by department; and, on the basis of the new and detailed hospital cost data generated, presenting Victoria Hospital, the St. Lucian Ministry of Health, and the Government of St. Lucia with a series of options for improving cost control at the hospital and, more broadly, for improving the allocation of the country's health care resources.

Major Findings: Government and Ministry of Health

In keeping with its strong commitment to health, the government of St. Lucia is shouldering much of the country's health care burden. Recurrent expenditures by the Ministry of Health amount to almost 5 percent of the country's Gross Domestic Product, a level of health expenditure that approximates Great Britain's and reflects the central role

of government in the organization and delivery of health services. As a share of total central government spending, MOH expenditures have declined from a high of 16 percent earlier in the decade to 12 percent, a proportion similar to public sector expenditures (under both MOH and Social Security programs) in LAC countries at comparable levels of socioeconomic development, such as Belize and Peru.

In constant prices, per capita spending on health has increased by nearly 64 percent over the last decade; in current prices, it has nearly tripled. The 1986/87 figure, EC $142 (US $53), is comparable to per capita health expenditures in other lower-middle income countries, but the rate at which spending for health care is increasing is nevertheless worrisome, particularly in view of recent changes in patterns of morbidity and mortality toward chronic and degenerative diseases requiring intensive and/or long-term care.

The National Insurance Scheme (NIS) annually contributes a substantial subvention, EC $1,500,000, to the MOH. It is unclear whether the NIS subvention is either appropriate under current legislation or adequate for coverage of health care costs incurred by NIS enrollees. In other LAC countries, levels of social security contributions similar to St. Lucia's are sufficient to cover costs of medical treatment for ill or injured workers and even to support limited care for enrollees' dependents.

Revenues generated within the MOH (as distinct from general tax revenues) have increased since 1983/84. However, hospital user fees represent only a relatively small proportion of the health-related revenues generated by the MOH; proportionately, most of the increase is accounted for by the NIS subvention. Excluding this subvention, MOH revenues are only about 3 percent of expenditures, a relatively (and consistently) low rate of "cost recovery." Reasons for this low rate include (a) St. Lucia's choice of a public sector approach to health care delivery; (b) the existence of legislation exempting an estimated 92.7 percent of the population from payment of fees for health care; and (c) the resulting conviction, on the part of many St. Lucians, that they need not take responsiblity for their own health expenses. It was estimated recently that only 2.3 percent of St. Lucians' disposable household income is spent on health, and most of that is for pharmaceuticals.

Some 18-20,000 St. Lucians (approximately 14 percent of the population) are covered by NIS, and about 7500 (5.3 percent) hold private health insurance policies. Allowing for some overlap, between 15 and 20 percent of the

population has some form of health insurance coverage.

The organization of private insurance in St. Lucia requires further investigation. In 1985, the value of claims against private insurance carriers was only 31.4 percent of gross premiums collected. In comparison, payout ratios were nearly 49 percent in Trinidad and Tobago, over 70 percent in Barbados, and 78 percent in Jamaica. Thus private insurance in St. Lucia appears to be highly profitable for insurance carriers, but government-sponsored health providers derive relatively little payback from these sources.

Data on St. Lucians' ability to pay for health care show that there is a large low-income group for whom substantial out-of-pocket expenditures for health are not possible. Some 23 percent of respondents to Government's 1982 Household Budget Survey reported annual incomes below EC $2000. Approximately 25 percent of the population is unemployed, and about half the workforce is in the informal sector, where wages and job security are low. Selected data on willingness to pay suggest that consumers can and do pay for outpatient visits at locations other than Victoria Hospital, but (in general) they do not pay for hospital care.

Rates of growth in expenditures for Victoria Hospital have exceeded both the growth rates for the Health and Medical Care Division of the MOH and for the Retail Price Index for Services. Because of the high personnel component in the hospital's expenditures, the growth rates of the hospital's budget were particularly high in years of public sector wage settlements.

Major Findings: Victoria Hospital

At a fully-accounted-for operating cost of EC $8,448,688 for fiscal year 1986/87, Victoria Hospital is costing the Government of St. Lucia some 31 percent more than the EC $6,451,130 in expenditures shown in the official "Estimates of St. Lucia." These greater total costs are the result of expenses for the hospital that appear on other MOH budgets, other ministries' budgets, or off-budget altogether. Since the facility is fully depreciated, this figure reflects total direct and indirect operating costs; if depreciation of buildings and annuitization of the capital costs of land were included, the total annual cost of Victoria Hospital over the same period would be EC $10,680,274, or nearly 66 percent more than the official expenditure estimate.

The hospital has firm control over only about 20 percent

of its total recorded expenditures. Personnel costs, its largest expense item, absorb nearly 69 percent of total expenditures. This line item is largely determined by negotiated agreements between the Public Service Union and a Cabinet-appointed negotiating team, and is therefore beyond the direct control of the hospital administration. The costs of pharmaceuticals and supplies are only partially under the control of the hospital, which shares responsibility for these costs with Central Medical Stores.

Current legislation exempting most St. Lucians from payment of health care fees means that Victoria Hospital is entitled to collect, in user fees, less than ten percent of the value of the services it provides. In 1986/87, the amount the hospital would have collected in fees if all patients -- exempt or not -- had paid for services, at existing levels of hospital, maternity and medical fees, was EC $3,816,701. The value of the services not billed because of exemption legislation was EC $3,538,082, more than 90 percent of the value of those services.

The small proportion of MOH revenues currently represented by hospital user fees is made smaller by appreciable leakage of potential revenue due to non-collection of fees payable at the hospital. Projections for 1987/88 suggest that collections of hospital, maternity and medical fees will be substantially below potential.

The user fees that the hospital charges those who are required to pay are, on average, considerably lower than the actual unit costs of services. For most inpatient wards, the fees set by the government schedule cover only 9 to 17 percent of costs. For Casualty, Radiology, Operating Theatre, and the (private) Baron Wing, fees are about 50 percent of costs. Only Laboratory and Physiotherapy have fees approximating the actual costs of the services provided.

For both the hospital and the government, it may be difficult to effect substantial reductions in costs, but it is possible to slow the rate of growth in expenditures and achieve better value for each dollar expended by improving the allocation of real and financial resources. The study team recommends consideration of the following short- and medium-term options for improved financial management.

Options: Government and Ministry of Health

Ultimately, St. Lucia will need alternatives to general taxation as a stable and reliable source of financing for

health. Cost recovery is presently low, but it will be difficult to make improvements in cost recovery (and thus in financing) without first protecting individuals and families against extraordinary losses. For this reason, the study team recommends that Government give high priority to the further development of risk-sharing mechanisms (health insurance in which the risk of illness is pooled). This will be essential both to ease the strain that health care places on central government finances and to protect St. Lucians from extraordinary household financial outlays. Two forms of risk-sharing mechanisms for health already exist in St. Lucia: the NIS (which covers 14 percent of the population) and private health insurance (5.3 percent). A third form, "preferred provider" arrangments, are now under development at St. Jude Hospital, and a fourth option, a "health levy" (similar to that used in Barbados), has recently come under consideration. Of these four mechanisms, two -- social security and health levies -- are forms of social insurance.

Before the development of any of these risk-sharing mechanisms proceeds further, St. Lucia should take two important steps. First, the role of government-sponsored health insurance in St. Lucia should be determined. This will involve addressing a number of questions. Is it necessary or advisable to have two separate programs, NIS and a health levy? This depends on several related questions. Are the current levels of contribution to NIS, and the program's financial situation, sufficient to support expanded health coverage? This could be determined via thorough analysis of NIS's financial circumstances and discussions with experts from the International Labor Organization and financial managers in other social insurance schemes. If it becomes clear that additional financial contributions are needed, a health levy, and the different ways it could be administered, should be further considered. Should such a levy be attached to Inland Revenue and administered along with other forms of general taxation, or applied in the form of a percentage increase in NIS contributions and administered under that scheme? In view of the human and financial resources involved, establishing an entirely new and separate system for administering a health levy seems unnecessary.

If it is determined that an expanded NIS role in providing social insurance for health is desireable, it must be determined whether or not existing NIS legislation is adequate to support such a development. Legislative changes would probably need to be made, and an appropriate basis found for either calculating a subvention or billing NIS directly for services. At the same time, St. Lucia should consider (a) implementing provisions of the NIS legislation

that allow for extension of NIS to cover the self-employed, and (b) including all government workers (pensionable as well as non-pensionable) as NIS contributors.

The second step in developing risk-sharing mechanisms in St. Lucia is to ascertain the role of private insurance as an adjunct to social insurance. The reasons for the low levels of payout by private health insurance carriers are unclear, and further investigation -- perhaps by a joint government/insurance industry task force -- is needed.

In choosing the appropriate path for the development of risk-sharing, Government will want to ensure that the mechanisms selected do not contribute to rising health care expenditures, as both social and private insurance have done in some countries. To ensure that costs are restrained even as sources and levels of financing are expanded, it is important that at one central point in the system, a single payor bears full responsiblity for reconciling costs and payments; a "pluralistic" system, in which there are many different payors (each of whom can shift reponsibility for costs to somebody else) should be avoided. This has several practical implications for choices among risk-sharing options. First, it suggests that St. Lucia should proceed with great caution in the expansion of third-party private insurance coverage, where financing and utilization are most sharply separated. Second, it argues that St. Lucia should encourage combinations of social insurance with preferred provider or other managed care arrangements between employers (or voluntary associations) and health facilities.

As short-term measures that might stimulate the development of risk-sharing schemes, St. Lucia should consider introducing a requirement that all employers offer some form of health insurance for their employees; improve the submission and payout of claims private insurance carriers; and promote managed care arrangements -- especially arrangements that make use of the country's two underutilized district hospitals.

St. Lucia should eventually revise its public hospital fee schedule, to bring fees more into line with costs and to distinguish among the different costs for services provided at different levels of care. This will take time, but in the meanwhile Government can begin now to rigorously enforce the collection of fees and, on the basis of the HCF/LAC cost analysis, to charge those already insured the full resource costs of the health care they receive.

Over the long term, it will be necessary to revise current laws under which some 92.7 percent of the population

is exempt from paying fees for health services. The substitution of an income tax credit for health expenditures may prove to be a politically acceptable alternative to blanket exemptions, consistent with efforts to improve personal and business income tax collection.

As part of the effort to secure financing for the proposed New National Hospital, St. Lucia should explore with donor and lending agencies the possibility of including systems development costs as a capital expense item. Structural changes to existing systems are needed to increase revenues from -- and improve resource allocation within -- the new hospital.

Finally, Victoria Hospital management should be given more autonomy through the establishment of an independent hospital board. The necessary degree of independence must include control over wages and benefits. In the long run, it will be difficult for the hospital to achieve effective cost control without semi-autonomous status.

Options: Victoria Hospital

The hospital should immediately implement an improved financial accounting and management data collection and reporting system, which would identify direct and indirect costs by departmental classification and link them with the statistical information system maintained by Medical Records. The revised system should include improvements in basic services information, including utilization as well as cost components, in order to generate full cost data by departments and other service centers, and should function on a routine rather than a special study basis. Ideally, it should apply not only to Victoria but to all inpatient service facilities in the health system. As a minimum, a thorough review, documentation, and revision of current procedures in financial data collection and reporting is required, and should be done hand in hand with revision of procedures on patient flow, admissions, and discharges.

The inventorying, storage, and requisitioning of supplies and pharmaceuticals within the hospital should be improved, to complement Central Medical Stores' ongoing effort under the ECDS project. Stores should be consolidated in a single location, and a manual inventory system for all stores should be instituted, with a view toward eventual computerization. A standardized system for requisitioning supplies and pharmaceuticals should be developed.

Possibilities for reallocating space and labor for

greater efficiency and productivity should be explored. Hospital Stores, for example, needs more space in order to centralize all supplies, and the single storeskeeper is overburdened. On the other hand, the large library reading room (also used for nurses' training), which is attended full time, is underutilized. It should be staffed only part time, and cleaned weekly rather than daily -- or devoted to another purpose.

Departmental management at the ward level should gradually be introduced. A good place to begin would be the introduction of a simple requisition system that would enable staff to track resources and their utilization, and provide summary analysis and feedback to ward-level staff, whose decisions affect the utilization (and thus the costs) of supplies and pharmaceuticals. The addition of data on staffing patterns and productivity would further enhance the ability of department staff to manage costs.

Patients presenting themselves in the Casualty Department should be charged for non-emergency visits that, in the opinion of the doctor on duty, should have been attended to at a health center. This would reduce the number of walk-in visits to the overburdened Casualty department, generate some regular revenue, and encourage patients to place a value on (and thus to save for) medical care. Non-emergency cases should not be seen in Casualty until they are paid for; patients who cannot pay should be referred to their local health centers for treatment. Alternatively, if a revised fee schedule with differential pricing (reflecting the actual costs of services and subsidies for low-income and other selected groups or services) were drawn up, non-emergency patients could be given the option of going to their local health centers for free care or paying the full costs of their care at Victoria.

The possibility of contracting out for selected services, such as food service (Catering) or laundry, should be explored. The HCF/LAC cost analysis can be used as a basis for assessing options in this area in terms of expenditures and potential cost savings. But caution is advisable here, since indirect costs may simply be reallocated rather than eliminated. Further investigation into the differential costs associated with these options is needed.

* * *

A national hospital such as Victoria will never be entirely free-standing. The public sector orientation of

health services in the country, as well as Government's commitment to their accessibility, mean that some government subsidy will continue to be required. However, the introduction of internal financial management reforms, and the establishment of Victoria Hospital as a quasi-public entity under an independent board, would go a long way toward enabling the facility to better manage and control its costs. This improvement, in turn, would allow for the reallocation of some MOH resources to areas in which they would better serve the health needs of all St. Lucians.

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GLOSSARY

ALOS (Average Length of Stay): the total number of patient days divided by the number of admissions.

Depreciation/annuitization: depreciation of buildings and annuitization of the capital costs of land.

Direct Costs: costs that can be specifically and unambiguously associated with particular hospital departments, such as salaries, pharmaceuticals, supplies, and depreciation of capital equipment.

Direct Service Departments: hospital departments whose primary function is to provide services to patients (e.g., maternity ward, laboratory, physiotherapy department).

Indirect Costs: generally, costs associated with more than one hospital department (e.g., costs of Administration, Laundry, or Housekeeping), and which therefore need to be apportioned among these departments. The term is also used occasionally to refer to the costs of indirect departments.

Indirect Departments: hospital departments whose primary function is to provide services to other hospital departments (e.g., Administration, Laundry, Housekeeping).

Occupancy Rate: the total number of patient days divided by (the number of beds X 365 days).

Payroll Costs: the sum of all direct expenses for payroll, but without allowance for fringe benefits.

Personnel Costs: the sum of all direct expenses for personnel, including fringe benefits expenses.

Total Direct and Indirect Costs: the sum of actual expenditures for Victoria Hospital according to the Estimates of St. Lucia, plus expenditures for items consumed at Victoria Hospital but reflected, in the Estimates, in the budgets of other departments in the Ministry of Health or other ministries, plus the value of items consumed at Victoria Hospital but not appearing on any budget. As used in this report, Total Direct and Indirect Cost refers to costs after application of the stepdown procedure for allocating indirect costs. The category has been calculated two ways: with and without depreciation of buildings and annuitization of the capital costs of land.

LIST OF ACRONYMS

AEP	Appropriateness Evaluation Protocol
ALOS	Average length of stay
CMS	Central Medical Stores
DMO	District Medical Officer
GDP	Gross domestic product
GOSL	Government of St. Lucia
HCF/LAC	Health Care Financing/Latin America and the Caribbean
ILO	International Labor Organization
IMF	International Monetary Fund
LAC	Latin America and the Caribbean
MCH	Maternal and Child Health
MOF	Ministry of Finance
MOH	Ministry of Health
NIS	National Insurance Scheme
OECS	Organization of Eastern Caribbean States
PAHO	Pan American Health Organization
PHC	Primary health care
SUNY/SB	State University of New York at Stony Brook
USAID	United States Agency for International Development
VH	Victoria Hospital
WHO	World Health Organization

NOTE ON EXCHANGE RATE USED

The exchange rate used throughout this report is 2.68 Eastern Caribbean dollars to 1.00 United States dollar. Throughout, the dollar sign ($) is used to denote EC dollars, unless it is preceded by US.

I. INTRODUCTION

A. Historical Background of Study

Early in 1987, the Government of St. Lucia indicated its interest in participating in the USAID-sponsored "Health Care Financing in Latin America and the Caribbean" project (HCF/LAC), implemented by the State University of New York at Stony Brook. During an HCF/LAC representative's exploratory visit to the island between 17-22 May 1987, St. Lucian officials unanimously agreed that a country study under this project should focus on the financial costs (1) of Victoria Hospital (VH), the public health system's principal hospital facility. An absence of data on all but general line item expenditures for the hospital was impeding government's financial control in the health sector, and constraining efforts to allocate resources in an optimally effective manner. In addition, efforts to plan for a new national hospital to replace VH, 100 years old in 1987, made this a particularly good time to better understand the costs of the existing facility.

A draft design for a study focusing on the costs of Victoria Hospital was drawn up in August, 1987, and shortly thereafter was approved by the St. Lucian Ministry of Health. Field research in St. Lucia was conducted between October 5 and November 6, 1987, by a three-person HCF/LAC study team in collaboration with St. Lucian counterparts, who were organized into a Steering Committee (based at the Ministry of Health) and a Working Group (based at Victoria Hospital). Between November, 1987, and January, 1988, the study findings were analyzed, and a preliminary draft of this report was prepared and disseminated to all study participants in February, 1988. At the request of the Ministry of Health, the HCF/LAC team leader revisited St. Lucia, also in February, 1988, to discuss the preliminary draft with St. Lucian health authorities. Subsequently the draft was thoroughly reviewed by study team members, host country counterparts, and other experts in hospital cost analysis at the third annual HCF/LAC workshop, held in Antigua, Guatemala, from March 16 to 18, 1988. This final version of the report incorporates the fruits of the team leader's follow-up visit to St. Lucia and the Antigua workshop.

B. Study Objectives and Methodology (2)

Specific objectives of the study were: 1) to document the role of Victoria Hospital in St. Lucia's health system and the organization of services at the hospital; 2) to identify and calculate both actual and imputed costs for all departments and other services at the hospital, and to express these costs in terms of service outputs (e.g., patient days, x-ray examinations, or laboratory tests); 3) to identify controllable and non-controllable costs at major levels of decision-making: national, central Ministry of Health, Victoria Hospital administration, hospital staff (physicians, nurses, department heads); 4) to analyse the cost structure and costs per unit of service (e.g., per ward, per patient day), and develop recommendations concerning areas in which improved management and/or cost savings might be effected; 5) to select one high-volume diagnostic category (e.g., childbirth) and conduct detailed utilization and average cost analysis, in order to test the applicability and utility of analysing and managing costs by diagnostic category rather than by deparment; and 6) to provide examples of cost reporting for financial management and control at the hospital level, feasible under the existing record keeping system.

It was understood that, in addressing these objectives, the study would offer to Victoria Hospital, the St. Lucian Ministry of Health, and the Government of St. Lucia a series of options for improving cost control at the hospital and, more broadly, for allocating the country's health care resources with greater effectiveness.

During the field research phase of the study, the HCF/LAC study team addressed all of these objectives and, in addition, broadened its investigation of the country's overall health financing system and revenue generation potential in order to provide a sounder context within which to recommend policy options at the national as well as the institutional level.

C. Context of the Hospital Cost Analysis

Since independence from Britain in 1979, the government of St. Lucia has consistently placed high priority on health services; public expenditures for health routinely exceeded 10 percent of total government expenditures throughout the 1980s, despite growing financial constraints. The present

organization of the country's government-run and/or government-supported health care facilities underscores this policy commitment to accessible health care. There are five hospitals in St. Lucia (four acute care general hospitals and one mental hospital), and a total of 522 hospital beds -- one for every 262 St. Lucians. Primary care also represents a major part of the government's policy commitment to health, and PHC (primary health care) services are provided at over thirty health centers around the country. In addition, the services of physicians are available privately.

Financial constraints in recent years have resulted in increased attention to financial accountability and revenue generation in all sectors of the St. Lucian economy, including health, and the introduction in recent years of changes in the national budgeting process and computerized financial reporting reflect the emergence of financial control as a national policy priority. At the same time, it continues to be a matter of policy to assure that health services are available without charge to many St. Lucians, including the elderly, schoolchildren, and most public employees. At present, according to Ministry of Health estimates, all but 7.3 percent of the population is exempt by law from paying health care fees. For those not exempt, there is an official schedule of user fees for public health services, in place since British times and updated in 1985. However, this fee schedule bears no relationship to the actual costs of the services for which fees are levied (a widely-acknowledged matter of concern within the health sector), and even those who should pay do not always do so.

It was within this context that St. Lucian health officials elected to focus this study on the costs of Victoria Hospital. According to the revised "Estimates" for 1986/87 (3), VH accounted for 32 percent of total recurrent expenditures by the Ministry of Health, Housing, Labour, Information, and Broadcasting (MOH), and nearly 40 percent of all expenditures by the Health and Medical Care component of the Ministry. Yet before the preparation of this report there were no detailed data to permit analysis of whether or not these expenditures accurately reflect the total costs of resources utilized by the hospital, nor analysis of the distribution of either direct expenditures or total resource costs among the hospital's various departments and services. A principal aim of the study, therefore, has been to provide St. Lucia with a more detailed database and empirical analyses to facilitate improved financial management and fiscal control at both the institutional and national levels.

D. Organization of Report

Chapter II of this report contains basic demographic data, plus information on the overall health status of the St. Lucian population and the organization of hospital, physician, and ancillary health care services in the country. The chapter also outlines the financing of health care in St. Lucia, discussing public and private revenues and expenditures for health, the effect of national legislation exempting over 90 percent of St. Lucians from payment for health care, and the role of the country's social security scheme and private insurance carriers in health care financing. The final section of the chapter presents conclusions and recommendations concerning St. Lucia's health financing situation.

Against this backdrop, Chapter III focuses on Victoria Hospital, first describing its management and organization and then providing an overview of the methodology used in the hospital cost analysis. (Details of the cost accounting methodology are found in Appendix A.) The chapter then presents a comprehensive analysis of the costs of Victoria Hospital, with a summary of key findings. The role of utilization review in hospital cost management, and the results of a review of a sample of medical records from VH using the Boston University AEP (Appropriateness Evaluation Protocol) procedure, are discussed, and the hospital's potential for revenue generation and collection are assessed. Finally, recommendations for improved cost management at VH are itemized.

II. SOCIOECONOMIC CONTEXT

A. Demographic and Social Profile

In 1987, St. Lucia had approximately 142,000 inhabitants -- up from about 121,000 in 1979, the year in which the country gained its independence from Great Britain (see Table 1). Because of an overall decline in the birth rate, the rate of natural increase slowed from 3.1 to 2.5 percent between 1970 and 1985, and emigration has helped to limit net population growth to a moderate 2 percent per year since 1977 (World Bank 1986:35) (4). Nevertheless, the population of St. Lucia continues to grow, and, if present trends continue, may more than double in the next fifty years (MOH 1985:10).

About 41 percent of the island's population now lives in Castries, the capital city, where VH is located (MOH 1985:5). The urban area surrounding Vieux Fort, where the country's second largest health care facility (St. Jude Hospital) is located, contains only 8 percent of the population (MOH 1985:103), although this privately-run hospital, in return for a government subsidy, is mandated to serve St. Lucians from the entire southern end of the island. Soufriere and Dennery, where the country's two small district hospitals are located, each contain less than 10 percent of the population; indeed, none of the country's eight other administrative districts contains more than 10 percent of the population (MOH 1985: Appendix 1).

The age distribution of St. Lucians reveals a young population: 43.5 percent were under 15 in 1985 (GOSL 1985/86), and the median age in 1984 was 16.23 years (up from 15.2 years in 1980) (MOH 1984:26; MOH 1985:14). The relatively large proportions of St. Lucians in the youngest and oldest age groups, and the resulting relatively small proportion of the population (now less than 50 percent) that is of working age, have obvious implications for health services needs and St. Lucians' ability to pay for health services (MOH 1985:13). Women of childbearing age (15-44 years) constitute some 20 percent of the population (MOH 1984:26), with those in their teens (15-19 years) accounting for 28 percent of all live births (USAID 1985:Attach.C:4). Estimates on the number of economically dependent St. Lucians vary, but the reported dependency ratio ranges from 100 (MOH 1984:26) to 122 (Bouvier 1984:7), depending on what unemployment rate is viewed as most closely approximating reality (see below).

The country's economic, social, and environmental conditions -- as measured in terms of income, education, sanitation, and health services -- have improved in recent years. Per capita income in 1986 was EC $3057 (US $1141). School enrollment is relatively high, with 81 percent of children 5-14 years old attending primary school and 43 percent of those 15-19 years old in secondary school (MOH 1985:24). Nevertheless, 33 percent of St. Lucians are illiterate (GOSL 1987:12), and only 39 percent of adults have had more than four years of schooling, leaving as many as 60 percent in the functionally illiterate category (MOH 1985:23). These illiteracy and functional illiteracy figures have ominous implications for the country's health care services, in view of the positive correlation between low income, low education, and the limited ability and willingness to pay for health care.

Some 70 percent of St. Lucians have access (if often at a distance) to potable water, with the other 30 percent dependent upon river water. Figures on sanitary waste disposal vary: it is estimated that over 60 percent of the population now have water closets, with 38 percent still relying on pit latrines (USAID 1985, Attach. C:3), but a 1983 community-based survey, sponsored by PAHO, found that fewer than 20 percent of responding households had water closets, over 53 percent still used pit latrines, and over 10 percent were using bucket latrines (PAHO 1987:61, Table 10). In general, sanitary conditions in St. Lucia lag behind the country's overall level of economic development.

B. Health Status and Coverage (S)

When compared to other countries in the Caribbean region (both island and mainland nations), the overall health status of the St. Lucian population is better than average (see Table 2). At 70 years, life expectancy at birth is the fifth highest among 18 countries in the region, and the infant mortality rate, 23.6 per thousand, is the region's sixth lowest -- down from 54.2 in 1972 (MOH 1987). The country recorded no maternal deaths in 1984, the most recent year for which this figure is available. In 1985, 90 percent of St. Lucian newborns weighed over 2,500 grams; of the nearby island nations, only Antigua, Cuba, and St. Kitts surpassed St. Lucia in this regard (Parra 1987:5).

St. Lucia's record of immunizations given in the first year of life also compares favorably with that of most other nations in the region (Parra 1987:11). The number of fully immunized children has increased dramatically since 1980; as of 1985, 83 percent of infants had received all three DPT shots, 64 percent had received a measles vaccination, 82

percent had received three doses of oral polio vaccine, and 86 percent had received a BCG vaccination (Table 3). Diphtheria, whooping cough, tetanus, polio, tuberculosis, and measles are no longer "major life threateners" (GOSL 1987:31), and the number of pregnant women and infants receiving professional medical care has grown (Table 3).

Patterns of both morbidity and mortality are changing in St. Lucia. In general, the last decade has seen a reduction in mortality from many of the causes that traditionally plague third world countries (e.g., pneumonia and influenza, tuberculosis, nutritional deficiencies), and an increase in deaths from ailments common to more developed countries (e.g., heart disease, cancer, motor vehicle accidents) (MOH 1984:36). Tables 4 and 5 illustrate these trends. Heart disease is now the leading cause of death; in 1976, it ranked third (Table 5). Cancer has moved into third place, from 5th place in 1976. Accidents and violence ranked 5th in 1986, up from 7th place in 1976. Motor vehicle accidents, in particular, have shown an alarming rate of increase over the last few years (Table 4); in 1977, 512 motor vehicle accidents were reported, a figure that had increased to 648 in 1980, 842 in 1983, and 945 in 1984 (GOSL: Annual Statistical Digest 1985:21). Meanwhile, pneumonia/influenza has dropped from the fourth leading cause of death in 1976 to 8th place in 1986, and intestional infections, in eighth place in 1976, are no longer among the ten leading causes of death in St. Lucia.

The relatively high number of deaths attributable to "signs, symptoms, and ill-defined conditions" has placed this "cause" of death among the top four in every year since 1976 (Table 5). If this imprecise category were eliminated, heart disease would continue to be St. Lucia's leading cause of death, but cancer would move up to second place, and other leading causes of death -- cerebrovascular problems, hypertension, accidents -- would move up correspondingly. However, the category has been retained as a "cause" of death because it suggests both the extent of incomplete reporting in St. Lucia and the degree to which the rank order of other causes may be inaccurate (6).

Reportable communicable diseases occurring between 1973 and 1986 are enumerated in Table 6. It is clear that vaccine-preventable diseases are not yet entirely under control; there have been periodic outbreaks of measles, mumps, and chicken pox. The figures for the last several years, however, show that recent immunization efforts have been effective. Gastroenteritis and influenza continue to afflict St. Lucians in significant numbers, although the 1986 figures show a decreased incidence of these two

diseases as well. Sexually transmitted diseases are by no means under control, but malnutrition, food-borne illnesses, and schistosomiasis have been much reduced since 1973.

Overall, then, chronic degenerative diseases are increasing, while certain infectious and parasitic diseases continue to take their toll. (Infectious diseases accounted for 50 percent of all visits to health clinics in 1985. Of these, 25 percent were for respiratory infections, 11 percent for dermatitis, and 9 percent for gastrointestinal problems [GOSL 1987:30]). Continuing development and urbanization, and the diseases associated with them, have meant that St. Lucia now suffers both from "first world mortality causes (heart disease, cancer, stroke, accidents) and from third word morbidity (infectious and parasitic diseases)" (GOSL 1987:3).

These trends in mortality and morbidity have obvious implications for the St. Lucian health services delivery system. First, the increasing absolute numbers of ill people and the variety of "modern" and "traditional" illnesses mean increased demand for diversified hospital services. Second, a number of the leading causes of death in St. Lucia (e.g., strokes, cancer) are associated with prolonged periods of debilitation, requiring long-term medical care before death. Third, preventing an illness generally costs less than curing it, but since St. Lucia's immunization programs have reduced the occurrence of preventable diseases, the major causes of morbidity and mortality in St. Lucia today are those that require major social and environmental changes. Finally, with increasing life expectancy, St. Lucia's demographic profile will incorporate more and more elderly persons, and, correspondingly, the health needs of the population will continue to shift toward this group (GOSL 1987:12).

In addition to the effects of changes in mortality and morbidity patterns, the utilization of St. Lucia's health care facilities -- especially primary care facilities -- will also be affected, in a more general way, by improvements in education and socioeconomic status. According to a recent government report, perceived need to see the doctor has "increased dramatically," (78 percent in two years), due in part to an increase in the number of clinic sessions held at health centers, and to the capacity of health centers to see more patients, resulting from the introduction of Family Nurse Practitioners (GOSL 1987:30). Public health education campaigns -- to promote birth control, for example -- have also had a positive effect on health services and facilities utilization.

C. Organization of Health Services

1. Public and Quasi-Public Services. In addition to its major public general hospital in Castries (Victoria), St. Lucia has two smaller district hospitals (Dennery and Soufriere Hospitals), offering primary and some secondary care but no specialized services; a quasi-public general hospital (St. Jude Hospital in Vieux Fort); and one mental hospital (Golden Hope, in Castries). Comparative statistics for these facilities are shown in Table 7. The country's 1984 bed/population ratio of 27/10,000 (based on a bed capacity for the general hospitals of 360, provided by MOH 1984:61) is only slightly below the ratio of 32.4/10,000 for the Caribbean area as a whole (PAHO 1986[I]:140).

Victoria is the major referral hospital for the country, providing secondary and some tertiary care not available elsewhere on the island. In addition, large numbers of patients seek ambulatory services at the hospital without referrals. While the occupancy rate at VH is approximately 75 percent, those at the two district hospitals are considerably lower -- reportedly 54 and 17 percent at Soufriere and Dennery Hospitals, respectively, in 1984. Present rates may be even lower. The primary reason for such low utilization is Government's policy decision to provide only a limited set of services at these facilities, whose beds are used principally for patients requiring follow-up care.

Another significant reason why the district hospitals are underutilized is that the current MOH "Maternal and Child Health Manual" (June 1985) defines any first pregnancy as high risk, which is interpreted by district hospital staff as requiring referral to VH. As a result, the VH maternity ward is overburdened, in many instances by normal deliveries that might have been safely accomplished in the district hospitals, while district hospital beds remain unoccupied. It is estimated, for instance, that 67 percent of babies born to mothers residing in Dennery are delivered at VH (GOSL 1987:34).

St. Jude Hospital is a 107-bed, quasi-public institution, owned by the Government of St. Lucia but leased to and operated by a religious order, the Sisters of the Sorrowful Mother. The hospital receives an annual government subsidy of about EC $2 million, in return for which it provides medical care, at the hospital, to everyone living in the three health regions at the southern end of the island. St. Jude Hospital serves patients from other regions as well; its administrator estimates that it actually serves a total population of approximately 60,000 people. The

hospital bills everyone it treats, whether exempt or not, at the same rates charged at St. Lucia's public hospitals, although of course not everyone pays.

St. Jude's offers secondary and tertiary level care and a variety of tertiary level specialty services provided by physicians visiting temporarily from overseas, but its occupancy rate (about 60 percent) is considerably lower than Victoria's. To help fill its beds, the hospital has in recent years begun to contract with local employers to provide health services to their employees on a "preferred provider" basis. Broadly speaking, this is an arrangement under which a health services institution, a group of health practitioners, or an individual practitioner agrees to provide a specified set of services to a certain population (for example, the employees of a company) in exchange for a negotiated rate of payment.

In addition to the outpatient services provided at each of St. Lucia's four general hospitals, ambulatory care is available at 32 government health centers and one health post. These facilities are distributed throughout the country's eight health regions. Each center is staffed by a District Nurse, a Community Health Nurse, two Community Health Aides, and a nursing attendant (cleaning staff), and is visited at least once weekly by the region's District Medical Officer. A Family Nurse Practitioner (FNP) may also be available on a part-time basis. As of 1985, the government calculated that every St. Lucian was within a one hour's walk of a hospital or health center (Table 3).

2. Physician Services. According to the Ministry of Health, there were 55 physicians practicing in St. Lucia in mid-1987, of whom only 7 were full-time private practitioners. Of the 48 in public service, however, all but two saw patients privately in addition to their government service obligations. This situation is accepted by Government as helping to compensate for the modest salaries it offers physicians; their government contracts provide them with a relatively low but stable flow of income, while contact with patients during their public service hours helps to build their private practices. In addition, Government offers physicians periodic supplemental income from a 25 percent gratuity granted at the end of each contract period.

Victoria Hospital alone employs 17 consultants and 12 junior officers, for a total of 29 physicians -- roughly half the medical doctors in the country (7). Only eight of the 29 are St. Lucians; the remaining 21 are of six different nationalities, reflecting the practice of

physician recruitment from abroad, especially South Asia. In the absence of written medical practice standards or any ongoing peer review process, one consequence of such diversity among physicians is considerable variation in standards of care and some degree of "shopping" by consumers, who reportedly visit several doctors for the same complaint.

Apart from one joint practice in Castries involving two physicians, there are no private "group practices," in the usual sense of the term, in St. Lucia. The explanation is threefold: first, doctors do not lack for patients or for public facilities at which to see them; second, the absolute number of physicians in the country is probably too small to support group practices; and third, it is doubtful whether group practices would be financially successful, since patients would weigh the costs and benefits of private physician services against those of "free" care provided in the public health system by the very same physicians, and many would probably choose the latter.

There are two medical organizations on the island. The St. Lucia Medical Council is the statutory body responsible for the licensing of physicians and surgeons, and the St. Lucia Medical and Dental Association is a voluntary group. The latter has recently argued for unionization of doctors.

3. Private Laboratory, Pharmaceutical, and Radiological Services. Apart from the lab facilities at Victoria Hospital, there are two private laboratories on the island. The laboratory at the Fitz-St. Rose clinic does a greater range of tests than is available at VH. St. Lucia Laboratory Services, Ltd., provides the same laboratory services as VH, but has more contacts off-island for special services and sophisticated tests.

There are ten establishments listed under "pharmacies and pharmaceutical supplies" in the St. Lucia phone book, seven of which are in Castries. It was not possible to determine whether all essential medicines are available at these pharmacies, although it appears that, at any given time, there is a wider range of pharmaceuticals available privately than is in stock at Central Medical Stores. This is consistent with the finding that household expenditures for health care in St. Lucia are heavily oriented toward pharmaceuticals (see below).

Radiological services are available only at Victoria and St. Jude Hospitals.

D. Health Care Financing in St. Lucia

1. Economic Overview. St. Lucia's is a small economy, subject to external forces over which Government may have little control. The country experienced an economic slowdown in the early 1980s, as it suffered the effects of two major hurricanes and felt the impact of worldwide inflation and worsening terms of trade. Since 1983, however, the St. Lucian economy has recovered, achieving accelerating real GDP growth which approached 6 percent per annum in the last two years (see Table 8). In 1986, per capita GDP was estimated to be EC $3057 (US $1141), placing St. Lucia into the category of "lower-middle income" countries, as defined by the World Bank (World Bank 1987: Table 1, Box A.1).

In 1986 (at constant prices), government services, at 20.2 percent, continued to be the largest source of GDP, but their earlier rapid growth had slowed somewhat. Agriculture, which accounted for 17 percent of GDP, recovered its earlier share of GDP as it experienced consistently rapid growth in output after a serious recession in 1979-82. The next largest sectors were transport and communications (15 percent) and hotels and restaurants (12 percent), reflecting improved infrastructure and tourist facilities (MOF 1986:254-255). Of these four economic sectors, the largest in terms of percentage of GDP, three -- agriculture, hotels/restaurants, and transport/ communcations -- were also among the country's fastest growing sectors.

The deficit in the government's current account in 1981/82 and 1982/83 has been reversed, and surpluses were recorded for 1985/86 and 1986/87. However, there continues to be a deficit on the government's capital account. The Finance Ministry estimates St. Lucia's public debt service to be approximately 12 percent of recurrent government expenditures annually, and debt payments continue to be in arrears (ibid:129) -- sobering conditions, in view of efforts to seek financing for a new national hospital.

2. Aggregate Public Health Expenditures. Central Government capital expenditures (total and MOH) are shown in Table 9. The Ministry of Health as a whole accounts for 12 percent of the total; however, almost 85 percent of its capital expenditures are for water and sewerage systems. Most of the remaining 15 percent of capital expenditures are related directly to the delivery of health care; of this amount, one third is accounted for by Victoria Hospital.

Key data on recurrent revenues and expenditures are presented in Tables 8, 10, 11, 12, and 13, and shown graphically in Figures 1 through 8. Revised estimates of total MOH expenditures in 1986/87 stood at $19,850,482, or

4.7 percent of GDP. As may be seen in Table 8 and Figure 3, MOH expenditures, after rising, in a period of recession, from 3.1 percent of GDP in 1979/80 to 5.4 percent in 1982/83, have since proportionately declined to 4.7 percent during the recent recovery. In view of St. Lucia's policy commitment to providing most health services publicly (as the British National Health Service does), and considering its overall level of socioeconomic development, both absolute total expenditures and the percentage of GDP devoted to public health appear appropriate. Moreover, it is noteworthy that public health expenditures in St. Lucia have been countercyclical, thus maintaining a consistent level of health care delivery despite economic volatility.

As a percentage of total recurrent government expenditure (Table 8 and Figure 4), MOH expenditure has ranged between 12 and 16 percent during this decade, again showing the government's tendency to spend countercyclically for health care. Currently at 12 percent of total government spending, MOH expenditure in St. Lucia, given the country's choice of a primarily public health system, seems quite appropriate, inasmuch as most St. Lucians are primarily dependent on public health services because of their limited coverage under social or private insurance (see below).

On a per capita basis, MOH expenditure, in current prices, has risen nearly three-fold over the decade, from less than $60 in 1979 to over $140 since 1986 (Table 8 and Figure 1). Current (public) per capita expenditures (1986/87) equal about US $53, a figure that is somewhat higher than levels found in other lower-middle income LAC countries (ibid.:15, Table 2) -- again, because St. Lucia has chosen a largely public sector health care system. Part of the increase is explained by inflation, especially rapid in the early 1980s, but per capita expenditure has also increased in constant prices over this period of recession followed by recovery -- by nearly 61 percent since 1979.

3. MOH Expenditure and Sources of Revenue. The Ministry of Health comprises not only health-related services, but also Labour and (more recently) Information and Broadcasting. All but health are small components of the Ministry (meaning that most MOH spending for administration is for the Health and Medical Care component, a fact with important implications for the hospital cost analysis below). The Health and Medical Care component accounted for some 85 percent of total Ministry expenditures throughout the decade, reaching a high of 87 percent in 1984/85. Recently, this proportion has dropped to 83 percent (1986/87 and 1987/88), due to the recent expansion of the Ministry's portfolio of activities. When considering MOH expenditures

in relation to revenues (Table 11), it thus is the Health and Medical Care component of the Ministry's budget on which we need to focus. Victoria Hospital, for example, absorbed 32 percent of total MOH recurrent expenditure in 1986. However, it accounted for nearly 40 percent of the Ministry's Health and Medical Care component in the same year. This is not at all surprising for a hospital with high inpatient utilization rates, that also provides a possibly excessive volume of primary care.

Both sets of figures for VH expenditures -- as percentages of total MOH recurrent expenditures and of the Ministry's Health and Medical Care component -- have remained relatively constant since 1981/82, showing fairly consistent fiscal allocations by Government to health care and to the hospital. Figures 5 and 6 depict trends in absolute levels of recurrent expenditure for VH. In current dollars, these levels have increased, if only slightly, in every year except 1983/84, when there was a one percent decrease, and 1986/87, when the level of expenditure stayed the same. When viewed in constant dollars, real expenditures also grew, although minimally.

Table 12 shows annual percentage changes in expenditures for VH in relation to changes in the Ministry's Health and Medical Care Division and in the retail price index for services. In 1984/85, the growth of expenditures in the Health Division was less than the growth in the price index, but expenditures for VH grew more rapidly than either. In 1985/86, expenditures in both the Health and Medical Care component and VH increased, despite a decline in the retail price index. In 1986/87, absolute levels of expenditure for Health and Medical Care declined by 2.3 percent; those for VH, however, increased by 6.6 percent.

The primary reason for VH's strong claim on MOH expenditures is the hospital's labor cost component, which has increased both relatively and absolutely due to wage settlements. The hospital, a labor-intensive organization and one, moreover, in which labor is relatively high-cost, is far more sensitive to the effects of salary and wage increases than other subcomponents of Health and Medical Care expenditure. For example, personal emoluments represent only 3 percent of expenditures for Central Medical Stores, and only 26 percent of expenditures for Sanitation and Inspection, but because of the labor-intensity of inpatient services, this line item accounts for 63 percent of all VH expenditures. (In comparison, the 1986 payroll cost figure for Belize City Hospital was 55 percent; see Raymond et al. 1987:16). In 1984 and 1986, government wage settlements averaged a generous 20.8 and 18 percent respectively. Thus

it is hardly surprising that rates of growth in expenditures for the hospital outstripped those for the Health and Medical Care component in those years.

Trends in MOH revenues generated by health-related activities, by source (excluding general tax revenues), are shown in Table 11, while Table 13 reflects trends in the relationship between health-related revenues (i.e., excluding work permits) and expenditures for the Health and Medical Care divisions. Figures 9 and 10 depict these relationships graphically. Overall, it appears that total health revenues have risen substantially, from a low of 4 percent in 1983 to 9 percent of total revenue (1986 revised Estimates); the 1987/88 Estimates project a rise to 13 percent. The explanation for this increase is that the National Insurance Scheme (NIS), beginning in 1984, has contributed an annual subvention to the MOH, for health care services rendered to NIS enrollees. When the amount of this subvention (termed "Contribution to Medical Board") is subtracted from MOH revenues, they have been in the range of 3 percent of expenditures -- a very low rate of direct cost recovery.

Apart from the NIS contribution, hospital user fees are the largest component of health revenue, but (as may be seen in Figures 7, 8, and 11) these fees have never exceeded 15 percent of total health revenues, and their proportionate contribution has fluctuated considerably from year to year.

4. Household Direct Expenditures for Health and the Population's Ability to Pay. There have been few if any efforts to estimate levels of private expenditures for health in St. Lucia, and indeed there are few data upon which to base such estimates. The 1982 Household Budget Survey (upon which the Consumer Price Index is based) reported that 2.3 percent of household disposable income is spent on health. This figure includes 1.2 percent of the household budget spent for pharmaceuticals, and 0.7 percent for doctor's fees, with the remainder spent on non-prescription items. No expenditures were reported for hospital fees among surveyed households.

Since survey respondents were a middle-income group, an even lower figure for the proportion of household disposable income spent on health may be more realistic. The figure of 2.3 percent, if applied to estimates of total private consumption for 1983 (IMF 1986), suggests that total private expenditures for health were approximately EC $5,479,000, or EC $42 (US $15.50) per person. These figures represent about one-fourth the amount of total central government health expenditures for 1984. Given that they may be overestimated,

it is clear that the proportion of households' total direct expenditures are relatively low, because of the choice of a public sector approach to health care.

In sum, private out-of-pocket expenditure is only about 20 percent of combined total national health expenditure, while the public sector accounts for 80 percent. Total national expenditures for health add up to about 6 percent of GDP, a slightly higher percentage than is found other countries at comparable levels of socioeconomic development.

The real capacity of St. Lucia's population to pay out-of-pocket for health is difficult to estimate, in part because the actual number of employed St. Lucians is not officially reported. The total 1985 population aged 15-64 was estimated to be 69,635, of whom 2,299 were enrolled in school (Annual Statistical Digest 1986:11, Table 9). The total labor force is estimated to number about 45,000. If we accept local estimates of unemployment of about 25 percent, then in 1986 the employed labor force was approximately 34,000, with 11,000 unemployed. Of the employed, approximately 18-20,000, or somewhat less than half the labor force, were currently eligible for NIS benefits -- a sizeable proportion, compared with other countries (8). This means that some 17,500 St. Lucians were either employed in the "non-covered" or informal sector, where wages are probably lower than in covered sectors, or unemployed. These workers are probably able to pay little or nothing out-of-pocket for health care.

Income distribution data for St. Lucia are relatively few, but they do support the assumption that inability to pay for health care is widespread. Among respondents who answered income questions in the 1982 Household Budget Survey, 23.4 percent earned annual incomes below EC $2000. These data, when combined with prevailing unemployment levels, suggest that a substantial number of St. Lucians find it impossible to make sizable out-of-pocket expenditures for health, a conclusion consistent with the study team's informal finding that payment of fees for private ambulatory care is often delayed. It is also consistent with the low level of fee collection for inpatient care at VH.

St. Jude Hospital is generally perceived as being quite successful in revenue collection, and indeed its administrator reports that 96 percent of all outpatients, exempt or not, do pay the charges, which are those set by the national fee schedule. However, 86 percent of <u>inpatients</u> do not pay, a figure all the more striking because every patient at St. Jude is billed. In addition, St. Jude's

(unlike VH) can retain all revenues collected -- a powerful incentive to pursue collections.

St. Jude's experience with revenue collection is consistent with findings at government health centres, where the Dispenser (pharmacist) collects fees for patients' visits to both the regular doctor (the District Medical Officer) and consultant specialists. Health Centre personnel report that about 90 percent of non-exempt outpatients do pay charges. A detailed annual breakdown of medical fees by source is not available for analysis, but the MOH report for September, 1987, shows that (outpatient) medical fee collections at Dennery and Soufriere Hospitals exceeded those from VH for the month in total dollars. Receipts at other health centres are quite variable, however, and the MOH collected no hospital fees apart from those at VH.

In summary, then, it is difficult, on the basis of currently available data, to give precise estimates of private consumption of health services in dollar amounts. It appears that, in general, St. Lucians can and do pay small amounts out-of-pocket for health care, but that many either cannot or do not pay the sizable sums associated with hospital care.

5. The Role of National Exemption Legislation. It is difficult to discern how much non-payment of health care fees in St. Lucia is attributable to the inability to pay, and how much to unwillingness to pay. The country's Hospital Regulation Act of 1985 (as ammended) exempts a number of categories of persons from having to pay the fees established in the Act (9). The MOH estimates that all but 7.3 percent of the population is effectively exempted from payment under the terms of this legislation. Whether this figure is precise or not, St. Lucians as a matter of custom do not view themselves as personally responsible for publicly-provided, personally-consumed health services. Until and unless this perception is changed, possibilities for improved revenue generation in the health sector will be limited to what can be achieved by improved revenue collection within the legal limits alone. The study team's estimates of this potential are discussed in Chapter III.

6. Other Sources of Revenue: NIS and Private Insurance Coverage. We noted earlier that since 1983 the National Insurance Scheme (NIS) has made an annual subvention to the MOH, for which the MOH provides free health care services to active NIS contributors. There is some question in St. Lucia as to whether this contribution represents an appropriate interpretation of the NIS mandate. A recent proposal that St. Lucia consider introducing a "health levy" (as in

Barbados) reflects, in part, the lack of clarity about this mandate.

NIS was established (NIS Act No. 10 of 1978) as an income maintenance program, with eight categories of benefits: sickness, invalidity, maternity, hospital and medical treatment, survivors, retirement, funeral grant, and employment injury and disablement (GOSL 1979:12). Employees contribute 5 percent of their salaries, which is matched by employers' contributions. This level of social security contributions is about the maximum found in Latin American countries, where it covers the costs of medical treatment for ill or injured workers and even supports limited health care for dependents at Social Security hospitals and health centers. However, in those countries the population bases are larger and social security schemes have been in existence much longer.

Although NIS maintains a manual system for recording the names of active contributors whose medical care is covered, this system has not yet been linked closely to revenue collection mechanisms at government health care facilities. The resulting inability to determine the expenses incurred by MOH in behalf of NIS contributors leaves open the question as to whether NIS's yearly contribution to MOH is too little or too much.

The extent of private health insurance in St. Lucia has recently been assessed by the Ministry of Finance, in a telephone survey of private insurance carriers. At present, 14 companies write health insurance policies in St. Lucia, which now has 7520 private health insurance policyholders, or 5.3 percent of the population (a figure slightly higher than the estimate of 3.4 percent among respondents to the PAHO community-based survey carried out in 1984). This is not an inconsiderable percentage, given that some 93 percent of St. Lucians are legally entitled to free health care services at government facilities.

Up to $400 in health insurance premium payments and medical fees are income tax deductible for individuals. According to a recent Inland Revenue audit survey, approximately 23,000 annual tax returns are filed in St. Lucia, representing at least half the labor force -- a figure that correlates fairly well with the figure of 20,000 NIS enrollees and 7,500 government employees. The absolute number of St. Lucians who are not in an exempt category and who would benefit from this provision of the tax law if they purchased private health insurance is thus a relatively small proportion of the total population. Another factor that keeps the number of St. Lucians covered by private

health insurance from increasing is that not all private employers are required to carry group insurance for their employees.

A final reason why a relatively small percentage of St. Lucians has private health insurance may be problems with reimbursement from private carriers. Table 14 shows gross premiums, claims paid and outstanding, and payout ratios for St. Lucia in comparison with other countries in the region. The payout ratio for St. Lucia is only 31.4 percent -- well below the levels of 48.8 percent in Trinidad and Tobago, 70.2 percent in Barbados, and 78 percent in Jamaica. Why payouts in St. Lucia are so low, relative to premiums, is not known, and the matter clearly warrants further study. Perhaps relatively few claims are being made; perhaps health care facilities are not submitting claims to the fullest extent possible; perhaps claimants are unable to document their receipt of services adequately; perhaps settlement of claims is a slow process in the still-youthful St. Lucian insurance industry. In any case, as long as so many people are exempted by legislation, improving collections from private insurance will solve only part of the problem.

In 1985, St. Lucia passed legislation requiring motor vehicle insurance policies to include provisions for medical care resulting from accidents. Attempts to implement that legislation support the conclusion that the mechanisms by which St. Lucian policyholders are reimbursed by insurance carriers are flawed. Determining liability for accidents has caused legal problems, the solutions to which have had to await improvements in police reporting of accidents. Apart from this reason for the low payout rate, exogenous to the health sector, some insurance carriers have reportedly found claimants' hospital bills insufficiently documented for payout. Alternatively, carriers may be using "insufficient documentation" as a tactic to delay payouts.

E. Summary Discussion and Conclusions

The St. Lucian Government's commitment to health has been strong and consistent throughout the decade since independence. The proportion of GDP that St. Lucia spends on health -- 5 percent -- is comparable to that of Great Britain. The share of total government expenditures devoted to health in St. Lucia -- 12 percent -- is comparable to that of other Latin American and Caribbean countries at similar income levels and with strong public (rather than private) health systems. It is notable that St. Lucia maintained its commitment to health even in the period of recession in the early 1980s, following two severe

hurricanes.

Per capita government spending on health, in constant prices, has increased by 64 percent over the last decade. In current prices, per capita spending has nearly tripled over the same period, to EC $142 -- again, a figure comparable to other countries at the same income level. While on the one hand these levels of expenditure can be seen as additional evidence of Government's commitment to health, the rates of increase have contributed to deepening concern among officials that St. Lucia's overall patterns of health financing require closer examination.

Several other factors also have contributed to a new focus on health financing in St. Lucia. The Report and Recommendations of the Multi-Disciplinary Committee on the New National Hospital, presented to Government in April 1987, noted that changes in morbidity/mortality patterns toward chronic and degenerative diseases will require at least the maintenance (if not the elevation) of current levels of resources in future. Second, concern over the level and proportion of budgetary resources going to Victoria Hospital, which prompted this study, has been heightened by recognition that other hospital facilities on-island (St. Jude, Dennery, Soufriere) are not fully utilized, while demands on VH sometimes exceed capacity -- which signals a health financing problem common to many developing countries today: poor resources allocation. Third, it has been noted at the highest levels that Government collects very little in health-related revenues for the services it provides, an observation that this study confirms. In the aggregate, health revenues are only about 8 percent of recurrent expenditures, and when the annual NIS subvention is subtracted, revenues from hospital and medical fees and similar sources amount to only 3 percent of expenditures. In comparison, the Dominican Republic collects approximately 6 percent from such sources (Lewis 1987).

This low level of revenue generation (or "cost recovery") is consistent with the study team's finding that private, out-of-pocket expenditures for health by households are only a fraction of total expenditures for health in St. Lucia. The 1982 Household Budget Survey estimated that only 2.3 percent of disposable household income is spent on health, and most of that is for pharmaceuticals. This percentage suggests that private per capita expenditures for health are only EC $42. In other words, of all expenditures for health, Government accounts for about 80 percent, and private citizens for about 20 percent.

There are three major reasons for these patterns of

expenditure and relatively low levels of cost recovery. First, as has been noted, St. Lucia has chosen a public sector approach to health care delivery, with most health services delivered through publicly-run clinics and hospitals; the private medical sector is small. Second, a substantial proportion of the population is exempt by law from having to pay health care fees. According to Ministry of Health estimates, 92.7 percent of the population is exempt, and in its own independent estimate the study team was able to confirm that at least 77 percent of the population is exempt; the figure may be higher. Third, and as a result of these two factors, people do not feel responsible for their health expenses, even when these are for personal health care services.

There is room for more vigorous revenue collection from those who are not exempt, and -- in the long-run -- changes to both the fee schedule and the exemption law are indicated. Realistically, however, it must be recognized that there is a proportion of the population that probably cannot pay out-of-pocket for health care. This assumption is supported by the 1982 Household Budget Survey, in which, of those responding to income questions, approximately 23 percent had incomes below EC $2000; by the current unemployment situation, estimated at about 25 percent; and by the fact that about half the workforce is in the "informal sector," where wages and job security are low.

On the other hand, about 20 percent of the population has some form of health insurance coverage: 14 percent of the population, or 18-20,000 people, are covered by NIS, and an additional 5.3 percent, or about 7500 people, have private health insurance. We noted that, in other countries in the LAC region, the level of social security contributions that now exists in St. Lucia is sufficient to cover the costs of medical care for ill or injured workers and even to support limited care for dependents, an observation that suggests the need for an additional study to determine the adequacy of current NIS contributions for an expanded program of health benefits. The study team's finding that the level of payouts by private insurance companies in St. Lucia is low, relative to those prevailing elsewhere in the Eastern Caribbean, similarly argues for further investigation. At present, it would appear that Government is not taking full advantage of the potential to recover the costs of services provided to individuals covered by private insurance.

Over the long term, the Government of St. Lucia seeks to establish alternatives (or at least supplements) to general taxation as a stable and reliable source of health

financing. At present, however, revenue generation ("cost recovery") from other sources is low, and it is difficult to improve cost recovery (and thereby financing) without first protecting individuals and families against unaffordable out-of-pocket expenditures. For this reason, the study team recommends that Government give high priority to further development of "risk-sharing" mechanisms. As noted above, two forms of risk-sharing (or insuring people against extraordinary financial outlays) for health already exist in St. Lucia: the National Insurance Scheme (NIS) and private health insurance. A third form, the "preferred provider" arrangement (whereby, in exchange for a negotiated rate, an institutional or other health provider gives a specified set of services to a defined population) is already under development at St. Jude's. Recently, a fourth option, a "health levy" similar to that used in Barbados, has been under discussion in St. Lucia.

How should St. Lucia proceed to develop its risk-sharing options? First, it should be recognized that both the NIS and the health levy are forms of social insurance -- that is, government-sponsored programs for risk-sharing. At present, it is not clear whether NIS is, in fact, mandated to provide for medical care and hospitalization. According to one view, NIS is basically and solely an income maintenance program for those employed persons who contribute to the scheme. According to another, however, NIS was always envisaged to develop into a full-fledged social insurance scheme and, if it has not until recently taken a role in providing health coverage, this circumstance is a refleciton of the fact that NIS is only now reaching a mature stage of development. It is, in part, this ambiguity about the role of NIS that has led to the proposal that a health levy be considered.

The first step in developing risk-sharing in St. Lucia, then, will be to determine the role of government-sponsored social insurance. Several key questions await answers. First, is it necessary or advisable to have two separate programs (NIS and a health levy)? This depends upon the response to several related questions. Are the current levels of contribution to NIS, and the program's financial situation, sufficient to support expanded health coverage? Thorough analysis of NIS's financial circumstances, and discussions with experts from the International Labor Organization (ILO) and financial managers in other social insurance schemes, can help to clarify this point. If it becomes clear that additional financial contributions are needed, then the question of a health levy comes into focus. Here, an important point to consider is how such a levy would be administered. Would it be attached to Inland

Revenue, and administered along with other forms of general taxation? Or could it be applied in the form of a percentage increase in contributions to NIS, and administered under that scheme? In view of the human and financial resources involved, it seems unlikely that St. Lucia would wish to establish an entirely new and separate system for administering a health levy.

If, in response to the first two questions, it is determined that it is desirable for NIS to play an expanded role in providing social insurance for health, it will be important to determine whether existing NIS legislation is adequate to support such a development, to make any necessary changes in the legislation, and then to determine the appropriate basis for either calculating a subvention or billing NIS directly for services. In concert with these actions, it will be useful to consider implementing provisions of the NIH legislation that allow for extension of NIS to cover the self-employed and to consider inclusion of all government workers (including those who are pensionable) as contributors to NIS.

The second step in developing risk-sharing in St. Lucia will be to ascertain the role of private insurance as an adjunct to social insurance. As this report has noted, the reasons for low levels of payout by private health insruance carriers are unclear, and further investigation, perhaps by a joint government/insurance industry task force, is indicated to answer the questions about private insurance posed in this report.

Although the development of preferred provider arrangements or other forms of "managed care" -- including Health Maintenance Organizations (HMOs) and other types of prepaid plans -- has some appeal, in view of the efforts that will be required to resolve the important questions surrounding social and private insurance options, an active role for Government in promoting such arrangements may be premature at this time.

In choosing the best path for developing risk-sharing in St. Lucia, Government will want to ensure that the mechanisms selected do not contribute to rising health care expenditures -- as both social and private insurance have done in some countries. Specifically, it will want to avoid a "pluralistic" system in which there are many different payors, each of whom can shift responsibility for costs to somebody else. So that costs can be restrained even as sources and levels of financing are expanded, it is important to ensure that, at one central point in the system, a single payor bears the full responsibility for

reconciling costs and payments. The Canadian system has been among the more successful in this regard, and bears close examination.

If St. Lucia wishes to embark seriously on risk-sharing, it must simultaneously introduce meaningful user charges and enforce their collection. User charges are sometimes viewed narrowly as a way of generating increased revenues. While they do serve that function -- not an unimportant one -- they do more than this; they also provide signals that can affect utilization and the allocation of resources. The World Bank has stated the relationship between user charges and fundamental shifts in the health system succinctly:

> The tendency to allocate too much of the government health budget to high-cost hospital care, with negative effects on overall cost-effectiveness and on equity, will be difficult to change until charges come close to reflecting real costs. But charges at hospitals and other government facilities cannot be raised to reflect costs and recover larger amounts unless much of the population is insured. At the same time, insurance and other forms of risk coverage will collect little revenue and in all likelihood fail if free services remain available at government facilities (World Bank 1987:8).

Chapter Three reports the study team finding that, with one exception, the fees charged by Victoria Hospital under the existing fee schedule are substantially below the average unit costs (the "full resource costs") of services provided. One of the principle applications of unit cost studies such as this one is setting prices. Even without any further development of risk-sharing (see above), Government can begin to charge those already insured the "full resource costs" of the services they receive.

This will require not only revising the existing fee schedule but also drawing a distinction between the insured and the uninsured. Insurance companies, the NIS, and some individuals can bear the burden of full resource costs (and should do so now), but many individuals cannot -- at least until they become insured. Both equity considerations and the role of the market in determining the prices individuals are willing to pay argue for different pricing structures for the insured and the uninsured. Among the latter, those who are unemployed and/or poor will require special consideration. Furthermore, public health considerations dictate that for some types of services (notably immunizations and some MCH care) fees be either waived or

negligible. But beyond these considerations, the fee schedule for the uninsured, and its application, should be one that encourages all who can do so to seek membership in a risk-sharing plan.

Three other, corollary, steps are indicated, both to support the development of risk-sharing and to facilitate the reallocation of resources within the health system.

First, in addition to revising the fee schedule, Government will need to press more firmly for collection of fees from those eligible to pay, for this is the only way that consumers will be moved to seek indemnification against risks. Immediate steps toward improved revenue collection include (1) instituting arrangements that would permit a portion of collections to be retained by the Ministry of Health and, within the MOH, by the facilities directly responsible for collection; (2) posting trained revenue officers in key locations (which would probably result in income far greater than the costs involved); and (3) improving the submission of claims against insurance companies.

Second, to rationalize utilization of resources and their allocation to district hospitals and health centers, Government will need to revise its policies governing the use of Dennery, Soufriere, and St. Jude Hospitals, and its MCH guidelines concerning use of Victoria Hospital for all first births.

Third, risk-sharing cannot develop further, nor user charges fulfill their allocative functions in St. Lucia, under the existing system of exemptions. Altering the present system will entail the exertion of significant political will, since it requires altering the existing exemption legislation, and elected officials are necessarily sensitive to voter response. St. Lucia may wish to consider combining such legislative change with a package of other reforms serving multiple purposes. For example, a change to the exemption legislation might be combined with efforts to improve tax collection by substituting a tax-deductible allowance for existing fee exemptions.

III. FINANCIAL COSTS OF VICTORIA HOSPITAL

A. Hospital Management and Organization

Victoria Hospital, 100 years old in 1987, stands on a nine-acre site overlooking St. Lucia's capital city of Castries and the Caribbean Sea. The facility's 211 beds are allocated among seven wards, to which there were 8185 admissions in fiscal year 1986/87 (April to March), the period under analysis in this study (see Table 15 for a summary of Victoria Hospital statistics for the year). Occupancy for the year was 74.3 percent, and the average length of stay (ALOS) was 7 days. In addition to its inpatient facilities, the hospital houses Casualty and Medical clinic areas. In fiscal 1986/87 these received 34,052 outpatients for emergency, walk-in, and scheduled outpatient clinic services.

St. Lucia's Public Hospitals (Management) Act of 1973 established a five- to ten-member Hospital Board, to be appointed by the Minister of Health, to "undertake...general management and administration" of Victoria Hospital. The Board is specifically empowered to: (1) "equip, furnish, manage, control, operate and maintain [the] hospital and all property thereof"; (2) "prepare an annual Estimate of Revenue and Expenditure [for the] hospital"; (3) "collect fees payable under [the] act"; (4) "make recommendation to the Minister with regard to any matter directly or indirectly affecting [the] hospital or the efficiency or improvement of the medical or nursing services therein"; and (5) "perform such other functions in relation to [the] hospital as the Minister may require to be performed by the Board." While it has responsibilities for financial reporting, fee collection, and physical facilities, however, the Board's ability to affect the financial costs of the hospital is constrained by its lack of control over key issues such as hiring and firing, and by its purely advisory role vis-a-vis medical or nursing services.

The situation is similar for the Hospital Administrator, customarily appointed by the Public Service Commission. While he serves as "Chief Executive of the Board and as such shall perform such duties as the Board may require of him from time to time," the law also states that he must comply with requests concerning administration and management made by the Medical Superintendent "or other Officer in charge." As of 1986/87, the post of Medical Superintendent was vacant. Direction over the hospital's medical staff was being provided by the Medical Staff Committee; nursing

services were under the direction of the hospital Matron.

Effectively, then, the Administrator's scope of authority spans three of the hospital's 15 direct service departments (Laboratory, Radiology, and Physiotheraphy) and ten of the 11 indirect departments (excluding Nursing Administration) (see Appendix B, Table B.2). Matters pertaining to appointments and discipline are under the purview of the Public Service Commission, a constitutional body. The Personnel Division of the Public Service (the Establishment) is responsible for working conditions. Salaries and fringe benefits are negotiated between the Public Service Union and a Cabinet-appointed team comprised of representatives from the Ministry of Finance and the Personnel Division of the Public Service, plus private sector individuals knowledgable about wage levels.

The divisions of responsibility for aspects of Victoria Hospital's management and administration documented in this brief overview underscore the need for national-level collaboration in efforts to control and manage the hospital's costs.

B. Cost Analysis Methodology

Five steps were undertaken to identify total costs and unit costs for Victoria Hospital departments. (Additional details of the methodology used may be found in Appendix B.)

First, the 1986/87 line item expense report for Victoria Hospital (reflecting actual expenditures) was identified from the Government's annual budget report, Estimates of Saint Lucia, 1987/88 (see Appendix B, Table B.1).

Second, twenty-seven departments were identified for purposes of cost allocation and calculation of unit costs. These departments were separated into indirect service (overhead) departments, direct service departments, and other departments (see Table B.2 for complete list).

Third, the line items in the expense report were assigned to the hospital's departments, in order to calculate the direct cost for each department. The figures were adjusted to include costs incurred by the hospital but not reflected in its budget or expense report (e.g., pharmaceuticals costs), and to subtract costs incurred elsewhere but recorded in the Hospital's expense report (e.g., time spent at other hospitals by VH maintenance personnel) (see Table B.3).

Fourth, the costs of the indirect departments were spread across the direct service departments through a stepdown procedure. This was done in two ways: first, under the assumption that the hospital's buildings were fully depreciated and thus represented no cost to the hospital (this is the case, since the existing facility is 100 years old); and second, under the assumption that a new hospital would be built, and that its buildings and the current market value of its land would have to be annuitized at full replacement cost (see Tables B.4 and B.5).

Fifth, the total (direct + indirect) costs of the direct service departments were divided by each department's service volume, in order to calculate the cost per unit of service (see Tables B.6 and B.7).

C. Summary of Key Findings

As may be seen in Table 16, the 1986/87 total direct and indirect cost of the existing hospital (without depreciation of buildings and annuitization of the capital costs of land) is EC $8,448,688. This figure is 31 percent higher than the EC $6,451,130 in recurrent expenditures attributed to VH in the Estimates. The difference between the two figures results from our addition of expenses for the hospital that do not appear on its own budget: those recorded in budgets of other MOH departments (e.g., pharmaceutical expenses paid through Central Medical Stores), those on the budgets of other ministries (e.g., telephone expenses paid by the Ministry of Communications and Works), and costs that do not appear on any budget (e.g., depreciation of equipment; donated salaries and equipment).

When depreciation of buildings and the annuitized capital cost of land are added, the total annual cost of Victoria Hospital comes to EC $10,680,274, or nearly 66 percent more than the figure for the hospital's recurrent expenses in the Estimates (Table 16).

Figure 12 shows the distribution of line item expenses within total direct and indirect cost (without depreciation/ annuitization). The largest expense by far is for personnel, which absorbs 68.7 percent of the total. Supplies, tools, and equipment account for another 16.7 percent, and pharmaceuticals for 8.1 percent. Together, these three items account for 93.5 percent of total direct and indirect costs (without depreciation/ annuitization). The remaining 6.5 percent of costs are apportioned among five less significant items. Note that the expense for operations and maintenance is less than one percent.

Table 17 shows the unit costs of Victoria Hospital's seven wards (with depreciation/annuitization). Total costs per department range from a low of EC $349,408 in Opthalmology to a high of EC $1,461,046 in Medical, reflecting, among other things, differences in department size, the average age of patients, occupancy rates, the average length of stay (ALOS), and the intensity of services. Total costs per patient day range from EC $90 for Paediatrics to EC $174 for Opthalmology, reflecting differences in both total costs and volume of services. Total cost per admission (a function of both cost per patient day and ALOS) ranges from approximately EC $415 in Maternity to EC $1,667 in the (private) Baron Wing.

Table 18 provides a detailed summary of cost allocations for VH. Average inpatient costs, summarized in Part 4 of Table 18, were calculated with and without operating theatre costs (depreciation/annuitization is included in all cases). Average cost per inpatient day without operating theatre costs was EC $103.61; with operating theatre costs, it was EC $131.80. Average total cost per admission without operating theatre was EC $724.21; with operating theatre, it rose to EC $921.26.

Unit costs (with depreciation and annuitization of the capital costs of land) for surgical operations, outpatient services, and ancillary services (shown in Table 19) were also calculated. The average cost per operation was $611; per outpatient visit, $30; per lab test, $10; and per x-ray, $49. The average cost of a physiotherapy treatment was $13.

1. Understanding Components of Costs. There are several different ways in which these data can be interpreted and used. First, they provide a more realistic picture of the actual costs of VH than was previously available, as well as details on the relative costs of different direct services. They also provide insights into why relative costs differ. For example, Maternity has the third highest total cost of any inpatient department, because -- although the ALOS in Maternity is the lowest of any department -- it has a very high number of admissions and therefore a high number of total patient days. As a result, costs per patient day are at the lower end of the range, and total cost per admission is the lowest of all. Ophthalmology, in contrast, has the lowest total cost of any department, and length of stay is only slightly above average. However, its low admission rate and resulting low occupancy rate and smallest number of patient days together result in Opthalmology's having the highest cost per patient day and the third highest cost per admission.

One of the probable reasons for the results on average costs, in terms of cost per patient day, is the intensity of utilization of each ward. Although the study results, based on a single year, do not provide an adequate test of this point, it is plausible to assume that, other things being equal, the more intense the use of a ward (that is, the greater the number of patient days it provides), the lower its average cost. Such an interpretation of costs is consistent with economic theory, especially considering the (no doubt high) proportion of total cost that is fixed in each ward.

By highlighting the component elements that affect both total and unit costs, cost analysis can point the way to measures that may help to reduce costs (e.g., closing beds in low-occupancy areas to lower fixed costs; increasing occupancy in low-occupancy areas when morbidity indicates these beds are needed). It is important to note, however, that estimates of total and unit costs necessarily reflect the situation at a given point in time and at a given level of service. If the scale should change -- if the volume of services should increase, for instance -- then the cost estimates might change.

The findings of this cost analysis also suggest that officials need to be realistic about the potential for cost reductions. Sixty-nine percent of the hospital's total direct and indirect cost (without depreciation/annuitization) lies beyond the control of the hospital administrator and even the MOH, dependent upon decisions negotiated by the Public Service Union and the Cabinet-appointed negotiating team mentioned earlier.

2. Comparison of Costs with Existing Fee Schedules. A second major use of these cost data is for comparison with existing fee schedules. St. Lucia's schedule of health care fees was recently revised (1985), and further revision is not expected as an outcome of this study, but officials acknowledge that existing fees were set without any consideration of actual costs, and have expressed interest in knowing what the relationship between fees and actual costs might be. The study findings shown in Table 19 are depicted graphically in Figure 13.

The only fees that appear to come close to total costs per unit are the average laboratory fees. This finding should be treated with some caution, however, since the fee figure represents an average of fees for all tests under EC $20, unweighted by differences in actual numbers of tests done. The weighted average might well be a lower fee.

In only one case, physiotherapy treatments, the estimated average fee per unit (EC $31.45), which reflects single and complex physiotherapy treatments combined, is higher than the "total cost per unit" figure (EC $13 for one treatment). If we look only at the fee charged for a single treatment (EC $10), however, it is -- like the fees in other departments -- below unit cost. If more of these single treatments are given than is assumed in the analysis, Physiotherapy's average fee per unit may be somewhat closer to the "total cost per unit" figure of EC $13.

The fees set for the (private) Baron Wing, Operating Theatre, Radiology, and Casualty are all around 50 percent of their costs. Not surprisingly, given a ward-bed charge of EC $15, the fee for most inpatient departments is only 9 to 17 percent of costs.

3. Other Comparisons. Determinations concerning the importance to be attached to relative differences in costs among services or between costs and fees are difficult to make without comparative data -- both year-to-year comparisons within a single institution and comparisons among institutions. These are uses of cost data for which only potential exists at this time, since Victoria Hospital and the MOH will probably not be able to replicate this cost study annually. However, both institutions now have the methodology to replicate it periodically, and the study has identified some concrete steps that would facilitate progress toward an on-going cost reporting and analysis system (discussed below).

Comparisons among institutions would also aid in the interpretation of Victoria Hospital's cost data. Because St. Lucia is one of only a very few countries at its particular level of income to have undertaken a detailed hospital cost analysis, the potential for international comparison is unfortunately slight at present (although a recent HCF/LAC study on the costs of the major public hospital in Belize (Raymond et al. 1987) does present one excellent opportunity for international comparison). An immediately useful comparison is possible, however, between the costs of VH and the projected costs of the proposed new National Hospital. In addition, comparison with the costs of St. Jude Hospital should be pursued. St. Jude's accounting system makes comparisons with VH theoretically feasible, although more detailed analysis would be required at St. Jude's, and special arrangements would probably be necessary to permit the release of its financial data since it is not a public institution in the usual sense. Cost analyses must, of course, be conducted in the same way if comparisons are to

be valid.

D. Costs and Clinical Staff: The Role of Utilization Review

Patterns of clinical care practiced by physicians and nurses have a profound effect on both the quality of care and the costs of services -- and in matters of health, it is not possible to separate one from the other. In order to address this aspect of health care cost management in St. Lucia, it is necessary to introduce some form of "utilization review," a process in which individual medical cases are examined to assess the potential for changes in practice patterns.

One increasingly well-known approach to utilization review, "DRG analysis," involves the comparison of cases within diagnostically-related groups -- hence its name. There are some practical drawbacks, however, to the application of the DRG approach in St. Lucia. First, if DRG analysis is to be used for utilization review, physicians must agree on standards of practice against which treatment for individual diagnoses will be assessed. Although peer review is standard in many medical communities, it has not been a tradition in St. Lucia, and considerable time and strong medical leadership would be needed to establish it. Second, in order to link treatment to costs, the DRG approach requires on-going cost data at a level of detail unavailable in St. Lucia (even after this cost study). Third and most important, DRG analysis requires International Classification of Disease (ICD) codes. At present, St. Lucian physicians do not regularly record final diagnoses in medical records, so it is impossible to assign ICD codes to cases.

Over the past several years, a health research group at Boston University in the US has pioneered an alternative approach to utilization review, the "Appropriateness Evaluation Protocol" (AEP). Briefly, the AEP examines whether a patient is receiving a level of care appropriate to an acute care facility, or whether that care could have been provided in a less costly setting such as an outpatient facility. The data requirements for the AEP are considerably simpler and more flexible than those for DRG analysis, which accounts for the AEP's rapidly-increasing use in the US and its introduction in countries with developing health systems (e.g., Portugal) (10).

First, a physician knowledgable about local medical conditions, standards of care, and institutional facilities

reviews the AEP criteria to assure their appropriateness for a given setting. Then a sample of medical records is selected, and reviewed against the criteria by a trained reviewer, usually a graduate-trained nurse. The reviewer addresses two questions. (a) was the admission to an acute-care setting appropriate at the time, in view of the patient's condition and the intensivity of service required? And (b) for one selected day of care, is there evidence that the patient required an acute-care setting, either because of the medical and nursing services required or because of clinical conditions?

To test the applicability of the AEP analysis as an approach to utilization review in St. Lucia, the study team selected Maternity as a high-volume inpatient service area with relatively straightforward criteria (the final diagnosis, for example, is generally clear even in the absence of notations on patients' charts). Next, the criteria were reviewed with Dr. MacDonald Chase, Consultant Obstetrician/Gynaecologist at VH and a member of the study's Working Group. In addition to changes in nomenclature and criteria based on services not used in St. Lucia, Dr. Chase recommended changes in the criteria for blood pressure levels and in the length of time required between admission and obstetrical surgery (the latter in view of the time required for laboratory tests and to otherwise prepare the patient for surgery).

A random sample of 2 percent of the records of uncomplicated cases and 7 percent of the records of complicated cases was drawn by Medical Records, and patients' names were deleted to protect confidentiality. These sample sets were then reviewed by the Senior AEP Reviewer at Boston University. The complete report of her review is presented in Appendix C.

In summary, 7 cases (14 percent) of all obstetrical admissions reviewed were found to be inappropriate, based on the objective criteria. However, the rates of inappropriate admission were quite different for uncomplicated and complicated cases. Only 8 percent of uncomplicated cases were deemed inappropriate; for comparison, the rate of inappropriate adult medical and surgical admissions at US hospitals participating in an on-going Boston-based study was 10.3 percent. In St. Lucia, there was a much higher rate of inappropriate admission (5 cases out of 25, or 20 percent) among complicated cases. Two of these cases were considered "premature admissions" (primarily for bed rest, without any evidence of special monitoring or question of preeclampsia). The remaining three were deemed inappropriate because the treatment given could have been rendered on an

outpatient basis.

In the day of care analysis, 20 percent of all cases reviewed were found to be inappropriate. Again, the rate of inappropriateness was much lower among uncomplicated cases (only 4 percent). Among complicated cases, 33 percent did not need to be in hospital on the day reviewed, according to the objective criteria. The comparison rate of inappropriate day of care in US hospitals is 13.8 percent. In the St. Lucia analysis, there were two primary reasons for the determination of inappropriateness: either no further care at any level was needed, or the plan of treatment was not documented in the chart.

This last point has important implications for both the interpretation of the AEP findings and for the potential for utilization review in St. Lucia. First, the levels of inappropriateness found may well be, in part, the result of poor notation. For example, patients admitted for bed rest may, in fact, have received special monitoring that could have been done only in hospital, but since such services were not recorded and the objective criteria not met, the cases were determined inappropriate. Similarly, patients found to be in hospital on a particular day of care, without any recorded evidence of treatment given, automatically fell into the "inappropriate" category.

Without better documentation of the reasons for inappropriateness (i.e., until poor notation is eliminated as a major reason for the designation "inappropriate"), it will be difficult to link AEP findings realistically to their cost implications. Under ideal conditions, AEP findings can help health authorities identify where cost-related problems exist and how they can be remedied. Typically such problems fall into one of three areas: they may be health system problems (e.g., lack of nursing home beds), which require action at the Ministry level; they may be problems with the patient and family, which could be addressed by lower-cost services such as home care or social work; or they may be problems under the control of the hospital and physicians (such as the slow return of lab tests). The latter category has been found to account for 50 to 80 of inappropriateness in the US.

When more specific data on causes of inappropriateness become available, the costs of inappropriateness can be quantified. If the indicated changes are then made, the hospital and health system can save the value of those costs.

At present, it is probably premature for St. Lucia to

embark on a full-scale utilization review program. However, it is not too soon to begin introducing the changes in medical record-keeping that would be necessary to facilitate such reviews. Nor is it too soon to introduce the concept of peer review, which is fundamental to both utilization review and quality assurance in health care.

E. Potential for Revenue Collection and Generation at VH

It has long been recognized by St. Lucian officials that the revenue collection system at Victoria Hospital is in need of streamlining and strengthening. As the country's largest inpatient facility and a significant provider of outpatient services as well, VH is potentially in a position to generate substantial revenues. The study team sought to document the current revenue collection system at VH, and to assess the potential for greater revenue generation.

1. Current Revenue Collection System. Revenue collection at VH is physically centered in the administration building. Patients presenting themselves to Casualty (the outpatient department) for visits to casualty officers or consultant physicians' clinics retrieve their clinic cards there, and must walk upstairs to the cashier's booth to be "assessed" as to whether they are (1) exempt from payment of medical fees by virtue of the national legislation exempting certain categories of the population ("non-payable"); (2) exempt from direct payment by virtue of being covered by the National Insurance Scheme ("payable-NIS"); or (3) required to pay fees ("payable").

This determination is made on the basis of socioeconomic data (occupation, student status, record of NIS coverage) written on each patient's "clinic card." Notation to the effect that assessment has been done is made, by the cashier, on sheets entitled "Record of Operations." Theoretically, each patient, before receiving services in the Casualty area, should give to the Casualty area nursing staff his or her clinic card, stamped with the date of the current visit to verify that assessment has been done.

In practice, there appear to be several problems with this system. First, many patients apparently do not present themselves to the cashier for assessment before receiving services. Out of a sample of 50 clinic cards examined by the study team, only one was stamped to reflect that an assessment had been done. This finding was corroborated by a sample study of clinic visits and assessments made in October, 1987. The total number of visits to consultant physicians was ascertained from appointment sheets in

Medical Records and appointment log books in the clinics themselves. Next, these were compared with completed "Record of Operations" sheets for the month, retained in the Revenue Collections Department. The results of this study are shown in Table 20 and summarized in Figure 14. Of 1085 patients, only 14 percent were recorded as having presented themselves for assessment. Of these, 8 percent were determined to be "non-payable," 4 percent "payable," and 1 percent "payable-NIS." In other words, out of all patients assessed, 59 percent were exempt from payment of fees, 31 percent were required to pay, and 11 percent were covered by NIS (Figure 15). While revenues from consultant visits alone should have been EC $1125.00 for the month studied, revenues from both consultant and casualty officer visit fees were only EC $882.50.

An additional problem is that there is no system for verifying that those who should have paid have actually done so; assessment data are recorded on "Record of Operations" sheets, while receipts are recorded separately in the Cash Book. Similarly, there is no effective system for identifying all patients who have private health insurance coverage, or for assuring that health insurance carriers are properly billed for services at cost. Finally, despite the reported existence at NIS of an excellent manual system for identifying who is covered by the scheme, these records are neither available at nor used by VH.

Several factors contribute to the low proportion of patients assessed. First is the sheer effort required of patients: one must collect one's clinic card at Casualty, walk upstairs, queue for the cashier, and return to the Casualty area before receiving services. Second, there is little evidence to suggest that patients are denied services until and unless they present evidence that an assessment has been conducted. Nursing and medical personnel, in St. Lucia as elsewhere, typically view policing the collection of revenues as being in conflict with their roles as providers of direct health services, so they apparently do not routinely insist that patients be assessed before they are given care. Third, the cashier's booth is open only during regular working hours, Monday through Friday. While these hours of operation should enable the hospital to assess most patients coming for visits to consultant physicians, those seeing Casualty officers during evenings and weekends cannot be assessed under the existing organization of revenue collection.

Revenue collection for inpatient services suffers similar problems. Patients who are admitted to hospital during regular working hours are supposed to obtain an

"operation paper" from the admitting physician. The patient then presents this at a window in Medical Records, where he or she receives a "bed ticket." This, in turn, is presented to the cashier, who assesses payability.

Here again, it is reported that patients frequently proceed directly to the wards, where they may be admitted without having completed the required assessment. This is most certainly the case during nights and weekends, when there are no staff on duty to issue bed tickets or to conduct the assessment and make collections. Revenue collection staff report they do not have the time to go to the wards to find and assess patients who may have bypassed regular admission procedures. There is a simple way in which these patients could be identified, however. Nursing staff regularly prepare a "midnight census" of all patients, which is presented to Medical Records each morning. This census is not presently transmitted to Revenue Collections, but if it were, patients admitted after hours could be identified, and their status vis-a-vis the assessment procedure could be ascertained.

2. Revenue-Generating Potential of VH. The revenue collection potential of Victoria Hospital is fundamentally affected by two key factors: the numbers of people who are exempt from having to pay fees in accordance with the Hospital (Amendment) Regulations No. 56 of 1985, and the efficiency of the revenue collection system at the hospital itself. In view of plans for a new National Hospital and the likelihood that St. Lucia will wish to adopt policies and procedures to enhance revenues from user fees, the study team analysed the separate effects of these two factors on potential revenue generation in three major revenue categories: hospital fees, confinement fees, and medical fees. The results are shown in Table 21.

If all patients who actually received services at VH in fiscal year 1986/87 had paid in full at existing fee levels (and utilization remained unchanged), the total revenues from these three categories would have been EC $3,817,001 (see also Appendix D). If, as the Ministry of Health has estimated, 92.7 percent of the population is exempt from paying fees (and assuming patients at VH represent a cross-section of the total population), EC $3,538,360 of this amount of revenue was foregone as a consequence of exisiting exemption legislation. This means that only $278,641 in revenue from these three categories was potentially collectible by VH during this period. Table 21 shows that the actual amount collected for the period was EC $203,747. Thus, EC $74,894 that could have been collected was not.

In summary, while there is significant room for improvement in revenue collection at the hospital, major changes in revenue generation will not occur without changes in the exemption legislation. The calculation that 92.7 percent of the population is exempt from payment may be disputed, but it is probably not far off the mark: even without reliable data on the numbers of people with incomes below EC $2400, registered paupers, and children of all people with incomes below $2400, the study team was able to confirm that at least 77 percent the population is currently exempt from paying fees.

F. Toward Improved Cost Management at VH

We noted earlier that many different ministries and agencies share responsibility for the costs of Victoria Hospital. The Public Service Union and the Cabinet-appointed negotiating team -- the entities that together determine wage and benefits packages (including vacations and leave) -- have effective control over the nearly 70 percent of total direct and indirect costs (without depreciation/ annuitization) attributable to personnel. Responsibility for supplies (16.7 percent of total direct and indirect costs) and for pharmaceutical expenses (another 8 percent of total direct and indirect costs) is shared between Central Medical Stores (CMS) of the MOH (where procurement practices and related prices of pharmaceuticals and supplies have an effect) and the hospital (where the organization of the Supplies Department and clinical staff decisions have cost effects).

If one assumes this responsibility to be fairly evenly divided between CMS and VH, then, adding the hospital's one-half share of control over pharmaceuticals expenses to the other major areas in which it has latitude to manage and control costs (supplies, office expenses, utilities, operating and maintenance expenses, equipment, and certain other expense items), the hospital has effective control over about 20 percent of its costs. In addition, its decisions about utilization and productivity may affect costs in other areas.

There are a number of practical measures Victoria Hospital can take to improve management of the costs under its control. Some are short-to-medium term efforts. These include:

1) Develop and implement an inventory system for supplies and pharmaceuticals. This effort would be greatly assisted by construction of a temporary central storage

facility. At present, supplies and pharmaceuticals are stored in at least ten different locations around the hospital, making an inventory exceedingly difficult. Eventually, VH will want to introduce a computerized system. A manual system may suffice for the time being, but it should be developed with an eye toward eventual computerization to minimize difficulties in transition.

2) Develop and introduce requisitions for supplies and pharmaceuticals. A standardized requisition system will not only facilitate better inventory control, it will also help to prevent stockouts that result in costly purchase of items on the retail market.

3) Strengthen financial management data collection and reporting in the accounts area (including revenue collection). Existing flows of data need to be thoroughly documented and then revised into a comprehensive system that will provide more complete and timely reporting. Revisions to the financial data system should be carried out hand in hand with a careful review of patient flow, admission, and discharge procedures, and all these systems should be linked to one another, as well as to selected data from medical records.

4) Explore the advantages and disadvantages of contracting-out for selected services, such as laundry and food service. The cost analysis provide some basis against which to assess these options.

5) Gradually introduce departmental management at the ward level. With the introduction of a requisition system (see above), this process may be started by providing feedback on the use of supplies and pharmaceuticals to ward sisters and medical staff, whose decisions affect costs in these areas. Such a system can also provide data on personnel mix and labor productivity.

Some of these measures can be undertaken by the MOH and VH without further ado. Those involving systems development may require the time and expertise of specialized technical cooperation. In the context of securing financing for the new national hospital, the MOH may wish to explore with donor and lending agencies the potential for including systems development as a capital expense item -- a cost of "structural adjustment" (to use the World Bank's term) needed to optimize revenues from and resource allocation within the new hospital.

It should be expected that implementation of the above-mentioned measures will result in net reductions of unit

costs, although opportunities for outright expenditure reduction are limited. There are strong possibilities for doing more with the resources that exist -- for getting greater value for money -- through improved allocation.

Over the longer term, even if improved revenue collection systems were to be introduced at VH, these alone would not be sufficient to ensure that collection would occur, for there are problems of incentives at the individual, institutional, and ministerial levels. It may be argued that individuals should not require incentives for simply "doing their job". On the other hand, it should be noted that it is not typically part of a nurse's job to ensure that patients have paid their fees. At the insitutional and ministerial levels, incentives to pursue revenue collection vigorously may be dampened if all collections continue to revert to the Consolidated Fund. A number of governments, including Jamaica, are beginning to address this problem by allowing the MOH and hospitals to retain a proportion of revenues collected. In St. Lucia, the Ministry of Health may wish to explore such incentives with the Ministry of Finance.

In the long term, it will be difficult to achieve effective control over the largest components of cost without enabling more autonomous management of Victoria through the establishment of an independent hospital board. The necessary degree of independence would have to include control over wages and benefits.

A national hospital such as Victoria will never be entirely free-standing; the nature of health services in St. Lucia and government's commitment to their accessibility mean that some subvention will continue to be required. However, establishment of Victoria Hospital as a quasi-public entity can go a long way toward enabling the facility to better manage and control its costs, thereby freeing resources for reallocation to better serve the health needs of all St. Lucians.

FOOTNOTES

1. This study focuses on fully-accounted-for financial costs, including direct and indirect recurrent operating costs as well as capital costs of land, buildings, and equipment. A broader concept -- economic costs -- would also include so-called opportunity costs (e.g., foreign exchange, income foregone by patients, their travel costs, etc.).

2. See Appendix A for detailed information on the study design and its implementation.

3. The Estimates of St. Lucia, published annually, contain the government's actual income and expenditures and planned budgets.

4. But see also MOH 1984:3, in which the population growth rate is estimated to have remained at about 1.5 percent per year since 1945. In general, demographic and health statistics vary, sometimes rather widely, among St. Lucian, USAID, World Bank, and PAHO sources. In instances in which sources disagree, the most recent figures have been used.

5. This section is based on the latest available figures provided by the St. Lucian Ministry of Health.

6. Recent insistence on the part of the Ministry of Health that final diagnoses be entered on all death records will, in the opinion of the Medical Officer of Health, drastically reduce the number of deaths attributable to "signs, symptoms and ill-defined conditions" in the near future.

7. In US terms, consultants and junior officers are equivalent to attending physicians and house staff, respectively.

8. There is a considerable difference between the number of people actively contributing to NIS (and thus currently entitled to NIS benefits) and the number who are registered with NIS -- an estimated 70,000, according to the NIS director.

9. Those exempt are: persons with annual incomes below EC $2400; registered paupers; children of the first two groups; persons over 60 years of age; women with incomes of less than EC $2400 admitted to Maternity; members of the fire, police, and nursing services; persons covered by NIS; and children below the age of 16 who are full-time students.

10. For a fuller discussion of the AEP methodology, see Payne 1987.

TABLE 1

ST. LUCIA: DEMOGRAPHIC TRENDS, 1970-85 (a)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Estimated mid-year population (1000s)	101.3	103.4	105.5	107.6	109.8	112.0	114.3	116.6	118.9	121.3	123.8	126.3	128.8	131.4	134.1	136.9
Population density per square mile (b)	471	481	491	501	511	521	531	542	553	564	576	575	584	616	631	656
% of pop. > 15 yrs.	49.6	49.0	48.6	48.1	47.6	47.1	46.6	46.0	45.5	44.7	44.4	44.4	44.4	44.4	43.6	43.5
Number of live births	3,958	4,083	4,151	4,286	3,909	4 125	4,095	4,116	4,140	3,789	3,889	3,860	4,045	3,936	4,130	4,297
Number of deaths	825	802	950	840	829	958	883	816	790	850	864	843	845	795	736	816
General fertility rate	214	214	212	212	188	193	186	182	178	156	157	153	157	150	154	152
Crude birth rate	39.1	39.3	39.2	37.5	35.6	35.0	35.8	35.3	34.8	30.8	30.6	30.6	31.4	31.0	31.0	30.6
Crude death rate	8.1	7.7	8.9	7.8	7.5	7.3	7.7	7.0	6.6	7.0	7.0	6.7	6.6	6.0	5.5	6.0
Rate of natural increase (%)	3.1	3.2	3.0	3.2	2.8	2.9	2.8	2.8	2.8	2.4	2.4	2.4	2.5	2.4	2.5	2.5
Net emigration	n/a	n/a	n/a	n/a	n/a	n/a	839	1006	896	483	499	520	681	689	638	496
Net population increase	n/a	n/a	n/a	n/a	n/a	n/a	2,198	2,305	2,352	2,399	2,447	2,497	2,547	2,598	2,651	2,705
Annual % growth rate	n/a	n/a	n/a	n/a	n/a	n/a	1.6	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

Sources: Annual Statistical Digests, 1975-1985; MOH 1984; Computerized files of the Ministry of Health; World Bank 1986.

Notes:

(a) Crude birth and death rates are per 1000 midyear population. General fertility rate is per 1000 females aged 15-44. Infant mortality rate is per 1000 live births.

(b) Based on the actual size of the island (238 sq. mi.) minus the area of the uninhabited Forest Preserve (25.6 sq. mi.)

TABLE 2

REGIONAL COMPARISON OF HEALTH STATUS INDICATORS

	Crude Birth Rate (a)		Crude Death Rate (a)		Life Expectancy (b)		Infant Mort. Rate (c)		Maternal Death Rate (d)	
Country	Year	Rate	Year	Rate	Year	Age	Year	Rate	Year	Rate
Antigua	83	15.0	83	5.2	83	70.0	83	11.0	n/a	n/a
Barbados	84	16.7	84	7.8	83	71.6	83	24.5	n/a	n/a
Belize	83	38.7	84	5.0	80-85	66.1	84	22.7	83	5.0
Costa Rica	83	30.0	83	3.9	80-85	73.0	83	18.6	82	12.6
Cuba	85	18.0	85	6.4	80-85	73.4	84	15.0	n/a	n/a
Dominica	n/a	n/a	n/a	n/a	83	70.9	83	13.9	n/a	n/a
El Salvador	83	30.5	83	6.9	80-85	64.8	83	43.8	83	7.4
Granada	n/a	n/a	n/a	n/a	82	65.5	80	21.0	n/a	n/a
Guatemala	83	38.4	83	10.1	80-85	59.0	83	81.1	83	12.3
Guyana	81	29.0	81	6.6	84	68.2	84	40.5	n/a	n/a
Haiti	80-85	41.3	80-85	14.2	78	52.7	82	124.0	n/a	n/a
Honduras	83	38.7	83	4.7	80-85	58.5	83	70.0	83	5.0
Jamaica	84	23.4	84	5.4	82	70.3	82	26.5	n/a	n/a
Mexico	83	32.7	82	5.6	80-85	65.7	83	33.0	83	9.1
St. Kitts	84	24.2	84	10.5	83	65.0	83	41.2	n/a	n/a
St. Lucia	85	30.6	85	6.0	85	70.0	85	23.6	84	0.0
St. Vincent	83	32.3	83	7.6	80	68.5	83	32.5	n/a	n/a
Trinidad	81	28.9	81	6.6	80-85	70.1	80-85	29.9	n/a	n/a

Sources: Raymond et al. 1987, Table I.1.
Parra 1987.
MOH 1984: 9.
GOSL: Annual Statistical Digest, 1986.

Notes:
(a) Birth and death rates are per 1000 population.
(b) Life expectancy is at birth.
(c) Infant mortality rate is per 1000 live births.
(d) Maternal death rate is per 10,000 live births, except for St. Lucia's, which is per 1000 live births.

TABLE 3

ST. LUCIA: HEALTH SERVICES COVERAGE, 1980-1985

	1980	1981	1982	1983	1984	1985
% children >1 imm. vs. DPT	63.5	68.0	77.0	86.0	80.0	88.0
% children >1 imm. vs. Polio	65.9	70.1	78.0	88.0	81.0	82.0
% children >1 imm. vs. Measles (a)	5.0	3.7	42.0	44.0	60.0	64.0
% children >1 imm. vs. TB	25.6	76.6	56.0	76.0	74.0	86.0
% preg. fems. rec. prenatal care at govt. facilities (b)	58.0	74.0	75.0	72.0	71.0	n/a
% childbirths attended by trained personnel (c)	n/a	98.9	99.4	93.0	94.6	n/a
% women rec. puerperal care at govt. facilities (d)	36.0	56.0	55.0	63.0	51.0	n/a
% children >1 rec. professional care at govt. facilities (e)	72.0	86.0	86.0	83.0	76.0	n/a
Pop. w/in 1 hr. walk h. care (f)	88.0	91.0	94.0	97.0	100.0	n/a
No. of hosp. beds	554	526	523	522	522	526
No. of hospital beds/1000 pop.	4.47	4.16	4.06	3.97	3.89	3.84
No. of hospital admissions	11,021	11,949	13,815	12,396	13,753	13,104
No. of hosp. admissions/1000 pop.	92	98	111	94	103	96
No. of doctors	32	48	50	51	58	43
No. of persons/doctor	3,759	2,546	2,480	2,478	2,311	2,853

Sources: MOH: Annual Reports of the Health Division, 1980-1984.
MOF 1986.
GOSL: Annual Statistical Digests, 1978/79 through 1985.
MOH 1985.

Notes:

(a) Measles immunization in St. Lucia was begun in August, 1980. An immunization campaign is responsible for the leap in the 1982 figure to 42%.
(b) The declining figures in 1983 and 1984 reflect increasing utilization of private care.
(c) The decline in the 1983 and 1984 figures reflects the fact that in these years more births fell into the "not accounted for" category.
(d) The low 1980 figure is due to underreporting, the result of hurricane damage to medical records. The declining 1984 percentage reflects increased use of private pediatricians.
(e) The 1984 decrease reflects increased use of private pediatricians.
(f) The steadily increasing percentages reflect the increasing number of health centers.

TABLE 4

LEADING CAUSES OF DEATH IN ST. LUCIA, 1976-1986: NUMBER OF DEATHS BY CAUSES/GROUPS OF CAUSES (a)

Disease or disease group	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986(c)
All diseases of the circulatory system	n/a	n/a	n/a	n/a	n/a	251	280	261	260	283	284
Cerebrovasc. disease	108	83	114	92	65	79	64	86	92	81	71
Heart diseases	85	137	114	143	95	119	146	125	124	150	155
Hypertensive disease	17	17	13	32	61	39	57	43	34	38	53
Signs, symptoms and ill-defined conditions (b)	109	125	113	139	192	152	117	81	76	104	118
All Neoplasms	n/a	n/a	n/a	n/a	n/a	71	90	100	103	109	91
Malignant neoplasms	57	61	39	80	91	71	87	97	99	105	86
All diseases of the respiratory system	n/a	n/a	n/a	n/a	n/a	68	61	54	47	45	78
Bronchitis, emphysema, asthma.	26	28	15	9	15	10	13	16	8	10	14
Pneumonia and influenza	67	46	63	60	38	47	40	33	27	18	37
All external causes	33	42	33	48	41	43	37	48	53	57	55
Mtr. venicle and traf. accids.	n/a	n/a	n/a	n/a	n/a	17	10	11	22	23	30
Congenital anomalies	n/a	n/a	n/a	n/a	n/a	9	15	12	9	17	7
Certain perinatal conditions	48	36	44	30	57	52	55	62	47	55	47
All diseases of the digestive system	n/a	n/a	n/a	n/a	n/a	40	37	36	19	27	43
Chronic liver disease and cirrhosis	n/a	n/a	n/a	n/a	n/a	18	26	20	7	14	20
All infective and parasitic diseases	n/a	n/a	n/a	n/a	n/a	44	42	30	26	41	34
Tuberculosis	14	12	17	9	16	16	14	7	3	5	5
Intestinal infect. diseases	27	18	34	22	13	12	12	7	9	19	12
Syphilis	2	3	1	1	1	1	1	1	0	0	0
AIDS	0	0	0	0	0	0	0	0	0	2	1
All diseases of the nervous system and sense organs	n/a	n/a	n/a	n/a	n/a	21	21	18	9	14	22
All endocrine, nutritional and metabolic diseases and immunity diseases	n/a	n/a	n/a	n/a	n/a	45	51	53	36	28	32
Diabetes Mellitus	13	21	16	26	29	36	36	40	28	22	20
Nutritional deficiencies	11	7	5	14	6	5	12	10	2	3	5
All diseases of the genitourinary system	n/a	n/a	n/a	n/a	n/a	21	14	13	23	24	18
Kidney diseases	10	4	4	13	12	14	10	10	16	19	16
ALL CAUSES	n/a	n/a	n/a	n/a	n/a	843	845	795	736	824	843

Sources: GOSL: Annual Statistical Digests, 1975-1986.

Notes:

(a) St. Lucia did not begin to record causes of death by groups of causes, or to assign ICD codes, until 1981. For years prior to 1981, data broken down by groups of causes are unavailable. All figures are the most recent available.

(b) According to Dr. James St. Catherine, Medical Officer of Health, the Ministry of Health has recently begun insisting on final diagnoses. This new policy will reduce the "ill-defined signs and symptoms" category to nil over the next few years.

(c) 1986 figures are provisional.

TABLE 5

ST. LUCIA: RANK ORDER OF LEADING CAUSES OF DEATH, SELECTED YEARS 1976-1986 (a)

Disease	1976	1978	1980	1982	1984	1986(b)
Heart disease (c)	3	1 *		1	1	1
Signs, symptoms and ill-defined conditions	1	3	1	2	4	2
Malignant neoplasms	5	6	3	3	2	3
Cerebrovascular disease	2	1 *		4	3	4
Accidents and violence	7	8	7	8	5	5
Hypertensive disease	9		5	5	7	6
Perinatal conditions	6	5	6	6	6	7
Pneumonia and influenza	4	4	8	7	9	8
Diseases of the nervous system and sense organs	n/a	n/a	n/a		10 *	9
Liver diseases	n/a	n/a	n/a	10		10 *
Intestinal infect. diseases	8	7			10 *	
Diabetes Mellitus		10	9	9	8	10 *
Kidney diseases					9	
Tuberculosis	10	9	10			

Source: Table 4: "Leading Causes of Death in St. Lucia, 1976-1986"

Notes:
(a) An empty cell indicates that a disease did not place among the ten leading causes of death in a given year.
(b) 1986 figures are provisional.

TABLE 6

ST. LUCIA: LEADING COMMUNICABLE DISEASES, 1973-1986

Disease	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Gastroenteritis	661	470	1,234	777		1,835	1,775	715	705	811	415	1,895	1,555	843
Gonorrhoea	359	696	559	320	221	627	312	325	322	297	663	653	405	429
Influenza	559	666	95	1,548	885	623	901	2,531	2,411	1,193	3,157	697	1,016	243
Syphilis	340	825	276	339	400	440	266	230	351	359	415	582	258	189
Dengue Fever			0	0	0	117	26	6	23	31	0	0	0	164
Pneumonia (under 5 yrs.)							218	157	139	105	137	105	112	85
Dysentery	3	2	11	32	17	116	175	153	103	19	40	100	49	71
Typhoid Fever	36	25	22	16	51	10	4	7	14	10	5	18	8	66
Chicken pox	74	96	268	97	0	138	83	34	69	38	57	78	59	39
Tuberculosis	72	61	54	33	37	50	42	41	39	37	48	55	21	34
Measles	960	382	202	7	1,084	134	9	35	134	2,037	71	13	9	32
Ophthalmia Neonatorum					0	69	48	51	55	12	18	23	33	32
Leprosy	5			0	11	118	5	4	29	16	24	26	15	31
Mumps	5	216	215	197		784	53	20	17	33	688	388	21	30
Infectious Hepatitis					0	45	40	24	41	7	15	15	8	26
Malnutrition (under 5 yrs.)					60	119	96	175	48	43	41	69	35	8
Schistosomiasis	362	436	380	232	249	159	24	39	32	27	18	59	4	10

Source: Ministry of Health: computer file containing weekly reports of communicable diseases

TABLE 7

ST. LUCIA HOSPITALS: COMPARATIVE STATISTICS 1984

	Acute General		District		Mental	Total
	Victoria	St.Judes	Soufriere	Dennery	Golden Hope	
No. of Beds	211	107 (a)	20 (b)	22 (c)	162	522
No. of Admissions	8,164	3,983	857	344	405	13,753
Admissions per 1000 population	61	30	614	2.6	3	103
Patient Days	60,088	23,066	3,906	1,370	--	--
Average Length of Stay	7.4	5.6	4.6	4.0	--	--
Percent Occupancy	78	59	54	17	--	--

Source: MOF 1985: 218.

Notes:

(a) A January 1988 PAHO-sponsored atudy on feasibility of the new National Hospital reported 114 beds.

(b) During a site visit to Soufriere Hospital in October 1987, the study team found 29 beds and 3 cots. The inpatient census that day was 10 patients (3% occupancy).

(c) At Dennery Hospital, during the same site visit, there were 20 beds, of which 2 were occupied (10% occupancy).

TABLE 8

ST. LUCIA: KEY HEALTH FINANCING INDICATORS (IN EC DOLLARS) (a)

	Actual 1979/80	Actual 1980/81	Actual 1981/82	Actual 1982/83	Actual 1983/84	Actual 1984/85	Actual 1985/86	Revised est. 1986/87	Estimates 1987/88
1. GDP at factor cost	$229,100,000	$264,200,000	$299,400,000	$312,500,000	$323,400,000	$353,000,000	$388,800,000	$426,600,000	n.a.
2. Total Government revenue	$73,571,757	$86,645,404	$92,952,172	$103,058,306	$116,525,966	$124,865,094	$164,707,315	$166,594,883	$190,655,142
3. Total Government expenditure	$55,395,296	$84,963,968	$96,897,839	$112,208,461	$116,525,966	$124,856,094	$154,388,196	$164,424,518	$185,652,695
4. Total MOH expenditure	$7,083,373	$11,642,878	$15,076,666	$16,912,274	$16,733,140	$18,130,556	$19,795,712	$19,850,482	$21,430,716
5. MOH expenditure as % of GDP	3.1	4.4	5.0	5.4	5.2	5.1	5.1	4.7	
6. MOH expenditure as % of total Gov't expenditure	12.8	13.7	15.6	15.1	14.4	14.5	12.8	12.1	11.5
7. Estimated mid-year population	121,325	123,773	126,270	128,817	131,415	134,066	136,952	139,529	142,528
8. Per capita MOH expenditure	$58.38	$94.07	$119.40	$131.29	$127.33	$135.24	$144.54	$142.27	$150.36
9. Retail price index (services)	339.3	398.1	436.9	439.3	441.4	493.4	491.9	503.6	
10. GDP at factor cost, constant prices	$183,500,000	$182,100,000	$184,300,000	$189,900,000	$197,600,000	$207,500,000	$219,900,000	$232,700,000	n.a.
11. GDP growth rate (in constant prices)		-0.76	1.21	3.04	4.05	5.01	5.98	5.82	
12. MOH expenditure at constant prices	$2,087,643	$2,924,611	$3,450,828	$3,849,823	$3,790,924	$3,674,616	$4,024,337	$3,941,716	
13. Per capita MOH expenditure at constant prices	$17.21	$23.63	$27.33	$29.89	$28.85	$27.41	$29.39	$28.25	

Sources:

1 and 10: GOSL: Annual Statistical Digest 1986: 55, 56. n.b.: April 1964=100; 1985 and '86 index numbers adjusted to 1964 base.

2 - 4: Estimates of St. Lucia, various years; recurrent expenditures only.

5, 6, 8 and 11 - 13: Author's calculation.

7: Through 1985: World Bank 1986, Table 1-1, p.35; 1986-87: MOF 1986: 348.

9: MOF 1986: 288.

Note:

(a) Figures in current prices unless otherwise indicated.

TABLE 9

ST. LUCIA: CENTRAL GOVERNMENT CAPITAL EXPENDITURES
TOTAL AND MINISTRY OF HEALTH BY MAJOR CATEGORY

	Approved Estimates 1985/86	% Dist of MOH Expends	Approved Estimates 1986/87	% Dist of MOH Expends	Approved Estimates 1987/88	% Dist of MOH Expends
1. Total Gov't expenditure	$78,335,738		$87,700,725		$98,306,864	
2. Total MOH expenditure	$7,316,340	100%	$7,480,348	100%	$12,121,027	100%
General Administration	$381,020	5.2%	$150,000	2.0%	$150,000	1.2%
Medical Care	$360,020	4.9%	$100,000	1.3%	$334,640	2.8%
Dental Services	$60,000	0.8%	$0	0.0%	$28,500	0.2%
Victoria Hospital	$210,260	2.9%	$267,900	3.6%	$681,056	5.6%
Soufriere Hospital	$40,000	0.5%	$0	0.0%	$70,000	0.6%
Dennery Hospital	$35,000	0.5%	$0	0.0%	$15,000	0.1%
Golden Hope	$20,020	0.3%	$603,000	8.1%	$383,577	3.2%
Kellogg Foundation	$710,000	9.7%	$710,000	9.5%	$124,054	1.0%
Sanitation and Inspection	$0	0.0%	$0	0.0%	$54,000	0.4%
Public Rels. & Info.	$0	0.0%	$0	0.0%	$54,000	0.4%
Water & Sewage Authority	$5,500,202	75.2%	$5,649,448	75.5%	$10,274,200	84.8%
3. MOH as % of total expenditure	9%		9%		12%	
4. Victoria Hospital as % of MOH capital expenditure	3%		4%		6%	

Source: Estimates of St. Lucia.

TABLE 10

ST. LUCIA: TRENDS IN MINISTRY OF HEALTH RECURRENT EXPENDITURES
BY MAJOR CATEGORIES

Category	Actual 1980/81	Actual 1981/82	Actual 1982/83	Actual 1983/84	Actual 1984/85	Actual 1985/86	Revised Ests 1986/87	Estimates 1987/88
Total MOH Expend (A+B+C+D)	$11,642,878	$15,076,666	$16,912,274	$16,733,140	$18,130,556	$19,795,712	$19,850,482	$21,430,716
General Administration (A)	$1,842,728	$2,549,498	$2,409,404	$2,409,282	$2,387,554	$2,717,178	$3,101,528	$2,940,890
Health & Medical Care (B)	$9,800,150	$12,527,168	$14,502,870	$14,323,858	$15,743,002	$16,780,267	$16,389,993	$17,811,882
Victoria Hospital	n.a.	$4,429,193	$5,022,825	$4,888,786	$5,706,075	$6,051,126	$6,451,130	$6,756,048
Labour (C)	$0	$0	$0	$0	$0	$298,267	$358,961	$403,102
Public Rels & Info. (D)	$0	$0	$0	$0	$0	$0	$0	$274,842
Gen Admin as % Total Expend	16%	17%	14%	14%	13%	14%	16%	14%
Health & Med Care as % Total Expenditure	84%	83%	86%	86%	87%	85%	83%	83%
Victoria Hospital as % Total Expenditure		29%	30%	29%	31%	31%	32%	32%
Victoria Hospital as % Health & Med Care		35%	35%	34%	36%	36%	39%	38%

Sources: Estimates of St. Lucia, various years; author's calculations.

TABLE 11

ST. LUCIA MINISTRY OF HEALTH REVENUE

	Actual 1983/84	Actual 1984/85	Actual 1985/86	Rev Ests 1986/87	Estimates 1987/88
Hospital Fees	$74,700	$106,874	$194,441	$176,432	$300,000
Reimburse Nurses Board	$14,723	$14,675	$15,018	$17,815	$17,900
Sale of Drugs	$12,387	$13,417	$32,177	$37,337	$50,000
Confinement Fees	$1,440	$1,430	$6,435	$7,450	$60,000
Sludge Disposal	$19,422	$34,910	$6,480	$4,200	$16,800
Sale Precast Supplies	$36,418	$6,540	0	0	0
Inspections	$0	$275	$2,922	$8,620	$9,500
Licenses	$20	$1,554	$11,229	$12,300	$15,000
Reg Food Handlers	$307,391	$884	$0	$0	$5,000
Other Receipts	$70	$5,043	$19,161	$20,693	$22,500
Contrib by Medical Board	$30,055	$1,000,586	$750,147	$1,000,000	$1,500,000
Opthalmology	$0	$9,616	$14,112	$17,161	$20,000
Fees Medical School	$9,260	$700	$196,500	$191,548	$196,500
Medical Fees	$18,785	$10,569	$20,730	$23,650	$30,000
Work Permits	$0	$0	$329,050	$337,274	$360,000
Total, All Sources	$524,671	$1,207,075	$1,598,402	$1,854,480	$2,603,200
Total, Health-related Sources *	$524,671	$1,207,075	$1,269,352	$1,517,206	$2,243,200
Ministry Revenues from Health Sources as % of Revenues from All Sources	100%	100%	79%	82%	86%
Hospital Fees as % of Total Health-related Sources	14%	9%	15%	12%	13%

* Excludes work permits issued by Labour Department of the Ministry.

Sources: Estimates of St. Lucia, various years (Recurrent Revenue Estimates, Division 0308, Ministry of Health).

TABLE 12

PERCENTAGE CHANGE IN RECURRENT EXPENDITURES FOR MEDICAL CARE DIVISION AND VICTORIA HOSPITAL, AND PERCENTAGE CHANGE IN RETAIL PRICE INDEX

	1982/83	1983/84	1984/85	1985/86	1986/87
% Change in Health and Medical Care Expenditures	15.8%	-1.2%	9.9%	6.6%	-2.3%
% Change in Victoria Hospital Expenditures	13.4%	-2.7%	16.7%	6.0%	6.6%
% Change in Retail Price Index (Services)	0.5%	0.5%	11.8%	-0.2%	n.a.

Sources:
Expenditures: Table 10
Retail Price Index: Table 8

TABLE 13

ST. LUCIA MINISTRY OF HEALTH: SUMMARY OF
HEALTH-RELATED RECURRENT EXPENDITURES AND REVENUES

	Actual 1983/84	Actual 1984/85	Actual 1985/86	Rev Ests 1986/87	Estimates 1987/88
(A) Expenditures for Health & Medical Care	$14,323,858	$15,743,002	$16,780,267	$16,389,993	$17,811,882
(B) Total Revenues from Health-related Sources	$524,671	$1,207,075	$1,269,352	$1,517,206	$2,243,200
(C) Total Revenues as % of Health Expenditures	4%	8%	8%	9%	13%
(D) Contrib. by Medical Board	$30,055	$1,000,586	$750,147	$1,000,000	$1,500,000
(E) Health Revenues net of Contrib. by Medical Board	$494,616	$206,489	$519,205	$517,206	$743,200
(F) Net Revenues as % of Health Expenditures	3%	1%	3%	3%	4%

Sources: Estimates of St. Lucia; author's calculations.

TABLE 14

PRIVATE ACCIDENT AND SICKNESS INSURANCE
COVERAGE AND PAYOUT RATIOS: ST. LUCIA, BARBADOS
TRINIDAD AND TOBAGO AND JAMAICA IN LOCAL
CURRENCIES OF COUNTRIES REPORTING
(1985 DATA)

	# Policy Holders	Gross Premiums	Claims Paid & Outstanding (a)	Payout Ratios
St. Lucia	7520	$1,305,170	$410,031	31.4%
Barbados	--	$6,896,000	$4,840,000	70.2%
Trinidad & Tobago	--	$24,800,000	$12,100,000	48.8%
Jamaica	--	$46,382,933	$36,380,355	78.4%

Source: Ministry of Finance, Government of St. Lucia.

Note: (a) These are total figures. The component proportions of claims paid and those outstanding are not known, and may differ among countries.

TABLE 15

VICTORIA HOSPITAL STATISTICS,
APRIL 1986 - MARCH 1987

	Surgical ward	Medical ward	Obs./Gyn. ward	Ophthalmology ward	Paediatric ward	Baron (Private) Wing	Total
Number of beds	45	52	47	10	47	10	211
Number of admissions	1,327	1,093	3,475	274	1,740	276	8,185
Number of discharges	1,262	1,039	3,520	275	1,680	311	8,087
Number of deaths	53	138	5	0	14	6	216
Number of patient days	12,946	14,228	16,161	2,009	8,745	3,148	57,237
Utilization Rates							
Av. length of stay (ALOS)	9.76	13.02	4.65	7.33	5.03	11.41	6.99
Percent occupancy	78.82	74.96	94.21	55.04	50.98	86.25	74.32
Bed turnover rate	29.49	21.02	73.94	27.40	37.02	27.60	38.79
Deliveries							
Live births							2,289
Still births							2,284
							29
Operations							
Major							2,642
Intermediate							741
Minor							812
							1,089
Physiotherapy Department							
No. of patients							1,105
Inpatients							192
Outpatients							266
No. of treatments							5,561
Inpatients							751
Outpatients							1,519
X-ray Department							
No. of X-rays taken							8,964
Inpatients							256
Outpatients							1,213
Casualty Department							
No. of patients seen							34,052
Injuries							3,404
Ophthalmic cases							7,422
Admissions via casualty							3,347

Source: MOH Statistics Department.

TABLE 16

VICTORIA HOSPITAL COST STUDY--SUMMARY OF COST STATISTICS

Total Cost Of Victoria Hospital:	
Total Direct and Indirect Cost (without depreciation or annuitization)	$8,448,688
+ Value Depreciation of Buildings and Annuitization of Capital Costs of Land	$2,231,586
Total Annual Cost Of VH (1986/87)	$10,680,274
Indirect Costs (with depreciation and annuitization) as % of Total Annual Cost	55.7%
Indirect Costs (without depreciation and annuitization) as % of Total Direct and Indirect Costs	29.3%
Personnel Costs as % of Total Direct and Indirect Costs (without depreciation and annuitization)	68.7%
Average Cost Per Inpatient Day: *	
Average cost per inpatient day (including operating theatre costs)	$131.80
Average cost per inpatient day (without operating theatre costs)	$103.61
Average Cost Per Admission: *	
Average total cost per admission (without operating theatre costs)	$724.24
Average total cost per admission (including operating theatre costs)	$921.28

* With depreciation of buildings and annuitization of capital costs of land.

Sources: Tables B.4, B.5.

TABLE 17

UNIT COST ANALYSIS OF WARDS (WITH DEPRECIATION AND ANNUITIZATION *)

Department	Number of beds (1)	Number of admissions (2)	Number of patient days (3)	Av. length of stay (ALOS) (4)	Percent occupancy (5)	Total Cost (6)	Cost per patient day (4)/(3) (7)	Cost per admission (4) x (7) (8)
Surgical Wards	48	1,327	12,946	9.76	78.82	$1,238,892	$96	$934.00
Medical Wards	52	1,093	14,226	13.02	74.96	$1,461,100	$103	$1,337.05
Maternity Ward (a)	28	2,538	9,866	3.89	96.50	$1,053,030	$107	$414.91
Gynaecology Ward	19	937	6,295	6.72	90.80	$584,960	$93	$623.62
Opthalmology Ward	10	274	2,009	7.33	55.04	$349,416	$174	$1,274.87
Paediatric Ward	47	1,740	8,745	5.03	50.98	$782,998	$90	$450.37
Baron (Private) Wing	10	276	3,148	11.41	86.25	$459,968	$146	$1,667.16
Totals, averages	211	8,185	57,237	6.99 (b)	74.32	$5,930,363	$104	$845.88

* - Depreciation of buildings and annuitization of capital costs of land.

Sources

Columns (1) and (4): Victoria Hospital Medical Records Department.
Columns (2) and (3): MOH Department of Statistics and Table 15.
Columns (2) and (4): Table B.7.

Notes:

(a) Disaggregated figures for maternity and gynaecology are from Victoria Hospital Medical Records Department.
(b) This is the total number of patient days divided by the number of admissions.

TABLE 18 (PART 1)

VICTORIA HOSPITAL COST STUDY--SUMMARY OF COST CALCULATIONS

		Source
1) Total Annual Cost of Victoria Hospital:		
Total Direct and Indirect Expense (without depreciation and annuitization *)	$8,448,688	Table B.3 (Part 2)
+ Value Depreciation and Annuitization	$2,231,586	Table B.5 (Part 1)
Total Annual Cost of VH	$10,680,274	
2) Indirect Costs (with depreciation and annuitization) as % of Total Direct and Indirect Costs:		
The sum of Indirect Costs (with depreciation and annuitization)	$4,702,930	Table B.5 (Part 1)
Indirect Costs as % of Total Direct and Indirect Costs	55.7%	
3) Indirect Costs (without depreciation and annuitization) as % of Total Direct and Indirect Costs:		
The sum of Indirect Expense (without depreciation and annuitization)	$2,471,344	Table B.4 (Part 1)
Indirect Costs as % of Total Direct + Indirect Costs (without depreciation and annuitization)	29.3%	

* - Depreciation of buildings and annuitization of capital costs of land.

TABLE 18 (PART 2)

VICTORIA HOSPITAL COST STUDY--SUMMARY OF COST CALCULATIONS

4) Administration as % of Selected Costs:		
Total Direct Expense of Administration	$696,931	Table B.3 (Part 2)
As % of Indirect Costs with depreciation and annuitization ($4,702,713)	14.8%	
As % of Indirect Costs without depreciation and annuitization ($2,471,127)	28.2%	
As % of Total Annual Costs (with depreciation and annuitization) ($10,688,274)	6.5%	
As % of Total of Direct and Indirect Expense (without depreciation and annuitization) ($8,448,688)	8.2%	
Total Direct and Indirect Costs of Administration (with depreciation & annuitization)	$986,813	Table B.5 (Part 1)
As % of Indirect Costs with depreciation and annuitization ($4,702,713)	21.0%	
As % of Indirect Costs without depreciation and annuitization ($2,471,127)	39.9%	
As % of Total Annual Costs (with depreciation and annuitization) ($10,688,274)	9.2%	
As % of Total of Direct and Indirect Expense (without depreciation and annuitization) ($8,448,688)	11.7%	

TABLE 18 (PART 3)

VICTORIA HOSPITAL COST STUDY--SUMMARY OF COST CALCULATIONS

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5) Payroll Costs as % of Total Cost (with and without depreciation and annuitization):

Total Payroll Costs (i.e. without fringe benefits)	$5,152,648	Table B.3 (Part 1) 01 + 02 + adj.
As % of Total Direct and Indirect Costs ($8,448,688) (without depreciation and annuitization)	61.0%	
As % of Total Annual Costs (with depreciation and annuitization) ($10,688,274)	48.2%	

6) Personnel Costs as % of Total Costs (with and without depreciation and annuitization):

Total Personnel Costs (i.e. with fringe benefits)	$5,803,229	Table B.3 (Part 1) Tot.Personnel Expense
As % of Total Direct + Indirect Costs (without depreciation and annuitization) ($8,448,688)	68.7%	
As % of Total Annual Costs (with depreciation and annuitization) ($10,688,274)	54.3%	

TABLE 18 (PART 4)

VICTORIA HOSPITAL COST STUDY--SUMMARY OF COST CALCULATIONS

7) Average Cost Per Inpatient Day and Total Cost Per Inpatient (with and without operating theatre costs):

a) With operating theatre:

Sum of Total Costs (Direct and Indirect with depreciation and annuitization for each ward and operating theatre	$7,543,838	Table B.7
Divided by Total Number of Inpatient Days	57,237	MOH Annual Statistics
= Average Cost Per Inpatient Day (including operating theatre costs)	$131.80	
Multiplied by ALOS	6.99	
= Average Total Cost Per Inpatient (with depreciation and annuitization and including operating theatre costs)	$921.28	

a) Without operating theatre

Sum of Total Costs (Direct and Indirect with depreciation and annuitization for each ward (without operating theatre)	$5,930,363	Table B.7
Divided by Total Number of Inpatient Days	57,237	MOH Annual Statistics
= Average Cost Per Inpatient Day. (without operating theatre costs)	$103.61	
Multiplied by ALOS	6.99	
= Average Total Cost Per Inpatient (with depreciation and annuitization and without operating theatre costs)	$724.24	

TABLE 19

COMPARISON OF TOTAL COST PER UNIT (WITH DEPRECIATION OF BUILDINGS AND ANNUITIZATION OF CAPITAL COSTS OF LAND) AND EXISTING FEE SCHEDULE

Department	Unit	Total cost per unit	Average fee per unit	Average fee as % of cost
Maternity Ward	# Patient-Days	$107	$15.00	14%
Gynaecology Ward	# Patient-Days	$93	$15.00	16%
Baron (Private) Wing	# Patient-Days	$146	$75.00	51%
Medical Wards	# Patient-Days	$103	$15.00	15%
Surgical Wards	# Patient-Days	$96	$15.00	16%
Paediatric Ward	# Patient-Days	$90	$15.00	17%
Ophthalmology Ward	# Patient-Days	$174	$15.00	9%
Operating Theatre	# Operations	$611	$272.00	45%
Laboratory	# Tests	$10	$9.85	99%
Radiology	# X-Rays	$49	$23.75	48%
Physiotherapy	# Treatments	$13	$31.45	242%
Casualty (Outpatients)	# Visits	$30	$15.54	52%

Sources:

Total cost/unit figures: Table B.7; Casualty and Clinic data combined.

Average fee/unit figures are based on the official fee schedule, but are adjusted for different fees attributable to different levels of service, as per Table 21, divided by Service Volume figures from Table B.7 (see also Appendix B).

TABLE 20

NUMBERS OF CONSULTATIONS PER CLINIC APPOINTMENT SHEET
VERSUS "RECORD OF CONSULTATIONS" FILE BOOK, OCTOBER 1987

Consultant	Total clinic visits	Total presenting for assessment	Assessment		
			Non-payable	Payable	Payable NIS
A	73	5	2	2	1
B	4	3	2	1	0
C	225	7	0	4	3
D	57	13	7	4	2
E	351	18	0	18	0
F	76	83	63	12	8
G	16	4	4	0	0
H	68	6	3	3	0
I	n.a.	3	3	0	0
J	95	5	2	1	2
K	18	0	0	0	0
L (a)	94	0	0	0	0
M	1	0	0	0	0
N	7	0	0	0	0
Total	1,085	147	86	45	16 (b)
% Distribution of tot. visits	100%	14%	8%	4%	1%
% Distribution of assessed		100%	59%	31%	11%
Expected or lost revenue at $25 per consultation	($27,125)	$3,675	$2,150	$1,125 (c)	$400

Notes:
(a) L is a pediatrician; all children are exempt.
(b) According to "NIS Book" at cashier, there were 36 NIS patients in October 1987.
(c) Actual revenues from medical fees at Victoria Hospital, (including fees for both consultant visits and Casualty Officer visits) were only EC $882.50 for October 1987.

Sources: Number of visits from Victoria Hospital, Medical Records Clinic Appointment sheets/book. Assessment data from Victoria Hospital, Revenue Collection Department, "Record of Operation" sheets.

TABLE 21

SUMMARY OF POTENTIAL REVENUE IF ALL PATIENTS AT VICTORIA HOSPITAL HAD PAID AT EXISTING FEE SCHEDULES FOR SERVICES ACTUALLY RECEIVED, APRIL 1986 THROUGH MARCH 1987 (MAJOR REVENUE CATEGORIES ONLY)

Type of fee	Major revenue categories			Totals
	Hospital fees	Confinement fees	Medical fees	
Casualty Officers			$214,530	
Consultant Physician Clinics			$314,975	
Laboratory Tests	$599,106			
Accomodation	$1,047,435			
X-Ray	$212,895			
Consultant Surgeons	$472,650			
Anaesthetists	$246,800			
Physiotheraphy Treatment	$174,885			
Delivery Room		$57,225		
Consultant OB/GYN		$412,000		
Caesarian Sections		$64,500		
(a) Category Total, i.e. Total Potential Revenues 1986/87	$2,753,771	$533,725	$529,505	$3,817,001
(b) Value of revenue foregone because of exemption legislation [92.7% x line (a)] *	$2,552,746	$494,763	$490,851	$3,538,360
(c) Revenues potentially collectible by Victoria Hospital [(a)-(b)]	$201,025	$38,962	$38,654	$278,641
(d) Actual amounts collected at Victoria Hospital per Rev. Estimates 1986/87	$195,169	$2,250	$6,328	$203,747
(e) Estimated uncollected revenues at Victoria Hospital 1986/87 [(c)-(d)]	$5,856	$36,712	$32,326	$74,894

* Based on MOH calculation that 92.7% of the population is exempted from paying fees.

Source: Appendix B

Figure 1

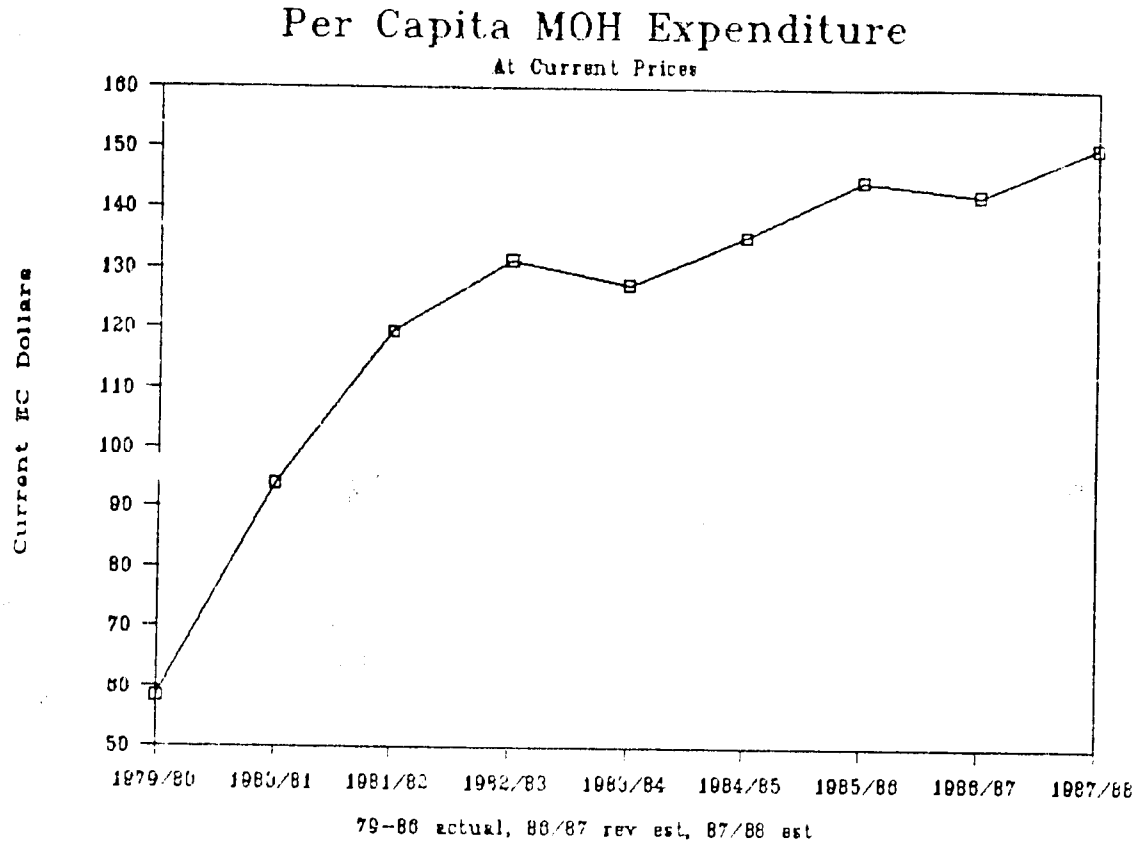


Figure 2

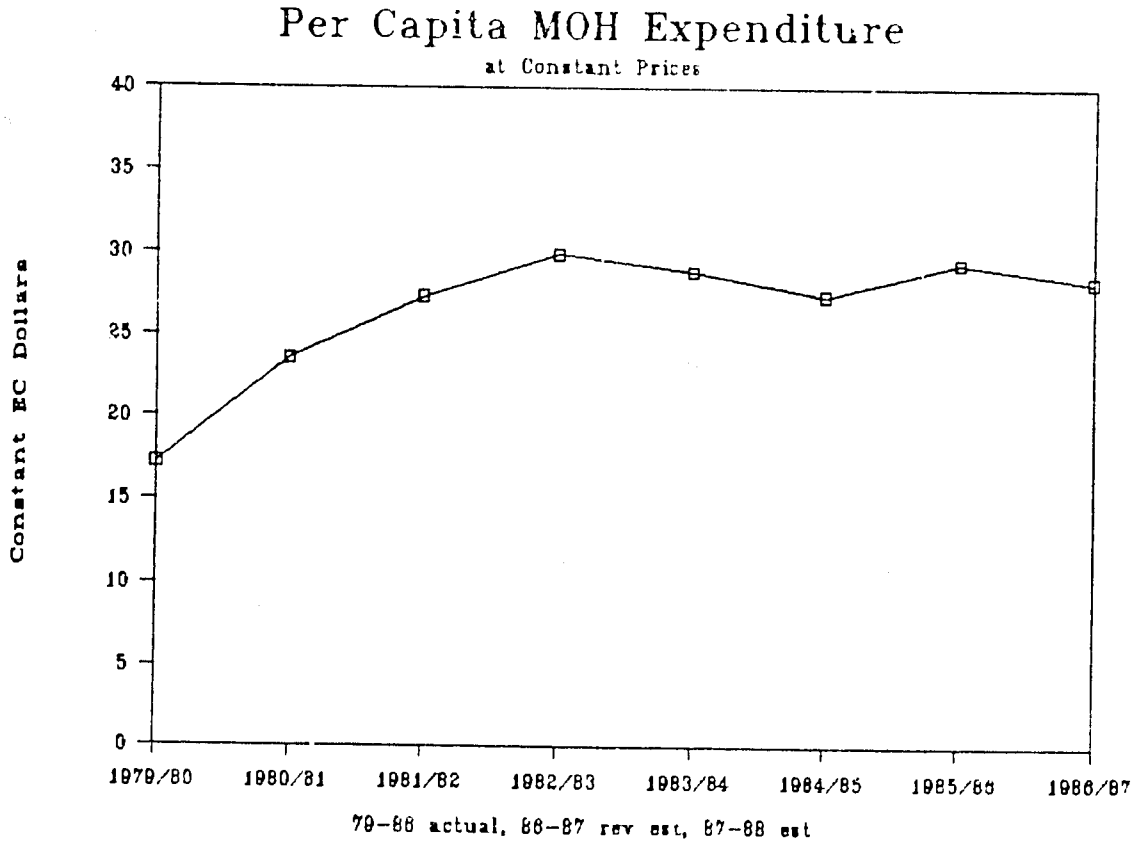


Figure 3

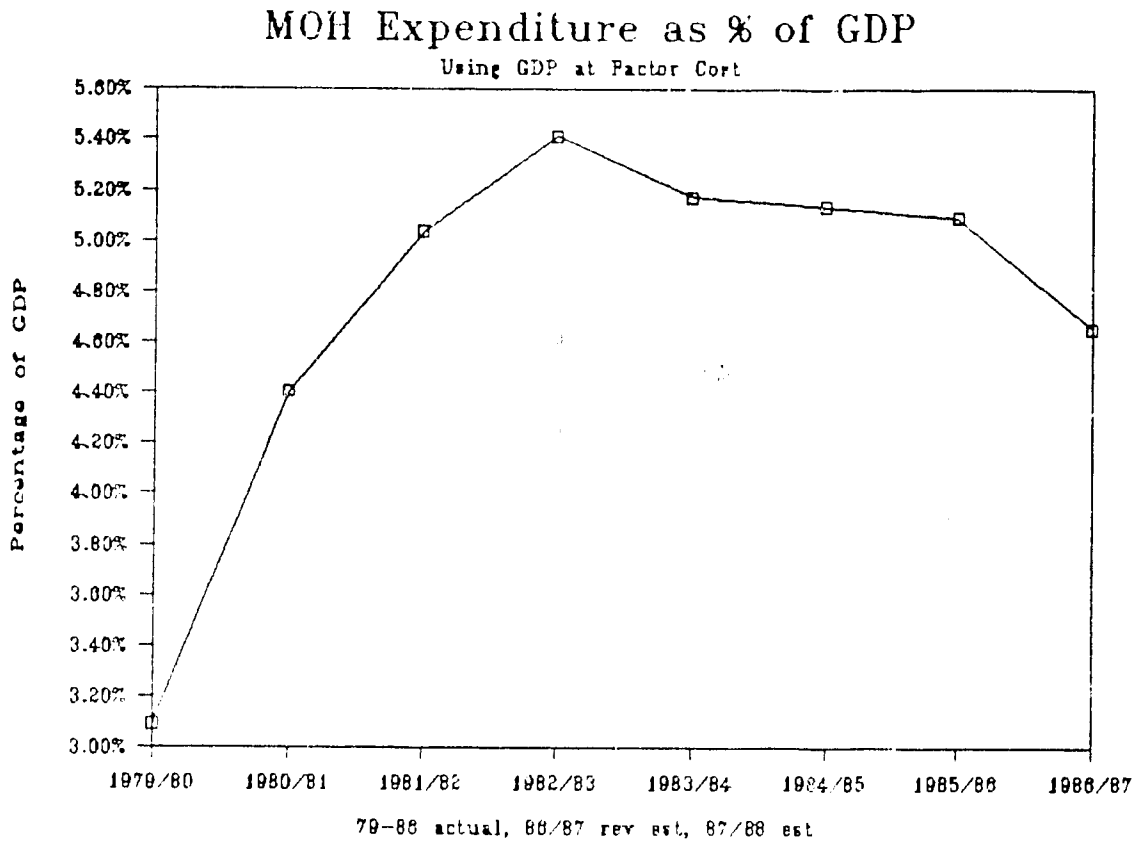


Figure 4

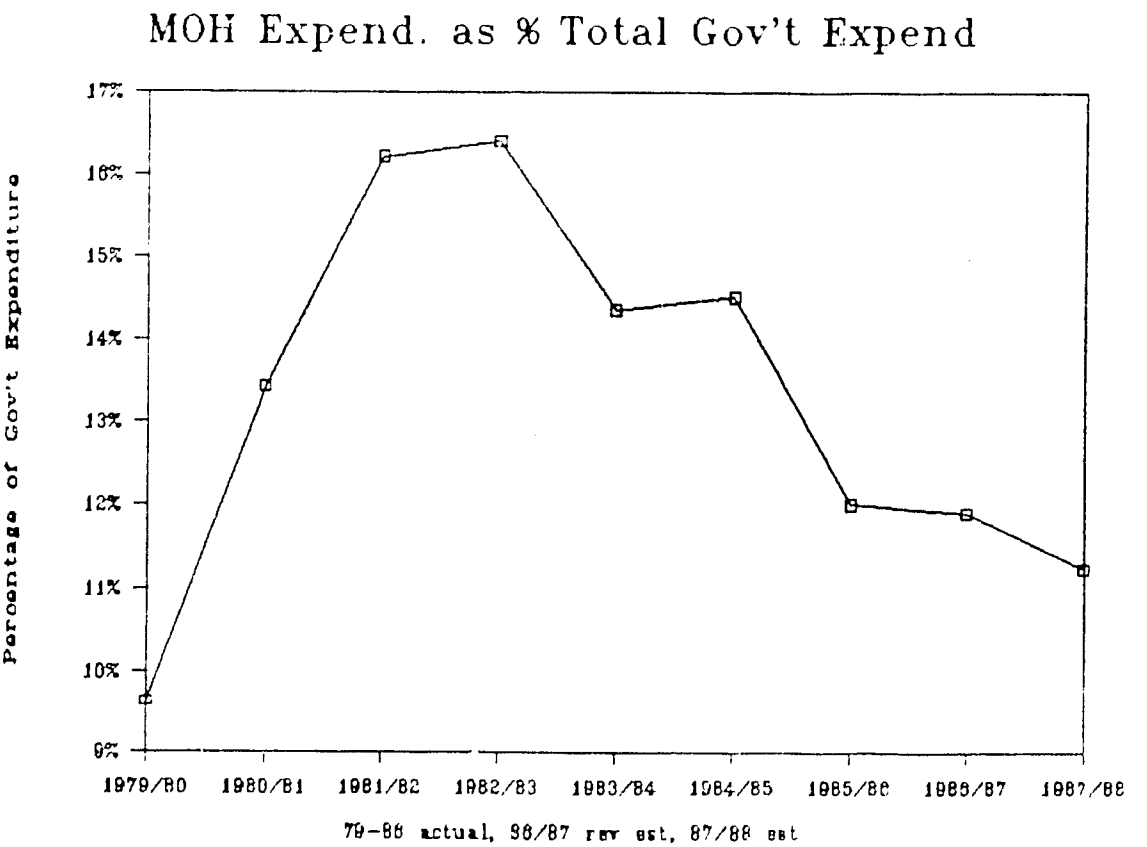


Figure 5

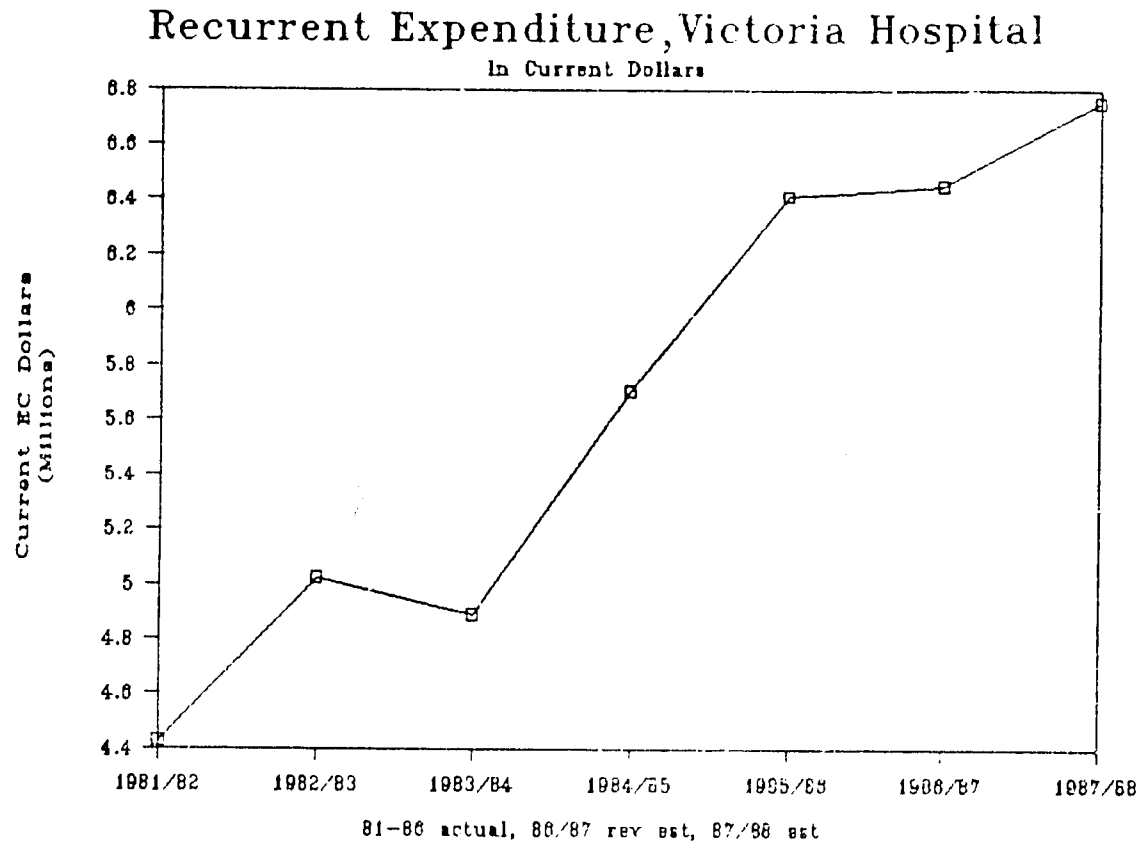


Figure 6

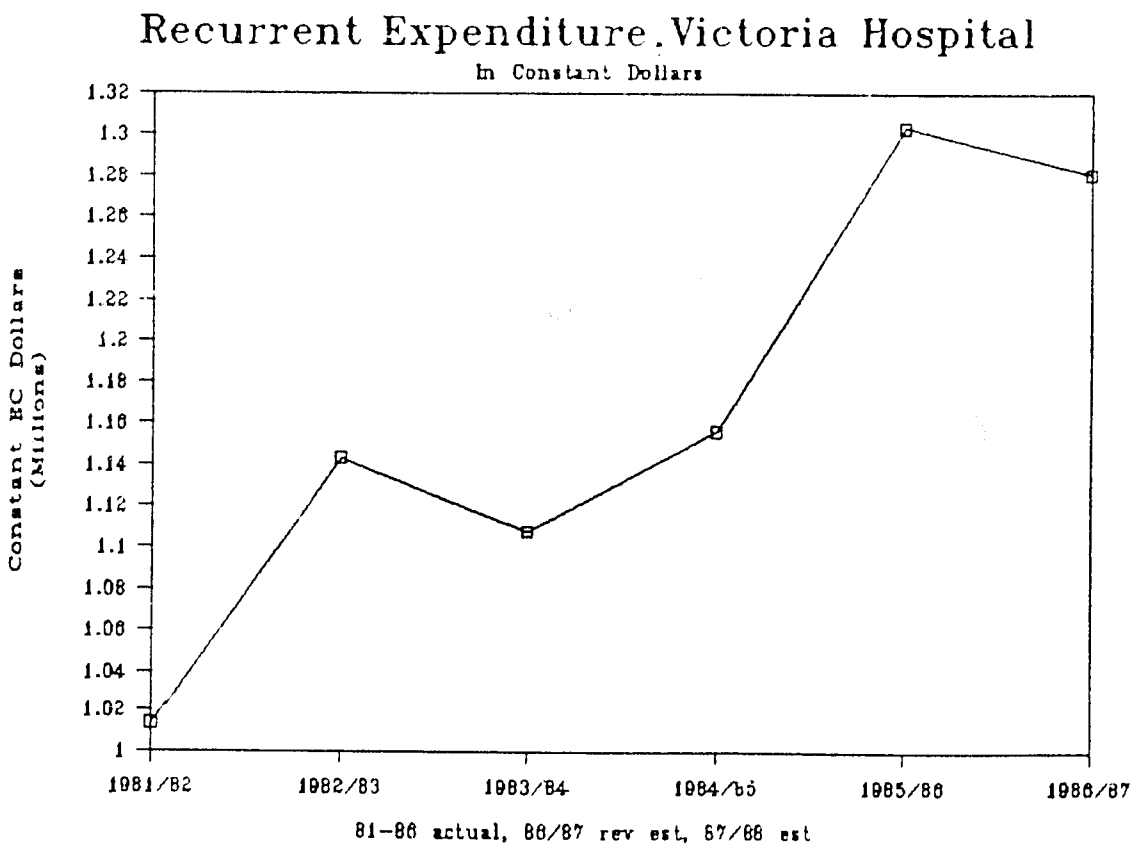


Figure 7

Hospital Fee and Total Health Revenues

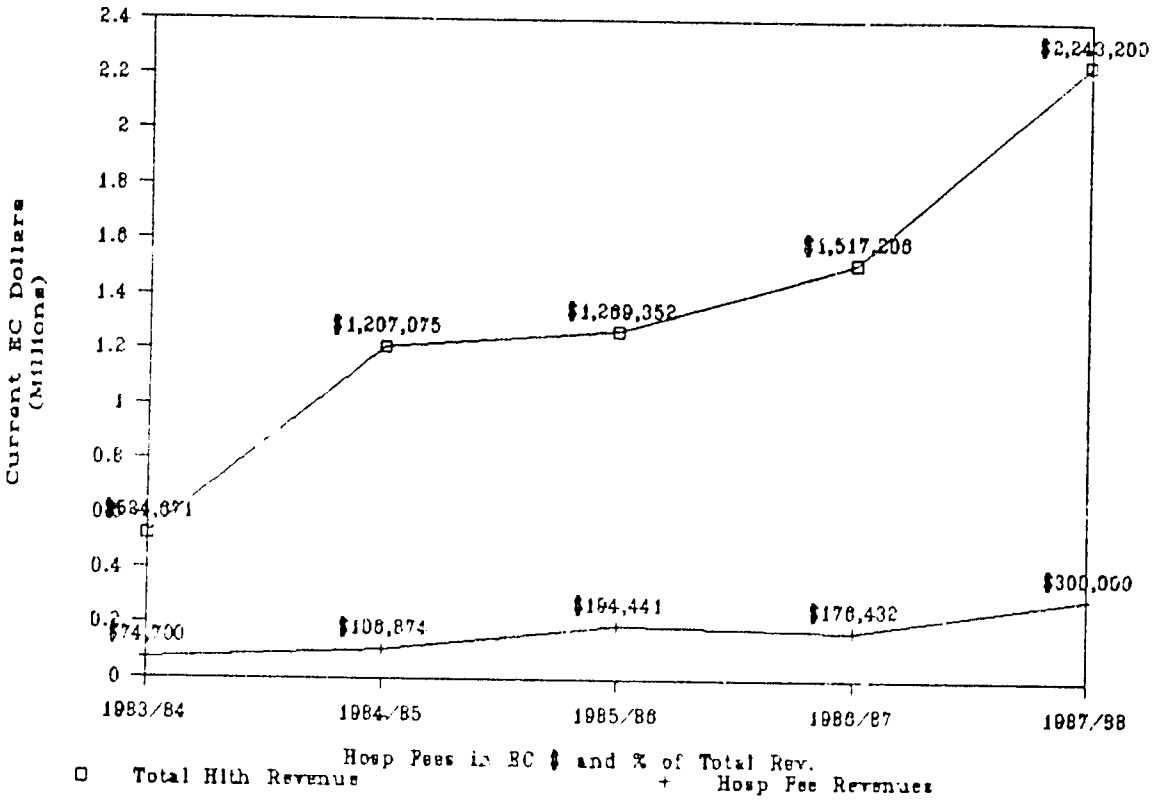


Figure 8

Hosp. Fees as % Total Health Revenue

From All Health-Related Sources

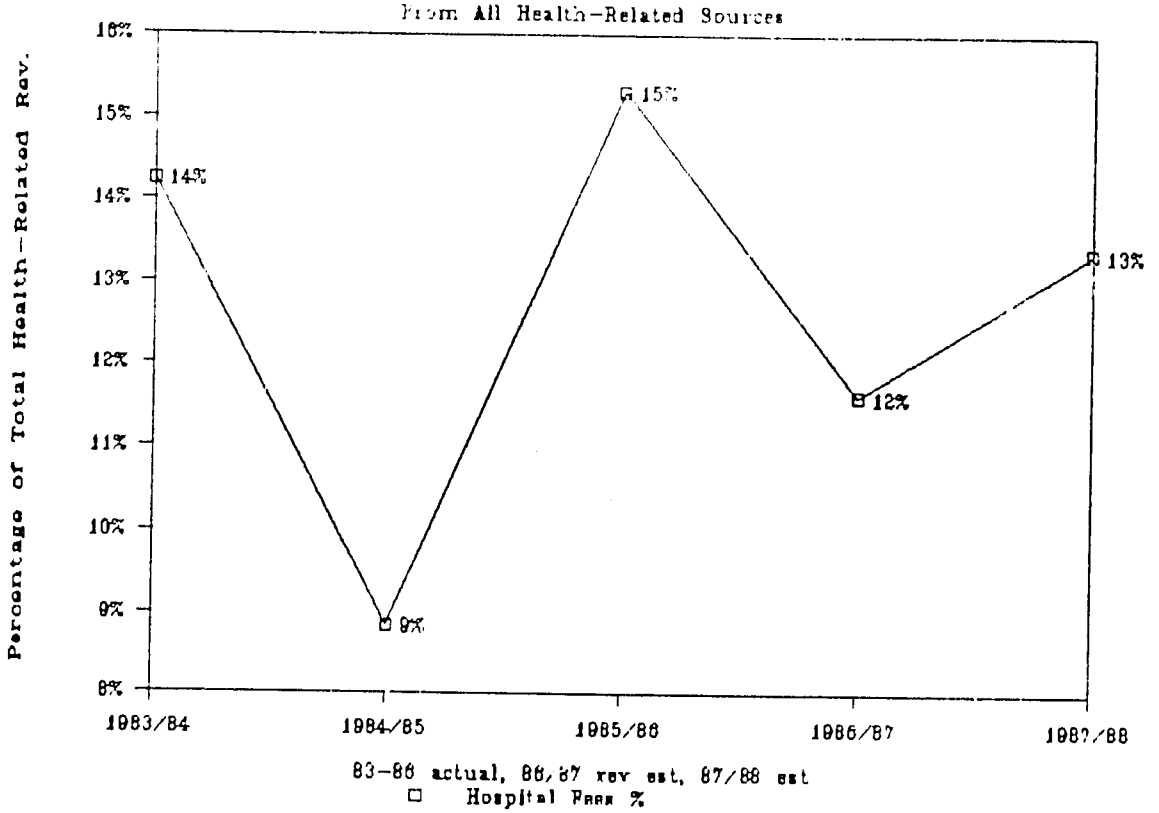


Figure 9

Health & Med. Care Expends. & Revenue

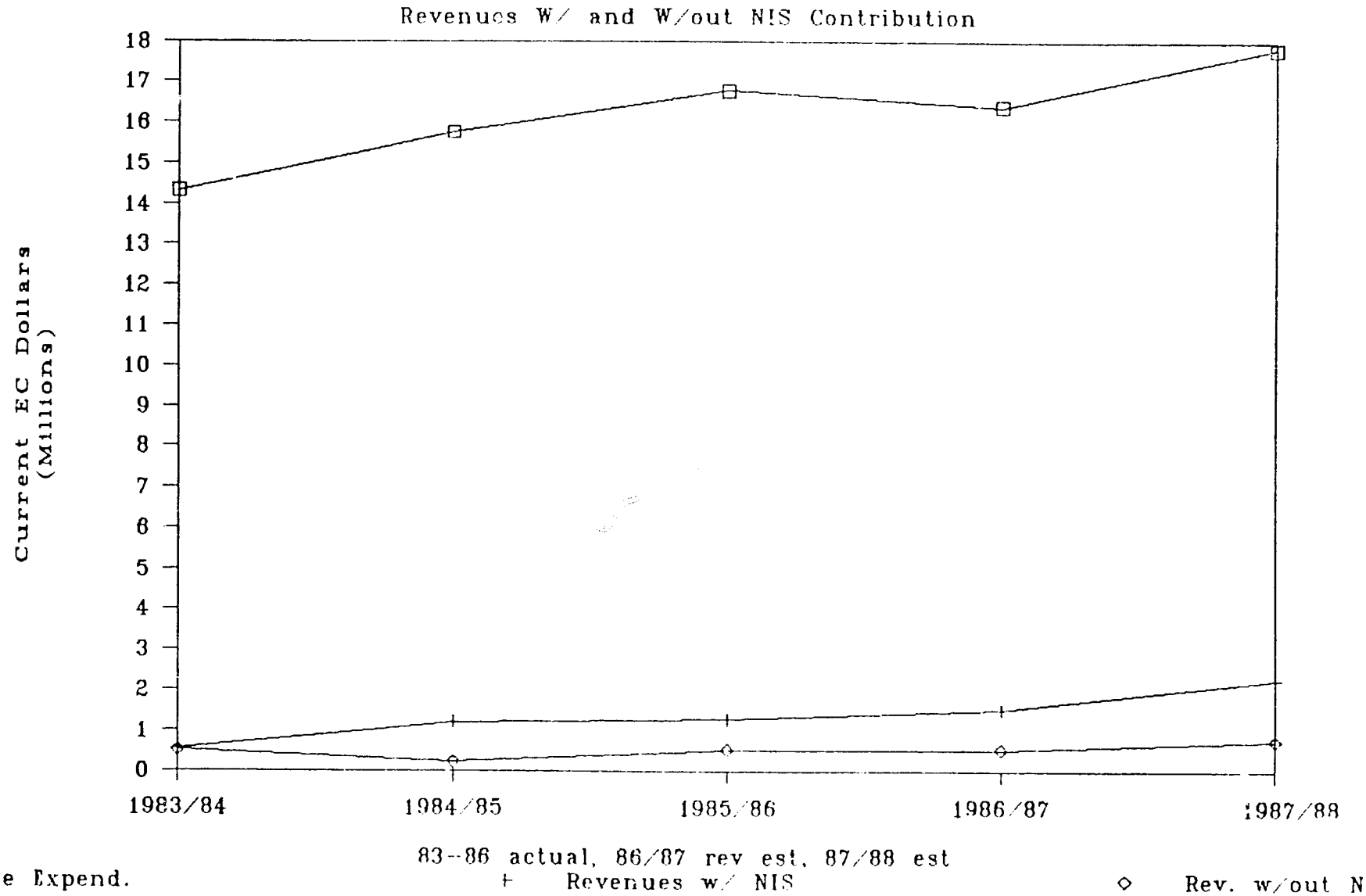


Figure 10

Total Health Revenues as % Expenditure

With and Without NIS Contribution

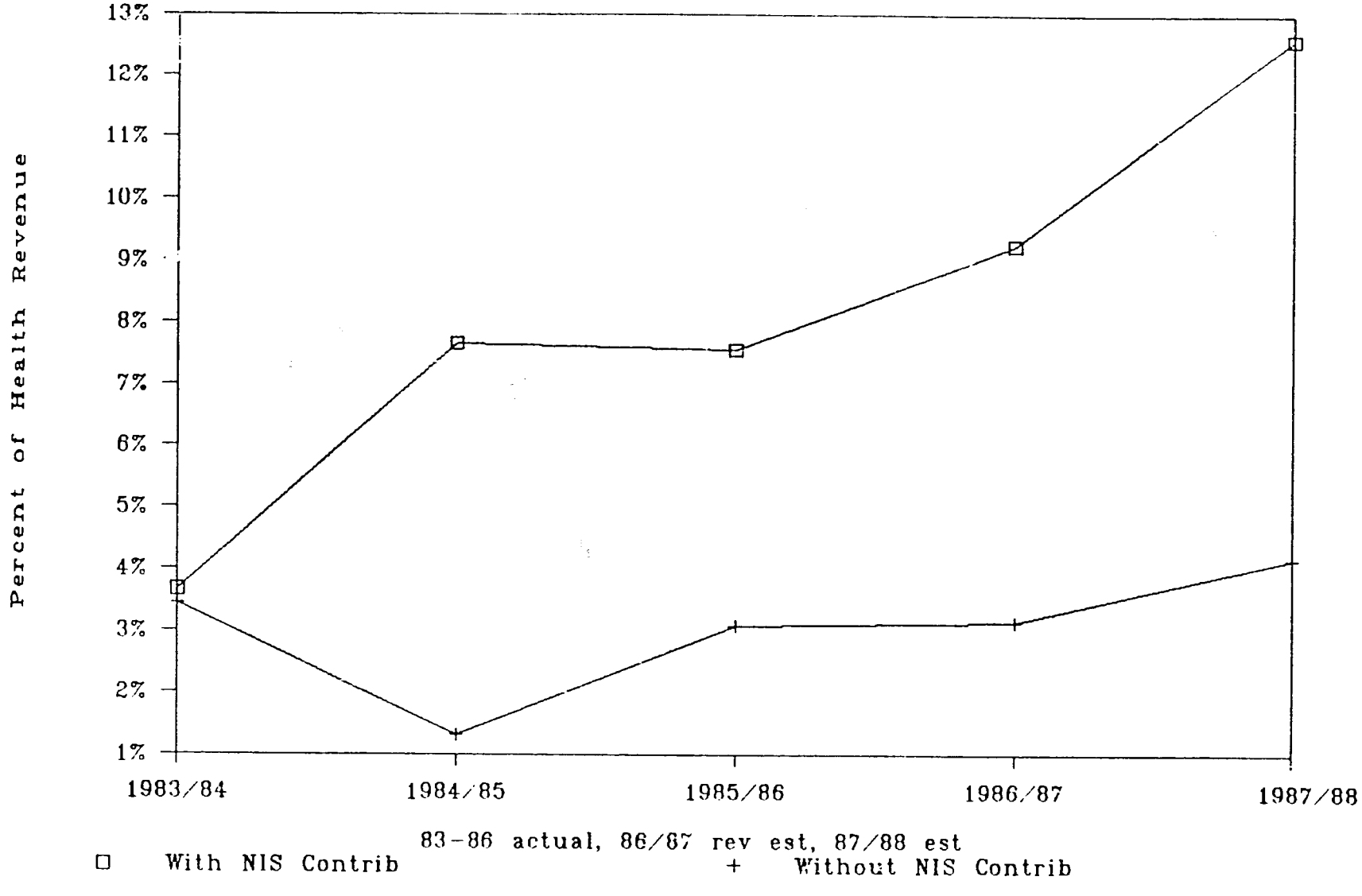


Figure 11

Hospital Fees as Share Health Revenues

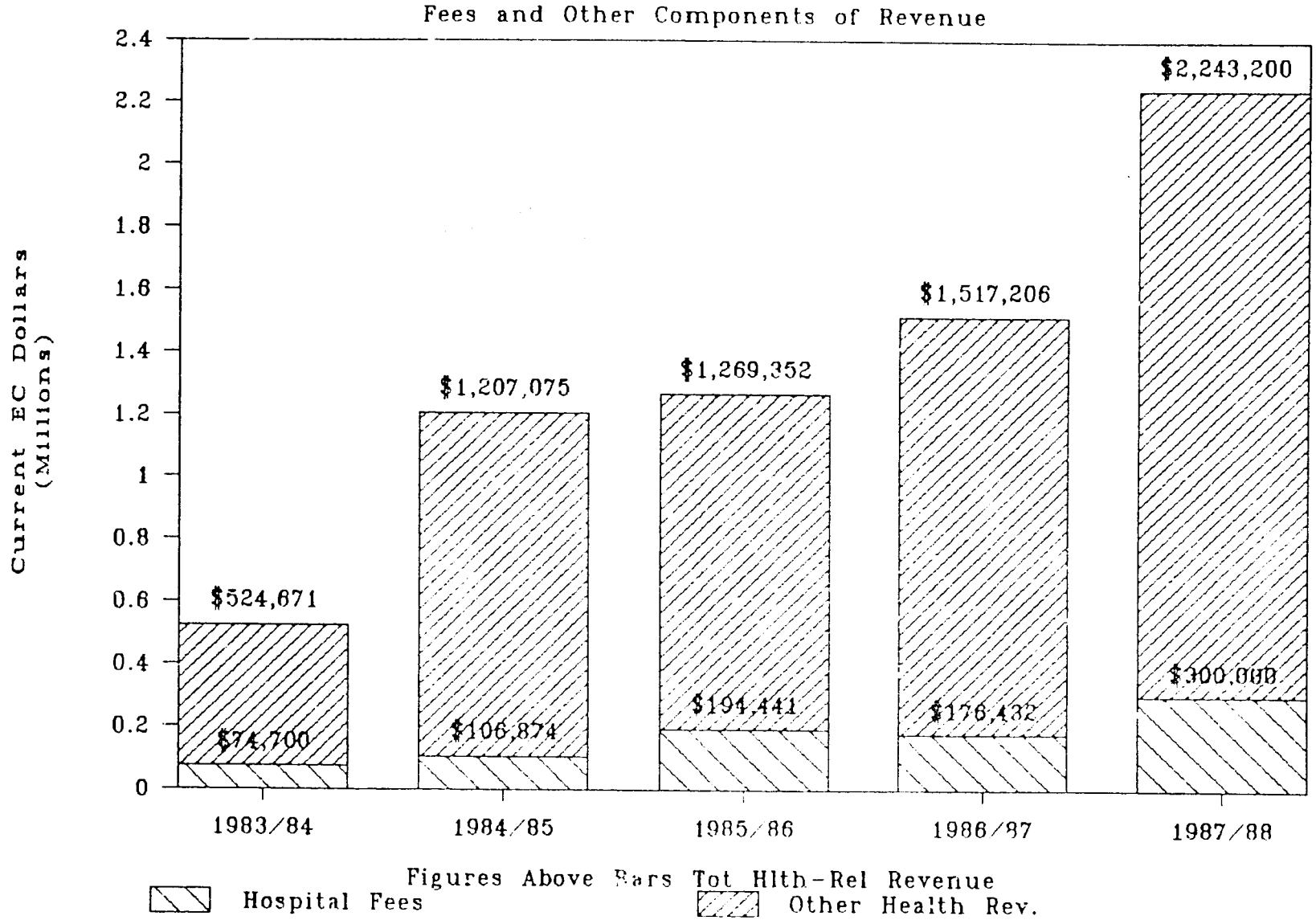


Figure 12

Allocation of Expenses

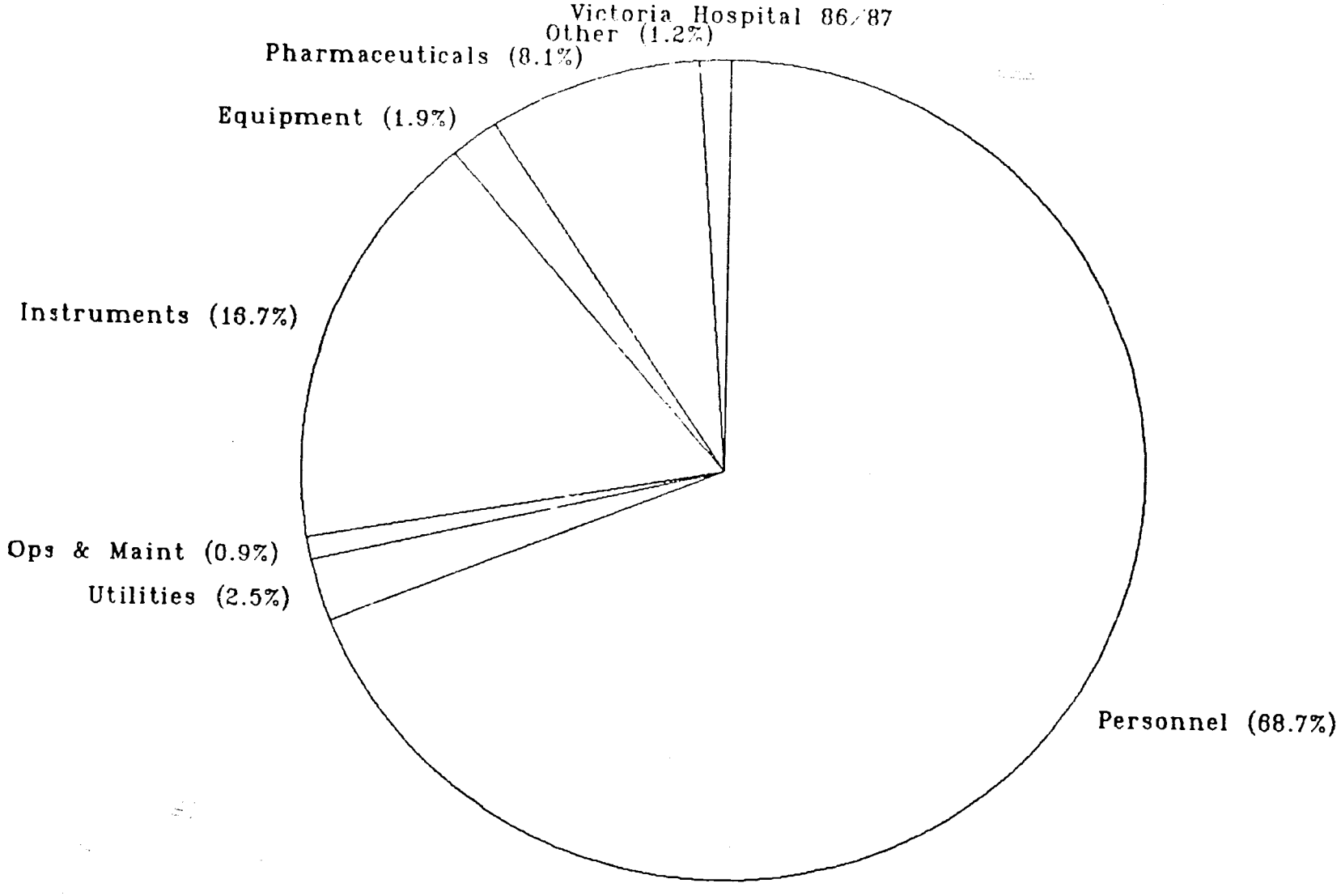
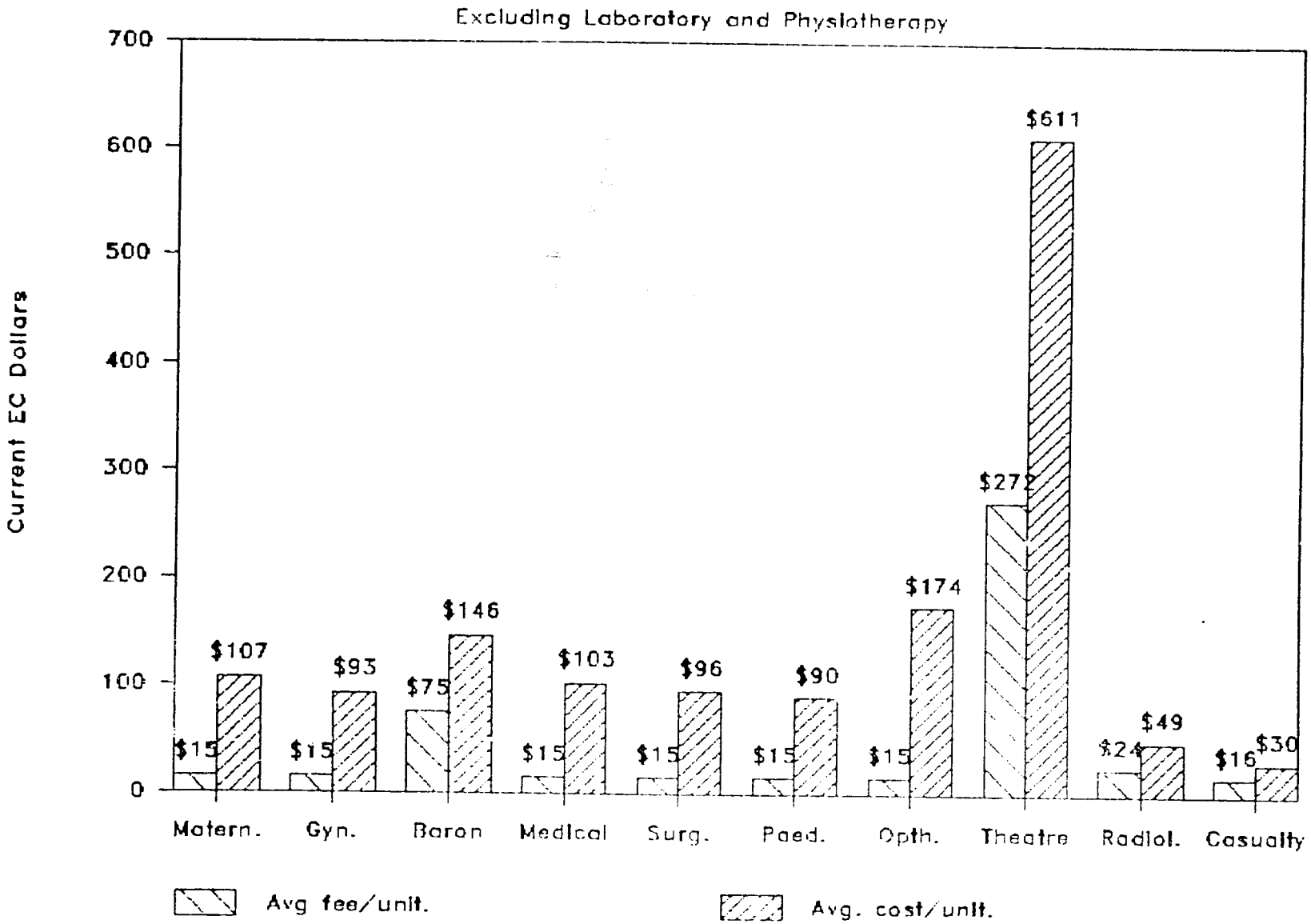


Figure 13

FEES IN RELATION TO UNIT COSTS



Source: Table 18

Figure 14

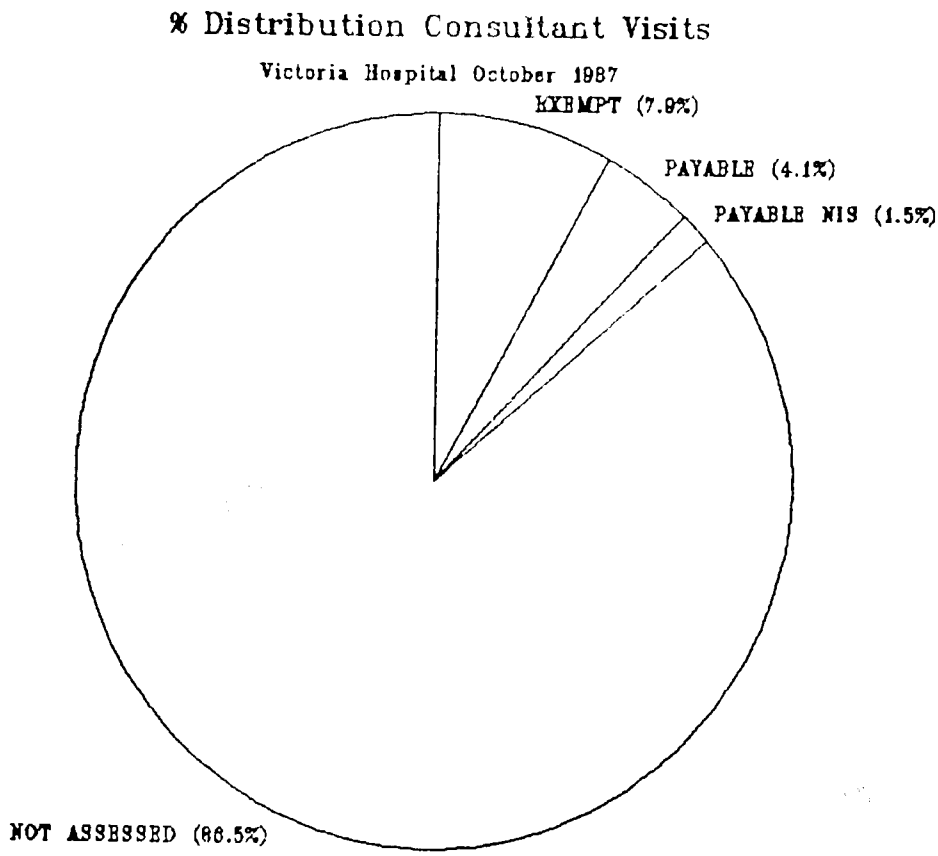
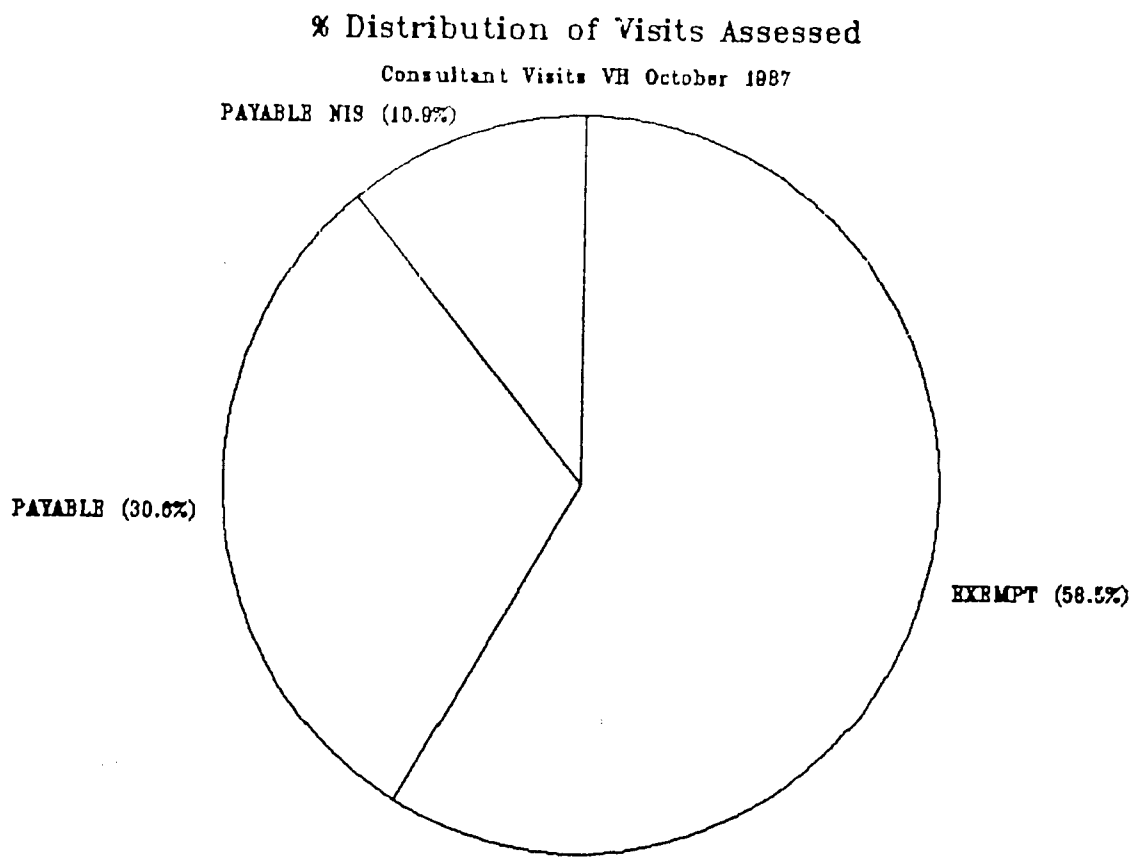


Figure 15



APPENDIX A

NOTES ON STUDY DESIGN AND IMPLEMENTATION

Major elements of the design for the study of hospital costs in St. Lucia were discussed during an exploratory visit to the island in May of 1987. Thereafter, a draft study design was prepared and sent to St. Lucia in August of 1987 for review by Government officials. There being no major changes needed in the design, this draft document served as the starting point for discussions between the study team and St. Lucian officials upon the team's arrival on-island.

A. Specific Objectives of the Study

The specific following objectives were agreed upon:

1. To document the organization of services at Victoria Hospital and the facility's role in St. Lucia's health system.

2. To identify and calculate actual and/or imputed costs (divided into fixed and variable as well as direct and indirect costs) for each department or service at the hospital.

3. To identify service output statistics for each department at the hospital.

4. To identify controllable and non-controllable costs at major levels of decision-making: national (parliament, cabinet); central Ministry of Health; Victoria Hospital administration; hospital staff (physicians, nurses, department heads).

5. To analyse the cost structure and costs per unit of service (e.g., per ward, per patient day), and develop recommendations concerning areas in which improved management and/or cost savings might be effected.

6. To select one high-volume diagnostic category (e.g., childbirth) and subject it to detailed utilization and average cost analysis, in order to test the applicability and utility of analysing and managing costs by diagnostic category rather than by department.

7. To provide examples of cost-reporting for financial management and control at the hospital level, feasible under the existing record-keeping system.

B. Methodology and Organization of the Study

The study was carried out during the autumn of 1987. Fieldwork in St. Lucia began on October 5th and proceeded until November 6th, a period of five weeks. Analysis of findings and preparation of a preliminary draft report of the study were carried out between November 8th and mid-December.

The study team from the State University of New York at Stony Brook (SUNY) was composed of a Senior Scientist/Health Financing expert who served as Team Leader, a Study Coordinator/ Anthropologist, and a Hospital Cost Accounting expert. The hospital's chief accountant was able to take leave from his regular duties to participate in implementation of the study on a full-time basis during the fieldwork phase, which greatly facilitated data collection.

Overall policy guidance to the joint study team was provided by a five-member Steering Committee comprising the Permanent Secretary of the Ministry of Health; the Principal Assistant Secretary (MOH); the Chair of the Public Hospital Board; the Chief Accountant of the MOH; and a representative of the Ministry of Finance. Steering Group members provided expertise in their specific areas, as well as their collective senior policy-level perspective, in both group and individual meetings over the five-week fieldwork period.

A Working Group, based at Victoria Hospital, was constituted to provide the study team with specific technical advice on a periodic basis, through both group and individual meetings. Working Group members included the Hospital Administrator; one of the hospital's Consultant physicians; the Hospital Storeskeeper; the Medical Records Officer; and the Matron (chief of Nursing).

During the initial meetings with the Steering Committee and Working Group, the study team delivered a brief presentation, accompanied by handouts, in order to provide an overview of study objectives, methodology, and expected results. Each Steering Committee and Working Group member also received a copy of the Draft Study Design, which was reviewed in detail.

The study was divided into several (overlapping) phases, including the following activities:

1. Planning (October 5-8).

a. Introductory meetings with the Permanent Secretary and other senior government officials and hospital staff, to review and confirm general aims, context, and the time period to be covered by the analysis. The 1985-86 books were closed in March 1987, and (unaudited) actual expenditures for this period were available for the team's use.

b. Scheduling and convening initial Steering Committee and Working Group sessions, to review and confirm study objectives, methodology, plan of action, and individual roles and responsibilities.

c. Organizing work-space for study team: installing and testing computer equipment and programs; gathering materials, supplies and basic documentation for study team use. The team travelled with 3 laptop computers and a printer. These were used in conjunction with the hospital's IBM PC, which was initially found to be in need of minor repairs.

d. Developing draft outline of final report.

2. Data Collection (October 8-19).

a. Document role of Victoria Hospital in St. Lucia's health system through review of existing reports and site visits to other levels of care. Obtain data on health status of the population (e.g., morbidity and mortality); health system utilization (including referral, admission, and by-pass patterns); organization of public and private physician services, and physician utilization of Victoria. Document linkages between Victoria Hospital and national health financing/resource allocation system.

b. Conduct site visit to St. Jude Hospital to examine organization of hospital departments, services, financial data, and reporting, in order to facilitate, to the maximum extent possible, future comparisons between Victoria and St. Jude's, should the government of St. Lucia wish to develop country-specific performance standards at a later time. In implementation, the visit to St. Jude's was

combined with visits to Dennery and Soufriere Hospitals.

c. Develop line-item budget for Victoria Hospital. A sample table of line items was developed during the study design phase, drawing upon the earlier HCF/LAC study of Belize City Hospital and upon St. Lucia's Estimates. The final line items for Victoria were selected in consultation with the Steering Committee and Working Group during initial meetings.

The following data collection activities required interviews with specific departments, as well as examination of central Ministry and hospital financial records. The general steps in the cost analysis were envisaged in the study design. Further technical details on the cost analysis methodology are presented in Appendix E.

d. Identify all Victoria Hospital departments or services (direct departments or "cost centers") to be used in cost analysis. As in the case of line items, a sample list of possible departments was drawn up during the study design phase and appended to the study design document. This list was reviewed and revised during the initial Working Group meeting.

e. Assign all line item expenses to one or more of the departments identified in step d, above. A sample table showing type of expense by department, together with sample working tables for individual departments, were prepared as part of the study design and appended to the design document, so that Steering Committee and Working Group members could see what results of the data collection effort would look like.

f. Adjust costs for each department to remove costs not attributable to Victoria Hospital (e.g., costs related to district hospitals or health centers) and to add costs for items not reflected in Victoria Hospital's accounts (e.g., donated drugs and equipment). This task required some specialized sub-studies: for example, to identify use of pharmaceuticals and supplies from Central Medical Stores by departments of the hospital, or to identify use of maintenance services by department.

g. Identify departments that constitute "indirect services" (e.g., laundry, dietary, medical reports) utilized by departments providing direct services to patients (e.g., male surgical ward, radiology,

medical clinics). These departments were determined in the same manner as direct departments (i.e., in consultation with the Working Group).

h. Identify statistics to be used to allocate indirect departments' costs. A sample list of options for these statistics was included in the study design, and formed the basis for discussion and revision with the Working Group. These statistics constitute the "factors" which appeared later in the "stepdown" allocation of indirect costs to other cost centers. During implementation, the values for these statistics were determined through examination of hospital documents, financial records, interviews with personnel, and special studies. For example, no details were available on square footage of the hospital buildings, so a carpenter was engaged to take measurements and develop a rough plan of the facility. The value of the buildings and land were determined in consultation with a local quantity surveyor.

i. Perform "stepdown" allocation of indirect costs. Technical details of this procedure are described in Appendix B.

j. Summarize Total Costs (direct and indirect) for each patient service department. Again, a sample table was included in the study design.

3. Data Processing and Preliminary Analysis (October 19-November 5).

a. Identify service output statistics for each department. A checklist of desirable statistics was included in the study design. In implementation, data- gathering for this task began during the data-collection phase, and necessitated working with the statistical section of the Central Ministry (where hospital data are aggregated), as well as with the hospital's Medical Records department (to obtain greater disaggregation of some statistics).

b. Identify controllable/non-controllable costs and variable/fixed costs for each department, for the hospital as a whole and for the MOH as a whole. In implementation, it was possible to ascertain controllable and non-controllable costs at different levels by determining which entities had responsibilities for different components of costs. In the time available, however, it was not possible

to distinguish between fixed and variable costs.

c. Calculate the cost per unit of service for each department in at least three ways: (1) Total Cost per Unit; (2) Controllable Cost per Unit; and (3) Variable Cost per Unit. In implementation, only total average cost per unit was calculated because of the difficulties in distinguishing fixed from variable costs.

d. Identify one high volume diagnostic category -- one (such as childbirth) that accounts for a significant number of admissions -- for detailed utilization review and cost analysis. Select a sample of 30-40 medical records for patients in each category. It was initially envisaged that a modified DRG approach, similar to that used in the Belize City Hospital study, would be implemented. This would have involved identifying average utilization of all hospital services for each category (e.g., bed-days, lab tests, etc.); ascertaining completeness of records with participation of knowledgable physician and nursing personnel; and using unit cost data to calculate average cost for each category. In implementation, however, the poor quality of medical notation in the records made this approach unsatisfactory. The decision was taken to apply the Appropriateness Evaluation Protocol, developed by the Health Care Research Unit at the Boston University School of Medicine, which allows determination of appropriateness of admission and of a selected day of care. Criteria for making these determinations (initially developed in the US) were reviewed with a Consultant Obstetrician at Victoria and modified for local practices in St. Lucia.

e. Develop summary of preliminary findings upon which recommendations would be based.

f. Review preliminary findings with study team members, Working Group, and Steering Committee. Clarify presentation of methodology, findings, emerging policy issues, questions, options for final analysis. The reviews were accomplished during concluding meetings with the Steering Committee and Working Groups, during which the team made a brief presentation. A concluding meeting was also held with the Minister of Health who, at that time, requested a follow-up visit to assist in formulating presentation of health financing and hospital management reforms to Cabinet.

g. Identify and obtain any missing data elements required for further analysis and development of recommendations. A detailed list of missing data elements was developed, and the hospital accountant was designated to obtain these during the week following the team's departure. Data were subsequently transmitted during follow-up telephone calls.

4. Final Analysis and Report Preparation (November 3 to mid-December).

a. SUNY study team reviews study findings with HCF/LAC project director, and determines organization of final report.

b. Senior Scientist and Project Coordinator organize, write, and edit final report with participation of cost accountant.

c. Review final report with Project Director.

d. Project Director transmits final report to St. Lucian officials.

Prior to leaving the Caribbean region, the study team visited the USAID Mission in Barbados and presented preliminary findings. Final work on the step-down allocation was completed in the US, following receipt of the last few missing data elements. Organization and analysis of findings was completed after receipt of the Cost Accountant's report. The preliminary draft report was reviewed by the Project Director, Senior Scientist, and Study Coordinator/Editor in Stony Brook in January, following which the revised draft was prepared and sent to St. Lucia.

At the Minister of Health's request, the Senior Scientist returned to St. Lucia in late February 1988. Key members of the Steering Committee and Working Groups had reviewed the draft report, and their suggested changes and clarifications were discussed in a joint meeting of these two bodies. Additional financial data, not available at the time of fieldwork, were obtained, and discussions were held with the Minister and Permanent Secretary concerning implementation of the report's findings and formulation of a package of reforms for presentation to Cabinet.

In March, 1988, the draft report was reviewed at the annual HCF/LAC workshop, held in Antigua, Guatemala.

APPENDIX B

METHODOLOGY USED FOR VICTORIA HOSPITAL COST ANALYSIS

Five steps were undertaken to identify total costs and unit costs for Victoria Hospital departments.

First, the 1986/87 line item expense report for Victoria Hospital was identified from the Government's annual budget report, Estimates of Saint Lucia 1987/88 (see Table B.1).

Second, twenty-seven departments were identified for purposes of cost allocation and calculation of unit costs. These departments were separated into indirect (overhead) departments, direct service departments, and other departments (see Table B.2).

Third, the line items in the expense report were assigned to the hospital's departments, in order to calculate the direct cost for each department. These figures were adjusted to include costs incurred by the hospital but not reflected in its budget or expense report (e.g., pharmaceuticals, prorated shares of Ministry of Health central administration), and to subtract costs incurred elsewhere but recorded in the hospital's expense report (e.g., time spent by VH maintenance personnel at other hospitals) (see Table B.3).

Fourth, the costs of the indirect departments were allocated to the direct service departments through a "stepdown" procedure, described in detail in Section 4 ("Stepdown Allocation of Indirect Departments' Costs"), below. This procedure is an excellent way of assessing true costs. The allocation of costs by the stepdown method was performed in two ways: first, under the assumption that the hospital's buildings are fully depreciated and thus represent no cost to the hospital, and second, assuming that a new hospital is built, and thus that its buildings and the current market value of the land must be annuitized at full replacement cost.

Fifth, the total (direct + indirect) costs of the hospital's direct service departments were divided by each department's service volume, in order to calculate costs per unit of service.

The following sections describe the tasks involved in each of these steps. Computer rounding accounts for small discrepancies between figures that should be identical.

1. Preparation of the Hospital's Line Item Expense Report. The hospital's annual budget and expense report are currently prepared in line item format and reported in the Government's annual financial report, the Estimates. The figures used for this cost study were the 1986/87 end-of-year actual expenses, reported as "Revised Estimates 1986/87". These figures are presented in Table B.1, which describes the types of expenses included in the report, the expense codes, and the expense figures for 1986/87.

The hospital prepares an annual budget using the eight line items listed in Table B.1, and maintains a ledger to record actual expenses associated with each line item. This ledger is called the hospital "Vote Book".

2. Identification Of Hospital Departments. Twenty-seven individual hospital departments were identified for purposes of cost allocation and calculation of unit costs. The identification of departments was achieved in discussions with hospital managers, nurses, and other employees, and reviewed by the hospital-based Working Group organized for this study. The departments identified are listed in Table B.2, where they are grouped into three categories: indirect departments, direct service departments, and other departments.

Indirect departments, sometimes called overhead departments, are those that support the work of the direct service and other departments. The costs of these departments are separated so that they can be allocated to the direct service departments to find the total costs and unit costs of the latter. The process of "stepping down" or allocating the costs of the indirect departments to the direct service departments is described in step four, below. The indirect departments include standard overhead functions such as Administration and Maintenance, as well as support departments such as Laundry and Medical Records. Pharmacy is listed here because the cost of pharmaceuticals is assigned directly to the direct service departments in step three, below. The Pharmacy, as defined for purposes of cost analysis, therefore does not include the pharmaceuticals themselves, but only the personnel, supplies, etc., used to distribute the pharmaceuticals.

The direct service departments include nursing wards, the operating theatre, ancillary departments, the Casualty department, and clinics. Casualty is grouped with several clinics, including the surgical, ophthalmology, paediatric, gynaecology, dermatology, and ear, nose, and throat clinics, since these share staff, supplies, space, and service volume reporting with Casualty. The medical and psychiatric clinics

are listed separately, since they are housed in a separate location and operate independently from the other clinics.

The Nurses' Home is listed separately since it is primarily involved in training student nurses. Its operations are thus neither directly related to patient care nor primarily used to support patient care activities.

3. Allocation of Line Item Expenses to Departments. Table B.3 includes the allocation of line item expenses among departments. The individual line items appear as columns in this table. The columns represent each of the line items listed in Table B.1, plus other types of costs associated with Victoria Hospital's operations but not included in the hospital's budget. These other types of costs are sometimes listed as separate columns, (e.g., pharmaceuticals), and are sometimes merged with columns that also contain budgeted costs, such as 01 (Personal Emoluments). Where the costs are merged, the total for the column will exceed the total listed for that line item in the Estimates; this is the case, for instance, for 01 (Personal Emoluments), as is shown in the last two rows of Table B.3.

The costs for each line item are assigned to individual departments as appropriate, and the total direct cost for each department is then calculated by summing the portions assigned to that department from each column in Table B.3. The total direct cost is listed for each department in the last column.

Table B.3 includes fourteen columns of line item costs allocated to individual departments. The method used for allocating each column is described below.

The first column includes costs for line item 01 (Personal Emoluments), which is salaried employees. This is by far the largest individual line item, representing 52% of the total cost of the hospital. Costs for all employees in this category except nurses were assigned through review of individual payroll figures with the hospital's chief accountant. The salary for each employee was assigned to the department in which the employee worked during fiscal year 1986/87. For employees who split their time between two or more departments, salaries were allocated based on the portion of time spent in each department. The breakdown of physicians' time between departments was determined through review of physician assignments with the chief of the hospital's medical staff. For physicians who also worked at other hospitals, proportional amounts of their salaries were subtracted from the total Victoria Hospital cost, based on

the amount of time spent at other hospitals.

Costs were added for physicians and other employees who worked at Victoria Hospital but were paid by other hospitals, other ministries, or donors (e.g., the psychiatric consultant). The final allocations of salaries and time were reviewed by both the Hospital's administrator and the Working Group.

For nurses' salaries, which are also included in line item 01 (Personal Emoluments), allocation of salaries was based on a review of the staff assignments logbook for fiscal year 1986/87. A sample of staff assignments for four different weeks, spaced throughout 1986/87, was selected. Staff assignments were identified by department for eight different categories of nursing staff: department sisters, ward sisters, staff nurses, registered nursing assistants, pupil nursing assistants, pupil midwives, third-year nursing students, and fourth-year nursing students. Average staff assignments were calculated for each department, and multiplied by the average salary for each category of nursing staff, to yield the total average nursing staff expense.

Pupil midwives, pupil nursing assistants, and student nurses are paid by a different department in the Ministry of Health (MOH), so their expense is not included in the Victoria Hospital budget. Their expense is included here since they do provide direct paitent care services at the hospital. The added expense for these pupils and students is the major reason the total expense for this column, calculated in Table B.3, exceeds the total included in the Estimates for 01 (Personal Emoluments). The final allocation of nursing staff time and expense was reviewed by the Matron in charge of the nursing staff and by the hospital administrator.

The second column in Table B.3 includes expenses for line item 05 (Travel and Subsistence, plus other types of fringe benefits received by hospital employees but not paid by the hospital). Travel and Subsistence expenses were allocated based on budgeted figures for care allowances. Mileage allowances were allocated evenly between all employees receiving car allowances.

"Other fringe benefits" included gratuities, passage, housing allowances, and telephone allowances provided to physicians. Figures for these fringe benefits were provided by the Personnel Ministry and by the Personnel representative in the Ministry of Health. Gratuities were calculated as 25% of a physician's salary, for those

physicians eligible to receive gratuities. Passage was calculated using average figures based on country of origin. Passage expenses were spread over six years, the typical length of stay for overseas physicians, unless a physician left after a shorter period of time. Housing and telephone allowances were based on average figures.

Two types of fringe benefits could not be quantified: pension benefits for VH staff on the Establishment and free medical care provided to nurses. Pension benefits are funded on the basis of current obligations; no provision is made for future obligations to provide pensions for currently employed individuals. Records were not available on the amount of free medical care provided to nurses.

The third column includes expenses for line item 02 (Wages) -- wages for non-salaried employees. These expenses were allocated through review of payroll records by the hospital's chief accountant. Expenses for each employee were assigned to the department in which that employee worked in fiscal year 1986/87.

The fourth column in Table B.3 includes the fringe benefit provided by the Government for the employees included in line item 02 (Wages). These employees receive National Insurance Scheme (NIS) coverage. Employee contributions of 5 percent of each paycheck are deducted from paychecks, and are matched by the Government. The figures included in this column represent the Government's matching contribution to NIS on behalf of each employee included in line item 02 (Wages). This contribution is not made by the hospital, so the amount included in this column is not included in the hospital's budget or expense report.

The fifth column includes other salaries and wages. This column includes costs reassigned within the MOH, either from other departments to Victoria Hospital, or from Victoria Hospital to other departments. The departments involved include MOH Administation, Maintenance, and Central Medical Stores.

MOH Administration salaries and wages include those that support the operations of Victoria Hospital but are paid out of other accounts within the MOH. These include the Minister of Health, the Permanent Secretary and other policy administration staff, and the Medical Officer of Health and other administrative staff within the Health and Medical Care Division. These salaries were added and then multiplied by 32%, the portion of total MOH expenses accounted for by Victoria Hospital. This figures was then assigned to the Administration Department in Table B.3.

Maintenance salaries are deducted from the Victoria Hospital total to account for time spent by Victoria Hospital maintenance workers on loan to other hospitals. The total subtracted here, $1,304, represents two days per month spent by one maintenance worker during fiscal 1986/87.

The Victoria Hospital portion of the Central Medical Stores salaries and wages was calculated by multiplying the total salaries and wages for Central Medical Stores by 32%, again the portion of total MOH expenses represented by Victoria Hospital.

The sixth column shows the total personnel expenses for each department -- the sum of the first five columns. Personnel expenses represent 69% of the total expenses of the hospital.

The seventh column includes expenses for line item 09 (Office and General Expense). This relatively small amount, $3561, was allocated directly to the Administration department.

The eighth column represents expenses for line items 10 (Supplies) and 14(Tools and Instruments). Examination of individual expense records in the Vote Book indicated that similar types of expenses were being charged to these two line items, so they were merged into one column for purposes of cost analysis.

Two types of supplies expenses were not included in the hospital's records: stationary provided by the Ministry of Finance, and medical records forms provided by the Government Printery. These items account for the difference between the total expenses found in this analysis and the total expenses listed in the Estimates.

The total expenses for this column were allocated between departments in two ways. First, individual entries in the Vote Book were reviewed, to identify all expenses that could be directly assigned to specific departments. Second, expenses for the remaining supplies were allocated based on estimates of monthly usage for each department, developed by ward sisters and department managers. Three departments -- Handymen, the Medical Clinic, and the Psychiatric Clinic -- were estimated to use less than $100 of supplies annually, which was deemed negligible.

The ninth column includes Pharmaceutical expenses, which are not included in the hospital's expense report. The total pharmaceutical expense was estimated through review of

a two month sample of pharmaceutical requisitions for Victoria Hospital provided by Central Medical Stores. Allocation of the total expense between departments was based on estimates of pharmaceutical usage provided by the hospital's Chief Pharmacist. Some pharmaceuticals are donated to the hospital by the International Eye Foundation for use in the Ophthalmology Clinic and Ophthalmology Ward. Records were not available for these donations, however, so this expense could not be quantified.

The tenth column includes expenses for line item 13 (Utilities). These expenses, which include electricity and water, were charged directly to the Maintenance department.

The eleventh column includes expenses for line item 16 (Operating and Maintenance). These expenses, which include fuel and upkeep for the hospital's vehicles, were charged directly to the Administration.

The twelfth column includes expenses for depreciation of capital equipment used by the hospital. These expenses are not included in the hospital's budget or expense report. Capital equipment was defined as items with a purchase cost of greater than EC $500. Capital costs associated with specific departments were annuitized based on the current value of the equipment, and assigned to each department. Capital costs for equipment were annuitized using a cost of capital of 10% and assuming a useful life of ten years. Equipment more than ten years old was assumed to be fully depreciated. Cost information was not available for one type of equipment: the diathermy equipment used in the Operating Theatre.

The thirteenth column shows additional expenses not included in the hospital's budget or report. Included here are telephone costs and costs of major renovations to the hospital's buildings. Telephone costs for VH are paid by the Ministry of Communications and Works, and include both rental of the PBX used at the hospital and charges for individual calls. These expenses were identified through interviews with a representative of the Ministry of Communications and Works, and were charged to the Administration department. Major renovations were defined as those performed by the Ministry of Communications and Works, and were treated as a capital cost for the hospital. These costs were annuitized using a cost of capital of 10% and assuming a useful life of twenty years. Included were renovation of the recovery room, which was allocated to the Operating Theatre, and construction of a generator house, which was allocated to Hospital Stores. Records were not available on the cost of repairs to hospital buildings

performed by the Ministry of Communications and Works in the aftermath of Hurricane Allen.

The last column in Table B.3 includes the total expenses for each department. These figures represent the sum of the thirteen columns of line item expenses for each department.

4. Stepdown Allocation of Indirect Departments' Costs. The cost of the indirect departments was allocated to the direct and other departments in order to calculate the total cost of providing hospital services to patients. Two additional departments are included in the stepdown procedure, which is displayed in Tables B.4 and B.5: Depreciation and Annuitization, and Central Medical Stores (space only). Depreciation and Annuitization is included to illustrate the magnitude of additional costs that will be incurred when the new hospital, currently in the planning stage, is built. These costs are not included in the first version of the stepdown, in Table B.4, but are added to the stepdown in Table B.5.

Central Medical Stores (space only) is included in the stepdown since Central Medical Stores is located on the Victoria Hospital campus. It receives space-related expenses, such as utilities, which must be deducted from the cost of Victoria Hospital in order to isolate the cost of providing hospital services to patients.

The stepdown allocation procedure is first presented in Table B.4, in which the expenses for Depreciation -- Buildings and Land, are set at $0. The indirect departments occupy the top twelve rows of the table, and also occupy each of the twelve column headings. The stepdown procedure begins by allocating all expenses from the first indirect department to the remaining indirect departments and the direct service and other departments. The second indirect department is then allocated in similar fashion, followed by the other indirect departments, until all expenses of indirect departments have been allocated to direct service and other departments.

Since the department which is allocated first does not receive any allocation of expense from the second department, the order in which the departments are allocated can affect the final calculation of costs. In general, to minimize the impact of this decision, the departments providing the highest volume of services to the widest range of other departments (e.g., Administration) are allocated prior to those providing fewer services to fewer departments (e.g., Medical Records).

Mathematical models are available that take into account the interdependency of services provided by indirect departments. However, the added precision of these models was viewed as unnecessary. In addition, these models do not allow the calculations involved in the allocation to be easily viewed, in contrast to the stepdown.

The allocation of indirect costs is performed using allocation statistics. These statistics are factors designed to measure, using the best available data, the proportion of services provided by each indirect department to the other indirect departments and the direct service and other departments. The statistics used to allocate the indirect departments in this study are as follows:

1. Depreciation and Annuitization: For both buildings and land, square feet occupied by each department.

2. Administration: Direct expense per department.

3. Maintenance: Square feet occupied by each department.

4. Domestic: Square feet occupied by each department.

5. Hospital Stores: Supplies expense per department.

6. Pharmacy: Pharmaceutical expense per department.

7. Nursing Administration: Nursing staff per department.

8. Laundry: Patient days per department.

9. Seamstress: Nursing staff per department.

10. Catering/Kitchen: Patient days per department.

11. Medical Records: Adjusted admissions (Admissions for inpatient wards or outpatient visits for outpatient departments, where 3 outpatient visits = 1 inpatient admission).

12. Handymen: Patient days per department.

The stepdown allocation is performed using two columns for each indirect department to be allocated, as illustrated in Tables B.4 and B.5. The first column shows the percentage distribution of the allocation statistic to the indirect departments following the department being allocated in the stepdown order and the percentage distribution to all appropriate direct service and other departments. The second column shows the total expense for

the department (direct expense + any indirect expense allocated) and the distribution of that expense, based on the percentages in the first column.

The indirect departments are allocated in sequence, moving from left to right, until all have been allocated. At that point, all indirect costs have been allocated to direct service and other departments. The last column in Tables B.4 and B.5 shows the total expense (direct + indirect) for these departments.

For Table B.5, the cost of depreciation of buildings and land was added to the stepdown to illustrate the magnitude of the additional costs involved in construction of the new Hospital now being planned. The estimates of square footage for the buildings and for individual departments were prepared by a local carpenter. The estimates of the land area occupied by the hospital and the replacement cost for the buildings and land were prepared by a local architect.

The replacement cost of the buildings was set at EC $130 per square foot. Total square footage was estimated to be 76,921; thus the total replacement cost of the buildings was estimated to be EC $9,999,730. The market cost of the land was set at EC $1.0 million per acre (a figure provided by a local quantity surveyor, Mr. Bradley Paul). The total land area was estimated at 9 acres; thus the total capital cost of the land was estimated to be EC $9,000,000. These costs were annuitized using a 10% cost of capital and a twenty year depreciation period.

5. Calculation of Unit Costs. The final step in the cost analysis involved calculation of unit costs for the major patient service departments. This process is illustrated in Tables B.6 and B.7. In these tables, the total costs from Tables B.4 and B.5 are divided by the total service volume for the major patient service departments to calculate the unit costs of providing those services. Table B.6 includes the unit costs not including the depreciation of buildings and land; thus the cost figures are taken from Table B.4.

Table B.7 shows the unit cost figures with the cost of depreciation of buildings and land included. The cost figures are taken from Table B.5.

Both Tables B.6 and B.7 indicate the types of units used to measure service volume for each department. The actual service volume for 1986/87 is used to calculate the unit costs.

TABLE B.1

VICTORIA HOSPITAL
LINE ITEM EXPENSE REPORT
1986/87

Code	Objectwise Classification	Amount	Percentages
01	Personal Emoluments	$4,055,271	62.9
02	Wages	$631,685	9.8
05	Travel and Subsistence	$99,732	1.5
09	Office and General Expense	$3,561	0.1
10	Supplies and Materials	$1,345,596	20.9
13	Utilities	$209,345	3.2
14	Tools and Instruments	$30,413	0.5
16	Operating and Maintenance Services	$75,467	1.2
	Total	$6,451,130	100.0

TABLE B.2

VICTORIA HOSPITAL
DEPARTMENTS

A. Indirect Departments

1. Administration
2. Maintenance
3. Domestic
4. Hospital Stores
5. Pharmacy
6. Nursing Administration
7. Laundry
8. Seamstress
9. Catering/Kitchen
10. Medical Records
11. Handymen

B. Direct Service Departments

1. Maternity Ward
2. Gynaecology Ward
3. Baron (Private) Wing
4. Medical Wards
5. Surgical Wards
6. Paediatric Ward
7. Ophthalmology Ward
8. Operating Theatre
9. Laboratory
10. Radiology
11. Physiotherapy
12. Mortuary
13. Casualty (with Clinics)
14. Medical Clinic
15. Psychiatric Clinic

C. Other Department

1. Nurses' Home

TABLE B.3 (PART 1)

VICTORIA HOSPITAL: ALLOCATION OF LINE ITEM EXPENSES BY DEPARTMENT

Departments	Expense Item					
	01-Personal Emoluments (1)	05-Travel & Subsistence & Other Fringe Benefits for 01-Personal Emoluments (2)	02-Wages (3)	Fringe Benefits for 02-Weges (4)	Adjustments (5)	Total Personnel (6)
A. Indirect Departments						
1. Administration	$253,818	$10,099	$86,242	$4,312	$91,630	$446,101
2. Maintenance	$57,940		$35,047	$1,752	($1,304)	$93,436
3. Domestic	$93,718		$194,578	$9,729		$298,025
4. Hospital Stores	$17,127		$7,931	$397		$25,455
5. Pharmacy	$61,342	$3,830			$23,701	$88,573
6. Nursing Administration	$106,420	$2,054	$13,608	$680		$122,762
7. Laundry	$52,446		$21,382	$1,069		$74,897
8. Seamstress	$10,833		$7,977	$399		$19,209
9. Catering/Kitchen	$16,254		$49,404	$2,470		$68,128
10. Medical Records	$43,034		$21,573	$1,079		$65,686
11. Handymen	$49,971		$80,065	$4,003		$134,039
B. Nursing Wards						
1. Maternity	$374,771	$28,943				$403,714
2. Gynaecology	$197,286	$28,943				$226,229
3. Baron (Private) Wing	$172,048	$4,764				$176,812
4. Medical Wards	$467,385	$79,845				$547,230
5. Surgical Wards	$443,109	$52,959				$496,068
6. Paediatrics	$265,036	$26,070				$291,106
7. Opthalmology	$143,723	$7,812				$151,535
8. Operating Theatre	$732,938	$177,421	$12,231	$612		$923,202
C. Ancillary Departments						
1. Laboratory	$312,041	$30,116	$2,509	$125		$344,791
2. Radiology	$67,794	$3,830	$4,094	$205		$75,923
3. Physiotherapy	$41,265					$41,265
4. Mortuary	$17,696	$18,590	$4,029	$201		$40,516
D. Outpatient Clinics						
1. Casualty (with Clinics)	$383,030	$135,710				$518,740
2. Medical Clinic	$9,706	$4,990				$14,696
3. Psychiatric Clinic	$6,932	$3,494				$10,426
E. Other Department						
1. Nurses Home	$19,034		$81,554	$4,078		$104,666
Totals 86/87	$4,416,396	$619,470	$622,224	$31,111	$114,028	$5,803,229
Totals in Estimates	$4,055,271	$99,792	$631,685	$0	$0	$4,786,748

TABLE B.3 (PART 2)

VICTORIA HOSPITAL: ALLOCATION OF LINE ITEM EXPENSES BY DEPARTMENT

Departments	Expense Item							
	09-Office & General (7)	10-Supplies & 14-Tools and Instruments (8)	Pharma-ceuticals (9)	13-Utilities (10)	16-Operating and Maintenance (11)	Equipment (12)	Adjustments (13)	Total (14)
A. Indirect Departments								
1. Administration	$3,561	$55,684			$75,467	$16,710	$99,408	$696,931
2. Maintenance		$73,841		$209,345				$376,622
3. Domestic		$1,749						$293,774
4. Hospital Stores		$233				$6,905	$967	$33,560
5. Pharmacy		$729				$689		$89,991
6. Nursing Administration		$811				$665		$124,238
7. Laundry		$66,879						$141,776
8. Seamstress		$118,916				$1,049		$139,174
9. Catering/Kitchen		$293,599				$2,060		$363,787
10. Medical Records		$5,549						$71,235
11. Handymen						$217		$124,256
B. Nursing Wards								
1. Maternity		$78,771	$109,759			$4,267		$596,511
2. Gynaecology		$22,953	$74,480					$323,662
3. Baron (Private) Wing		$12,312	$27,295			$537		$216,956
4. Medical Wards		$64,021	$124,374			$2,667		$738,291
5. Surgical Wards		$55,404	$107,631					$659,103
6. Paediatrics		$14,630	$62,095			$889		$368,720
7. Opthalmology		$12,312	$27,295			$2,065		$193,207
8. Operating Theatre		$184,148	$60,731			$10,791	$2,324	$1,181,195
C. Ancillary Departments								
1. Laboratory		$139,318				$5,721		$489,830
2. Radiology		$140,727				$98,382		$315,032
3. Physiotherapy		$979						$42,244
4. Mortuary		$1,561						$42,077
D. Outpatient Clinics								
1. Casualty (with Clinics)		$12,052	$85,071			$6,147		$622,010
2. Medical Clinic			$3,282					$17,978
3. Psychiatric Clinic			$355					$10,781
E. Other Department								
1. Nurses Home		$53,802				$1,279		$159,747
Totals 86/87	$3,561	$1,410,980	$682,367	$209,345	$75,467	$161,040	$102,699	$8,448,688
Totals in Estimates	$3,561	$1,376,009	$0	$209,345	$75,467	$0	$0	$6,451,130

TABLE B.4 (PART 1)

VICTORIA HOSPITAL: STEPDOWN ALLOCATION - WITHOUT DEPRECIATION OF BUILDINGS AND ANNUITIZATION OF CAPITAL COSTS OF LAND

Departments	Direct Expense	Deprec.& Annuitization		Administration		Maintenance	
		Allocation Statistic	Allocation of Expense	Allocation Statistic	Allocation of Expense	Allocation Statistic	Allocation of Expense
		Square Feet		Direct Expense		Square Feet	
Indirect Departments							
Depreciation and annuitization *	$0	100.0%	$0				
Administration	$696,931	13.0%	$0	100.0%	$696,931		
Maintenance	$376,622	1.2%	$0	4.9%	$34,104	100.0%	$410,726
Domestic	$299,774	0.1%	$0	3.9%	$27,145	0.2%	$684
Hospital Stores	$33,560	1.0%	$0	0.4%	$2,991	1.2%	$4,883
Pharmacy	$89,991	0.3%	$0	1.2%	$8,264	1.1%	$4,510
Nursing Administration	$124,238	1.1%	$0	1.6%	$11,190	1.2%	$5,132
Laundry	$141,776	5.3%	$0	1.8%	$12,638	6.1%	$25,151
Seamstress	$139,174	0.2%	$0	1.8%	$12,603	0.2%	$1,002
Catering/Kitchen	$363,787	1.1%	$0	4.7%	$32,941	1.3%	$5,381
Medical Records	$71,235	1.7%	$0	0.9%	$6,450	1.9%	$7,926
Handymen	$134,256			1.7%	$11,737		
Direct Service Departments							
Maternity Ward	$596,511	4.0%	$0	7.8%	$54,015	4.7%	$19,335
Gynaecology Ward	$323,662	2.3%	$0	4.2%	$29,308	2.6%	$10,868
Baron (Private) Wing	$216,956	4.1%	$0	2.8%	$19,597	4.8%	$19,789
Medical Wards	$738,291	9.6%	$0	9.6%	$66,853	11.2%	$45,823
Surgical Wards	$659,103	6.1%	$0	8.6%	$59,683	7.1%	$29,064
Paediatric Ward	$368,720	5.2%	$0	4.8%	$33,793	6.0%	$24,654
Ophthalmology Ward	$193,207	2.2%	$0	2.5%	$17,495	2.5%	$10,308
Operating Theatre	$1,181,195	6.8%	$0	15.2%	$106,748	7.9%	$32,473
Laboratory	$489,830	2.1%	$0	6.4%	$44,355	2.4%	$10,003
Radiology	$315,032	2.4%	$0	4.1%	$28,527	2.8%	$11,384
Physiotherapy	$42,244	0.7%	$0	0.5%	$3,625	0.8%	$3,434
Mortuary	$42,077	0.7%	$0	0.5%	$3,810	0.8%	$3,303
Casualty (with clinics)	$622,010	4.7%	$0	8.1%	$56,324	5.4%	$22,364
Medical Clinic	$17,978	0.5%	$0	0.2%	$1,632	0.5%	$2,221
Psychiatric Clinic	$10,781	0.2%	$0	0.1%	$976	0.3%	$1,107
Other Departments							
Nurses' Home	$159,747	17.5%	$0	1.4%	$9,478	20.4%	$83,697
Central Medical Stores (space only)		5.5%	$0			6.4%	$26,228
Totals	$8,448,688		$0		$1,393,862		$821,451

* - Depreciation of buildings and annuitization of capital costs of land.

TABLE B.4 (PART 3)

VICTORIA HOSPITAL: STEPDOWN ALLOCATION - WITHOUT DEPRECIATION OF BUILDINGS AND ANNUITIZATION OF CAPITAL COSTS OF LAND

Departments	Nursing Administration		Laundry		Seamstress	
	Allocation Statistic: Nursing Staff	Allocation of Expense	Allocation Statistic: Patient Days	Allocation of Expense	Allocation Statistic: Nurse Staffing	Allocation of Expense
Indirect Departments						
Depreciation and annuitization *						
Administration						
Maintenance						
Domestic						
Hospital Stores						
Pharmacy						
Nursing Administration	100.0%	$144,689				
Laundry			100.0%	$202,218		
Seamstress					100.0%	$157,770
Catering Kitchen						
Medical Records						
Handymen						
Direct Service Departments						
Maternity Ward	13.9%	$20,066	17.2%	$34,856	13.9%	$21,881
Gynaecology Ward	6.6%	$9,505	11.0%	$22,240	6.6%	$10,364
Baron (Private) Wing	7.3%	$10,561	5.5%	$11,122	7.3%	$11,516
Medical Wards	16.5%	$23,895	24.9%	$50,267	16.5%	$26,055
Surgical Wards	16.8%	$24,291	22.6%	$45,738	16.8%	$26,487
Paediatric Ward	10.2%	$14,786	15.3%	$30,896	10.2%	$16,123
Opnthalmology Ward	6.6%	$9,505	3.5%	$7,098	6.6%	$10,364
Operating Theatre	13.1%	$19,010			13.1%	$20,729
Laboratory						
Radiology						
Physiotherapy						
Mortuary						
Casualty (with clinics)	8.8%	$12,673			8.8%	$13,819
Medical Clinic	0.2%	$264			0.2%	$288
Psychiatric Clinic	0.1%	$132			0.1%	$144
Other Departments						
Nurses' Home						
Central Medical Stores (space only)						
Totals		$289,378		$404,435		$315,541

* - Depreciation of buildings and annuitization of capital costs of land.

TABLE B.4 (PART 4)

VICTORIA HOSPITAL: STEPDOWN ALLOCATION - WITHOUT DEPRECIATION OF BUILDINGS AND ANNUITIZATION OF CAPITAL COSTS OF LAND

Departments	Catering/Kitchen		Medical Records		Handymen		Total
	Allocation Statistic: Patient Days	Allocation of Expense	Allocation Statistic: Adjusted Admissions	Allocation of Expense	Allocation Statistic: Patient Days	Allocation of Expense	
Indirect Departments							
Depreciation and annuitization *							
Administration							
Maintenance							
Domestic							
Hospital Stores							
Pharmacy							
Nursing Administration							
Laundry							
Seamstress							
Catering/Kitchen	100.0%	$416,759					
Medical Records			100.0%	$92,139			
Handymen					100.0%	$146,393	
Direct Service Departments							
Maternity Ward	17.2%	$71,837	12.7%	$11,673	17.2%	$25,234	$890,728
Gynaecology Ward	11.0%	$45,836	4.7%	$4,314	11.0%	$16,101	$493,251
Baron (Private) Wing	5.5%	$22,921	1.4%	$1,269	5.5%	$8,052	$342,279
Medical Wards	24.9%	$103,598	5.5%	$5,027	24.9%	$36,391	$1,154,441
Surgical Wards	22.6%	$94,264	6.6%	$6,103	22.6%	$33,112	$1,019,783
Paediatric Ward	15.3%	$63,675	8.7%	$8,003	15.3%	$22,367	$613,088
Ophthalmology Ward	3.5%	$14,628	1.4%	$1,260	3.5%	$5,138	$281,925
Operating Theatre							$1,402,052
Laboratory							$557,092
Radiology							$369,000
Physiotherapy							$52,281
Mortuary							$51,885
Casualty (with clinics)			56.7%	$52,205			$810,939
Medical Clinic			2.2%	$2,050			$26,720
Psychiatric Clinic			0.3%	$235			$14,315
Other Departments							
Nurses' Home							$321,688
Central Medical Stores (space only)							$47,182
Totals		$833,518		$164,277		$292,787	$8,448,688

* - Depreciation of buildings and annuitization of capital costs of land.

TABLE B.5 (PART 1)

VICTORIA HOSPITAL: STEPDOWN ALLOCATION - WITH DEPRECIATION OF BUILDINGS AND ANNUITIZATION OF CAPITAL COSTS OF LAND

Departments	Direct Expense	Deprec.& Annuitization		Administration		Maintenance	
		Allocation Statistic		Allocation Statistic		Allocation Statistic	
		Square Feet	Allocation of Expense	Direct Expense	Allocation of Expense	Square Feet	Allocation of Expense
Indirect Departments							
Depreciation and annuitization *	$2,231,586	100.0%	$2,231,586				
Administration	$696,931	13.0%	$289,882	100.0%	$986,813		
Maintenance	$376,672	1.2%	$26,264	4.9%	$48,289	100.0%	$451,195
Domestic	$299,774	0.1%	$3,191	3.9%	$38,436	0.2%	$752
Hospital Stores	$33,560	1.0%	$22,774	0.4%	$4,179	1.2%	$5,365
Pharmacy	$89,991	0.9%	$21,233	1.2%	$11,545	1.1%	$4,955
Nursing Administration	$124,238	1.1%	$23,934	1.6%	$15,844	1.2%	$5,638
Laundry	$141,776	5.3%	$117,293	1.8%	$18,178	6.1%	$27,629
Seamstress	$139,174	0.2%	$4,671	1.8%	$17,844	0.2%	$1,100
Catering/Kitchen	$362,787	1.1%	$25,295	4.7%	$46,643	1.3%	$5,911
Medical Records	$71,235	1.7%	$36,961	0.9%	$9,133	1.9%	$8,706
Handymen	$134,256			1.7%	$17,188		
Direct Service Departments							
Maternity Ward	$596,511	4.0%	$90,167	7.8%	$76,482	4.7%	$21,240
Gynaecology Ward	$323,662	2.3%	$50,683	4.2%	$41,498	2.6%	$11,939
Baron (Private) Wing	$216,956	4.1%	$92,285	2.8%	$27,748	4.8%	$21,739
Medical Wards	$738,291	9.6%	$213,698	9.6%	$94,660	11.2%	$50,339
Surgical Wards	$659,103	6.1%	$135,541	6.6%	$64,507	7.1%	$31,928
Paediatric Ward	$368,720	5.2%	$114,372	4.8%	$47,848	6.0%	$27,083
Opnthalmology Ward	$193,207	2.2%	$48,072	2.5%	$24,772	2.5%	$11,324
Operating Theatre	$1,181,195	6.4%	$141,440	15.3%	$151,149	7.9%	$35,673
Laboratory	$499,830	2.1%	$46,650	6.4%	$62,804	2.4%	$10,989
Radiology	$315,032	2.4%	$53,091	4.1%	$40,392	2.8%	$12,506
Physiotherapy	$42,244	0.7%	$16,014	0.5%	$5,416	0.8%	$3,772
Mortuary	$42,077	0.7%	$15,405	0.5%	$5,395	0.8%	$3,629
Casualty (with clinics)	$622,010	4.7%	$104,796	8.1%	$79,751	5.4%	$24,568
Medical Clinic	$17,978	0.5%	$10,357	0.2%	$2,311	0.5%	$2,440
Psychiatric Clinic	$10,781	0.2%	$5,164	0.1%	$1,382	0.3%	$1,216
Other Departments							
Nurses' Home	$159,747	17.5%	$390,319	1.4%	$13,420	20.4%	$91,943
Central Medical Stores (space only)		5.5%	$122,312			6.4%	$28,812
Totals	$10,680,274		$4,463,172		$1,973,626		$902,390

* - Depreciation of buildings and annuitization of capital costs of land.

TABLE B.5 (PART 2)

VICTORIA HOSPITAL: STEPDOWN ALLOCATION - WITH DEPRECIATION OF BUILDINGS AND ANNUITIZATION OF CAPITAL COSTS OF LAND

Departments	Domestic		Hospital Stores		Pharmacy	
	Allocation Statistic: Square Feet	Allocation of Expense	Allocation Statistic: Supplies Expense	Allocation of Expense	Allocation Statistic: Pharm. Expense	Allocation of Expense
Indirect Departments						
Depreciation and annuitization *						
Administration						
Maintenance						
Domestic	100.0%	$342,153				
Hospital Stores	1.2%	$4,075	100.0%	$69,952		
Pharmacy	1.1%	$3,763	0.1%	$40	100.0%	$131,327
Nursing Administration	1.3%	$4,283	0.1%	$44		
Laundry	6.1%	$20,987	5.2%	$3,641		
Seamstress	0.2%	$836	9.3%	$6,474		
Catering/Kitchen	1.3%	$4,490	22.9%	$15,984		
Medical Records	1.9%	$6,613	0.4%	$302		
Handymen						
Direct Service Departments						
Maternity Ward	4.7%	$16,134	6.1%	$4,289	16.1%	$21,124
Gynaecology Ward	2.7%	$9,069	1.8%	$1,250	10.9%	$14,334
Baron (Private) Wing	4.8%	$16,512	1.0%	$670	4.0%	$5,253
Medical Wards	11.2%	$38,237	5.0%	$3,485	18.2%	$23,937
Surgical Wards	7.1%	$24,252	4.3%	$3,016	15.8%	$20,714
Paediatric Ward	6.0%	$20,572	1.6%	$1,088	9.1%	$11,951
Ophthalmology Ward	2.5%	$8,601	1.0%	$670	4.0%	$5,253
Operating Theatre	7.9%	$27,097	14.3%	$10,026	8.9%	$11,688
Laboratory	2.4%	$8,347	10.8%	$7,585		
Radiology	2.8%	$9,499	11.0%	$7,662		
Physiotherapy	0.8%	$2,865	0.1%	$53		
Mortuary	0.8%	$2,756	0.1%	$85		
Casualty (With clinics)	5.5%	$18,662	0.9%	$656	12.5%	$16,373
Medical Clinic	0.5%	$1,853	0.0%	$3	0.5%	$632
Psychiatric Clinic	0.3%	$924			0.1%	$68
Other Departments						
Nurses' Home	20.4%	$69,839	4.2%	$2,929		
Central Medical Stores (space only)	6.4%	$21,885				
Totals		$684,305		$139,905		$262,654

* - Depreciation of buildings and annuitization of capital costs of land.

TABLE 5.5 (PART 3)

VICTORIA HOSPITAL: STEPDOWN ALLOCATION - WITH DEPRECIATION OF BUILDINGS AND ANNUITIZATION OF CAPITAL COSTS OF LAND

Departments	Nursing Administration		Laundry		Seamstress	
	Allocation Statistic: Nursing Staff	Allocation of Expense	Allocation Statistic: Patient Days	Allocation of Expense	Allocation Statistic: Nurse Staffing	Allocation of Expense
Indirect Departments						
Depreciation and annuitization *						
Administration						
Maintenance						
Domestic						
Hospital Stores						
Pharmacy						
Nursing Administration	100.0%	$173,981				
Laundry			100.0%	$329,505		
Seamstress					100.0%	$170,099
Catering/Kitchen						
Medical Records						
Handymen						
Direct Service Departments						
Maternity Ward	13.9%	$24,129	17.2%	$56,797	13.9%	$23,590
Gynaecology Ward	6.6%	$11,429	11.0%	$36,239	6.6%	$11,174
Baron (Private) Wing	7.3%	$12,699	5.5%	$18,123	7.3%	$12,416
Medical Wards	16.5%	$28,732	24.9%	$81,908	16.5%	$28,091
Surgical Wards	16.8%	$29,208	22.6%	$74,528	16.9%	$28,557
Paediatric Ward	10.2%	$17,779	15.3%	$50,344	10.2%	$17,382
Ophthalmology Ward	6.6%	$11,429	3.5%	$11,566	6.6%	$11,174
Operating Theatre	13.1%	$22,859			13.1%	$22,349
Laboratory						
Radiology						
Physiotherapy						
Mortuary						
Casualty (with clinics)	8.8%	$15,239			8.8%	$14,899
Medical Clinic	0.2%	$317			0.2%	$310
Psychiatric Clinic	0.1%	$159			0.1%	$155
Other Departments						
Nurses' Home						
Central Medical Stores (space only)						
Totals		$347,962		$659,009		$340,198

* - Depreciation of buildings and annuitization of capital costs of land.

TABLE B.5 (PART 4)

VICTORIA HOSPITAL: STEPDOWN ALLOCATION - WITH DEPRECIATION OF BUILDINGS AND ANNUITIZATION OF CAPITAL COSTS OF LAND

Departments	Catering/Kitchen		Medical Records		Handymen		
	Allocation Statistic: Patient Days	Allocation of Expense	Allocation Statistic: Adjusted Admissions	Allocation of Expense	Allocation Statistic: Patient Days	Allocation of Expense	Total
Indirect Departments							
Depreciation and annuitization *							
Administration							
Maintenance							
Domestic							
Hospital Stores							
Pharmacy							
Nursing Administration							
Laundry							
Seamstress							
Catering/Kitchen	100.0%	$461,911					
Medical Records			100.0%	$132,951			
Handymen					100.0%	$151,442	
Direct Service Departments							
Maternity Ward	17.2%	$79,620	12.7%	$16,843	17.2%	$26,104	$1,053,030
Gynaecology Ward	11.0%	$50,802	4.7%	$6,225	11.0%	$16,656	$584,960
Baron (Private) Wing	5.5%	$25,405	1.4%	$1,832	5.5%	$8,329	$459,968
Medical Wards	24.9%	$114,822	5.5%	$7,254	24.9%	$37,645	$1,461,100
Surgical Wards	22.6%	$104,476	6.6%	$8,807	22.6%	$34,253	$1,238,892
Paediatric Ward	15.3%	$70,573	8.7%	$11,547	15.3%	$23,138	$787,998
Ophthalmology Ward	3.5%	$16,213	1.4%	$1,818	3.5%	$5,316	$349,416
Operating Theatre							$1,613,475
Laboratory							$626,205
Radiology							$438,182
Physiotherapy							$70,366
Mortuary							$69,347
Casualty (with clinics)			56.7%	$75,328			$971,782
Medical Clinic			2.2%	$2,958			$39,159
Psychiatric Clinic			0.3%	$338			$20,188
Other Departments							
Nurses' Home							$728,198
Central Medical Stores (space only)							$173,009
Totals		$923,822		$265,901		$302,884	$10,680,274

* - Depreciation of buildings and annuitization of capital costs of land.

TABLE B.6

VICTORIA HOSPITAL
UNIT COST ANALYSIS -- WITHOUT DEPRECIATION OF BUILDINGS AND ANNUITIZATION OF CAPITAL COSTS OF LAND

Department	Total Cost	Service Volume	Type of Unit	Total Cost/Unit
Maternity Ward	$890,728	9,866	Patient-Days	$90
Gynaecology Ward	$493,291	6,295	Patient-Days	$78
Baron (Private) Wing	$342,279	3,148	Patient-Days	$109
Medical Wards	$1,154,441	14,228	Patient-Days	$81
Surgical Wards	$1,019,783	12,946	Patient-Days	$79
Paediatric Ward	$613,088	8,745	Patient-Days	$70
Ophthalmology Ward	$281,925	2,009	Patient-Days	$140
Operating Theatre	$1,402,052	2,642	Operations	$531
Laboratory	$557,092	60,823	Tests	$9
Radiology	$369,000	8,964	X-Rays	$41
Physiotherapy	$52,281	5,561	Treatments	$9
Casualty (with clinics)	$810,939	34,052	Visits	$24
Medical Clinic	$26,720	1,327	Visits	$20

TABLE B.7

VICTORIA HOSPITAL
UNIT COST ANALYSIS -- WITH DEPRECIATION OF BUILDINGS AND
ANNUITIZATION OF CAPITAL COSTS OF LAND

Department	Total Cost	Service Volume	Type of Unit	Total Cost/Unit
Maternity Ward	$1,053,030	9,866	Patient-Days	$107
Gynaecology Ward	$584,960	6,295	Patient-Days	$93
Baron (Private) Wing	$459,968	3,148	Patient-Days	$146
Medical Wards	$1,461,100	14,228	Patient-Days	$103
Surgical Wards	$1,238,892	12,946	Patient-Days	$96
Paediatric Ward	$782,998	8,745	Patient-Days	$90
Ophthalmology Ward	$349,416	2,009	Patient-Days	$174
Operating Theatre	$1,613,475	2,642	Operations	$611
Laboratory	$626,205	60,823	Tests	$10
Radiology	$438,182	8,964	X-Rays	$49
Physiotherapy	$70,366	5,561	Treatments	$13
Casualty (with clinics)	$971,782	34,052	Visits	$29
Medical Clinic	$39,159	1,327	Visits	$30

APPENDIX C

ANALYSIS OF THE APPROPRIATENESS OF OBSTETRICAL CASES AT VICTORIA HOSPITAL

Lillian L. Tarr, R.N., M.B.A.

A. Study Objectives

This report contains results of the Obstetrical Appropriateness Evaluation Protocol (OB AEP) review conducted on 50 obstetrical cases from Victoria Hospital. The OB AEP, an objective instrument to assess appropriateness of hospital use, was applied to a sample of patients discharged from the Victoria Hospital obstetrical service between January 1986 and October 1986. The objective of this study was to provide, as accurately as possible, an assessment of appropriateness of utilization of the VH obstetrical service. The sub-objectives of the study were:

1. to estimate the total percentage of inappropriate obstetrical admissions;

2. to estimate the total percentage of inappropriate obstetrical patient days;

3. to estimate the percentage of inappropriate complicated and uncomplicated obstetrical admissions;

4. to estimate the percentage of inappropriate complicated and uncomplicated obstetrical patient days;

5. to determine factors causing inappropriate admissions and patient days; and

6. to suggest improvements to the medical records in order to improve the quality of a utilization review program or study.

B. Source of Comparative Rates

The comparative results were obtained as part of AEP studies conducted in participating hospitals under the direction of the Boston University Health Care Research Unit. AEP reviews were performed by the utilization review coordinators at each participating hospital on adult medical/surgical cases. Although these were not obstetrical

cases, it is felt that the inappropriateness range for any type of case should fall within the same acceptable percentages.

C. Results

1. Admissions. Table C.1 presents information on the numbers of total obstetrical admissions, complicated and uncomplicated obstetrical admissions and the rates of inappropriate admissions for these cases. Complicated obstetrical admissions included Caesarean Sections, Normal Vaginal Deliveries with Tubal Ligation, Preeclampsia, and Stillbirths. Uncomplicated cases included all other Normal Spontaneous Vaginal Deliveries (NSVD).

Overall, 14 percent of the obstetrical admissions were inappropriate based on objective criteria. A much higher proportion of complicated cases (20 percent) were deemed inappropriate, vs. an inappropriate rate of 8 percent for uncomplicated cases.

In the comparison hospitals, the rate of inappropriate adult admissions was 10.3 percent. The reasons for inappropriateness were difficult to assess because of the poor quality of the medical charts. However, the reasons appear to fall into two categories: (1) premature admissions, or (2) any treatment could have been rendered on an outpatient basis.

2. Days of Care. Table C.2 presents similar information in the days of care reviewed. The rates for all patients were also based on objective criteria using the OB AEP. The inappropriate rate for all days of care reviewed was 20 percent. Again a higher proportion of the complicated cases reviewed were deemed inappropriate (33 percent) vs. an inappropriate rate of 4 percent for uncomplicated cases for day of care reviews.

In comparison, the adult services at comparison hospitals had an inappropriateness rate of 13.8 percent. As with the admission reviews, the reason for inappropriateness was also difficult to determine. However, it appears that these reasons fall into two categories: (1) no further care at any level is needed or (2) plan of treatment is not documented in the chart.

D. Conclusions

The objective rates of uncomplicated (8 percent) inappropriate admissions at Victoria Hospital are somewhat lower than at the comparison hospitals. However, the rate of inappropriate complicated admissions is much higher (20 percent), as is the inappropriate rate for total admissions

(14 percent). The rate of inappropriate days at Victoria Hospital for uncomplicated cases was far below the rate at the comparison hospitals (4 percent vs. 13.8 percent). However, the rate of inappropriateness for total and complicated days was much higher (20 percent and 33 percent respectively).

The Office of Health Policy of the Commonwealth of Massachusetts has established the following guidelines for judging the level of efficiency in hospital. An inappropriateness of 0-10 percent of days is considered acceptable; a rate of 11-20 percent is considered marginal; and a rate of 21 percent and higher is considered unacceptable.

Although these guidelines are from the United States, these rates have been used in other countries such as Portugal. These rates have also been set to include all services including pediatric cases.

E. Recommendations to Improve Medical Records

What follows are suggestions to improve the quality of medical records at Victoria Hospital in order to perform accurate utilization review.

1. Include a patient's prenatal sheet (if any).

2. Include a patient's history and physical (in order to determine the patient's baseline status).

3. Include a complete doctor's order sheet (except for a printed order sheet for Pitocin drip and occasional medication orders, no order sheets were found).

4. Include a labor flow sheet.

5. Improve and include doctor's progress notes and nurse's notes.

6. Exclude newborn record from mother's record.

7. Include physician's name or code number in order to perform physician specific analysis.

8. To alleviate these problems, printed standard sheets might be used, i.e., delivery sheets, order sheets and labor sheets. This would not only improve the quality of the medical records but would also standardize the chart, improve documentation, and decrease the time needed to write in the chart.

9. Add discharge diagnosis.

Table C.1

Admissions Analysis

	Total Cases % (no.)	Uncomplicated Cases % (no.)	Complicated Cases % (no.)
No. of cases reviewed	100% (50)	50% (25)	50% (25)
Inappropriateness Rates	14% (7)	8% (2)	20% (5)

Table C.2

Days of Care Analysis

	Total Days % (no.)	Uncomplicated Days % (no.)	Complicated Days % (no.)
No. of days reviewed	100% (55)	45% (25)	55% (30)
Inappropriateness Rates	20% (11)	4% (1)	33% (10)

APPENDIX D

ASSUMPTIONS FOR CALCULATION OF POTENTIAL REVENUE
IF ALL PATIENTS AT VICTORIA HOSPITAL HAD PAID FOR
SERVICES ACTUALLY RECEIVED FROM APRIL 1986
THROUGH MARCH 1987 AT EXISTING FEE SCHEDULES
(MAJOR REVENUE CATEGORIES ONLY)

REVENUE CATEGORY: MEDICAL FEES.

Medical fee revenues comprise fees received from visits to consultant physician clinics and to casualty officers. Medical Records service statistics report monthly and annual total numbers of visits to "Casualty" [outpatient department], which also comprises visits to consultant physicians and to casualty officers. The average distribution of visits between these two types of doctors was estimated by calculating the total number of visits to consultant physicians in October 1987 (N=1050). The total number of visits to "Casualty" for October 1987 was obtained from Medical Records (N=2932). By subtraction, the total number of visits to casualty officers in this month was obtained (N=1847). In summary, 37% of "Casualty" [or OPD] visits were to consultant physicians; 63% were to casualty officers.

Next, this distribution of visits was applied to the actual total number of visits to "Casualty" in fiscal year 1986/87 (N=34,052). The results were an estimated 12,599 visits to consultants and 21,453 visits to casualty officers. Based on the current official fee schedule in Hospitals (Amendment) Regulations, 1985, No. 56, as applied to these volumes of services, potential revenues were calculated as follows:

	# Visits	x	Fee	=	Total
Fees from visits to consultant physicians:	12,599		$25		$314,975
Fees from visits to casualty officers:	21,453		$10		$214,530
TOTAL POTENTIAL MEDICAL FEE REVENUES:					$529,505

REVENUE CATEGORY: HOSPITAL FEES

Revenues from hospital fees include fees derived from laboratory tests; accomodation (bed charges); X-ray procedures; services of consultant surgeons and those of anaesthetists attending at operations; and physiotheraphy treatments. Calculation of potential revenues from each of these sources was as follows:

(A) LABORATORY TESTS:

An average fee per test was calculated arithmetically from the offical fee schedule. To avoid overestimation of the average fee, four types of tests were excluded, all with fees over $20: tests done in Jamaica; those done in Barbados; urine titration of human chronic gonadotropin; and life insurance exams. Total number of lab tests conducted in fiscal year 1986/87 was obtained from laboratory records. Potential revenues were calculated as follows:

	# Tests	x	Fee	=	Total
TOTAL POTENTIAL LABORATORY TEST REVENUES :	60,823		$9.85		$599,107

(B) ACCOMMODATION:

Although the fee schedule provides for four different types of accommodation (each at a different fee), Victoria Hospital in fact has only two. The Baron (Private) Wing has 9 single rooms and 1 two-person room; for purposes of this analysis, all 10 rooms were considered to be payable at the single room rate of $75.00 per day. The remaining 201 beds are considered ward accommodation, payable at $15.00 per day.

Service statistics on the number of patient days for each type of bed were obtained from regular medical records reports for fiscal year 1986/87. Calculation of potential revenues was as follows:

	# Pt. Days	x	Fee	=	Total
Fees from Baron (Private) Wing:	3148		$75		$236,100
Fees from all other beds:	54,089		$15		$811,335
TOTAL POTENTIAL ACCOMMODATION REVENUES:					$1,047,435

(C) X-RAY:

It is assumed that 75% of all x-ray exams are straightforward large films (at $20 each) or mini films (at $10 each), or an average of $15 per film. The remaining 25% of x-ray exams were assumed to be a mix of more expensive procedures, at an average of $50 per exam. According to medical records, the total number of x-rays in 1986/87 was 8964. The calculation of potential revenues was as follows:

	# Exams	x	Fee	=	Total
Fees from large and mini films (75% of total):	6723		$15		$100,845
Fees from more expensive exams (25% oftotal):	2241		$50		$112,050
TOTAL POTENTIAL X-RAY REVENUES:					$212,895

(D) CONSULTANT SURGEONS:

The official fee schedule assigns three different fees payable for the serives of consultant surgeons, depending upon the complexity of the operation performed. Data as to the numbers of each type of operation performed in 1986/87 were taken from regular medical records. The calculations of potential revenues were as follows:

	# Operats.	x	Fee	=	Total
Fees from Major Operations:	741		$400		$296,400
Fees from Intermediate Operations:	812		$150		$121,800
Fees from Minor Operations:	1089		$50		$54.450
TOTAL POTENTIAL CONSULTANT SURGEONS FEES:					$472,650

(E) ANAESTHETISTS:

As with Consultant Surgeons, the fee schedule assigns three different fees for services of anaesthetists, again depending upon the level of complexity of the operation. Using the same data on number of operations, the calculation of potential revenues is as follows:

	# Operats.	x Fee	= Total
Fees from Major Operations:	741	$150	$111,150
Fees from Intermediate Operations:	812	$100	$81,200
Fees from Minor Operations:	1089	$50	$54,450
TOTAL POTENTIAL ANAESTHETISTS FEES:			$246,800

(F) PHYSIOTHERAPHY TREATMENTS:

The fee schedule specifies two different fees for physiotherapy treatments: $10 for simple treatments and $75 for compound or multiple treatments. Medical records do not record treatments by this breakdown, but rather by whether they were conducted on an inpatient or an outpatient basis. Accordingly, for purposes of this analysis, it was assumed that outpatient treatments were single and inpatient treatments complex. Records from 1986/87 show 5561 total treatments; detail on the number of inpatient and outpatient treatments are shown for only 6 months, however. Accordingly, the percentage distribution of these two types of treatment (67% out, 33 % in) were applied to the annual total to obtain annual estimates for each category. Calculation of potential revenues was as follows:

	# Treats.	x Fee	= Total
Fees from single treatments:	3726	$10	$37,260
Fees from multiple/complex treatments:	1835	$75	$137,625
TOTAL POTENTIAL PHYSIOTHERAPHY FEES			$174,885

REVENUE CATEGORY: CONFINEMENT FEES

Revenue from confinement fees comprises charges for delivery room, for the services of the consultant OB/GYN when in attendance during labour and delivery (so-called "booked cases"), and doctors' fees for Caesarian sections. Medical records for 1986/87 provide data on total number of deliveries and Caesarian sections (as well as on numbers of notable types of deliveries). The hospital administrator estimates that 90% of all deliveries qualify as "booked cases" and this proportion was used in calculating this component of potential revenue from this source. Calculations are as follows:

	# Delivs.	x	Fee	=	Total
Fees from delivery room charges (all deliveries):	2289		$25		$57,225
Fees from "booked cases (90% of all deliveries):	2060		$200		$412,000
Fees from Caesarian sections:	129		$500		$64,500
TOTAL POTENTIAL CONFINEMENT FEES:					$533,725

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