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COST ANALYSIS OF SERVICES AT VICTORIA HOSPITAL, ST. LUCIA

April 2012

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ACRONYMS

A&E	Accidents and Emergency Unit
ALOS	Average Length of Stay
ARV	Antiretroviral Drug
CSSD	Central Sterilization Supply Department
EC$	Eastern Caribbean Dollar
FTE	Full-time Equivalent
GDP	Gross Domestic Product
ICU	Intensive Care Unit
MOH	Ministry of Health
MOPS	Ministry of Public Service
NIC	National Insurance Corporation
NNH	New National Hospital
NSPH	National Strategic Plan for Health
SLUHIS	St. Lucia Health Information System
STI	Sexually Transmitted Infections
UHC	Universal Health Care
USAID	United States Agency for International Development

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EXECUTIVE SUMMARY

Background

As a part of the U.S.-Caribbean Regional HIV and AIDS Partnership Framework 2010-2014, USAID/Barbados and the Eastern Caribbean (USAID) asked the Health Systems 20/20 and the Strengthening Health Outcomes through the Private Sector projects to conduct an integrated health systems and private sector assessment to identify priorities for technical assistance that would ensure financial sustainability of HIV programming. The assessment team found one of the main threats to financial sustainability for health programs, including HIV, was that limited data exist on the cost of providing health services in St. Lucia. In preparation for the commissioning of the New National Hospital (NNH), it will be beneficial for the Ministry of Health (MOH) to understand their current cost of services as a foundation to project their costs at the NNH and ensure appropriate resources are allocated for other facilities and programs. Given the high visibility and priority of opening a new facility, unexpected costs at the NNH have the potential to divert resources from primary care, including HIV services. The costing study described in this report was requested by the MOH to provide input into its planning process for the NNH and the transition of Victoria Hospital into a polyclinic. Victoria Hospital is currently St. Lucia's main referral hospital. The public facility has 164-beds, a 24-hour Accidents and Emergency Unit[1] (A&E) and outpatient clinics, including a Renal Dialysis Unit.

Objective

The objective of this study is to assess the current cost of resources used to produce hospital services at Victoria Hospital. The results of this study can be used by the MOH to project costs for the effective and efficient operation of NNH.

The study is based on data compiled for the period of April 1, 2010 to March 30, 2011. The Health Systems 20/20 team worked with a small team from Victoria Hospital led by the Finance Director, Medical Director, and Principal Nurse to gather and compile most financial and service delivery data over a three-week period in December 2011. The final compilation of data was verified by the Finance Director.

Methodology

This study uses a tool for costing hospital services called Management Accounting System for Hospitals (MASH) (Partners for Health Reform*plus* 2004). This tool uses a top-down approach for allocating costs, with the intent that all hospital costs should end up in the departments (also called cost centers) that ultimately provide "final" services to patients, either as inpatients or outpatients. Hospital departments were classified into three types: "administrative and logistics," "intermediate medical services," and "final medical services." The final medical services cost centers were divided between inpatient and outpatient services. The method of allocating costs follows a "step-down" process, starting with the administrative cost centers, then the intermediate cost centers. The determination of cost centers followed discussions with the hospital staff to align with current budget allocations.

Findings

For fiscal year 2010/2011, operating costs at Victoria Hospital were EC$32,421,801 (Table ES-1). These operating costs include the expenditures reported in the Victoria Hospital's accounts plus the costs of

[1] Ambulance services are provided by Emergency Services, managed by the Fire Department.

staff of the Sexually Transmitted Infections (STI) clinic, the value of the Cuban volunteer doctor who works in the Renal Dialysis Unit, and the cost of antiretroviral drugs (ARVs) which are normally reported in other parts of the MOH budget and are not accounted for by the hospital.

TABLE ES-1: VICTORIA HOSPITAL TOTAL COSTS AND REVENUE, 2010/2011

Revenue	EC$	% of Total
Hospital Fees	532,147	21%
Confinement Fees	18,838	1%
Medical Fees	488,676	19%
Laboratory Fees	639,769	25%
Ophthalmology Fees	9,900	0%
Sundry	488,886	19%
Pharmaceutical Fees	333,468	13%
Total Revenue	**2,511,684**	**100*%**
Costs		
Salaries and Wages	21,473,972	66.2%
Pharmaceuticals and Medical Supplies	6,746,987	20.8%
Electricity	1,412,536	4.4%
Medical Gases	1,023,382	3.2%
Food Services	405,497	1.3%
Telephone Services	369,435	1.1%
Water	210,480	0.6%
Equipment Maintenance and Supplies	203,990	0.6%
Building Maintenance	123,979	0.4%
Cleaning and Washing	111,375	0.3%
Gasoline and Lubricants	96,982	0.3%
Stationery	76,353	0.2%
Heating Fuel	76,275	0.2%
Laundry	45,997	0.1%
Textiles and Linen	23,854	0.1%
Butane Gas (Kitchen)	20,707	0.1%
Total Costs**	**32,421,801**	**100%**
Net Expenditure Funded by MOH	**25,910,117**	--
Net Cost Recovery	**--**	**7.8%**
Cost Recovery on Non-Wage Expenditure	**--**	**22.9%**

Notes:
* Totals may not add to 100% due to rounding
**Cost data will be higher than Victoria Hospital expenditure reports as the costs reported here include cost of donated ARVs and costs for staff of the STI clinics based on the campus. It also imputes a salary cost to the Cuban physician working at the hospital's Renal Dialysis Unit for free.

At Victoria Hospital, staffing and pharmaceuticals and other medical supplies make up about 87 percent of costs (excluding medical gases). This cost analysis exercise paid particular attention to these two cost drivers to make the final unit cost information as accurate as possible.

Inpatient services accounted for 63 percent of costs while outpatient services accounted for 37 percent (Table ES-2). The A&E was the largest cost center for outpatient services, followed closely by the Renal Dialysis Unit. Hospital managers were keen to learn what portion of costs in the A&E were for casualties versus primary care. Unfortunately, hospital medical records did not differentiate A&E patients seen for primary health care versus emergency care and did not allow for separate allocation of costs. Based on staff experiences, most of the patients in the A&E came for primary care services; some staff reported the proportion to be as much as 70 percent.

TABLE ES-2: TOTAL COST ALLOCATIONS BY INPUT FOR HOSPITAL DEPARTMENTS

	Total	Medicines & Supplies (EC$)	*% of Total*	Salaries (EC$)	*% of Total*	Other Costs (EC$)	*% of Total*
General Outpatient	1,916,847	144,692	*8%*	1,545,838	*81%*	226,316	*12%*
Outpatient Specialty Clinic (gynecology, obstetrics, pedatrics, oncology)	1,183,096	240,170	*20%*	844,796	*71%*	98,130	*8%*
Outpatient Ophthalmology (Cuban Eye Clinic)	325,259	13,684	*4%*	290,974	*89%*	20,601	*6%*
Accidents & Emergency Unit	4,682,509	920,750	*20%*	3,178,351	*68%*	583,407	*12%*
STI Clinic	963,060	464,572	*48%*	376,750	*39%*	121,739	*13%*
Renal Dialysis Unit	3,020,094	1,573,013	*52%*	1,201,686	*40%*	245,394	*8%*
Inpatient Obstetrics	3,561,268	430,951	*12%*	2,510,304	*70%*	620,013	*17%*
Inpatient Pediatrics	2,502,561	478,265	*19%*	1,673,899	*67%*	350,398	*14%*
Inpatient Medical Male Ward	2,642,951	510,910	*19%*	1,772,986	*67%*	359,055	*14%*
Inpatient Medical Female Ward	2,789,489	733,370	*26%*	1,696,448	*61%*	359,671	*13%*
Chest Ward	761,196	32,750	*4%*	537,982	*71%*	190,464	*25%*
Gynecology Ward	1,970,459	180,716	*9%*	1,510,269	*77%*	279,474	*14%*
Inpatient Surgical Male Ward	3,120,038	547,388	*18%*	2,175,256	*70%*	397,394	*13%*
Inpatient Surgical Female Ward	2,089,072	395,010	*19%*	1,431,895	*69%*	262,167	*13%*
Neonatal Unit	893,902	80,746	*9%*	726,538	*81%*	86,619	*10%*
Total	**32,421,801**	**6,746,987**	***21%***	**21,473,972**	*66%*	**4,200,842**	*13%*

Obstetrics made up the largest inpatient cost center, primarily because of the higher number of nurses in this ward compared to the others.

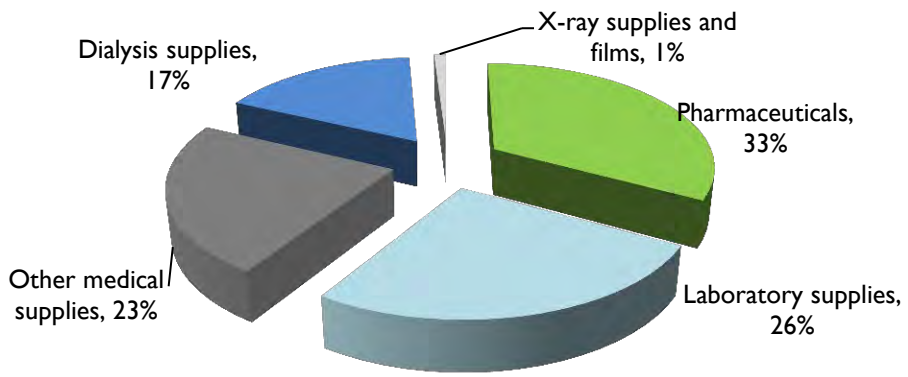
The Victoria Hospital incurs costs to maintain the Cuban Eye Clinic on its campus, but the clinic's expenditures are not generally accounted for in the hospitals books or budget allocations. The same is true for the STI Clinic. However, some of these costs are captured in budgets by a different MOH department.

Salaries remained the largest expense for most cost centers. Medicines and medical supplies represented the major cost component for the STI Clinic, as the majority of its other costs are borne by other MOH departments and Victoria Hospital mostly supports filling prescriptions and indirect costs.[2] Medicines and medical supplies also made up the majority of allocated costs for the Renal Unit due to the high cost of medications used for dialysis. Costs captured by this analysis for Outpatient Ophthalmology only included two items of cost that are incurred by the hospital, namely salary for the physician who runs

[2] Salaries for staff at the STI Clinic were recorded in the analysis; however the National AIDS Program funds these positions.

the outpatient clinic, and medical supplies, prescription drug costs, and the clinic's share of indirect (administrative) costs. The Cuban Eye Clinic supports most of its own costs, including hosting its own small pharmacy. Figure ES-1 breaks down the direct costs of pharmaceutical and medical supplies that were allocated to the various cost centers.

FIGURE ES-1: BREAKDOWN OF PHARMACEUTICAL AND MEDICAL SUPPLIES COST 2010/2011



Unit Costs

Unit costs can be used to demonstrate hospital efficiency. Table ES-3 shows unit costs at Victoria Hospital. Since the unit cost is merely the arithmetic outcome of dividing the total costs of a cost center by the output, it will be influenced by the size of the denominator and numerator. Unit costs can be lowered by increasing the volume of services or decreasing the total cost for the cost center. Interpreting the meaning of differences in unit costs between cost centers requires careful consideration of the factors that influence both the costs and volume of services as well as the types of services. Unit costs may also reflect differences in quality of services, or differences in patient case mix; for example, some units may require more expensive drugs (such as for dialysis) resulting in higher unit costs or some units may experience high volumes of patients and have a low unit cost while sacrificing higher quality of care. Salaries for specialists in some departments may also drive up the total costs for a department.

TABLE ES-3: UNIT COSTS BY COST CENTERS, 2010/2011

	Patient Volume (Outpatient visits; patient days[1])	ALOS[2]	Bed Occupancy Rate	Per Outpatient Visit (EC$)	Per Patient Admission (EC$)	Per Patient Day (EC$)	Per Hospital Bed (EC$)
General Outpatient	6,799	-	-	282	-	-	-
Outpatient Specialty Clinic	2,136	-	-	554	-	-	-
Outpatient Ophthalmology[3]	-	-	-	-	-	-	-
Accidents & Emergency Unit	37,094	-	-	126		-	-
STI Clinic[4]	2,705	-	-	356		-	-
Renal Dialysis Unit	9,828		-	307		-	-

	Patient Volume (Outpatient visits; patient days[1])	ALOS[2]	Bed Occupancy Rate	Per Outpatient Visit (EC$)	Per Patient Admission (EC$)	Per Patient Day (EC$)	Per Hospital Bed (EC$)
Inpatient Obstetrics	4,165	1.99	36%	-	1,830	855	111,290
Inpatient Pediatrics	4,079	2.93	37%	-	1,798	614	83,419
Inpatient Medical Male Ward	4,141	4.62	71%	-	2,950	638	165,184
Inpatient Medical Female Ward	4,945	5.30	85%	-	2,990	564	174,343
Chest Ward	2,174	42.63	40%	-	14,925	350	50,746
Gynecology Ward	4,101	4.34	86%	-	962	480	151,574
Inpatient Surgical Male Ward	4,357	4.94	80%	-	3,537	716	208,003
Inpatient Surgical Female Ward	2,820	5.00	64%	-	3,704	741	174,089
Neonatal Unit	2,418	5.77	55%	-	2,133	370	74,492

Note: Outpatient volume was collected directly from the nursing staff who track visits in clinic registers. Inpatient admissions were provided by the Ward Sisters.

1 – Patient days were calculated based on a two-month record developed by Victoria Hospital's Medical Director.

2 – ALOS – average length of stay in days

3 – Service delivery statistics were not available for the Cuban Eye Clinic and visits to the Victoria Hospital Ophthalmology Clinic were captured in the General Outpatient numbers.

4 – STI Clinic visits were reported by the National AIDS Program. The number of visits reported here reflects STI visits only, not visits for People Living with HIV. The STI visits are for all the STI Clinic visits, which rotate between Victoria and two other sites. This estimate was used as the best obtainable estimate.

Among outpatient departments, the Outpatient Specialty Clinics, which include obstetrics, pediatrics, and oncology, had the highest cost per outpatient visit. Salaries comprise 71 percent of the unit costs for this cost center (Table ES-3). The A&E has a very low cost per visit. This may be explained by the very high volume of patients seen and the reported overuse of the A&E for primary care services which are likely to have lower treatment costs. Data to separate primary care costs from actual casualty were not available.

The Gynecology Ward had the lowest unit cost per admission at $962, while the Chest Ward had the highest at $14,925. The average length of stay for Chest Ward patients, who often have suspected cases of tuberculosis, is quite long and hence the high cost per admission coupled with the lowest cost per patient day.

TABLE ES-4: BREAKDOWN OF UNIT COSTS BY EXPENDITURE TYPE, 2010/2011

Final Medical Services	Outpatient Visits/ Patient Days	Bed Occupancy Rate	Costs per Unit (EC$)			
			Drugs and Medical Supplies	Salaries	Other	Total
General Outpatient	6,799	-	21	227	33	283
Outpatient Specialty Clinics	2,136	-	112	396	46	554
Accidents & Emergency Unit	37,094	-	25	86	16	126
STI Clinic	2,705	-	172	139	45	356
Renal Dialysis	9,828	-	160	122	25	307
Inpatient Obstetrics	4,165	36%	103	603	149	855

Final Medical Services	Outpatient Visits/ Patient Days	Bed Occupancy Rate	Costs per Unit (EC$)			
			Drugs and Medical Supplies	Salaries	Other	Total
Inpatient Pediatrics	4,079	37%	117	410	86	613
Inpatient Medical Male Wards	4,141	71%	123	428	87	638
Inpatient Medical Female Wards	4,945	85%	148	343	73	564
Chest Ward/TB	2,174	40%	15	247	88	350
Gynecology Ward	4,101	86%	44	368	68	480
Inpatient Surgical Male Ward	4,357	80%	126	499	91	716
Inpatient Surgical Female Ward	2,820	64%	140	508	93	741
Neonatal Unit	2,418	55%	33	300	36	370

When unit costs are broken down by inputs, salaries, drugs and other, the General Outpatient Clinic had the lowest drug costs per visit while the STI Clinic had the highest. The STI Clinic's drug costs took into account the costs of ARVs, which are currently funded in part by the Global Fund to Fight AIDS, Tuberculosis, and Malaria. All drug costs for STI Clinic patients, including ARVs, are provided for free.

Hospital Financial Management Systems

The hospital's current accounting system is largely based on cash accounting, meaning that it only records expenditures when there is a flow of cash. In-kind goods and services are not captured in the accounts. Fixed assets are also not recognized in the accounts and hence no depreciation expense is accounted for. The "accruals" basis of accounting records expenses when they occur. Moving toward an accrual accounting system would allow the hospital to reflect a truer picture of the costs of running the hospital each year since expenditures would be captured in the year in which they occur.

Whether or not the hospital continues to use a cash-based accounting system, it is important that all costs are captured in the accounts. For example, the costs of drugs need to be reflected in the accounts, even if the hospital does not make a direct payment for them. The same applies to donated labor, which should be valued at the equivalent of locally hired personnel. It would also be important to show clearly in the accounts the costs of the Cuban and STI clinics.

Data Management and Using Data for Decision Making

Currently, Victoria Hospital's only statistician is on a two-year training leave. Standard hospital efficiency indicators, such as patient days and occupancy rates, are not readily available. Estimates based on limited data were used. Ideally, this information should be available to the management of the hospital on a regular basis to track any issue that may be arising and ensuring an efficient allocation of staff and resources. Much of this information exists in the wards and clinics but is not analyzed. More staff with an adequate mix of knowledge of the medical records and statistics, and familiarity with electronic formats may be needed to improve the use of available data.

Moving from paper-based records would also improve the timeliness and accuracy of information. This would make data easier to use and analyze. This is an issue that also needs to be addressed also in planning for the NNH, to ensure the regular collection and analysis of data so that hospital managers can assign staff to the areas most in need according to patient load.

Prescription Tracking

The Pharmacy at Victoria Hospital maintains separate record books for ward orders of standard stock supplies, in-patient prescriptions, outpatient prescription, dialysis users' prescriptions, and ARVs. Any prescriptions paid for by Universal Health Care are recorded in an electronic system and in the paper

record books. The current recording format for outpatient prescriptions does not capture which outpatient department the prescription is coming from, but shows only the prescribing doctor. Given that drugs and medical supplies represent one of the most significant costs of the hospital, it is important that a good system is put in place to track usage by department.

Referral System

The A&E accounts for over 14 percent of the hospitals resources. Compared to other costing studies, this is a relatively high proportion of total costs (La Foucade, Scott, Theodore 2005). This may support the belief among staff that a large portion of A&E services are going toward primary care cases, which could be seen at health centers or the regular outpatient clinics. Visits to the A&E are not tracked in sufficient detail to distinguish primary care users from those who are actual emergency cases. There are no barriers, other than a longer wait time, to accessing primary care services in the A&E at Victoria Hospital. The MOH has recognized the need to avoid this at NNH and plans to convert Victoria into a polyclinic with extended hours (in comparison to a health center) to help route patients to the appropriate care facility. However, this alone may not be enough to prevent patients from coming to the NNH for care as it is likely they will see the new facility as providing better care since it is new.

NIC Capitation Payment to Hospital

Currently, the National Insurance Corporation pays a negotiated capitation rate of EC$5 million to the MOH for services at both Victoria and St. Jude Hospitals. During this analysis, data on how many NIC members use services at Victoria Hospital were not available. Improving tracking of patient exemptions and hospital costs may serve to better align the cost of providing services with the amount the NIC pays toward the MOH budget for Victoria Hospital.

1. BACKGROUND

In the late 1990s, the government of St. Lucia embarked on a comprehensive strategic planning process to improve its existing health system. Based on feedback from key stakeholders, a comprehensive review of existing systems, and extensive research on various models for health system reform, a health sector reform committee developed the National Strategic Plan for Health, 2006 – 2011 (NSPH). One strategic objective within the NSPH was to strengthen health infrastructure. To meet this goal the government has received assistance from the European Community to build a new, centrally located secondary hospital, the New National Hospital (NNH), to replace the aging Victoria Hospital. The NSPH also called for the conversion of Victoria Hospital into a polyclinic to ensure outpatient access to primary care in the Castries area and prevent overuse of the Accidents and Emergency Unit (A&E) at NNH for these primary care services.

As a part of the United States-Caribbean Regional HIV and AIDS Partnership Framework 2010-2014, USAID/Barbados and the Eastern Caribbean (USAID/EC) asked the Health Systems 20/20 and the Strengthening Health Outcomes through the Private Sector (SHOPS) projects to conduct an integrated health systems and private sector assessment to identify priorities for technical assistance that would ensure financial sustainability of HIV programming. The assessment team found one of the main threats to financial sustainability for health programs, including HIV, was that limited data exist on the cost of providing health services in St. Lucia. In preparation for the commissioning of the NNH, it is beneficial for the Ministry of Health (MOH) to understand its current cost of services as a foundation to project its costs at the NNH and ensure appropriate resources are allocated for other facilities and programs. Given the high visibility and priority of opening a new facility, unexpected costs at the NNH have the potential to divert resources from primary care, including HIV services. The costing study described in this report was requested by the MOH to provide input into its planning process for the NNH and the transition of Victoria Hospital into a polyclinic.

1.1 HEALTH SECTOR FINANCING IN ST. LUCIA

The latest available figures from 2009 estimate that public health expenditures were approximately 5 percent of Gross Domestic Product (GDP) (World Bank 2012). The government of St. Lucia dedicated about 12 percent of government expenditures to health (World Bank 2012).

In St. Lucia, government health facilities like Victoria Hospital are financed out of general tax revenues. Standardized user fees for services like pharmaceuticals, operations, hospitalization, and laboratory services are charged by hospital facilities; however, these revenues are returned to the Ministry of Finance. The Public Hospital Management Act sets the price for hospital services. User fee exemption policies exist for the poor, nurses, police officers, firefighters, and prison wardens. At the hospital level, hospitalization fees are waived for members of the National Insurance Corporation (NIC). The NIC, which serves as the national social security scheme, covers maternity leave, pension, workers' compensation for injury on the job, short-term illness, and long-term invalidity benefits. Each year the NIC contributes a negotiated amount to the MOH to cover hospital services for NIC members at Victoria Hospital and at St. Jude Hospital; the current contribution is EC$5 million.

1.2 VICTORIA HOSPITAL

Victoria Hospital is St. Lucia's main referral hospital. The public facility has 164 beds[3] and a 24-hour A&E unit.[4] The facility also offers rotating outpatient clinics during the morning hours and a Renal Dialysis Unit that is open daily. Outpatient clinics include medical, surgical, pediatrics, obstetrics, oncology, ear/nose/throat, ophthalmology, orthopedic, diabetes/hypertension, cardiology, and nephrology. These services are offered once, or twice for pediatrics and obstetrics, per week. The hospital also offers diagnostic services for the public, and its pharmacy also fills prescriptions for patients from outside the hospital, mainly filling other public sector prescriptions or specialized prescriptions from the private sector. The hospital campus also hosts a free eye clinic that is run by Cuban doctors through an arrangement with the MOH[5] and a Sexually Transmitted Infections (STI) Clinic, which is managed by the National AIDS Program. Both programs have separate funding streams and management.

With the opening of the NNH, many of the services at Victoria are slated to be transferred to NNH. Final decisions regarding which services will move are still under discussion, but at the time the data for this analysis were collected, the MOH envisioned that outpatient services outside of the A&E would not transfer to the NNH. Victoria Hospital will be transitioned into a polyclinic and maintain the outpatient services which primarily provide primary care. Discussions at the time of this study indicated that the STI Clinic would also remain in its current location.

1.3 OBJECTIVES OF THE COSTING STUDY

The MOH acknowledges that there is currently inadequate hospital-level cost data for decision making. Limited cost data make it difficult to analyze the adequacy of its budget allocations in relation to need and services used (Rodriguez et al. 2012). This challenge has become particularly acute as the MOH plans for the NNH and Universal Health Care (UHC), a government-provided health insurance scheme providing a basket of services for free. The objective of this study is to assess the current cost of resources used to produce hospital services at Victoria Hospital. The results of this study can be used by the MOH to project costs for the effective and efficient operation of NNH.

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[3] Bed numbers used here exclude six beds in the eye ward as data were not collected for the eye ward as an individual cost unit.

[4] Ambulance services are provided by Emergency Services, managed by the Fire Department.

[5] Victoria Hospital also has its own ophthalmology clinic once a week but the services for treatment (such as operations) are not free of charge. The Cuban eye clinic provides all services free of charge.

2. METHODOLOGY

The study is based on data compiled for the period of April 1, 2010 to March 30, 2011. The Health Systems 20/20 team worked with a small team from Victoria Hospital led by the Finance Director, Medical Director, and Principal Nurse to gather and compile most financial and service delivery data over a three-week period in December 2011. The final compilation of data was verified by the Finance Director.

This study uses a tool for costing hospital services called Management Accounting System for Hospitals (MASH) (Partners for Health Reform*plus* 2004). This is a step-down allocation of costs where hospital services were classified into three types: overhead, intermediate services, and final medical services. The division of these categories was determined with the hospital staff to align with current budget allocations. Overhead services include all administrative services and ancillary services such as laundry and kitchen services. Intermediate services include diagnostic and sterilizations services, the operating room, and intensive care unit. The final medical services include outpatient and inpatient services. These medical services will serve as "cost centers" for purposes of accumulating costs. For the full list of cost centers for this costing exercise, see Annex A.

After determining the appropriate cost centers, direct cost information was collected. Direct costs are those costs that can be directly identified with or traced to a cost center. For example, the salary cost of a laboratory technician is a direct cost of the laboratory. The drugs consumed in a ward are a direct cost of that ward (cost center). Where financial records were not detailed enough to allow for matching costs with cost centers, estimates were used. For example, a two-month census of prescription records and ward orders was used to obtain a total quantity of drugs used by each cost center and multiplied by unit cost/price to estimate the cost of drugs and medical supplies issued by the pharmacy over that period. The relative proportions of usage by each cost center were used to allocate the total cost of pharmaceuticals reported by the hospital for the year. Direct salary costs were determined by identifying the full-time equivalent number of staff who work in each cost center and their annual remuneration. Staff who did not provide care to patients were initially allocated to the "Administration" cost center.

After all the direct costs were allocated to their respective cost centers, indirect costs were allocated on bases that would most accurately reflect the reality of how the activities that produce these costs relate to each cost center. Indirect costs are those costs that cannot be directly traced to or associated with a particular cost center or product. Therefore, indirect costs were allocated to cost centers on bases that provide the closest relationship between the cost and the cost center or service. This process of allocation is, at best, an estimate. However, it is important to bear in mind that the direct costs (staff costs, medical and other supplies), which are usually more straightforward to deal with, account for close to 90 percent of the total costs at Victoria Hospital. Victoria Hospital does not keep track of its full inventory of fixed assets and therefore it was not possible to calculate depreciation for this exercise. Allocation rules were used to allocate the cost of the overhead cost centers to intermediate and final cost centers. Finally, the costs of intermediate services (original and the allocated overhead costs) were allocated to the final cost centers (the direct service departments that serve patients). This approach of allocating overhead and intermediate services across direct medical services is known as "step-down allocation" and provides the fully loaded costs of providing services at the hospital. These costs were combined with utilization information to calculate the unit cost of services. A fuller description of the methodology can be found in Annex B.

3. COST ANALYSIS

3.1 TOTAL COSTS

3.1.1 COSTS AND REVENUE

For fiscal year 2010/2011, operating costs at Victoria Hospital were EC$32,421,801 (Table 3.1). These operating costs include the expenditures reported in the Victoria Hospital's accounts and the costs of staff of the STI Clinic, the value of the Cuban volunteer doctor who works in the Renal Dialysis Unit, and the cost of antiretroviral drugs (ARVs), which are normally reported in other parts of the MOH budget and are not accounted for by the hospital. These costs were included in this analysis because the STI Clinic uses parts of the hospital building which Victoria Hospital supports in terms of maintenance and filling prescriptions and because some staff felt that the STI Clinic and associated costs may be absorbed in Victoria's budget in the near future.[6]

TABLE 3.1: VICTORIA HOSPITAL TOTAL COSTS AND REVENUE, 2010/2011

Revenue	EC$	% of Total
Hospital Fees	532,147	21.2%
Confinement Fees	18,838	0.8%
Medical Fees	488,676	19.5%
Laboratory Fees	639,769	25.5%
Ophthalmology Fees	9,900	0.4%
Sundry	488,886	19.5%
Pharmaceutical Fees	333,468	13.3%
Total Revenue	**2,511,684**	
Cost		
Salaries and Wages	21,473,972	66.2%
Pharmaceuticals and Medical Supplies	6,746,987	20.8%
Electricity	1,412,536	4.4%
Medical Gases	1,023,382	3.2%
Food Services	405,497	1.3%
Telephone Services	369,435	1.1%
Water	210,480	0.6%
Equipment Maintenance and Supplies	203,990	0.6%
Building Maintenance	123,979	0.4%
Cleaning and Washing	111,375	0.3%
Gasoline and Lubricants	96,982	0.3%
Stationery	76,353	0.2%
Heating Fuel	76,275	0.2%
Laundry	45,997	0.1%
Textiles and Linen	23,854	0.1%
Butane Gas (Kitchen)	20,707	0.1%
Total Cost*	**32,421,801**	

[6] Hospital staff believed that the STI Clinic could end up being supported by Victoria Hospital's budget since the funding that supported much of the clinic, a World Bank Loan for the National AIDS Program, ended in 2010.

Net Expenditure Funded by MOH	**29,910,117**	
Net Cost Recovery		**7.7%**
Cost Recovery on Non-Wage Expenditure		**22.9%**

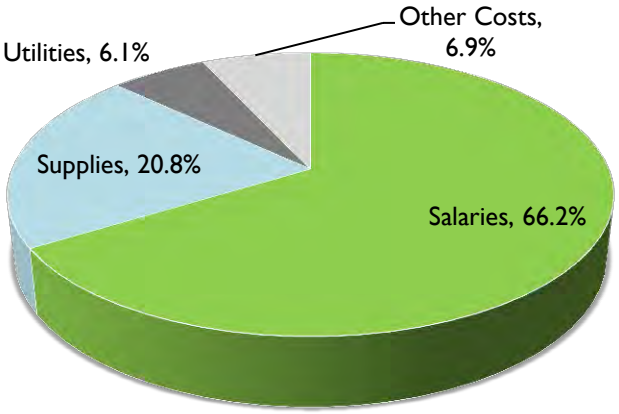
Notes:

* Totals may not add to 100% due to rounding

**Cost data will be higher than Victoria Hospital expenditure reports as the costs reported here include cost of donated ARVs and costs for staff of the STI clinics based on the campus. It also imputes a salary cost to the Cuban physician working at the hospital's Renal Dialysis Unit for free.

At Victoria Hospital, staffing and pharmaceuticals and other medical supplies make up about 87 percent of direct costs (excluding medical gases), see Figure 3.1. This costs analysis exercise paid particular attention to these two cost drivers to make the final unit cost information as accurate as possible. Cost controls targeted at these two areas would yield the greatest results since they are the main cost drivers; however, the hospital management is limited in its ability to change these areas. Management of human resources for health largely falls within the domain of the Ministry of Public Service (MOPS) and the Public Service Commission (Rodriquez et al. 2012). All technical staff positions proposed by the MOH must be approved by Cabinet, then the MOPS, and the Ministry of Finance for fund allocation (Rodriguez et al. 2012). Purchasing of medical supplies and pharmaceuticals is done through Central Procurement. Legislation sets the price for pharmaceuticals at unit cost and also sets the prices for laboratory and x-ray services (Government of St. Lucia 2001). User fees, if they were retained at the facility, cover approximately 8 percent of hospital expenditures and 23 percent of non-wage expenditures.

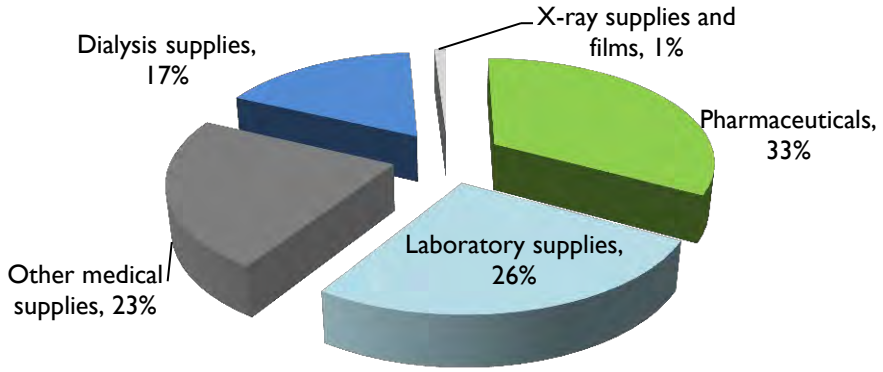
FIGURE 3.1: BREAKDOWN OF DIRECT COSTS, 2010/2011



Personnel wages and salaries were the largest cost driver at 66.2 percent. Of this, physicians made up 21 percent of the costs, nurses 56 percent, and non-medical personnel, including administrators, lab technicians, and pharmacists, 23 percent. Pharmaceuticals and other medical supplies made up the second largest category of costs at 20.8 percent. As shown in Figure 3.2, within this cost category, pharmaceuticals and supplies ordered through the hospital pharmacy made up 33 percent, laboratory reagent 26 percent and dialysis supplies 17 percent.[7]

[7] Medical supplies for wards in Victoria Hospital, such as facemasks and sanitary coverings for shoes, are mostly ordered through the Accounts Department. These orders are reported here as "other medical supplies." The Pharmacy processes orders for a minimum number of medical supplies such as alcohol, Savlon, cotton, syringes, and needles alongside orders for pharmaceuticals.

FIGURE 3.2: BREAKDOWN OF PHARMACEUTICAL AND MEDICAL SUPPLIES COSTS, 2010/11



3.1.2 ALLOCATION OF COSTS TO COST CENTERS

This cost analysis divided cost centers into "administrative and logistics," "intermediate medical services" and "final medical services." The final medical services cost centers were divided between inpatient and outpatient services. Outpatient services accounted for 20 percent of direct hospital costs[8]; however, the administrative (overhead) direct costs were relatively high at 23 percent.[9] Among the direct costs in the outpatient departments, the largest share of costs, 33 percent, is for the Renal Dialysis Unit alone. The next highest category was the A&E at 28 percent of outpatient direct costs, followed by the general outpatient services at 18 percent, and the Outpatient Specialty Clinics (obstetrics/pediatrics/oncology) at 12 percent. Among the costs in the intermediate departments, laboratory services accounted for 38 percent of direct costs, followed by the pharmacy at 24 percent, and the operating theater at 16 percent.

The method of allocating costs so that the hospital's total costs end up only in the final medical services cost centers follows a "step-down" process. It is a top-down process that starts by accumulating the direct costs of each cost center. This first step produced the following costs structure for Victoria Hospital represented in Table 3.2.

[8] The term direct cost means costs prior to any allocation rules being applied.

[9] In this analysis, overhead costs included: administration, medical records, accounting, laundry, maintenance and cleaning, security, catering and transportation.

TABLE 3.2: DIRECT COSTS ALLOCATIONS TO COSTS CENTERS

Cost Centers	Direct Costs (EC$)
Administrative Services and Logistics	
General Administration	3,869,211
Transport	110,155
Accounting	100,248
Domestic, Handymen, Maintenance	827,101
Catering/Kitchen/Dietician	1,757,362
Security	581,866
Laundry	95,743
Medical Records and Statistics	184,678
CSSD	173,531
Intermediate Medical Services	
Pharmacy	1,966,595
Physiotherapy	256,119
Laboratory/Blood Bank/Pathology	3,093,160
Radiology/Ultrasound	843,794
Operating Theater	1,346,894
ICU	704,183
Final Medical Services	
General Outpatient	1,159,102
Outpatient Specialty Clinics	807,025
Outpatient Ophthalmology (Cuban Clinic)	272,564
Accidents & Emergency	1,833,724
STI Clinic	357,381
Renal Dialysis Unit	2,200,482
Inpatient Obstetrics	1,681,467
Inpatient Pediatrics	1,232,465
Inpatient Medical Male Wards	1,288,226
Inpatient Medical Female Wards	1,459,690
Chest Ward/TB	427,754
Gynaecology	852,477
Inpatient Surgical Male Wards	1,375,486
Inpatient Surgical Female Wards	938,704
Neonatal unit	624,614
Total Costs	32,421,801

Note: CSSD=Central Sterilization Supply Department; ICU=Intensive Care Unit

Step 2 in the allocation process takes the administrative and logistics cost center costs and allocates them to the intermediate and final cost centers, in the order in which they appear in Table 3.2 (i.e., starting with general administration, followed by transport, accounting, etc.). The criteria used for allocating any cost center's costs reflects the use of that cost center's services by others and include space occupied; number of staff; and number of patients. At the end of Step 2, the costs appear as shown in Table 3.3.

TABLE 3.3: COSTS AFTER ADMINISTRATIVE AND LOGISTICS COSTS ALLOCATED

	Costs Before Administration Allocation (EC$)	Administration Costs Allocated (EC$)	Costs After Administration Costs Allocation (EC$)	% of Total
Intermediate Medical Services				
Pharmacy	1,966,595	330,684	2,297,279	7%
Physiotherapy	256,119	64,098	320,217	1%
Laboratory/Blood bank/Pathology	3,093,160	548,131	3,641,291	11%
Radiology/Ultrasound	843,794	234,756	1,078,550	3%
Operating theater	1,346,894	383,490	1,730,384	5%
ICU	704,183	147,189	851,372	3%
			9,919,093	**31%**
Final Medical Services				
General Outpatient	1,159,102	257,651	1,416,754	4%
Outpatient specialty clinics	807,025	153,077	960,102	3%
Outpatient Ophthalmology	272,564	44,374	316,938	1%
Accidents & Emergency	1,833,724	659,768	2,493,492	8%
STI Clinic	357,381	109,603	466,984	1%
Renal Dialysis Unit	2,200,482	434,548	2,635,030	8%
Inpatient Obstetrics	1,681,467	1,001,122	2,682,589	8%
Inpatient Pediatrics	1,232,465	543,531	1,775,996	5%
Inpatient Medical Male Ward	1,288,226	573,207	1,861,433	6%
Inpatient Medical Female Ward	1,459,690	567,947	2,027,637	6%
Chest Ward/TB	427,754	206,104	633,858	2%
Gynecology Ward	852,477	398,086	1,250,564	4%
Inpatient Surgical Male Ward	1,375,486	562,218	1,937,704	6%
Inpatient Surgical Female Ward	938,704	358,384	1,297,088	4%
Neonatal Unit	624,614	121,927	746,541	2%
	24,721,906	**7,699,894**	**32,421,801**	**100%**

Note: Totals may not add to 100% due to rounding

Among the intermediate and final costs centers, laboratory services including the blood bank consumed about 11 percent of overall hospital costs. The laboratory serves as the national laboratory and charges standard fees for services. The fees recovered approximately 18 percent of the costs to operate the laboratory department in 2010/2011. The pharmacy also consumes a larger share of the hospitals resources and recovers approximately 15 percent of its costs.

3.2 COSTS BY FINAL COST CENTERS

The third step is to allocate the costs of the Intermediate medical service cost centers to the final cost centers. This is done on the basis of the usage of these intermediate cost center services by the final cost centers. The result is the "total costs by cost center" in Table 3.4.

TABLE 3.4: TOTAL COSTS BY COST CENTER

Cost Center	EC$	%
General Outpatient	1,916,847	5.9%
Outpatient Specialty Clinics	1,183,096	3.6%
Outpatient Ophthalmology	325,259	1.0%
Accidents & Emergency	4,682,509	14.4%
STI Clinic	963,060	3.0%
Renal Dialysis Unit	3,020,094	9.3%
Sub-total - Outpatient	**12,090,865**	**37%**
Inpatient Obstetrics	3,561,268	11.0%
Inpatient Pediatrics	2,502,561	7.7%
Inpatient Medical Male Wards	2,642,951	8.2%
Inpatient Medical Female Ward	2,789,489	8.6%
Chest Ward/TB	761,196	2.3%
Gynecology	1,970,459	6.1%
Inpatient Surgical Male Ward	3,120,038	9.6%
Inpatient Surgical Female Ward	2,089,072	6.4%
Neonatal Unit	893,902	2.8%
Sub-total – Inpatient	**20,330,937**	**63%**
TOTAL	**32,421,801**	**100.0%**

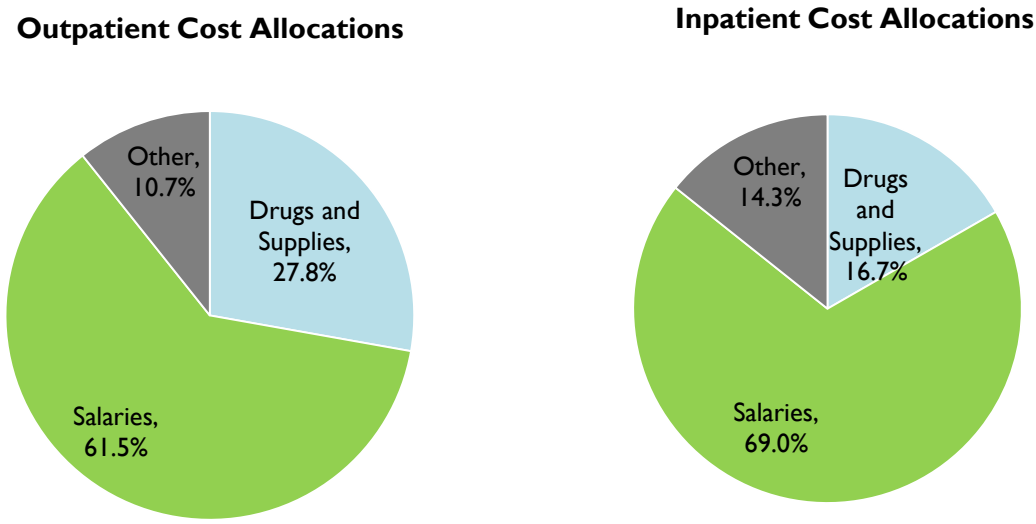
Inpatient services accounted for 63 percent of costs, while outpatient services accounted for 37 percent. The A&E was the largest cost center for outpatient services, followed closely by the Renal Dialysis Unit. Hospital managers were keen to learn what portion of costs in the A&E were for casualties versus primary care. Unfortunately, hospital medical records did not distinguish services offered between real emergencies and normal primary health care, to allow for separate allocation of costs. Staff felt that most of the services in the A&E was for primary care. To estimate what proportion of A&E services are for primary care, the A&E staff record tracked where patients were seen for one week in April 2012. The one-week tracking showed 84 percent of A&E patients were seen for primary care. This survey of patient was done after the study was concluded and has not been used in the analysis to try and split A&E costs between primary care and emergencies..

Obstetrics made up the largest inpatient cost center, primarily because of the higher number of nurses in this ward compared to the others.

It is also important to note that Victoria Hospital does incur costs to maintain the Cuban Eye Clinic on its campus, but is not generally accounted for in the hospitals expenditure reports or budget allocations. The same is true for the STI Clinic. However, some of these costs are captured in budgets by a different MOH department.

For both inpatient and outpatient services, salaries make up the majority of allocated costs at 69.0 percent and 61.6 percent, respectively (Figure 3.3).

FIGURE 3.3: COST ALLOCATION BY INPUT FOR OUTPATIENT AND INPATIENT SERVICES, 2010/2011



Salaries remained the largest expense within most hospital wards and outpatient areas, as shown in Table 3.5. Medicines and medical supplies represented the major cost component for the STI Clinic as the majority of its other costs are borne by other MOH departments and Victoria Hospital mostly supports filling prescriptions and indirect costs.[10] Medicines and medical supplies also made up the majority of allocated costs for the Renal Unit due to the high cost of medications used for dialysis. Costs captured by this analysis for Outpatient Ophthalmology only included two items of cost that are incurred by the hospital, namely salary for the physician who runs the outpatient clinic, and medical supplies, prescription drug costs, and the clinic's share of indirect (administrative) costs. The Cuban Eye Clinic supports most of its own costs, including hosting its own small pharmacy.

[10] Salaries for staff at the STI Clinic were recorded in the analysis; however the National AIDS Program funds these positions.

TABLE 3.5: COST ALLOCATIONS BY INPUT FOR HOSPITAL DEPARTMENTS

	Total	Medicines & Supplies (EC$)	*% of Total*	Salaries (EC$)	*% of Total*	Other Costs (EC$)	*% of Total*
General Outpatient	1,916,847	144,692	*8%*	1,545,838	*81%*	226,316	*12%*
Outpatient Specialty Clinic (gynecology, obstetrics, pedatrics, oncology)	1,183,096	240,170	*20%*	844,796	*71%*	98,130	*8%*
Outpatient Ophthalmology (Cuban Eye Clinic)	325,259	13,684	*4%*	290,974	*89%*	20,601	*6%*
Accidents & Emergency Unit	4,682,509	920,750	*20%*	3,178,351	*68%*	583,407	*12%*
STI Clinic	963,060	464,572	*48%*	376,750	*39%*	121,739	*13%*
Renal Dialysis Unit	3,020,094	1,573,013	*52%*	1,201,686	*40%*	245,394	*8%*
Inpatient Obstetrics	3,561,268	430,951	*12%*	2,510,304	*70%*	620,013	*17%*
Inpatient Pediatrics	2,502,561	478,265	*19%*	1,673,899	*67%*	350,398	*14%*
Inpatient Medical Male Ward	2,642,951	510,910	*19%*	1,772,986	*67%*	359,055	*14%*
Inpatient Medical Female Ward	2,789,489	733,370	*26%*	1,696,448	*61%*	359,671	*13%*
Chest Ward	761,196	32,750	*4%*	537,982	*71%*	190,464	*25%*
Gynecology Ward	1,970,459	180,716	*9%*	1,510,269	*77%*	279,474	*14%*
Inpatient Surgical Male Ward	3,120,038	547,388	*18%*	2,175,256	*70%*	397,394	*13%*
Inpatient Surgical Female Ward	2,089,072	395,010	*19%*	1,431,895	*69%*	262,167	*13%*
Neonatal Unit	893,902	80,746	*9%*	726,538	*81%*	86,619	*10%*
Total	**32,421,801**	**6,746,987**	***21%***	**21,473,972**	*66%*	**4,200,842**	*13%*

3.3 COST EFFICIENCY INDICATORS

Unit costs can be used to demonstrate hospital efficiency. Unit costs can be lowered by increasing the volume of services or decreasing the total cost for the department or cost center. However, some care should be taken when comparing costs between departments as factors other than efficiency influence unit costs (Dept. of Planning et al. 1997). Unit costs may also reflect quality of services, or differences in patient case mix; for example, some units may require more expensive drugs (such as for dialysis) resulting in higher unit costs or some units may experience high volumes of patients and have a low unit cost while sacrificing higher quality of care. Salaries for specialists in some departments may also drive up the total costs for a department. Some departments, for example the Chest Ward, may show lower unit cost when looking at patient days and very high costs when looking at cost per admission because the length of stay tends to be much longer in this ward. The unit cost indicator may not necessarily reflect the efficiency of this ward compared to others since treatments are vastly different; it may be more useful to compare this indicator over time to see what efficiency gains are made. Table 3.6 provides the unit costs per department with the corresponding patient volumes (visits for outpatient services and patient days for inpatient services).

TABLE 3.6: UNIT COSTS BY COST CENTERS

	Patient Volume (Outpatient visits; patient days[1])	ALOS[2]	Bed Occupancy Rate	Per Outpatient Visit (EC$)	Per Patient Admission (EC$)	Per Patient Day (EC$)	Per Hospital Bed (EC$)
General Outpatient	6,799	-	-	282	-	-	-
Outpatient Specialty Clinic	2,136	-	-	554	-	-	-
Outpatient Ophthalmology [3]	-	-	-	-	-	-	-
Accidents & Emergency Unit	37,094	-	-	126		-	-
STI Clinic [4]	2,705	-	-	356		-	-
Renal Dialysis Unit	9,828		-	307		-	-
Inpatient Obstetrics	4,165	1.99	36%	-	1,830	855	111,290
Inpatient Pediatrics	4,079	2.93	37%	-	1,798	614	83,419
Inpatient Medical Male Ward	4,141	4.62	71%	-	2,950	638	165,184
Inpatient Medical Female Ward	4,945	5.30	85%	-	2,990	564	174,343
Chest Ward	2,174	42.63	40%	-	14,925	350	50,746
Gynecology Ward	4,101	4.34	86%	-	962	480	151,574
Inpatient Surgical Male Ward	4,357	4.94	80%	-	3,537	716	208,003
Inpatient Surgical Female Ward	2,820	5.00	64%	-	3,704	741	174,089
Neonatal Unit	2,418	5.77	55%	-	2,133	370	74,492

Note: Outpatient volume was collected directly from the nursing staff who track visits in clinic registers. Inpatient admissions were provided by the Ward Sisters.

1 – Patient days were calculated based on a two-month record developed by Victoria Hospital's Medical Director.

2 – ALOS – average length of stay in days

3 – Service delivery statistics were not available for the Cuban Eye Clinic and visits to the Victoria Hospital Ophthalmology Clinic were captured in the General Outpatient numbers.

4 – STI Clinic visits were reported by the National AIDS Program. The number of visits reported here reflects STI visits only, not visits for People Living with HIV. The STI visits are for all the STI Clinic visits, which rotate between Victoria and two other sites. This estimate was used as the best obtainable estimate.

Among outpatient departments, the Specialty Clinics, which include obstetrics, pediatrics, and oncology, had the highest cost per outpatient visit. Salaries comprise 71 percent of the unit costs for this cost center (Table 3.5). The A&E has a very low cost per visit. This may be explained by the very high volume of patients seen and the reported overuse of the A&E for primary care services which are likely to have lower treatment costs. Data to separate primary care costs from actual casualty costs were not available for the time period analyzed.

The Gynecology Ward had the lowest unit cost per admission at $962 while the Chest Ward had the highest at $14,925. As explained earlier, the average length of stay for Chest Ward patients, who often have suspected cases of tuberculosis or are being isolated until diagnosis, is quite long. Therefore, while there are a smaller number of Chest Ward admissions and thus a high cost per admission, the ward has the lowest cost per patient day.

TABLE 3.7: BREAKDOWN OF UNIT COSTS BY EXPENDITURE TYPE

Final Medical Services	Outpatient Visits/ Patient Days	Bed Occupancy Rate	Costs per Unit (EC$)			
			Medicines & Supplies	Salaries	Other	Total
General Outpatient	6,799	-	21	227	33	283
Outpatient Specialty Clinics	2,136	-	112	396	46	554
Outpatient Ophthalmology	NA	-				
Accidents & Emergency Unit	37,094	-	25	86	16	126
STI Clinic	2,705	-	172	139	45	356
Renal Dialysis Unit	9,828	-	160	122	25	307
Inpatient Obstetrics	4,165	36%	103	603	149	855
Inpatient Pediatrics	4,079	37%	117	410	86	613
Inpatient Medical Male Wards	4,141	71%	123	428	87	638
Inpatient Medical Female Wards	4,945	85%	148	343	73	564
Chest Ward/TB	2,174	40%	15	247	88	350
Gynecology Ward	4,101	86%	44	368	68	480
Inpatient Surgical Male Wards	4,357	80%	126	499	91	716
Inpatient Surgical Female Wards	2,820	64%	140	508	93	741
Neonatal Unit	2,418	55%	33	300	36	370

When unit costs are broken down by inputs, salaries, drugs, and other, the general medical outpatient clinic had the lowest drug costs per outpatient visit while the STI Clinic had the highest. The STI Clinic's drug costs took into account the unit costs for ARVs, which are currently funded in part by the Global Fund to Fight AIDS, Tuberculosis, and Malaria. All drug costs for STI Clinic patients, including ARVs, are provided for free.

The overall occupancy rate for the hospital was 57 percent. This was lower than the 2009 rates reported in a 2011 Policy Review and Analysis for UHC, which reported 62.6 percent in 2008 (Barrett 2011). This continues to follow the downward trend in occupancy rates shown in that analysis: 69.2 percent in 2007, 68.3 percent in 2008, and 62.6 percent in 2009. Increased occupancy rates would contribute to lowering the unit costs shown in the inpatient departments like obstetrics and pediatrics. Some departments are found to have higher occupancy; staff indicated that at times beds in other wards are used to deal with overflow of patients from high occupancy wards.

Data on patient days were not available for the full year as the statistician for Victoria Hospital has been on study leave for an extended period. Therefore, the costing team estimated patient days on the basis of the Medical Director's review of two months of ward records. These data were used to estimate average length of stay and then calculate patient days. The actual number of patient days and occupancy rates would provide more accurate unit costs. The Medical Director noted that discharge dates were not available on a small portion of those records which also affects the estimate.

4. KEY FINDINGS AND RECOMMENDATIONS FROM COST ANALYSIS EXERCISE

The purpose of this exercise was both to inform the management at Victoria Hospital of the distribution of its resources and to begin using this information to plan for the NNH. A number of key findings and recommendations from this exercise can help improve the financial management and efficiency of both Victoria Hospital and the NNH.

4.1 HOSPITAL FINANCIAL MANAGEMENT SYSTEMS

The hospital's current accounting system is largely based on cash accounting, meaning that it only records the expenditures when there is a flow of cash. In-kind goods and services are not captured in the accounts. Fixed assets are also not recognized in the accounts and hence the hospital does not account for depreciation expenses. The "accruals" basis of accounting records expenses when they occur. Moving toward an accrual accounting system may allow the hospital to reflect a truer picture of the costs of running the hospital each year since expenditures would be captured more accurately in the year in which they occur.

Whether the hospital continues to use a cash-based accounting system, it is important that all costs are captured in the accounts. For example, the costs of drugs needs to be reflected in the accounts, even if the hospital does not make a direct payment for them. The same applies to donated labor, which should be valued at the equivalent of locally hired personnel. It would also be important to show clearly in the accounts the costs of the Cuban and STI clinics.

4.2 DATA MANAGEMENT AND USING DATA FOR DECISION-MAKING

Currently, Victoria Hospital is suffering from the lack of a statistician. Standard hospital efficiency indicators, such as average length of stay and occupancy rates, were not readily available for the costing team to use, thus calculation based on limited data were used. Ideally, this information should be available to the management of the hospital on a regular basis to track issues that may arise and ensure an efficient allocation of staff and resources. Much of this information exists as ward and outpatient record books are relatively well-kept and there is a system of paper reporting to Medical Records. Much of the data, however, remains in folders without being analyzed. More staff with an adequate mix of knowledge of the medical records and statistics, and familiarity with electronic formats may be needed to improve the use of available data.

Paper records make analyzing any data extremely time-consuming. This is particularly true for tracking the consumption of pharmaceuticals, a major cost component of any hospital. An electronic system, even a simple Excel file or Access Database, would assist managers in planning and understanding what financial resources are supporting. The Operating Theater has a simple Access Database that was easily used to produce the number of operations by hospital department, including the severity of the surgery which equates to the price charged; this could serve as a model for the pharmacy. The new St. Lucia Health Management Information System (SLUHIS) should support the regular tracking of data from the

hospital, but it is likely that managers need to create simple systems internally to allow for easy collection of data and submission to the SLUHIS.

In planning for the NNH, adequate measures should be incorporated into the operations plan to ensure the regular collection and analysis of data so that hospital managers can assign staff to the areas in most need due to patient load.

4.3 PRESCRIPTION TRACKING

The Pharmacy at Victoria Hospital maintains separate record books for ward orders of standard stock supplies, inpatient prescriptions, outpatient prescriptions, dialysis users' prescriptions, and ARVs. Any prescriptions paid for by UHC are recorded in an electronic system and in the paper record books. Creating an electronic system with a standard ordering form for ward orders would enable regular reporting on the use of medicines by department. The current recording format for outpatient prescriptions does not capture which outpatient department the prescription is coming from, only the prescribing doctor. For this analysis, the "home" department of the prescribing doctor was used to determine in which clinic the prescription originated. This process took a considerable amount of time and required knowledge of the staffing structure to complete it, making it challenging for an outside consultant to perform the task.

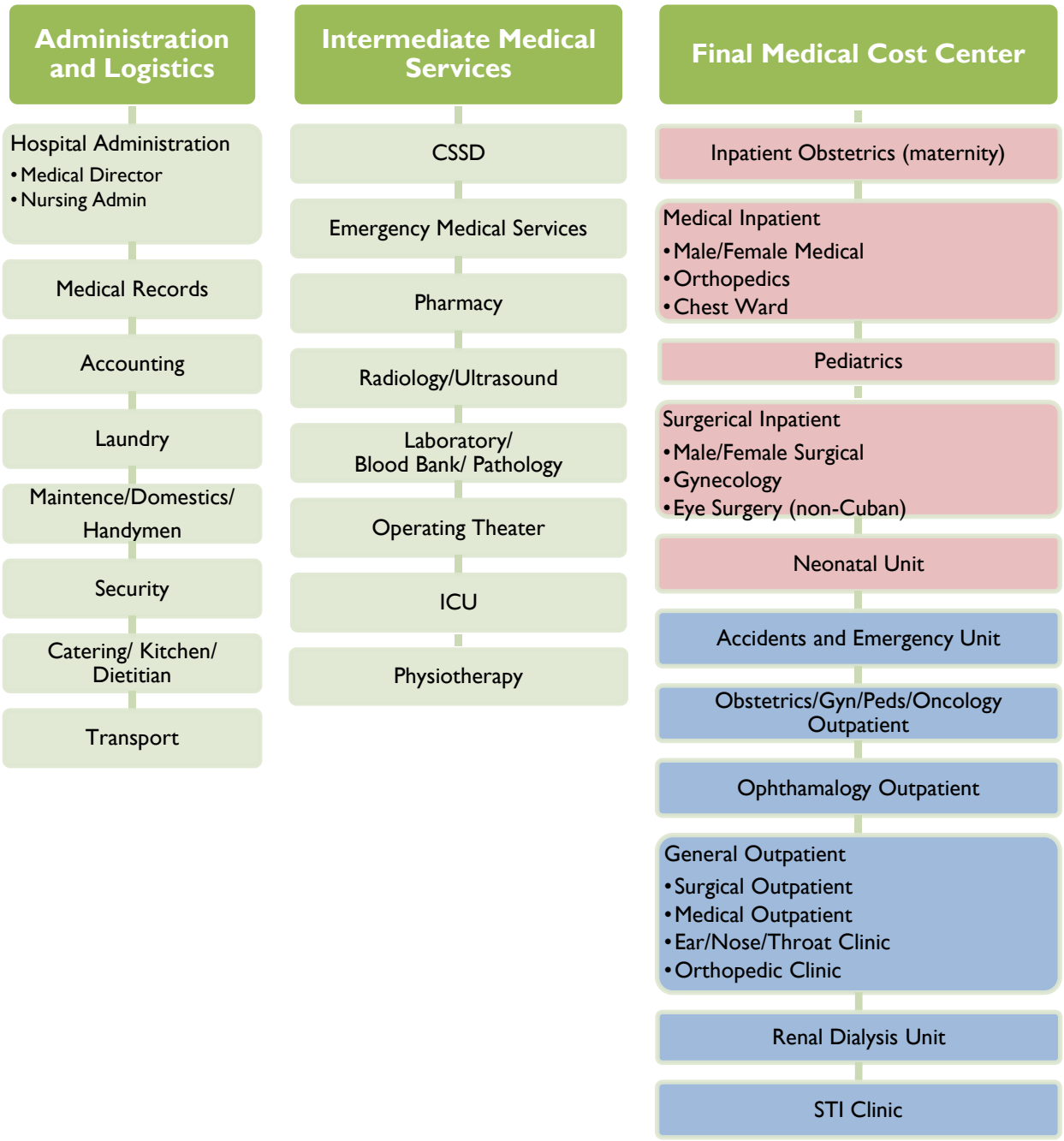
4.4 REFERRAL SYSTEM

The A&E accounts for over 14 percent of the hospital's resources. Compared to other costing studies, this is a relatively high proportion (La Foucade, Scott, Theodore 2005).This may support the view among staff that a large portion of A&E services are going toward primary care cases, which could be seen at health centers or the regular outpatient clinics. Visits to the A&E are not tracked in sufficient detail to distinguish primary care users from those who are actual emergency cases. There are no barriers, other than a longer wait time, to access primary care services in the A&E at Victoria Hospital. The MOH has recognized the need to avoid this at NNH and plans to convert Victoria into a polyclinic with extended hours (in comparison to a health center) to help route patients to the appropriate care facility. However, this alone may not be enough to prevent patients from coming to the NNH for care as it is likely they will see the new facility as providing better care since it is new. There is a need to understand what draws patients to the A&E. For example, if people come to Victoria Hospital because they have a better chance of seeing a doctor versus a nurse, then simply expanding the facility hours with access to nurses only will not address the public's preferences for seeing physicians and the public will continue to use the A&E. Other mechanisms may need to be established if the MOH wants more patients to access primary care from other facilities. This may include a public education campaign, establishing a higher fee to use the NNH A&E for non-emergency purposes when other facilities are open, or potentially requiring a referral for non-emergency purposes.

4.5 NIC CAPITATION PAYMENT

Currently, the NIC pays a negotiated capitation rate of EC$5 million to the MOH for services at both Victoria and St. Jude Hospitals. During this analysis, data on how many NIC members use fee-based services at Victoria Hospital were not available. Improving tracking of patient exemptions and hospital costs may serve to better align the cost of providing free services with amount the NIC pays toward the MOH budget. Using the electronic medical records that are planned with the new SLUHIS, a mechanism may be available to track a patient's exemption type and compare the average cost to provide inpatient care for NIC members against the NIC contribution.

ANNEX A: COST CENTER ASSIGNMENTS



ANNEX B: METHODOLOGY

The costing methodology used classified the hospitals into three major sections (administration and logistics (overhead), intermediate medical services, and final medical services) and then broken them down into cost centers. Costs were assigned to those cost centers either directly for direct inputs or through allocation rules for indirect inputs. The administration and intermediate medical services were later allocated to final cost centers. Within each final cost center, cost units were calculated, for example, per inpatient day, admission and outpatient visit.

ALLOCATION OF STAFF TIME AND SALARIES

Many staff typically work in multiple departments. For example, sometimes doctors or nurses work for both inpatient and outpatient departments or for departments of different specialties. Staff time, salaries, and allowances are allocated to relevant cost centers according to the proportion of the time spent at that cost center. To estimate and allocate joint time costs across cost centers, we used weekly schedules as a basis.

INDIRECT COST ALLOCATIONS

Indirect Cost	Allocation Rule
Water	40% to the laundry, then the rest to other departments according to space occupied
Electricity	25% to operating theaters and CSSD, 20% to the laundry, 5% to radiology/ultrasound, and 5% to laboratory/blood bank/pathology, then the rest to all remaining departments according to space occupied
Fuel and oil	Completely to vehicles
Propane gas/	80% to the kitchen, 20% to laundry
Communications	Included in General Administration
Medical Gases	Number of cylinders per cost center ICU and Theater = 50 cylinders of Oxygen per week Theater = 4 cylinders of nitrous oxide per week Theater = 1 cylinder of nitrogen every 3-4 months Nursery = 10 cylinders of compressed air per week
Stationery	Equally across cost centers

ADMINISTRATION AND LOGISTICS COST ALLOCATION RULES

All indirect costs (overhead and intermediate department costs) were allocated to final cost centers. Overhead costs (e.g., the direct costs of general and administrative departments) were allocated to intermediate department costs and final service costs (Inpatient and the Outpatient) using a "Step-down Approach." The following rules were applied:

Administration and Logistics Departments	Allocation Rules
Administration	According to number of Full-time Equivalent staff (FTE)
Medical Records	According to number of FTE staff in intermediate and final medical cost centers
Accounting	According to FTE staff
Domestics/Handymen/ Maintenance (building)	According space allocations
Laundry	Weight per department of use according the hospital's recommendation or record
Security	According to FTE Staff
Kitchen/Dietitian	According to inpatient days by final cost centers

INTERMEDIATE DEPARTMENT COST ALLOCATION RULES

Intermediate costs were allocated to final cost centers using a step down approach according to the following allocation rules.

Intermediate	Allocation Rules
Operating Theatre	Number of surgeries conducted from every cost center
Laboratory/Blood Bank/Pathology	Actual consumption by every final cost center
Radiology	Actual number of films consumed by every cost center
Pharmacy	Actual consumption of drugs by every cost center
CSSD	% consumption within each area (operating theater, lab. inpatient, outpatient)
ICU	Number patients coming from every cost center

ANNEX C: BIBLIOGRAPHY

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