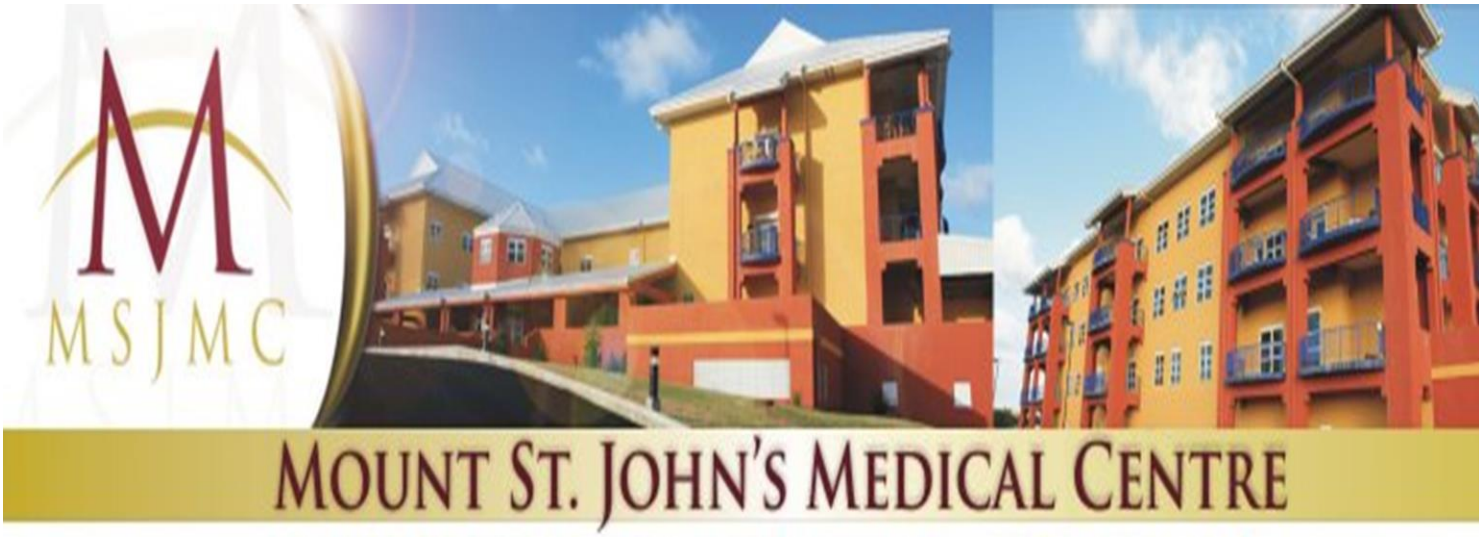
USAID
FROM THE AMERICAN PEOPLE

HEALTH SYSTEMS 2020
better systems, better health

COSTING OF SERVICE PROVISION AT THE MOUNT ST. JOHN'S MEDICAL CENTRE IN ANTIGUA AND BARBUDA: FINAL REPORT



June 2013

Health Systems 20/20 Caribbean is a technical assistance program within the U.S.-Caribbean Regional PEPFAR Partnership Framework. Its purpose is to support governments to strengthen their health financing systems for a sustainable HIV/AIDS response in the Caribbean. The Health Systems 20/20 Caribbean project is implemented by Abt Associates Inc. and it is funded by the United States Agency for International Development (USAID), under the Cooperative Agreement # AID-538-LA-12-00001.

June 2013

For additional copies of this report, please email info@healthsystems2020.org or visit our website at www.healthsystems2020.org

Cooperative Agreement No.: GHS-A-00-06-00010-00

Submitted to: René Brathwaite, AOR
USAID/ Barbados and the Eastern Caribbean
St. John's, Barbados

Recommended Citation: Routh, Subrata. June 2013. *Costing of Service Provision at the Mount St. John's Medical Center in Antigua and Barbuda: Final Report.* Bethesda, MD: Health Systems 20/20 Caribbean project, Abt Associates Inc.

Abt Associates Inc. | 4550 Montgomery Avenue | Suite 800 North
| Bethesda, Maryland 20814 | P: 301.347.5000 | F: 301.913.9061
| www.healthsystems2020.org | www.abtassociates.com

COSTING OF SERVICE PROVISION AT THE MOUNT ST. JOHN'S MEDICAL CENTER IN ANTIGUA AND BARBUDA: FINAL REPORT

DISCLAIMER
The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development (USAID) or the United States Government

CONTENTS

Acronyms ..... **ix**

Acknowledgments **11**

Executive Summary **12**

1. Background **17**

1.1 Antigua and Barbuda: Country Overview 17
1.2 Health Systems 20/20 Project in Antigua and Barbuda 17
1.3 Objectives 18

2. Methodology **19**

2.1 Technical Approach 19
2.2 Team Approach 20

3. Results and Findings **21**

3.1 Summary of Output and Input Data 21
3.2 Staffing and Cost Data By Department 23
3.3 Step-down Costing Results: Allocation of Overhead Costs Among Clinical (Final) Departments 26
3.4 Per Unit Costs of Services Produced at the MSJMC 32
3.5 Cost Estimates for the Inpatient Care Dispensed to HIV/AIDS Patients 35

4. Discussion and Recommendations **38**

4.1 Analysis of Data Limitations 38
4.1.1 Output Data Reporting 38
4.1.2 Input Data Reporting 38
4.2 Analysis of Hospital Occupancy/Capacity Use Rate 39
4.3 Cost-Revenue Analysis 40
4.4 Recommendations and Conclusions 41

Annex A. Information on Cuban Medical Brigade **43**

Annex B. Distribution of MSJMC Physicians' Time (Length of Effort) Among Inpatient/Outpatient Departments/Wards **44**

Annex C: Summary of Pharmaceuticals Procurement by MSJMC in 2011 & 20012 (In EC$) **45**

Annex D: Summary of Pharmaceuticals and Other Medical Supplies Contributed to MSJMC from CMS in 2011 & 2012 (in EC$) **47**

Annex E: Summary of Utility and Other Operating Costs in 2011 & 2012 (in EC$) **48**

Annex F: Estimates of the Annual Depreciation Costs for the Capital Items (in EC$) 49

Annex G: Area/Floor Space and Construction Costs for MSJMC Departments 50

Annex H: Results of the Stepdown Allocation of Overhead/Common Costs Across the Clinical (Final) Departments in 2011 (in EC$) 51

Annex I: Results of the Stepdown Allocation of Overhead/Common Costs Across the Clinical (Final) Departments in 2012 (in EC$) 53

Annex J: Bibliography 55

LIST OF TABLES

Table 1. Select Output and Input Data in 2011 and 2012 21

Table 2. Summary of Department-specific Staffing and Cost Data in 2011 24

Table 3. Summary of Department-specific Staffing and Cost Data in 2012 25

Table 4. Allocation Factors for Distribution of the Overhead and Common Costs 27

Table 5. Summary of Costs for the Clinical (Final) Departments in 2011, After Step-down Distribution Among Them of the Overhead/Common Costs 28

Table 6. Summary of Costs for the Clinical (Final) Departments in 2012, After Step-down Distribution Among Them of the Overhead/Common Costs 29

Table 7. Summary of Per Unit Service Costs for the Clinical (Final) Departments in 2011 and 2012 33

Table 8. Cost of Inpatient Services Dispensed from MSJMC to HIV-positive Patients in 2011 35

Table 9. Cost of Inpatient Services Dispensed from MSJMC to HIV-positive Patients in 2012 36

Table 10. Analysis of Average Length of Stay and Occupancy Rate for the Inpatient Final Departments in 2011 and 2012 39

Table 11. Summary of Cost-Revenue Analysis in 2011 40

Table 12. Summary of Cost-Revenue Analysis in 2012 41

LIST OF FIGURES

Figure 1. Percentage share of various cost components in the total costs for the clinical final departments in 2011, after the step-down distribution 31

Figure 2. Percentage share of various cost components in the total costs for the clinical final departments in 2012, after the step-down distribution……31

Figure 3.Comparison of department-specific service costs in 2011 and 2012……..34

ACRONYMS

ABTB	Antigua and Barbuda Transport Board
ALOS	Average length of stay
APUA	Antigua Public Utility Agency
ART	Antiretroviral Therapy
CMS	Central Medical Stores
EC$	Eastern Caribbean Dollar
EMS	Emergency Medical Services
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immunodeficiency Syndrome
HS/PSA	Health Systems and Private Sector Assessment
ICU	Intensive Care Unit
IT	Information technology
MBS	Medical Benefit Scheme
MOH	Ministry of Health, Social Transformation and Consumer Affairs
MSJMC	Mount Saint John's Medical Center
NICU	Neo-natal intensive care unit
OIs	Opportunistic infections
PLHIV	Person(s) Living with HIV
PPS	Pharmaceutical Procurement Service
USAID	United States Agency for International Development

ACKNOWLEDGMENTS

The author would like to thank the Antigua and Barbuda Ministry of Health and the Mt. Saint John Medical Center (MSJMC) Board of Directors and management for their generous support of the accomplishment of the costing exercise, and of the data collection work in particular. Profound thanks goes to Permanent Secretary Mr. Edson Joseph, Chief Medical Officer (CMO) Dr. Rhonda Sealey-Thomas, Head of the Ministry of Health (MOH) Health Information Department Mr. Colin O'Keiffe, and MSJMC CEO Mr. Sean DesChamps.

Special thanks are due to the members of the MOH Costing Committee: The Chair of the Committee CMO Dr. Sealey-Thomas, Principal Nursing Officer Ms. Elnora Warner, Medical Officer Dr. Cleofoster Beazer, MSJMC Financial Controller Ms. Michele Simon, MSJMC Accountant Mr. Casford King, and National AIDS Program Deputy Head Ms. Sonia Cochrane-Joseph, who have been instrumental in mobilizing the needed data for the costing study. Ms. Michele Simon, in particular, played a pivotal role in the collection and validation of the cost and output data.

Many MSJMC staff members and managers substantially supported the costing study with important input and data. Among them, the author would like to thank Dr. Dane Abbott (formerly the Medical Director), Head of Infection Control Ms. Anne-Marie Zachariah-King, Head of Pharmacy Department Mr. Bridgewater, Information Technology (IT) specialist Mr. Osbert Josiah. Special thanks are also due to Central Medical Stores Head Ms. Faye Edwards for her input to compiling data on government contributions to MSJMC in terms of pharmaceuticals and medical supplies.

The report benefited from technical and other inputs of Mr. Joseph Tayag, Dr. Laurel Hatt, and Ms. Lisa Tarantino of the Abt Associates Inc.-led HS 20/20 Caribbean project.

Lastly, the author would like to thank Ms. Kendra Phillips and Ms. Rene Brathwaite of the United States Agency for International Development/Barbados and the Eastern Caribbean for their support of this costing exercise and the work of the project in Antigua and Barbuda more generally.

EXECUTIVE SUMMARY

BACKGROUND

As a part of the United States-Caribbean Regional HIV and AIDS Partnership Framework 2010-2014, the United States Agency of International Development (USAID)/Barbados and the Eastern Caribbean asked the Health Systems 20/20 Project to help the Ministry of Health (MOH) in Antigua and Barbuda accomplish costing assessments for the primary health and outpatient HIV/AIDS services in 2012. As the next logical step of this costing work, the MOH requested further support of the HS 20/20 Caribbean Project to conduct a comprehensive costing of the services at the only public hospital of the country, the Mt. Saint John's Medical Center (MSJMC), including a detailed assessment of the MSJMC costs for treating HIV positive patients.

OBJECTIVE

The objective of the costing study was to ascertain the total cost of service provision at MSJMC—considering both capital and recurrent costs, determine the cost of service provision at each clinical department, conduct unit costing of the services provided at each clinical department, and assess the costs of secondary and specialized in-patient care - treatment of opportunistic infections (OIs) and general conditions - provided by MSJMC to HIV-positive patients. Specifically, this activity contributes to three goals that strive to ultimately improve the efficiency of the health system:

1. Improve resource allocation related to secondary care, particularly of the country's only hospital, MSJMC
2. Measure the financial implications of health seeking practices by comparing the cost structures of patients seeking out-patient services among the MSJMC's emergency department, the hospital's out-patient center, and other primary health care facilities
3. Assist the MOH in understanding the costs related to delivering HIV/AIDS services, and potentially planning for the integration and expansion of ambulatory HIV/AIDS care into the primary healthcare system

METHODOLOGY

The MOH led the establishment of a Costing Committee comprised of MOH, MSJMC and HS 20/20 Caribbean professionals to conduct the costing of the hospital services. The Costing Committee was chaired by Dr. Rhonda Sealey-Thomas, Chief Medical Officer (CMO) of Antigua and Barbuda. The costing exercise was conducted over a four month period, from February through May, 2013. The Antigua-based team provided valuable data collection support and other informative inputs to the costing study under the technical direction of Dr. Subrata Routh of Abt Associates Inc.

A full costing required adopting a technical approach based on collecting all relevant recurrent and capital cost information for all of the Management and support, Outpatient clinical departments and Inpatient wards of MSJMC. Data to ascertain separately MSJMC inputs/costs consumed on secondary and specialized in-patient care (treatment) as well as on laboratory/diagnostic services and drugs dispensed to the HIV-positive patients was compiled on the basis of their individual patient records. Data collection work was conducted in close collaboration with local counterparts from mid-February to mid-May 2013.

The costing exercise was accomplished for the years 2011 and 2012. Total costs for MSJMC and its various departments were estimated as the product of all recurrent costs and the annualized value of the concerned capital costs separately for each of the two reference years. Distribution of the overhead department costs and MSJMC common costs among the final (clinical) departments (i.e. the main Cost Centers producing the end results for patients) was done following a step-down approach. Reasonable allocation principles (e.g., number of staff, floor area, and number of bed-days) were used to this end. Following the absorption of the common, overhead department costs by the clinical (final) departments, individual total costs for the clinical (final) departments were ascertained. The per unit service costs for each clinical (final) department were then determined by dividing its total annual costs with the corresponding number/amount of services it had produced in each of the two reference years.

FINDINGS

SELECT OUTPUT AND INPUT DATA

MSJMC handled a total of 5,827 admissions entailing 32,606 bed-days in 2011, and 5,678 hospital admissions involving 30,300 bed-days in 2012. The average length of stay was thus 5.6 in 2011 and 5.3 in 2012. The number of laboratory tests performed in 2011 was much higher than in 2012—85,144 as opposed to 53,909. In contrast, the totals for the outpatient clinic visits and radiological tests registered in 2012 were substantially greater than those in 2011: 16,304 outpatient visits and 33,447 radiological tests in 2012 against 13,024 outpatient visits and 30,087 radiological tests in 2011. Also was higher the number of dialysis treatments in 2012 than in 2011 (7,657 in 2012 compared to 7,005 in 2011). No such variation, however, was evident across these two years of reporting in terms of the emergency cases handled and surgical operations performed, which were around 30,000 and 2,000, respectively, for both of the years. One general limitation of the MSJMC performance data reporting system is that it does not contain information on the number of distinct individual patients availing the services.

With regard to the inputs employed to generate the above outputs, MSJMC has a capacity of 185 inpatient beds, and it had employed a total of 524 full-time and part-time staff in 2011 and 530 in 2012. MSJMC recurrent costs include salary and benefits for personnel, pharmaceuticals (medicines/drugs), medical supplies (non-drug medical items such as bandage, cotton), office/non-medical supplies, and utility and other operating costs (like electricity, water, telephone, outsourcing costs for cleaning, security, diet/food). In 2012, the total of the recurrent costs amounted to EC$ 4.3 million (US$ 18.2 million). Of these, 53 percent accounted for salary and benefits, 31 percent for utility and other operating costs, 12 percent for other medical supplies, 4 percent for pharmaceuticals and 1 percent for non-medical supplies. The total of the MSJMC recurrent costs in 2011 was EC$ 42.5 million. The MSJMC total for the recurrent costs in 2012 was almost 16 percent more than in 2011. This increase in 2012 came from considerably increased costs compared to 2011 for other medical supplies' costs, utility and other operating costs and salary and benefits costs.

Capital costs for MSJMC comprise building and construction costs, costs of furniture and equipment, and other allied capital expenditures. The total of all capital assets in MSJMC totaled EC$ 90 million or US$ 33 million as of 2012. The annualized depreciation costs for all capital assets amounted to EC$ 4.77 million or US$ 1.77 million in 2011 and EC$ 4.81 million (US$ 1.78 million) in 2012. Building and construction costs and equipment costs are the two largest components of MSJMC capital costs, together accounting for more than 95 percent of these costs. Recurrent and annualized capital costs together amounted to EC$ 47.3 million or US$ 17.5 million in 2011 and EC$ 54.1 million or US$ 20.0 million in 2012.

STAFFING AND COSTS BY DEPARTMENT

MSJMC has a total of 25 various administration and management, outpatient clinical, and inpatient wards. Based on MSJMC's key output indicators, these departments could be categorized into two distinct cost centers: (i) the Overhead/supporting category comprising all of the admin and management and three outpatient clinical departments that essentially provide support services to the remaining outpatient and inpatient clinical departments/wards; and (ii) the Clinical (final) category including the six main outpatient clinical departments and all of the eight inpatient wards.

Of the 534 personnel in 2011, 170 worked in the overhead (supporting) departments and 364 in the clinical departments. Similarly, out of a total of 545 personnel in 2012, 176 were employed in the overhead (supporting) departments and 369 in the clinical departments. In general, for both of these years, Operations, Finance, Admin, Nursing and Pharmacy were the five personnel and salary cost-intensive departments in the Overhead category, and Operating Theatre (OT), Emergency, Outpatient Clinic, Laboratory and Female Surgical in the Clinical (Final) category.

Included in the above-mentioned manpower at MSJMC, as part of the Cuban assistance to Antigua and Barbuda, a Cuban Brigade provides certain medical support to MSJMC. It comprised a total of 23 persons in 2011 and 32 in 2012, involving a salary cost of approximately EC$ 922 thousand and EC$ 1.5 million, respectively. These costs along with other allied expenses for the Cuban Brigade are born by the Cuban government.

Department-specific disaggregated cost information for non-medical and other medical supplies is partially available in the MSJMC book of records. However, cost data for pharmaceuticals and utility and other operating items are aggregated at the hospital level. Department-specific disaggregated data on the capital items (medical and non-medical furniture, medical and non-medical equipment, building and construction costs, other relevant investments/expenditures) is also missing.

Allocation of the overhead department costs among the clinical (final) departments/wards was done on the basis of the step-down approach. Operating theatre, Laboratory, Emergency, Maternity, Outpatient clinic and Female surgical appeared as the most cost-intensive departments. Salary and benefit, utility and other operating, and capital costs together accounted for a significant part of the total costs, in most cases for 80 percent or more. The cost of each clinical (final) department divided by the respective number of ouput/services produces the unit service costs.

PER UNIT COSTS OF MSJMC SERVICES

Comparison of the per unit service costs for 2011 and 2012 revealed that in both of the years, the five most costly services in terms of per unit production costs were:

(i) Operating theatre (Cost of each surgical operation amounted to EC$ 2,788 or US$ 1,033 in 2011, and EC$ 3,209 or US$ 1,189 in 2012);
(ii) Intensive Care Unit (ICU) ward (Cost of each bed-day amounted to EC$ 1,559 or US$ 577 in 2011, and EC$ 3,023 or US$ 1,131 in 2012);
(iii) Neo-natal intensive care unit (NICU) ward (Cost of each bed-day amounted to EC$ 1,066 or US$ 395 in 2011, and EC$ 1,304 or US$ 483 in 2012);
(iv) Maternity ward (Cost of each bed-day amounted to EC$ 1,026 or US$ 380 in 2011, and EC$ 1,316 or US$ 487 in 2012); and
(v) Pediatric ward (Cost of each bed-day amounted to EC$ 1,060 or US$ 393 in 2011, and EC$ 1,054 or US$ 390 in 2012).

In terms of per unit cost for each admission in the inpatient wards, ICU, NICU, Male and Female surgical wards, and Pediatrics ward appeared to be the most costly ones.

COST ESTMATES FOR INPATIENT CARE PROVIDED TO HIV-POSITIVE PATIENTS

In 2011, a total of 62 admissions of HIV-positive patients were registered in MSJMC which involved 918 bed-days for the needed treatment and amounted to an average length of stay (ALOS) of 15 days. This had accounted for 1.0 percent of all MSJMC inpatient admissions and 2.8 percent of total bed/patient-days that year. Inpatient care sought by these patients was provided at the ICU, Pediatrics, Obstetrics/Maternity, Male and Female medicine, and Male and Female surgical wards. Based on the number of bed-days consumed by the HIV-positive patients in each of these wards and the corresponding unit costs for 2011, it is estimated that MSJMC had to spend a total of approximately EC$ 603,000 (US$ 223,000) on providing inpatient care to the HIV-positive patients. This was around 1.4 percent of all MSJMC recurrent costs in 2011, and resulted in an estimated cost of EC$ 9,733 (US$ 3,605) per HIV-positive inpatient admission—twice as much as the MSJMC average inpatient cost of EC$ 4,363 (US$ 1,616) per patient admission.

In 2012, however, a total of 84 admissions of HIV-positive patients were registered that involved 1,371 bed-days for treatment. These accounted for an ALOS of 16 days by each patient, 1.5 percent of all MSJMC inpatient admissions and 4.5 percent of all bed/patient-days for that year. Inpatient care costs for these patients amounted to a total of EC$ 1.2 million or US$ 456,000, which was 2.5 percent of all MSJMC recurrent costs in 2012. This resulted in an estimated cost of EC$ 14,671 (US$ 5,434) per HIV-positive inpatient admission, implying almost a three-fold higher per patient cost than the MSJMC inpatient average of EC$ 4,893 (US$ 1,812). Thus, the cost of inpatient care for persons living with HIV (PLHIV) was much higher in 2012 compared to that in 2011, indicating a possible further increase of this cost in the years to come.

DISCUSSION AND RECOMMENDATIONS

The cost estimates suggested by the study require to be interpreted with caution, due to some data limitations. The output data recording and reporting system in MSJMC is extremely disintegrated and fragmented, and the number of patients served/treated is not reported. There is no unified or integrated output reporting system. Accounting of cost data lacks department-specific tracking of input-use. Disaggregated cost data on the use of pharmaceuticals, non-medical and medical supplies, and other operating inputs by various outpatient and inpatient clinical departments is largely unavailable. Most of the cost data is aggregated at the hospital level. Department-specific disaggregated data on the capital items is missing as well. Consequently it is possible that estimated apportioning of the aggregated, common costs across the clinical wards and services had impacted the accuracy of the cost results. For example, the unit cost for dialysis treatment estimated in the study could appear to be lower than what it is in actuality.

Apart from the upfront cash financing by the MOH and Medical Benefit Scheme (MBS) and the revenues earned by MSJMC through user fees charged to clients and reimbursements collected from private insurers, MSJMC also receives a number of in-kind contributions from the government and other sources, such as pharmaceutical and medical supplies from the Central Medical Stores (CMS), transport support from the Antiguan and Barbuda Transport Board (ABTB), free ambulance services from the Emergency Medical Services (EMS). However, these contributions are not properly documented in the MSJMC accounts for operating costs.

Despite the above shortcomings, the costing results offered certain useful information with regard to further efficiency improvement and financial sustainability of MSJMC services. For example, the predominance of fixed costs (salary and benefit costs, utility costs and capital costs) in the overall costs for MSJMC indicates to the pressing need for examining the capacity utilization status and undertaking the needed measures to improve it.

Analysis of the hospital's occupancy/capacity use revealed low levels of use in general. Only a half of all inpatient capacity in MSJMC was utilized in 2011 and 2012. For Pediatric and ICU wards, the capacity use rate was even lower. To improve efficiency of the service provision, it is imperative that MSJMC management take all possible measures to attract more patients and attain higher occupancy/capacity use rates. One option is to offer space utilization to private practice physicians or to consider other alternative and cost effective uses of underutilized space. Alternatively, management should make a concerted effort to reduce fixed costs through effective rationalization/ balancing of the inputs (cutting back on certain fixed inputs or implementing measures for their shared use).

A cost-revenue comparison based on the data obtained from MSJMC and CMS sources showed that MSJMC had experienced a net surplus of EC$ 6.6 million (US$ 2.5 million) on the recurrent costs incurred in cash in 2011. However, MSJMC reported that it did not afford to pay the utility bills amounting to EC$ 8.6 million (US$ 3.2 million) to the Antigua Public Utility Agency (APUA) because of shortage of enough funds. Once these accounts payable are paid back, its net cost-revenue status would have turned into a deficit of EC$ 2.0 million (US$ 730,000). Further, if the capital depreciation funds were considered, the net cost-benefit outcome for MSJMC in 2011 would have amounted to a loss of EC$ 7.7 million or US$ 2.8 million. In 2012, MSJMC saw a net deficit of approximately EC$ 0.5 million (US$ 185 thousand) on the recurrent costs incurred in cash. This year, too, MSJMC could not pay its utility bills amounting to EC$ 9.4 million (US$ 3.5 million) because of a shortage of funds. Given these accounts payable, the net cost-revenue status would have grown into a deficit of EC$ 8.4 million or US$ 3.1 million. Capital depreciation funds and Cuban salary payments considered, the net loss for MSJMC in 2012 would total to EC$ 14.7 million or US$ 5.5 million. One reason for the much increased net shortfall in 2012 over 2011 could be linked to the substantial rise in the recurrent costs largely resulting from considerably greater medical items/supplies' costs in 2012. The latter is partly caused by the changed accounting practice introduced in 2012 (market price-based revaluation of supplies received from CMS).

The cost-revenue analysis indicates that MSJMC needs to strengthen the financial sustainability of its service provision. In conjunction with more regular contribution of needed funds from the MOH and other government sources, it is also important that MSJMC adopts appropriate cost-containment and efficiency-improvement measures as well as prudent revenue-generating strategies in order to operate at break-even. Any contractual obstacles in this regard must be urgently addressed by the MOH, MSJMC and all other parties concerned.

Regarding the accounting of input (cost) and output data, there is an urgent need to improve the reporting and information system at MSJMC so as to enable appropriate and consistent recording and reporting of performance indicators (service statistics). It is also imperative that the number of patients served/treated is added as an output measure for all outpatient and inpatient departments. Similarly, the cost accounting and financial systems at MSJMC urgently need to be streamlined so as to enable detailed tracking of input-use. Accurate and proper cost accounting based on the types and amounts of inputs/resources used by each overhead and clinical department needs to be established. The cost accounting system should be able to document and ascertain the monetary value of all non-cash, in-kind contributions from government and external sources as well. It is also essential to carry out a complete inventory of all capital items immediately. It should enable department-specific tracking of the building

and construction costs, non-medical and medical furniture and fixtures, non-medical and medical equipment, and other capital items together with their respective quantities, procurement (or current) price and year of procurement. It is reaffirming that at the time this report was in finalization, MSJMC management reported to have initiated measures to upgrade data recording and reporting systems.

The costing exercise has been a useful learning experience for costing team members from MSJMC and the MOH who had jointly worked with the HS 20/20 Caribbean costing specialist. The team provided valuable input to the development of data collection and analysis tools and templates that can be used for future costing estimations. The regular interactions between the costing specialist and the local working group members were instrumental in identifying the limitations with the existing cost accounting and information systems at MSJMC. As for the next steps, MOH and MSJMC should take effective measures to address the above recommendations.

Costing is not a one-off activity. Sound management practice requires periodic review of the costs, and any such future effort of MSJMC can build on the existing costing work. Once the input and output data accounting systems are improved based on the above recommendations and more accurate data is generated, the Excel costing worksheets/tool developed in this costing exercise could be easily adapted to derive revised cost estimates.

1. BACKGROUND

1.1 ANTIGUA AND BARBUDA: COUNTRY OVERVIEW

Considered an upper-middle-income country by the World Bank, Antigua and Barbuda has the second-lowest poverty level among English-speaking Caribbean nations. Even so, nearly 15 percent of the population of nearly 90,000 is considered poor, living on less than EC$19 (US$7) per day. Tourism accounts for nearly 60 percent of gross domestic product and 40 percent of investment in the country. With agricultural production focused on domestic markets and a limited manufacturing sector, economic growth will remain dependent on tourism.

With the exception of funding for HIV/AIDS, Antigua and Barbuda's health system is not dependent on external aid. The country has a well-functioning primary health care system and the populations enjoy relatively good access to health care services (Health Systems 20/20 & SHOPS 2012). However, the country suffers from increasing rates of non-communicable disease and the eventual end of Global Fund support for antiretroviral drugs. These developments, coupled with the fact that the country is fast becoming ineligible for donor funding due to its upper-middle-income status, reinforce the need to comprehensively assess the cost implications of strategic policy decisions being considered.

1.2 HEALTH SYSTEMS 20/20 PROJECT IN ANTIGUA AND BARBUDA

In 2009, the United States Government (USG) supported a process to develop the U.S.-Caribbean Regional HIV and AIDS Partnership Framework 2010-2014 (Partnership Framework) together with twelve Caribbean countries: Antigua and Barbuda, the Bahamas, Barbados, Belize, Dominica, Grenada, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and

Tobago. A major goal of the Partnership Framework is to move the region toward greater sustainability of HIV/AIDS programs.

As a part of the U.S.-Caribbean Regional HIV and AIDS Partnership Framework, 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 (HS/PSA) to identify priorities for technical assistance in Antigua. In May 2012, Health Systems 20/20 project agreed with the Antigua and Barbuda Ministry of Health (MOH) to conduct a detailed health services costing study, in order to meet some of the stated priorities of the stakeholders as articulated in the February 2012 HS/PSA Validation and Prioritization Workshop.[1] Specifically, this activity would contribute to three goals that strive to ultimately improve the efficiency of the health system:

4. Improve resource allocation related to secondary care, particularly of the country's only hospital, the Mount St. John's Medical Center (MSJMC)
5. Measure the financial implications of health seeking practices by comparing the cost structures of patients seeking out-patient services among the MSJMC's emergency department, the hospital's out-patient center, and other primary health care facilities
6. Assist the MOH in understanding the costs related to delivering HIV/AIDS services, and potentially planning for the integration and expansion of ambulatory HIV/AIDS care into the primary healthcare system.

To this end, Health Systems 20/20 collaborated with the MOH in completing the costing assessments for the primary health and outpatient HIV/AIDS services last year. As the next logical step of the above costing exercise, the MOH requested further support of USAID/EC in involving HS 20/20 Caribbean to conduct a comprehensive costing of the services at the only public hospital of the country, the MSJMC. As part of conducting a detailed costing of the MSJMC services in general, the MOH was also keen to acquire specific information on the costs for treating HIV-positive inpatients. This report summarizes the results of this final hospital costing study.

1.3 OBJECTIVES

The costing study aimed to accomplish the following:

- Ascertain the total cost of service provision at MSJMC, considering both capital and recurrent costs
- Determine the cost of service provision at each clinical department
- Conduct unit costing of the services provided at the clinical departments
- Assess the costs of secondary and specialized in-patient care (treatment of OIs and general conditions) provided to HIV-positive patients

[1] For details see Tarantino, Lisa; Andrew Won. March 2012. *Workshop Report: Antigua and Barbuda Health Systems and Private Sector Assessment.* Bethesda, MD: Health Systems 20/20 project and SHOPS Project, Abt Associates Inc.

2. METHODOLOGY

2.1 TECHNICAL APPROACH

A full costing of the MSJMC required an approach based on collecting all relevant recurrent and capital cost information. The list of information to collect included:

- Expenditure by department for direct costs including, personnel, medicine/drugs, non-medical (office) and medical supplies, and other relevant operating costs. This was applicable for all distinct 'cost centers' within MSJMC that consume specific inputs/costs to deliver a particular function. Thus, all Management and support departments, Outpatient clinical departments and Inpatient wards of MSJMC were considered for data collection.
- Equipment, furniture and fixture, building/construction and all other capital expenditure since the inception of MSJMC in 2009
- Overhead costs such as electricity, fuel, water, cleaning, repair and maintenance, including allied outsourcing costs
- Staff distribution by departments and related salary and benefits costs
- Costs of pharmaceuticals, other medical/clinical supplies, and office/stationery and other non-medical supplies
- Service/output-related information for each clinical department such as name of the key services/ final outputs (visits, tests, hospital admissions, bed-days or patient-days), quantity/volume of the services dispensed, number of patients served/treated
- Distribution of floor space by department or service type (e.g., square feet) and unit cost of building/construction

Three separate data collection tools were designed to capture the above-mentioned information. MSJMC books of accounts and finance, data systems within the Information Technology (IT) department and MSJMC Performance Reporting Dashboard, and individual monthly/periodic reports of the clinical departments served as the main source for information. Also, MOH and CMS were contacted for certain information and verification regarding their contribution to MSJMC.

Data to ascertain separately MSJMC inputs/costs consumed on secondary and specialized in-patient care (treatment) as well as on laboratory/diagnostic services and drugs dispensed to the HIV-positive patients was compiled on the basis of their individual patient records.

The costing exercise was initially planned to focus on 2012, the immediate past calendar year. But 2011 was included later on MOH's request—to help them better understand cost trends.

Total costs for MSJMC and its various departments were estimated as the product of all recurrent costs and the annualized value of the concerned capital costs separately for each of the two reference years of costing. Capital costs were annualized on the basis of the economic life of the capital assets as adopted by MSJMC. In keeping with MSJMC accounting practices, simple (undiscounted) approach to determining annual depreciation costs was applied.

Apportioning (distribution/allocation) of the overhead department costs and MSJMC common costs among the final (clinical) departments (i.e. the main Cost Centers producing the end results to patients)

was done following a step-down approach. Reasonable allocation principles (e.g., number of staff, floor area, number of bed-days), as agreed upon with the counterparts, were used to this end.

Following the absorption of the common, overhead department costs by the clinical (final) departments, the individual total costs (comprising both recurrent and annualized capital costs) for the clinical (final) departments in the particular year were ascertained. The per unit service costs for each clinical (final) department were then determined by dividing its total annual costs with the corresponding number/amount of services it had produced in each of the reference years.

Data collection work for the costing exercise was conducted from mid-February to mid-May, under the overall guidance of the HS 20/20 Caribbean costing specialist. A two-week in-country trip was undertaken by the costing specialists in mid-February to finalize the design of the costing study and the data collection tools with the counterparts, conduct orientation meetings with the counterparts to explain them the data collection procedures, and initiate the data collection work.

Analysis of costs and write-up of the preliminary report were completed in end-May, followed by a dissemination seminar in Antigua on May 29, 2013. During this May meeting, the MSJMC staff provided some additional data and feedback (for example, information on Cuban Brigade) which was incorporated into the final analyses and this final report.

2.2 TEAM APPROACH

The costing study has been a collaborative effort between the HS 20/20 Caribbean project and Antigua and Barbuda professionals from its conceptualization stage. As the key counterpart and primary user of the data and analysis of this exercise, the MOH commissioned a five-member Costing Committee to assist the HS 20/20 Caribbean Costing Specialists in the overall work on data collection and analysis. The Costing Committee comprised two MOH representatives, two MSJMC staff designated by MSJMC management, and one senior manager nominated by the AIDS Secretariat. CMO Dr. Rhonda Sealey-Thomas formed and chaired the committee. She and Head of the Health Information Division Mr. Colin O'Keiffe provided overall coordination and supervision of the Costing Committee activities.

The Costing Committee members worked together with the HS 20/20 Caribbean costing specialist in the data collection work. The HS 20/20 Caribbean costing specialist maintained regular liaison with the Costing Committee in accomplishing the needed data collection and validation work. The co-member of the Costing Committee representing the AIDS Secretariat was instrumental in compiling MSJMC data on HIV/AIDS patients by accessing their individual medical records.

3. RESULTS AND FINDINGS

3.1 SUMMARY OF OUTPUT AND INPUT DATA

Key output and input data for MSJMC in 2011 and 2012 are summarized in Table 1 below. Outputs include measures of service provision, such as the number of surgical operations conducted.

TABLE 1. SELECT OUTPUT AND INPUT DATA IN 2011 AND 2012

Select output and input data		2011			2012	
OUTPUT DATA		#			#	
Total number of inpatient (hospital) admissions		5,827			5,678	
Total number of patient/bed-days		32,606			30,300	
Total number of outpatient clinic visits		13,024			16,304	
Total number of emergency visits		29,802			29,833	
Total number of laboratory tests		85,144			53,909	
Total number of radiology tests		30,087			33,447	
Total number of dialysis treatments		7,005			7,657	
Total number of surgical operations		2,055			1,988	
INPUT DATA						
Total number of inpatient beds		185			185	
Staff strength		#	%		#	%
Number of doctors/physicians (incl. 2 part-timers in 2011; 4 in 2012)		61	11.2		62	11.0
Number of other medical staff (incl. 37 part-timers in 2011; 56 in 2011)		314	57.4		335	59.6
Number of management & support staff (incl. 1 part-timer in 2012; None in 2011)		172	31.4		165	29.4
Total staff		**547**	**100**		**562**	**100**
Cost data (Recurrent/yearly costs)	**EC$**	**US$***	**%**	**EC$**	**US$**	**%**
Total salaries and benefits paid	24,976,346	9,250,498	58.7	26,568,291	9,840,108	53.9
Total cost of pharmaceuticals (Medicines/Drugs)	1,598,274	591,953	3.8	1,665,711	616,930	3.4
Total cost of all other medical supplies	2,655,389	983,477	6.2	5,805,896	2,150,332	11.8
Total cost of all office and non-medical supplies	255,690	94,700	0.6	423,413	156,820	0.9
Total cost of utility and other operating costs	13,047,878	4,832,547	30.7	14,796,086	5,480,032	30.0
Total of recurrent costs	**42,533,577**	**15,753,175**	**100**	**49,259,397**	**18,244,222**	**100**
Cost data (Capital costs)	**EC$**	**US$**	**%**	**EC$**	**US$**	**%**
Total annual depreciation for building & construction costs	2,520,000	933,333	52.8	2,520,000	933,333	52.4
Total annual depreciation for furniture costs	55,603	20,594	1.2	56,759	21,022	1.2
Total annual depreciation for equipment costs	2,065,042	764,830	43.3	2,102,365	778,654	43.7
Total annual depreciation for all other capital costs	129,662	48,023	2.7	129,662	48,023	2.7
Total of Capital Costs	**4,770,307**	**1,766,780**	**100**	**4,808,786**	**1,781,032**	**100**
Total of MSJMC Costs (Recurrent+Capital)	**47,303,884**	**17,519,955**		**54,068,183**	**20,025,254**	

* 1 US$=2.7 EC$

Output numbers reported above were available from three sources: (i) MSJMC Performance Dashboard for the years of 2011 and 2012, respectively; (ii) the information system at the IT department of MSJMC, and (iii) individual reports collected from the various departments. In the instance of any incompleteness or inconsistency observed in the dashboard or IT reporting, output numbers provided by the individual departments were considered.

As seen from Table 1, MSJMC handled a total of 5,827 admissions entailing 32,606 bed-days in 2011, and 5,678 hospital admissions involving 30,300 bed-days in 2012. The average length of stay was 5.6 days in 2011 and 5.3 days in 2011. The number of laboratory tests performed in 2011 was much higher than in 2012—85,144 as opposed to 53,909 in 2012. In contrast, the totals for the outpatient clinic visits and radiological tests registered in 2012 were substantially greater than those in 2011: 16,304 outpatient visits and 33,447 radiological tests in 2012 against 13,024 outpatient visits and 30,087 radiological tests in 2011. Also the number of dialysis treatments in 2012 was greater than in 2011 (7,657 in 2012 compared to 7,005 in 2011). No such variation, however, was evident across these two years of reporting in terms of the emergency cases handled and surgical operations performed, which were around 30,000 and 2,000, respectively, for both of the years.

One general limitation of the MSJMC performance data reporting system is that it does not contain information on the number of distinct individual patients availing the services. For instance, we cannot assess how many individuals were provided with the 7,657 or 7,005 dialysis treatments; or the precise number of patients that made 16,304 outpatient clinic visits. It could be a small number of individuals with numerous repeat visits, or a large number of patients visiting only once or a few times each.

With regard to inputs, Table 1 reveals that MSJMC has a capacity of 185 inpatient beds, and it had employed a total of 530 full-time and part-time staff in 2012 and 524 in 2011. In general, approximately a third of them were management and support personnel, and the rest medical/clinical staff comprising physicians/doctors, nurses, counselors, and technicians. A little more than a tenth of all MSJMC staff is physicians (around some 60 of them).

On top of the above-mentioned manpower in MSJMC payrolls, as part of the Cuban assistance to Antigua and Barbuda, a Cuban Brigade provides certain medical support to MSJMC. It comprised a total of 23 persons in 2011 and 32 in 2012, involving a salary cost of approximately EC$ 922 thousand and EC$ 1.5 million, respectively. These costs along with other allied expenses for the Cuban Brigade are borne by the Cuban government, and are not tracked by the MSJMC cost accounting system. The costs of the Cuban Brigade have been included in the current cost estimates. More information on the department-specific deployment of the Cuban Brigade could be found in Annex A.

MSJMC recurrent costs include personnel salary and benefits, pharmaceuticals (medicines/drugs), medical supplies (non-drug medical items such as bandages, cotton), office/non-medical supplies, and utility and other operating costs (like electricity, water, telephone, outsourcing costs for cleaning, security, and food). In 2012, total recurrent costs amounted to EC$ 49.3 million (US$ 18.2 million). Of these, 54 percent accounted for salary and benefits, 30 percent for utility and other operating costs, 12 percent for other medical supplies, 3 percent for pharmaceuticals and 1 percent for non-medical supplies. In 2012, the MSJMC total for the recurrent costs was almost 16 percent more. This increase in 2012 came from considerable increased costs compared to 2011 for other medical supplies' costs, utility and other operating costs and salary and benefits costs.

Part of the reason for the observed increase in total recurrent costs in 2012 is likely due to a change in how the hospital records the value of medical items and supplies received and dispensed. MSJMC reported that in 2012 it initiated a revaluation of the medical supplies it receives free-of-cost from the

CMS. The Organization of Eastern Caribbean States (OECS)/Pharmaceutical Procurement Service (PPS) unit prices of the CMS-supplied items are much lower than the market prices in Antigua. Also, on top of what MSJMC receives from CMS, it carries out its own procurement of pharmaceuticals and medical supplies, which is based on the local market prices in general. To maintain consistency in the cost accounting for these inputs, MSJMC reportedly decided to value them all on the same basis using market prices. This change could have been the main reason for more than two-fold increase in other medical supplies' costs in 2012 compared to the preceding year.

MSJMC capital costs comprise building and construction, furniture and equipment, and other allied capital expenditures (including building improvement costs). The total annualized depreciation costs for all capital assets/expenditure was estimated to amount to EC$ 4.77 million (US$ 1.77 million) in 2011 and EC$ 4.81 million (US$ 1.78 million) in 2012. Building and construction and equipment were the two most prominent cost drivers, together accounting for more than 95 percent of MSJMC capital costs in both of these years.

The sum of all recurrent and capital costs amounted to EC$ 47.3 million (US$ 17.5 million) in 2011 and EC$ 54.1 million (US$ 20.0 million) in 2012.

3.2 STAFFING AND COST DATA BY DEPARTMENT

Tables 2 and 3 below summarize staffing and cost data for each department in MSJMC in 2011 and 2012, respectively. MSJMC has a total of 25 various administrative and management departments, outpatient clinical departments, and inpatient wards. Based on MSJMC's key output indicators reported in Table 1, these departments could be categorized into two distinct cost centers for the costing exercise: (i) the Overhead/support services category comprising all of the eight administrative and management and three supporting outpatient clinical departments; and (ii) the Clinical (final) category comprising six outpatient clinical departments and all of the eight inpatient wards as depicted in Tables 2 and 3.

The cost accounting system in MSJMC tracks the distribution of staff by department and the corresponding salary and benefits costs for management and support personnel as well as for non-physician medical staff. However, such disaggregated information is largely unavailable for the physicians. Therefore, to distribute physicians' time (level of effort) across the final clinical departments, a key informant interview was conducted with the Medical Director. Annex B exhibits the results of this exercise.

As seen from Tables 2 and 3, out of the 534 personnel working at MSJMC in 2011, 170 (32 percent) were employed in the overhead (supporting) departments and the rest of 364 (68 percent) in the final clinical departments. Similarly, of the 545 personnel in 2012, 176 (32 percent) were employed in the overhead (supporting) departments and 369 (68 percent) in the final clinical departments. In general, for both of these years, Operations, Finance, Administration, Nursing and Pharmacy were the five personnel and salary cost-intensive departments in the Overhead category, and Operating Theatre (OT), Emergency, Outpatient Clinic, Laboratory and Female Surgical Ward in the Clinical (Final) category.

TABLE 2. SUMMARY OF DEPARTMENT-SPECIFIC STAFFING AND COST DATA IN 2011

COST CENTRES	Staff dist-ribu-tion	Salary & benefit costs	Drug/Med costs	Other med/non-med supplies' costs	Utility & other operating costs	Total of recurrent costs	Total of capital (deprecia-tion costs)	Total costs (Recurrent+ Capital)
	#	EC$*	EC$	EC$	EC$	EC$	EC$	EC$
MSJMC overall (Not disaggrega-ted by department)	**-**		**1,598,274**	**-**	**13,047,878**	**14,646,152**	**4,770,307**	**19,416,459**
Overhead/suppor-ting departments/ Offices								
Internal audit, etc.	2	166,200	0	0	0	166,200	0	166,200
Human resource	6	384,864	0	5,728	0	390,592	0	390,591
Finance	36	1,039,956	0	8,138	0	1,048,094	0	1,048,094
Operations	41	980,190	0	19,704	0	999,894	0	999,894
Admin	36	1,253,540	0	36,165	0	1,289,705	0	1,289,705
Quality	3	203,513	0	3,659	0	207,172	0	207,172
Nursing	23	649,408	0	404	0	649,812	0	649,812
Pharmacy	13	583,239	0	4,427	0	587,666	0	587,666
Rehab/Physiotherapy	6	147,229	0	2,365	0	149,594	0	149,594
Dietary	3	74,279	0	29,988	0	104,267	0	104,267
Occupational health	1	56,712	0	2,460	0	59,172	0	59,172
Sub-total	**170**	**5,539,130**	**0**	**113,038**	**0**	**5,652,167**	**0**	**5,652,167**
Clinical (final) departments								
Outpatient clinic	30.8	1,631,227	0	88,763	0	1,719,989	0	1,719,989
Emergency	38.2	1,778,612	0	340,439	0	2,119,051	0	2,119,051
Laboratory	29	1,087,512	0	61,974	0	1,149,486	0	1,149,486
Radiology	27	810,257	0	30,190	0	840,447	0	840,447
Dialysis	16	683,727	0	745,229	0	1,428,956	0	1,428,956
Operation theatre	46.8	2,572,618	0	522,217	0	3,094,835	0	3,094,835
Male surgical	22.4	1,390,982	0	179,559	0	1,570,541	0	1,570,541
Female surgical	24.9	1,773,584	0	184,271	0	1,957,855	0	1,957,855
Male medicine	22.2	1,352,721	0	118,539	0	1,471,261	0	1,471,261
Female medicine	22.2	1,352,721	0	149,337	0	1,502,059	0	1,502,059
Maternity	22	1,568,533	0	113,240	0	1,681,773	0	1,681,773
Paediatrics	21.6	1,103,440	0	21,242	0	1,124,682	0	1,124,682
ICU	19.4	1,135,815	0	155,903	0	1,291,718	0	1,291,718
NICU	21.6	1,195,467	0	87,137	0	1,282,604	0	1,282,604
Sub-total	**364**	**19,437,216**	**0**	**2,798,040**	**0**	**22,235,257**	**0**	**22,235,257**
Total for MSJMC in 2011	**534**	**24,976,346**	**1,598,274**	**2,911,078**	**13,047,878**	**42,533,576**	**4,770,307**	**47,303,883**

* 1 US$=2.7 EC$

TABLE 3. SUMMARY OF DEPARTMENT-SPECIFIC STAFFING AND COST DATA IN 2012

COST CENTRES	Staff dist-ribu-tion	Salary & benefit costs	Drug/Med costs	Other med/non-med supplies' costs	Utility & other operating costs	Total of recurrent costs	Total of capital (deprecia-tion costs)	Total costs (Recurrent+ Capital)
	#	EC$*	EC$	EC$	EC$	EC$	EC$	EC$
MSJMC overall (Not disaggrega-ted by department)	**-**	**-**	**1,665,711**	**-**	**14,796,086**	**16,461,797**	**4,808,786**	**21,270,583**
Overhead/suppor-ting departments/ Offices								
Internal audit, etc.	2	167,361	0	566	0	167,927	0	167,927
Human resource	6	390,663	0	4,368	0	395,030	0	395,030
Finance	34	997,811	0	75,902	0	1,073,713	0	1,073,713
Operations	40	1,030,561	0	31,727	0	1,062,287	0	1,062,287
Admin	33	1,267,764	0	291,877	0	1,559,641	0	1,559,641
Quality	3	205,770	0	17,483	0	223,253	0	223,253
Nursing	32	762,795	0	1,491	0	764,286	0	764,286
Pharmacy	16	666,532	0	788,443	0	1,454,975	0	1,454,975
Rehab/Physiotherapy	7	231,659	0	23,428	0	255,087	0	255,087
Dietary	2	77,086	0	46,270	0	123,356	0	123,356
Occupational health	1	58,029	0	34	0	58,063	0	58,063
Sub-total	**176**	**5,856,031**	**0**	**1,281,589**	**0**	**7,137,618**	**0**	**7,137,618**
Clinical (final) departments								
Outpatient clinic	32.8	1,760,785	0	204,853	0	1,965,638	0	1,965,638
Emergency	41.2	2,084,125	0	407,305	0	2,491,430	0	2,491,430
Laboratory	28	1,137,723	0	1,529,160	0	2,666,883	0	2,666,883
Radiology	28	963,490	0	137,057	0	1,100,548	0	1,100,548
Dialysis	15	709,697	0	741,361	0	1,451,058	0	1,451,058
Operation theatre	50.8	2,648,396	0	823,598	0	3,471,994	0	3,471,994
Male surgical	21.9	1,494,332	0	165,355	0	1,659,687	0	1,659,687
Female surgical	24.4	1,868,024	0	169,694	0	2,037,718	0	2,037,718
Male medicine	21.7	1,456,963	0	129,127	0	1,586,090	0	1,586,090
Female medicine	21.7	1,456,963	0	162,675	0	1,619,639	0	1,619,639
Maternity	22	1,588,038	0	84,667	0	1,672,704	0	1,672,704
Paediatrics	19.6	1,197,948	0	61,556	0	1,259,504	0	1,259,504
ICU	21.4	1,137,369	0	262,437	0	1,399,807	0	1,399,807
NICU	20.6	1,208,405	0	68,875	0	1,277,280	0	1,277,280
Sub-total	**369**	**20,712,258**	**0**	**4,947,720**	**0**	**25,659,980**	**0**	**25,659,980**
Total for MSJMC in 2012	**545**	**26,568,289**	**1,665,711**	**6,229,309**	**14,796,086**	**49,259,395**	**4,808,786**	**54,068,181**

* 1 US$=2.7 EC$

Disaggregated department-specific cost information for non-medical and other medical supplies is partially available from MSJMC's records. However, cost data for pharmaceuticals, utilities, and other operating items is only available in the aggregate at the hospital level. These aggregated common costs have been listed in Tables 2 and 3 against the 'MSJMC overall' cost center.

Pharmaceutical items for MSJMC are obtained in 3 ways: (i) direct purchases by MSJMC; (ii) directly supplied by the Government's CMS; and contribution by the MBS. Similarly, a substantial amount of the utility costs are also subsidized by the government. Detailed information on pharmaceutical procurement and utility and other operating costs are provided in Annexes C, D and E.

MSJMC's records do not track department-specific disaggregated data on capital investments (medical and non-medical furniture, medical and non-medical equipment, building and construction costs, other relevant investments/expenditures). No physical inventory has been carried out so far since the inception of MSJMC in 2009. MSJMC follows a simple (undiscounted) approach to determining the annual depreciation amounts for the capital costs, which were estimated by the costing exercise to total to EC$ 4.81 million (US$ 1.78 million) for MSJMC overall in 2012 and EC$ 4.77 million or US$ 1.77 million in 2011. For more details of the annualized depreciation cost estimates, refer to Annexes F and G.

As it is evident from Tables 2 and 3, according to the information available from the existing cost accounting systems, some 12 to 13 percent of the MSJMC total costs are consumed directly by the overhead (supporting) costs: EC$ 5.7 million out of the EC$ 47.3 million total cost in 2011, and EC$ 7.1 million out of the EC$ 54.1 million total cost in 2012. Further, a total of EC$ 19.4 million (42 percent) in 2011 and EC$ 21.3 million (41 percent) in 2012 have been lumped as "common" (MSJMC overall) costs that are not disaggregated across the departments, such as utilities, pharmaceuticals and capital costs. In costing out the outputs/services produced by MSJMC, the next logical step is to distribute these overhead department costs as well as the "common" costs among the clinical (final) departments/wards that ultimately deliver the end products (clinical outputs/services).

3.3 STEP-DOWN COSTING RESULTS: ALLOCATION OF OVERHEAD COSTS AMONG CLINICAL (FINAL) DEPARTMENTS

The accounting process adopted by this costing exercise -- to systematically distribute the overhead department and MSJMC "common" costs among the final clinical departments -- is known as the Step-down (or top-down) cost allocation approach. This approach maps the step-by-step distribution of overhead/common cost centers across the final cost centers, resulting in a full absorption of all costs by the final cost centers that produce the end results. The allocation principles used for this distribution are delineated in Table 4. All technical details of the computations for the step-down allocation as well as the costing exercise overall are available in the Excel worksheet files accompanying this report.

TABLE 4. ALLOCATION FACTORS FOR DISTRIBUTION OF THE OVERHEAD AND COMMON COSTS

Overhead/supporting departments/ MSJMC overall common costs	**Allocation factors for distribution of overhead/common costs**
Internal audit, etc.	Equal distribution among all departments
Human resource	By number of staff in respective departments
Finance	By number of staff in respective departments
Operations	Equal distribution among all departments
Admin	By floor area/space (square feet) of respective departments
Quality	By number of bed-days in respective clinical (final) inpatient departments
Nursing	By number of services offered in respective clinical (final) departments
Pharmacy	By number of services offered in respective clinical (final) departments
Rehab/Physiotherapy	Equal distribution among the clinical (final) departments
Dietary	Number of bed-days in respective clinical (final) inpatient departments
Occupational health	Equal distribution among the clinical (final) departments
MSJMC overall (common costs)	Pharmaceuticals: Number of services offered from respective clinical (final) departments Utility and other operating costs: Number of bed-days in respective clinical (final) inpatient departments for dietary/food costs Equal distribution among all departments for telephone and communication and other rental costs Floor area/space (Square Feet) of respective departments for all other utility costs Capital costs: Floor area/space (Square Feet) of respective departments

The summary of total costs for the clinical (final) departments in 2011 and 2012, after the step-down distribution of the overhead and common costs, is presented in Tables 5 and 6, respectively. More information on the step-down allocation process could be found in Annexes H and I.

TABLE 5. SUMMARY OF COSTS FOR THE CLINICAL (FINAL) DEPARTMENTS IN 2011, AFTER STEP-DOWN DISTRIBUTION AMONG THEM OF THE OVERHEAD/COMMON COSTS

Clinical (final) departments	Cost unit	Salary & benefit costs	Drug/Med costs	Other med/non-med supplies' costs	Utility & other operating costs	Total of recurrent costs	Total of capital (deprecia-tion) costs	Total costs (Recurrent +Capital)
Outpatient clinic	EC$	2,031,940	104,224	95,216	1,080,225	3,311,605	443,695	3,755,301
	US$*	752,571	38,601	35,265	400,083	1,226,521	164,332	1,390,852
	%	54	3	3	29		12	100
Emergency	EC$	2,278,843	238,489	346,571	735,803	3,599,706	311,505	3,911,211
	US$	844,016	88,329	128,360	272,520	1,333,225	115,372	1,448,597
	%	58	6	9	19		8	100
Laboratory	EC$	1,962,346	681,361	69,959	727,916	3,441,581	308,629	3,750,210
	US$	726,795	252,356	25,911	269,599	1,274,660	114,307	1,388,967
	%	52	18	2	19		8	100
Radiology	EC$	1,278,766	240,770	35,978	721,885	2,277,399	301,039	2,578,438
	US$	473,617	89,174	13,325	267,365	843,481	111,496	954,977
	%	50	9	1	28		12	100
Dialysis	EC$	901,875	56,057	748,443	315,896	2,022,271	133,129	2,155,400
	US$	334,028	20,762	277,201	116,999	748,989	49,307	798,296
	%	42	3	35	15		6	100
Operating theatre	EC$	2,998,569	16,445	530,283	1,548,490	5,093,786	635,887	5,729,673
	US$	1,110,581	6,091	196,401	573,515	1,886,587	235,514	2,122,101
	%	52	0	9	27		11	100
Male surgical	EC$	1,787,017	47,871	191,769	1,245,229	3,271,885	397,300	3,669,186
	US$	661,858	17,730	71,026	461,196	1,211,809	147,148	1,358,958
	%	49	1	5	34		11	100
Female surgical	EC$	2,166,361	43,909	195,973	1,217,718	3,623,962	396,471	4,020,433
	US$	802,356	16,263	72,583	451,007	1,342,208	146,841	1,489,049
	%	54	1	5	30		10	100
Male medicine	EC$	1,739,676	44,822	130,289	1,221,245	3,136,032	394,583	3,530,615
	US$	644,324	16,601	48,255	452,313	1,161,493	146,142	1,307,635
	%	49	1	4	35		11	100
Female medicine	EC$	1,749,765	48,231	161,614	1,253,883	3,213,493	399,809	3,613,302
	US$	648,061	17,863	59,857	464,401	1,190,183	148,078	1,338,260
	%	48	1	4	35		11	100
Maternity	EC$	1,934,548	30,377	123,513	1,332,664	3,421,102	470,101	3,891,203
	US$	716,499	11,251	45,746	493,579	1,267,075	174,111	1,441,186
	%	50	1	3	34		12	100
Pediatrics	EC$	1,392,129	19,846	28,664	875,387	2,316,027	312,221	2,628,247
	US$	515,603	7,350	10,616	324,218	857,788	115,637	973,425
	%	53	1	1	33		12	100
ICU	EC$	1,334,339	10,131	160,278	345,896	1,850,645	123,012	1,973,657
	US$	494,199	3,752	59,362	128,110	685,424	45,560	730,984
	%	68	1	8	18		6	100
NICU	EC$	1,420,173	15,741	92,528	425,638	1,954,080	142,926	2,097,006
	US$	525,990	5,830	34,270	157,644	723,733	52,936	776,669
	%	68	1	4	20		7	100
MSJMC total cost in 2011	EC$	**24,976,347**	**1,598,274**	**2,911,078**	**13,047,875**	**42,533,574**	**4,770,307**	**47,303,883**
	US$	**9,250,498**	**591,953**	**1,078,178**	**4,832,549**	**15,753,176**	**1,766,781**	**17,519,957**
	%	**53**	**3**	**6**	**28**		**10**	**100**

* 1 US$=2.7 EC$

TABLE 6. SUMMARY OF COSTS FOR THE CLINICAL (FINAL) DEPARTMENTS IN 2012, AFTER STEP-DOWN DISTRIBUTION AMONG THEM OF THE OVERHEAD/COMMON COSTS

Clinical (final) departments	Cost unit	Salary & benefit costs	Drug/Med costs	Other med/non-med supplies' costs	Utility & other operating costs	Total of recurrent costs	Total of capital (deprecia-tion) costs	Total costs (Recurrent +Capital)
Outpatient clinic	EC$	2,234,603	156,585	335,677	1,205,285	3,932,150	451,145	4,383,295
	US$*	827,631	57,994	124,325	446,402	1,456,352	167,091	1,623,443
	%	51	4	8	27		10	100
Emergency	EC$	2,667,712	286,518	592,623	815,306	4,362,159	317,951	4,680,110
	US$	988,042	106,118	219,490	301,965	1,615,614	117,760	1,733,374
	%	57	6	13	17		7	100
Laboratory	EC$	1,913,368	517,746	1,822,408	765,830	5,019,352	298,548	5,317,900
	US$	708,655	191,758	674,966	283,641	1,859,019	110,573	1,969,593
	%	36	10	34	14		6	100
Radiology	EC$	1,545,267	321,227	336,763	804,476	3,007,734	308,980	3,316,714
	US$	572,321	118,973	124,727	297,954	1,113,975	114,437	1,228,413
	%	47	10	10	24		9	100
Dialysis	EC$	954,590	73,538	809,049	343,150	2,180,327	134,677	2,315,004
	US$	353,552	27,236	299,648	127,092	807,528	49,880	857,409
	%	41	3	35	15		6	100
Operating theatre	EC$	3,090,669	19,093	903,458	1,725,258	5,738,478	641,957	6,380,435
	US$	1,144,692	7,071	334,614	638,984	2,125,362	237,762	2,363,124
	%	48	0	14	27		10	100
Male surgical	EC$	1,910,903	54,532	255,722	1,461,935	3,683,092	402,015	4,085,108
	US$	707,742	20,197	94,712	541,457	1,364,108	148,895	1,513,003
	%	47	1	6	36		10	100
Female surgical	EC$	2,296,758	55,963	261,874	1,489,148	4,103,743	409,252	4,512,994
	US$	850,651	20,727	96,990	551,536	1,519,905	151,575	1,671,479
	%	51	1	6	33		9	100
Male medicine	EC$	1,839,259	42,584	210,001	1,338,175	3,430,019	387,382	3,817,401
	US$	681,207	15,772	77,778	495,620	1,270,377	143,475	1,413,852
	%	48	1	6	35		10	100
Female medicine	EC$	1,870,985	53,648	252,434	1,458,195	3,635,261	402,763	4,038,024
	US$	692,957	19,870	93,494	540,072	1,346,393	149,171	1,495,564
	%	46	1	6	36		10	100
Maternity	EC$	1,967,165	34,133	164,806	1,526,776	3,692,880	473,874	4,166,754
	US$	728,579	12,642	61,039	565,473	1,367,733	175,509	1,543,242
	%	47	1	4	37		11	100
Pediatrics	EC$	1,507,037	27,689	126,651	1,056,773	2,718,150	321,238	3,039,388
	US$	558,162	10,255	46,908	391,397	1,006,722	118,977	1,125,699
	%	50	1	4	35		11	100
ICU	EC$	1,335,628	6,598	299,244	338,062	1,979,532	118,030	2,097,562
	US$	494,677	2,444	110,831	125,208	733,160	43,715	776,875
	%	64	0	14	16		6	100
NICU	EC$	1,434,347	15,856	113,686	467,718	2,031,608	140,974	2,172,581
	US$	531,240	5,873	42,106	173,229	752,447	52,212	804,660
	%	66	1	5	22		6	100
MSJMC total cost in 2012	EC$	**26,568,291**	**1,665,710**	**6,484,396**	**14,796,087**	**49,514,485**	**4,808,786**	**54,323,270**
	US$	**9,840,108**	**616,930**	**2,401,628**	**5,480,032**	**18,338,698**	**1,781,032**	**20,119,730**
	%	**49**	**3**	**12**	**27**		**9**	**100**

* 1 US$=2.7 EC$

Cost information in Tables 5 and 6 is displayed for each clinical (final) department, separately for the four recurrent cost components (salary and benefit costs, pharmaceutical/drug costs, other medical and non-medical supplies' costs, and utility and other operating costs), capital costs, and total costs. Also, corresponding cost data have been represented in EC$, US$ and in terms of percentage of the total costs. In the next step, when we divide the cost of each clinical (final) department by the respective number of ouput/services produced, we will be able to estimate the unit production costs or the cost per service.

As it is seen from Table 5, the top five most costly clinical (final) departments in 2011 were:

- Operating theatre (total cost EC$ 5.7 million or US$ 2.1 million)
- Female surgical ward (total cost EC$ 4.02 million or US$ 1.49 million)
- Emergency ward (total cost EC$ 3.91 million or US$ 1.45 million)
- Maternity ward (total cost EC$ 3.90 million or US$ 1.44 million)
- Outpatient clinic (total cost EC$ 3.76 million or US$ 1.39 million)

In 2012, however, the ranking of the top five clinical (final) departments that accounted for maximum costs was slightly different. As revealed in Table 6, these were:

- Operating theatre (total cost EC$ 6.4 million or US$ 2.4 million)
- Laboratory (total cost EC$ 5.3 million or US$ 2.0 million)
- Emergency ward (total cost EC$ 4.7 million or US$ 1.7 million)
- Female surgical ward (total cost EC$ 4.5 million or US$ 1.7 million)
- Outpatient clinic (total cost EC$ 4.4 million or US$ 1.6 million)

An important feature that can be observed in the cost composition for almost all of the clinical (final) department costs, both in 2011 and 2012, is that salary and benefit, utility and other operating costs, and capital costs together account for a significant part of the total costs, in most cases for 80 percent or more. These trends are better evident from Figures 1 and 2 below. Unlike pharmaceutical (drug/meds) and other medical and non-medical costs that tend to increase or decrease in value with the rise or fall in service volume (number of visits, tests, admissions), salary and benefit costs, most of the utility and other operating item costs, and capital costs essentially remain unchanged with the changes in service volume. The latter costs are categorized in economics as 'fixed' costs. Therefore, greater service volumes generally would result in lower per unit (average) costs for these categories.

FIGURE 1. PERCENTAGE SHARE OF VARIOUS COST COMPONENTS IN THE TOTAL COSTS FOR THE CLINICAL FINAL DEPARTMENTS IN 2011, AFTER THE STEP-DOWN DISTRIBUTION

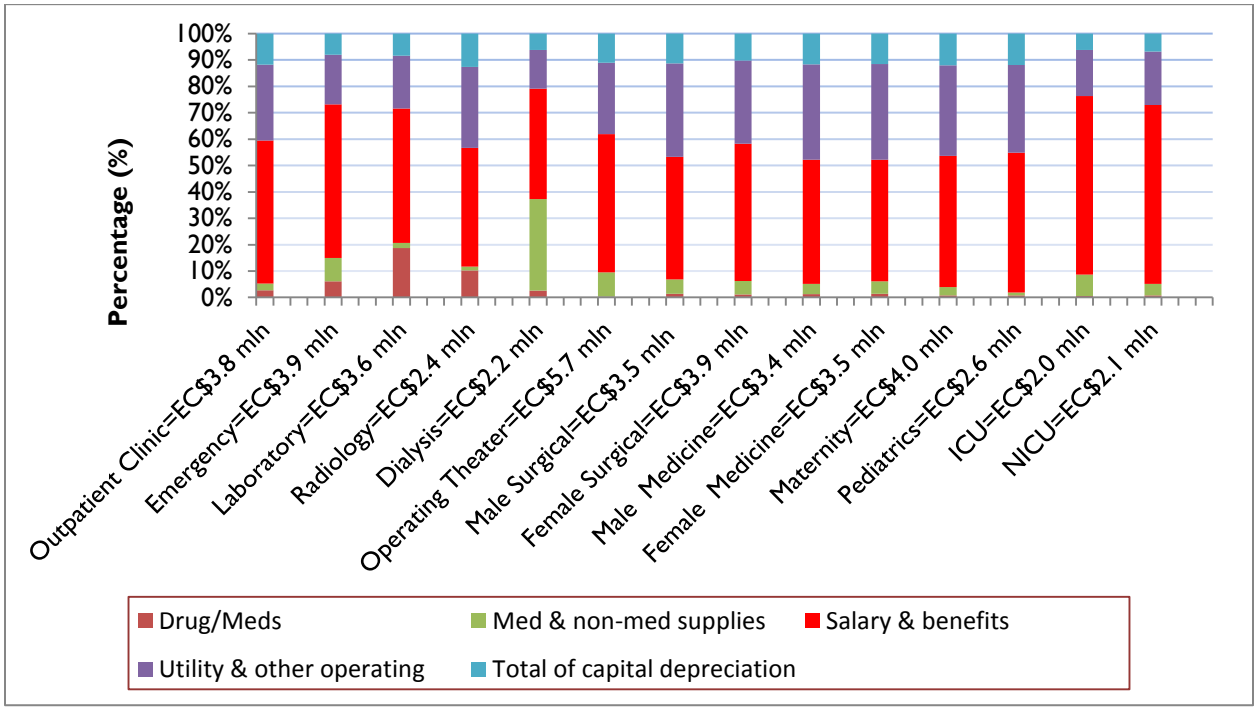
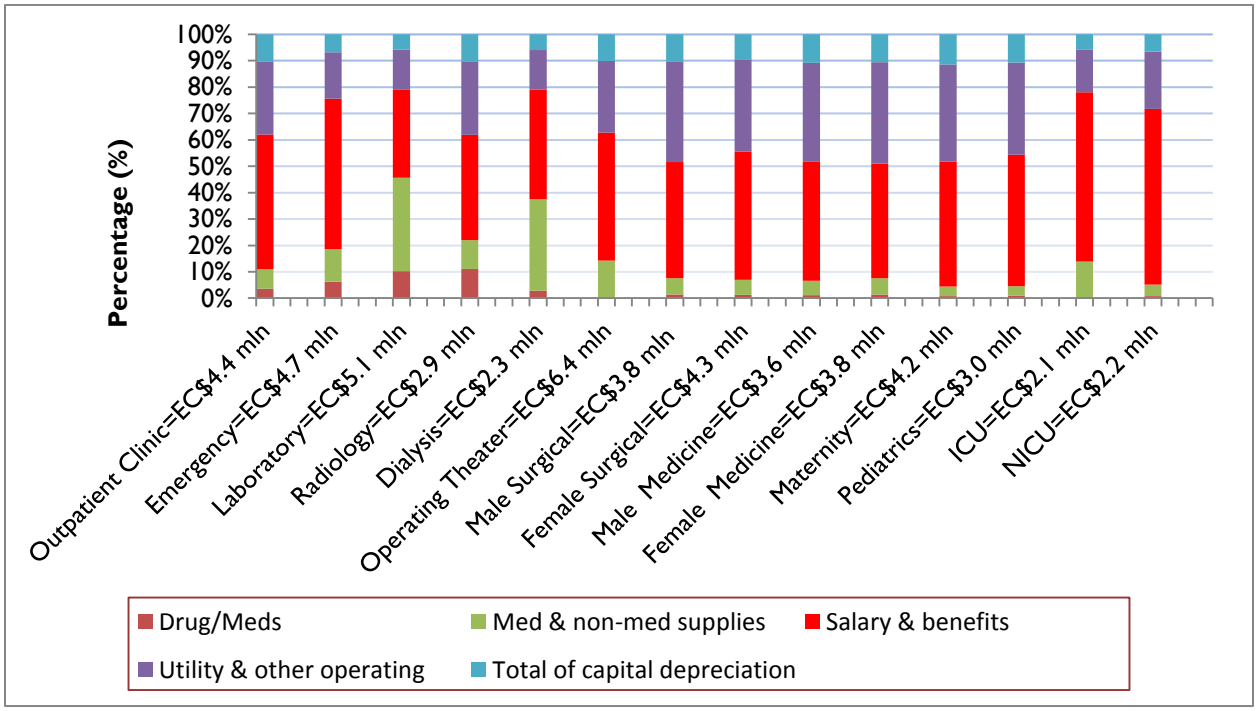


FIGURE 2. PERCENTAGE SHARE OF VARIOUS COST COMPONENTS IN THE TOTAL COSTS FOR THE CLINICAL FINAL DEPARTMENTS IN 2012, AFTER THE STEP-DOWN DISTRIBUTION



3.4 PER UNIT COSTS OF SERVICES PRODUCED AT THE MSJMC

The volume of key outputs/services for each of the clinical (final) departments and corresponding per unit costs in producing them in 2011 and 2012 have been summarized in Table 7. Per unit costs in Table 7 were computed based on total costs (Capital + Recurrent) as well as on recurrent costs only. For an easier understanding of the comparisons of unit costs of MSJMC services in 2011 and 2012, the main findings of Table 7 have also been represented in chart form in Figure 3.

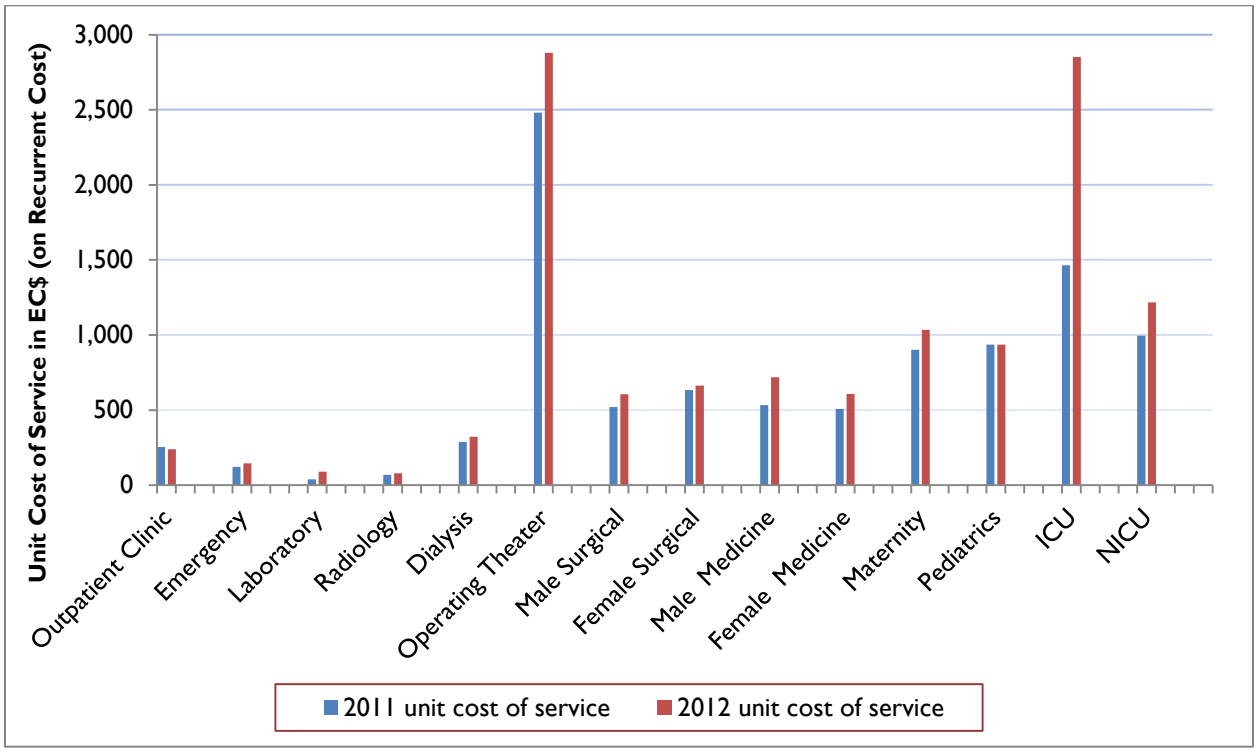
In both years, the five most costly services in terms of per unit production costs were for:

- Operating theatre (Cost of each surgical operation amounted to EC$ 2,788 or US$ 1,033 in 2011, and EC$ 3,209 or US$ 1,189 in 2012, and)
- ICU ward (Cost of each bed-day amounted to EC$ 1,559 or US$ 577 in 2011, and EC$ 3,053 or US$ 1,131 in 2012)
- NICU ward (Cost of each bed-day amounted to EC$ 1,066 or US$ 395 in 2011, and EC$ 1,316 or US$ 487 in 2012)
- Maternity ward (Cost of each bed-day amounted to EC$ 1,025 or US$ 380 in 2011, and EC$ 1,172 or US$ 434 in 2012)
- Pediatric ward (Cost of each bed-day amounted to EC$ 1,060 or US$ 393 in 2011, and EC$ 1,054 or US$ 390 in 2012)

TABLE 7. SUMMARY OF PER UNIT SERVICE COSTS FOR THE CLINICAL (FINAL) DEPARTMENTS IN 2011 AND 2012

Clinical (final) departments/ wards	Unit of service	2011					2012				
		# of service	Per unit service cost (on total cost)		Per unit service cost (on recurrent cost only)		# of service	Per unit service cost (on total cost)		Per unit service cost (on recurrent cost only)	
			EC$	US$		EC$		EC$	US$	EC$	US$
Outpatient clinic	Clinic visit	13,024	288	107	254	94	16,304	269	100	241	89
Emergency	Emergency visit	29,802	131	49	121	45	29,833	157	58	146	54
Laboratory	Laboratory test	85,144	44	16	40	15	53,909	99	37	93	34
Radiology	Radiology test	30,087	86	32	76	28	33,447	99	37	90	33
Dialysis	Dialysis treatment	7,005	308	114	289	107	7,657	302	112	285	105
Operating theatre	Surgical operation	2,055	2,788	1,033	2,479	918	1,988	3,209	1,189	2,887	1,069
Male surgical	Bed/patient day	5,982	613	227	547	203	5,678	719	266	649	240
	Admission	667	5,420	2,007	4,833	1,790	682	5,990	2,218	5,400	2,000
Female surgical	Bed/patient day	5,487	733	271	660	245	5,827	774	287	704	261
	Admission	883	4,553	1,686	4,104	1,520	920	4,905	1,817	4,461	1,652
Male medicine	Bed/patient day	5,601	630	233	560	207	4,434	861	319	774	287
	Admission	810	4,359	1,614	3,872	1,434	849	4,496	1,665	4,040	1,496
Female medicine	Bed/patient day	6,027	600	222	533	197	5,586	723	268	651	241
	Admission	948	3,812	1,412	3,390	1,255	962	4,198	1,555	3,779	1,400
Maternity	Bed/patient day	3,796	1,025	380	901	334	3,554	1,172	434	1,039	385
	Admission	1,462	2,662	986	2,340	867	1,360	3,064	1,135	2,715	1,006
Pediatrics	Bed/patient day	2,480	1,060	393	934	346	2,883	1,054	390	943	349
	Admission	653	4,025	1,491	3,547	1,314	650	4,676	1,732	4,182	1,549
ICU	Bed/patient day	1,266	1,559	577	1,462	541	687	3,053	1,131	2,881	1,067
	Admission	113	17,466	6,469	16,377	6,066	81	25,896	9,591	24,439	9,051
NICU	Bed/patient day	1,967	1,066	395	993	368	1,651	1,316	487	1,231	456
	Admission	281	7,463	2,764	6,954	2,576	198	10,973	4,064	10,261	3,800

FIGURE 3. COMPARISON OF DEPARTMENT-SPECIFIC SERVICE COSTS IN 2011 AND 2012



In terms of per unit cost for each admission in the inpatient wards, the ICU, NICU, Male and Female surgical wards, and the Pediatric ward appeared to be the most costly ones.

Except for the unit costs for one Outpatient Clinic visit and one bed (patient)-day in the Pediatric ward, per unit costs for all other services were higher in 2012 than in 2011. Although final costs for the Outpatient Clinic and Pediatric Wards, as evident from Tables 5 and 6, were higher in 2012 (EC$ 4.4 million and EC$ 3.0 million, respectively) as opposed to those in 2011 (EC$ 3.8 million and EC$ 2.6 million, respectively), greater volume of services produced in 2012 (16,304 outpatient visits and 2,883 pediatric bed-days) than in 2011 (13,024 outpatient visits and 2,480 pediatric bed-days) resulted in lower per unit costs in 2012 for these two departments.

3.5 COST ESTIMATES FOR THE INPATIENT CARE DISPENSED TO HIV/AIDS PATIENTS

Tables 8 and 9 summarize the inpatient services provided from MSJMC to PLHIV in 2011 and 2012, respectively. Services provided include treatment of general health conditions, OIs, and other medical needs. These data have been aggregated in the below tables on the basis of individual medical record analysis for HIV-positive patients who received inpatient care from MSJMC during the two years. Analysis of the individual medical records and data compilation to this end were accomplished by a team of two specialists, one from the Infection Control department of MSJMC and another from the AIDS Secretariat.

TABLE 8. COST OF INPATIENT SERVICES DISPENSED FROM MSJMC TO HIV-POSITIVE PATIENTS IN 2011

Total number of PLHIV admissions at MSJMC	Total number of bed-days for HIV-positive patients	List of key clinical services dispensed to persons with HIV	MSJMC departments where these services were provided	Number of bed-days used for these services	Unit cost of bed-day in 2011 (in EC$)	Total cost	
						EC$	US$
62	918	OI's	ICU	6	1,559	9,354	3,464
		Pediatrics	Pediatrics	20	1,060	21,196	7,850
		Obstetrics	Obstetrics/ Maternity	35	1,025	35,878	13,288
		Medicine	Male Medicine	708	630	446,291	165,293
			Female Medicine	127	600	76,139	28,200
		Surgery	Male Surgical	13	613	7,974	2,953
			Female Surgical	9	733	6,594	2,442
		TOTAL		**918**		**603,425**	**223,491**

TABLE 9. COST OF INPATIENT SERVICES DISPENSED FROM MSJMC TO HIV-POSITIVE PATIENTS IN 2012

Total number of PLHIV admissions at MSJMC	Total number of bed-days for HIV-positive patients	List of key clinical services dispensed to persons with HIV	MSJMC departments where these services were provided	Number of bed-days used for these services	Unit cost of bed-day in 2012 (in EC$)	Total cost	
						EC$	US$
84	1,371	OI's	ICU	39	3,027	118,041	43,719
		Pediatrics	Pediatrics	23	1,048	24,102	8,927
		Obstetrics	Obstetrics/ Maternity	111	1,167	129,569	47,988
		Medicine	Male Medicine	689	857	590,355	218,650
			Female Medicine	371	720	266,979	98,881
		Surgery	Male Surgical	57	716	40,826	15,121
			Female Surgical	81	771	62,481	23,141
		TOTAL		**1,371**		**1,232,354**	**456,428**

Table 9 reveals that a total of 84 admissions of HIV-positive patients were registered in MSJMC in 2012. These involved 1,371 bed-days for the needed treatment. The average length of hospital stay (ALOS) was 16 days. PLHIV admissions accounted for 1.5 percent of all MSJMC inpatient admissions and 4.5 percent of all bed/patient-days for that year.

Inpatient care sought by these patients was provided at the ICU, Pediatrics, Obstetrics/Maternity, Male and Female medicine, and Male and Female surgical wards. Based on the number of PLHIV bed-days and the corresponding unit costs for 2012 in Table 7, it was estimated that a total of approximately EC$ 1.2 million or US$ 456,000 was spent by MSJMC in 2012 on providing inpatient care to the HIV-positive patients. This amounted to 2.5 percent of all MSJMC recurrent costs in 2012, and resulted in an estimated cost of EC$ 14,671 (US$ 5,434) per HIV-positive inpatient admission, which is almost three times higher than the MSJMC average cost of EC$ 4,893 (US$ 1,812) per patient admission.

Similarly, as it is seen from Table 8, 62 HIV-positive admissions involving a total of 918 bed-days were recorded in 2011, which amounted to an ALOS of 15 days, and accounted for 1.0 percent of all MSJMC inpatient admissions and 2.8 percent of total bed/patient-days. Approximately EC$ 603,000 (US$ 223,000) was spent by MSJMC in 2011 on providing inpatient care to the HIV-positive patients. This was around 1.4 percent of all MSJMC recurrent costs in 2011, and resulted in an estimated cost of EC$ 9,733 (US$ 3,603) per HIV-positive inpatient admission—twice as much as MSJMC average cost of EC$ 4,363 (US$ 1,616) per patient admission.

It is apparent from the numbers in Table 8 and 9 that the cost of inpatient care for PLHIV patients was much higher in 2012 compared to that in 2011, indicating to a likely further increase of this cost in the years to come.

The cost estimates presented above do not include the costs of anti-retroviral drugs or other treatments that the HIV-positive patients might have been accessing elsewhere, and comprise only the inpatient care costs of HIV-positive patients who took treatment from MSJMC during the reporting years.

4. DISCUSSION AND RECOMMENDATIONS

The costing exercise has estimated the costs for each of the MSJMC final clinical departments and the per unit service costs in 2011 and 2012. A full costing encompassing all capital and recurrent inputs was performed, based on data available with the MSJMC accounting and finance systems. However, the cost estimates presented in the above-mentioned section must be interpreted with caution, due to certain data limitations revealed in course of the costing study. One major problem with the MSJMC cost accounting system is that it is not capable of providing department-specific disaggregated data for most of the inputs. Understandably, lack of department-specific disaggregated data generally results in less precise cost estimates. For example, the unit cost for dialysis treatment estimated in the study could appear to be much lower than what it is in actuality.

4.1 ANALYSIS OF DATA LIMITATIONS

4.1.1 OUTPUT DATA REPORTING

The output data recording and reporting system in MSJMC is extremely disintegrated and fragmented. The researcher needed to check with several clinical departments/wards to obtain the right service/output data. There is no unified/integrated output reporting system.

Three distinct sources of output data exist: the MSJMC dashboard, the data systems at the IT department, and individual performance reports of the clinical departments. However, output information reported in the MSJMC dashboard does not always match the IT and other line department numbers. These confusions apart, output reporting is based predominantly on the services offered (such as visits made, tests conducted, operations performed, and inpatient bed-days). Number of *patients* served/treated is not reported. This has been the main reason why the costing exercise could not perform a per-patient unit costing.

4.1.2 INPUT DATA REPORTING

Cost accounting systems do not track all inputs used by department. Disaggregated cost data on the use of pharmaceuticals, non-medical and medical supplies, and other operating inputs by various outpatient and inpatient clinical departments is largely unavailable. Most of the cost data is aggregated at the hospital level.

Department-specific disaggregated data on the capital items (medical and non-medical furniture, medical and non-medical equipment, building and construction costs, other relevant investments/expenditures) is missing as well. What is available is aggregated cost data for the entire stock of capital items in MSJMC.

MSJMC receives a number of in-kind contributions to its operating expenses from the government, such as free utilities (electricity, water, and communication services), pharmaceuticals and medical supplies provided through the CMS, transport support, and free ambulance service. However, not all of these contributions are fully documented in the MSJMC accounts for the operating costs. For instance, cost information on transport support rendered by the ABTB and ambulance service extended by the EMS is absent from the MSJMC books.

Despite the above shortcomings, the costing results offered certain useful information with regard to further efficiency improvement and the financial sustainability of MSJMC services. For example, the predominance of fixed costs (salary and benefit costs, utility costs, and capital costs) in the overall costs for MSJMC indicates the pressing need for examining better use of the hospital's existing capacity and undertaking needed measures to improve this.

4.2 ANALYSIS OF HOSPITAL OCCUPANCY/CAPACITY USE RATE

Table 10 below summarizes the results of the Average Length of Stay (ALOS) and occupancy rate analyses for the MSJMC inpatient departments in 2012 and 2011.

TABLE 10. ANALYSIS OF AVERAGE LENGTH OF STAY AND OCCUPANCY RATE FOR THE INPATIENT FINAL DEPARTMENTS IN 2011 AND 2012

Inpatient wards	# of beds	2011				# of beds	2012			
		# of admis-sions	# of bed-days	ALOS (days)†	Hospital occu-pancy/ Capacity use rate (%)‡		# of admis-sions	# of bed-days	ALOS (days)	Hospital occu-pancy/ Capacity use rate (%)*
Male surgical	29	667	5,982	8.8	57	29	682	5,678	8.3	54
Female surgical	29	883	5,487	6.2	52	29	920	5,827	6.3	55
Male medicine	29	810	5,601	6.9	53	29	849	4,434	5.2	42
Female medicine	30	948	6,027	6.4	55	30	962	5,586	5.8	51
Maternity	19	1,462	3,796	2.6	55	19	1,360	3,554	2.6	51
Pediatrics	20	653	2,480	3.8	34	20	650	2,883	4.4	39
ICU	9	113	1,266	11.2	39	9	81	687	8.5	21
NICU	0	281	1,967	7.0	-	0*	198	1,651	8.3	-
Total	165*	5,827	32,606	5.6	54	165**	5,702	30,300	5.3	50

* NICU has space for incubators, not beds

** Remaining 20 inpatient beds are located in the Emergency and Casualty department

† Average Length of Stay (ALOS) = Number of bed-days / Number of admissions

‡ Hospital occupancy rate in % = {(Number of bed-days) / (Number of beds X days in the reporting period)} X 100

The ALOS for MSJMC overall was around 5 days for both of the reporting years. Except for ICU in 2011, ALOS for the various wards was consistent by and large. However, the occupancy/capacity use rates were quite low in general. Only a half of the all inpatient capacity in MSJMC was utilized in 2012 and 2011. For Pediatric and ICU wards, the capacity use rate was even lower. To improve efficiency of the MSJMC service provision, it is imperative to take measures to attract more patients and attain higher occupancy/capacity use rates, or reduce fixed costs through input rationalization/balancing (cutting back on certain fixed inputs or implementing measures for their shared use).

4.3 COST-REVENUE ANALYSIS

Detailed cost information compiled in the costing exercise provided a reasonable basis for conducting cost-revenue comparisons for the hospital. To examine the cost-revenue comparisons, information on revenues earned in 2012 and 2011 was collected from MSJMC financial records. To compensate its costs, MSJMC receives upfront cash payments from the MOH and MBS, charges modest user-fees from patients for selected services, and collects reimbursement from private insurance companies for the services provided to their clients. Donations and rental earnings serve as a fourth source of MSJMC revenues. Apart from the cash receipts and revenues mentioned above, MSJMC also receives certain in-kind, non-cash contributions from MBS, CMS and various other government agencies. The current costing exercise attempted to document the nature and monetary value of these contributions. However, the value of a number of such contributions could not be assessed because of a lack of data. For instance, the ABTB bears fuel, driver and maintenance costs for the two vehicles used by MSJMC for staff transportation, and free Ambulance service is provided to MSJMC by the. Also, substantial contributions from the government and the former Holberton Hospital were made to MSJMC's capital asset acquisition. But the costing exercise could not ascertain the monetary values of these contributions from MSJMC or other records that were made available. Table 11 and 12 summarize the results of the cost-revenue analysis for 2011 and 2012, respectively, based on the cash and non-cash cost and revenue/receipt data that was possible to compile.

In 2011, MSJMC had a net surplus of EC$ 6.6 million (US$ 2.5 million) on the recurrent costs incurred in cash. However, MSJMC reports it could not afford to pay the utility bills amounting to EC$ 8.6 million (US$ 3.2 million) to the APUA because of shortage of enough funds. Once these accounts payable are paid back by MSJMC, its net cost-revenue status would have turned into a deficit of EC$ 2.0 million (US$1.1 million). Further, if the capital depreciation funds and Cuban payments to health care workers are considered, the net cost-benefit outcome for MSJMC in 2011 would have amounted to a loss of EC$ 7.7 million or US$ 2.8 million.

TABLE 11. SUMMARY OF COST-REVENUE ANALYSIS IN 2011

Total of MSJMC cost			Total of revenues/Cash receipts			Other non-cash receipts			Net of cost and revenue
Cost type	EC$	US$	Source	EC$	US$	Source	EC$	US$	
● Recurrent total: - Cash expenses - Accounts payable (utility charges to APUA)* - Cuban payments to health care workers ● Capital	42,533,577 32,991,226 8,620,586 921,765 4,770,307	15,753,175 12,218,972 3,192,810 341,394 1,766,780	● Capita-tion payment (MOH) ● MBS ● User fees ● Private insurance ● Other (Donations, Rentals)	23,388,385 9,550,000 8,071 4,434,879 137,517	8,662,365 3,537,037 2,989 1,642,548 193,865	● CMS supplies (MOH) ● Salary donation s from Cuba	1,196,847 921,765	443,277 341,394	● <u>On recurrent cash expenses:</u> EC$ 6,646,238 or US$ 2,461,570 ● <u>On total recurrent cost:</u> (EC$ 2,896,113) or (US$ 1,072,634) ● <u>On total cost:</u> (EC$ 7,666,420) or (US$ 2,839,415)
TOTAL	**47,303,884**	**17,519,955**	**TOTAL**	**37,518,852**	**14,038,804**	**TOTAL**	**2,118,612**	**784,671**	

* MSJMC reported of not being able to pay these costs because of funding shortage. Therefore, upon receipt of additional funds from MOH/Government, MSJMC would need to off-set these payments with the APUA.
** 1 US$=2.7 EC$

TABLE 12. SUMMARY OF COST-REVENUE ANALYSIS IN 2012

Total of MSJMC cost			Total of revenues/Cash receipts			Other non-cash receipts*			Net of cost and revenue
Cost type	EC$	US$	Source	EC$	US$	Source	EC$	US$	
● Recurrent total: - Cash expenses - Accounts payable (utility charges to APUA)* - Cuban payments to health care workers ● Capital	49,259 ,397 38,305,635 9,435,563 1,518,199 4,808,786	18,244,222 14,187,272 3,494,653 562,296 1,781,032	● Capitation payment (MOH) ● MBS ● User fees ● Private insurance ● Other (Donations, Rentals)	19,818,009 11,914,887 314,339 4,024,082 193,865	7,340,003 4,412,921 116,422 1,490,401 71,802	● CMS supplies (MOH) ● MBS (pharma-ceuticals) ● Salary donations from Cuba	1,531,946 9,763 1,518,199	567,387 3,616 562,296	● On recurrent cash expenses: (EC$ 1,019,455) or (US$ 377,576) ● On total recurrent cost: (EC$ 9,934,307) or (US$ 3,679,373) ● On total cost: (EC$ 14,743,093) or (US$ 5,460,405)
TOTAL	**54,068,183**	**20,025,254**	**TOTAL**	**36,265,182**	**13,431,549**	**TOTAL**	**3,059,908**	**1,133,299**	

* Upon receipt of additional funds from MOH/govt, MSJMC would require to off-set these payments with APUA.

** 1 US$=2.7 EC$

In 2012, MSJMC had experienced a net surplus of approximately EC$ 1.0 million (US$ 378 thousand) on the recurrent costs incurred in cash. This year, too, MSJMC could not pay its utility bills amounting to EC$ 9.4 million (US$ 3.5 million) because of shortage of funds. If these accounts payable were settled by MSJMC, the net cost-revenue status would have become a deficit of EC$ 8.4 million or US$ 3.1 million. Capital depreciation funds and Cuban salary payments considered, the net loss for MSJMC in 2012 would total to EC$ 14.7 million or US$ 5.5 million.

One reason for the considerably increased net shortfall in 2012 than in 2011 could be linked to the substantial rise in the recurrent costs largely resulting from noticeably greater medical items/supplies' costs in 2012. The latter might partly be caused by the changed accounting practice introduced in 2012 (market price-based revaluation of supplies received from CMS).

4.4 RECOMMENDATIONS AND CONCLUSIONS

There is an urgent need to improve the reporting and information system at MSJMC so as to enable appropriate and consistent recording and reporting of service provision statistics. It is also imperative that the number of patients served/treated is added as an output measure for all outpatient and inpatient departments.

Similarly, the cost accounting and financial systems at MSJMC need to be streamlined on an urgent basis so as to enable detailed tracking of input use, including staff time, medicines, and supplies. Accurate and proper cost accounting based on the types and amounts of inputs/resources used by each overhead and clinical department needs to be established. The cost accounting system should be able to document and ascertain the monetary values of all non-cash, in-kind contributions/cost-sharing from government and other external sources as well.

A complete inventory of all capital items needs to be carried out immediately. It should enable department-specific tracking of the building and construction costs, non-medical (office) and medical furniture and fixtures, non-medical (office) and medical equipment, and other capital items together with their respective quantities, procurement (or current) price and year of procurement.

To improve efficiency of the service provision, it is imperative that MSJMC management takes all possible measures to attract more patients and attain higher occupancy/capacity use rates. Alternatively, it should make a concerted effort to reduce fixed costs through effective rationalization/balancing of the inputs (cutting back on certain fixed inputs or implementing measures for their shared use).

The cost-revenue analysis indicates that MSJMC management should improve the financial sustainability of its service provision. In conjunction with more regular contribution of needed funds from the MOH and other government sources, it is also important that MSJMC management adopts appropriate cost-containment and efficiency-improvement measures as well as prudent revenue-generating strategies to at least operate at break-even. Any contractual obstacles in this regard must be urgently addressed by the MOH, MSJMC management and all other parties concerned.

The costing exercise has been a useful learning experience for the team of the working group members from MSJMC management and staff and the MOH who had jointly worked with the HS 20/20 costing specialist. Despite the challenges in mobilizing needed data for the costing exercise, the working group was instrumental in finding a solution and acquiring the right or "next-best" proxy information. The regular interactions between the costing specialist and the local working group members helped the latter to better understand the limitations with the existing cost accounting and information systems at MSJMC. As for the next steps, MOH and MSJMC management should take effective measures to address the above recommendations. Costing is not a one-off activity. Sound management practice requires periodic review of the costs, and any such future effort of MSJMC management can build on the existing costing work.

It is reaffirming that MSJMC management reported to have already initiated measures in upgrading its data recording and reporting systems at the time this report was being finalized. Once the input and output data accounting systems are improved based on the above recommendations and more accurate data is generated, the Excel costing worksheets/tool developed in this costing exercise could be easily adapted to derive revised cost estimates.

ANNEX A. INFORMATION ON CUBAN MEDICAL BRIGADE

Medical personnel category/workplace	2011		2012	
	# of persons	Annual salary (in EC$)*	# of persons	Annual salary (in EC$)*
Pathology/Lab	3	87,808.40	3	172,536.00
Radiology	6	202,151.16	8	345,072.00
Pharmacy	1	36,000.00	2	86,268.00
Physiotherapy	0	-	2	86,268.00
Nurse	11	504,000.00	16	721,176.00
Physician	2	91,804.97	1	106,878.60
Total	**23**	**921,764.53**	**32**	**1,518,198.60**

* Salary payments are made by the Cuban government.

ANNEX B. DISTRIBUTION OF MSJMC PHYSICIANS' TIME (LENGTH OF EFFORT) AMONG INPATIENT/OUTPATIENT DEPARTMENTS/WARDS

Physician Specialties/ Departments	# of physi-cians	Estimated distribution of physicians' time/LOE by clinical activities (in %) among inpatient/outpatient departments/wards										
		Male Surgery	Female Surgery	Male Medicine	Female Medicine	Mater-nity	Pedia-tric	ICU	NICU	OT	OPD	Emer-gency
General Surgical	10	25	25					5		25	10	10
Internal Medicine	11			35	35			15			10	5
Obstetrics & Gynecology	10		25			50		5		10	5	5
Pediatrics	9						40		40		10	10
Orthopedics	4	25	25					5		20	10	15
Ear, Nose & Throat	2	25	25					5		20	10	15
Ophthalmology	2	5	5					5		20	50	15
Oncology	1	5	5	5	5			5			70	5
Anesthesia	3							10		90		
Total	**52**	**85**	**110**	**40**	**40**	**50**	**40**	**55**	**40**	**185**	**175**	**80**
Allocation (number) of physicians		4.15	6.65	3.90	3.90	5.00	3.60	3.40	3.60	7.80	5.80	4.20

Other than the physicians mentioned above, dedicated staffing of MSJMC physicians at various outpatient departments was as follows for:

Outpatient departments	Type of physicians	2012	2011
Pathology/Lab	Consultant	1	1
	House officer	1	1
Radiology	Consultant	1	1
Dialysis	House officer	1	1
Outpatient Clinic	Consultant	1	1
Emergency	Part-timer doctors	4	2
Total		**9**	**7**

ANNEX C: SUMMARY OF PHARMACEUTICALS PROCUREMENT BY MSJMC IN 2011 & 20012 (IN EC$)

Names	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Total from Jan to Dec 2011
A. S. Brydens & Sons	10,757	10,312	0	26,094	10,688	18,701	18,370	41,008	43,029	79,771	80,599	39,222	**378,551**
Lifeline Pharmaceuticals	0	0	0	0	0	16,085	5,388	31,797	0	0	11,886	7,554	**72,711**
Ceco Pharmacy	16,824	0	536	298	597	0	0	0	0	0	0	5,760	**24,014**
Cecil Charles	0	7,591	3,000	7,000	6,578	8,892	0	0	8,466	2,700	8,340	0	**52,566**
Caribbean Pharmaceutical Supplies	1,162	15,765	5,275	14,031	4,591	5,128	18,011	8,961	7,527	7,007	10,324	2,636	**100,417**
Collins (B/dos) Ltd.	0	0	45,045	0	21,101	11,745	0	0	19,117	13,286	0	0	**110,294**
Epicurean Pharmacy	0	0	0	0	0	300	0	454	0	0	0	0	**754**
Stokes & Bynoe	0	0	13,114	0	23,756	0	0	12,742	0	0	0	0	**49,612**
National Drug Source	0	0	0	0	0	0	7,045	0	0	0	0	0	**7,045**
Pharmacare	7,764	5,043	5,803	9,902	6,689	2,900	8,755	9,454	9,978	8,494	6,675	4,235	**85,691**
Pipers Pharmacy	2,122	0	2,407	0	0	0	0	210	2,499	930	1,750	0	**9,918**
Woods Pharmacy	0	0	0	0	0	0	0	214	0	0	0	0	**214**
Monthly Total :	**38,630**	**38,710**	**75,180**	**57,325**	**74,001**	**63,751**	**57,568**	**104,840**	**90,614**	**112,187**	**119,575**	**59,406**	
Overall Total													**891,788**

Names	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Total from Jan to Dec 2012
A. S. Brydens & Sons	30,830	51,677	36,825	24,891	47,264	35,731	53,567	43,707	42,244	20,726	32,467	22,751	**442,681**
Lifeline Pharmaceuticals	0	27,737	9,936	3,176	54,196	0	0	17,166	7,298	0	0	0	**119,508**
Ceco Pharmacy	2,500	0	0	0	0	0	650	0	0	281	558	0	**3,989**
Cecil Charles	0	2,300	7,496	9,000	4,500	5,400	5,400	0	0	0	0	0	**34,096**
Caribbean Pharmaceutical Supplies	22,645	14,534	4,124	18,404	11,611	9,588	11,295	17,346	12,260	29,349	13,001	3,432	**167,590**
Collins (B/dos) Ltd.	26,224	0	5,728	0	11,990	0	16,583	0	15,847	0	7,530	0	**83,902**
Epicurean Pharmacy	2,393	0	0	0	0	0	0	0	0	225	1,499	0	**4,117**
Stokes & Bynoe	0	0	61,553	0	0	0	0	0	0	0	0	0	**61,553**
National Drug Source	0	0	0	0	0	0	0	0	9,943	0	0	0	**9,943**
Pharmacare	1,997	13,661	1,879	7,516	8,454	5,748	9,089	0	0	0	16,380	10,321	**75,043**
Pipers Pharmacy	248	310	830	1,618	0	0	357	0	2,659	300	400	1,025	**7,747**
Woods Pharmacy	0	0	0	0	228	196	0	0	0	957	210	0	**424**
Antigua Medical Center	0	0	10,960	0	0	1,504	0	3,800	6,000	6,000	0	0	**16,264**
Medical Benefit Board	0	0	0	0	0	0	0	0	0	0	9,763		**9,763**
VI Hospital & Medical Supply	0	0	0	2,989	0	0	0	0	0	0	0	0	**2,989**
Monthly Total :	**86,836**	**110,218**	**139,330**	**67,593**	**138,244**	**58,167**	**96,943**	**82,019**	**96,251**	**57,837**	**81,807**	**37,529**	
Overall Total													**1,039,607**

ANNEX D: SUMMARY OF PHARMACEUTICALS AND OTHER MEDICAL SUPPLIES CONTRIBUTED TO MSJMC FROM CMS IN 2011 & 2012 (IN EC$)

CMS CONTRIBUTION TO MSJMC	**2011**	**2012**
Pharmaceuticals (medicaments/drugs)	706,486	626,104
Other medical supplies	490,361	905,842
TOTAL	**1,196,847**	**1,531,946**

ANNEX E: SUMMARY OF UTILITY AND OTHER OPERATING COSTS IN 2011 & 2012 (IN EC$)

COST ITEMS	2011	2012	Source of supply/ Contributor
Electricity	6,234,119	6,654,346	Government
Water	1,900,340	2,260,391	Government
Chemicals & Gas	137,845	388,026	MSJMC
Transport fuel (in gallon)*	-	-	Government
Other transport-related operating costs (driver salary, repair/maintenance, etc.)*	-	-	Government
Telephone & communications	348,282	132,799	Government
All other repair & maintenance costs for the hospital equipment & building	535,055	665,391	MSJMC
Outsourcing costs for cleaning	1,670,798	1,863,678	MSJMC
Outsourcing costs for security	718,251	746,747	MSJMC
Outsourcing costs for food/catering	1,503,187	2,063,427	MSJMC
Other related costs and rentals	0	21,280	MSJMC
TOTAL	**13,047,878**	**14,796,086**	
Total of government	8,620,586	9,435,563	

* Driver and fuel costs for the 2 MSJMC vehicles (buses) used for transportation of its staff are borne by the Government Transport Board. Heavy maintenance is done by the Transport Board as well. MSJMC does not have any records on the Transport Board costs. However, MSJMC reported that it buys fuel for these transports to operate on the Sundays (weekends) and occasionally share light servicing & maintenance works. But MSJMC did not maintain separate records for these transport costs until before 2013. Starting this year, MSJMC transport officer has initiated separate accounting of these costs.

ANNEX F: ESTIMATES OF THE ANNUAL DEPRECIATION COSTS FOR THE CAPITAL ITEMS (IN EC$)

Names	Year of purchase	Office/ non-medical	Clinical/ Medical	Total	Assumed useful (economic) life	Simple undiscounted, annualized depreciation cost*	Simple undiscounted, annualized depreciation cost -- Cumulative
		EC$	EC$	EC$	Years	EC$	EC$
Furniture	2009	135,137.75		135,137.75	5	27,027.55	27,027.55
	2010	125,624.32		125,624.32	5	25,124.86	52,152.41
	2011	6,702.70	10,550.00	17,252.70	5	3,450.54	55,602.95
	2012	5,781.42		5,781.42	5	1,156.28	56,759.24
Equipment	2009	1,866,812.26	6,597,749.57	8,464,561.83	5	1,692,912.37	1,692,912.37
	2010	127,482.22	159,106.28	286,588.50	5	57,317.70	1,750,230.07
	2011	172,424.21	1,401,634.14	1,574,058.35	5	314,811.67	2,065,041.74
	2012	5,863.00	180,753.60	186,616.60	5	37,323.32	2,102,365.06
Building improvement and other capital expenditure	2009	3,274,128.13	478,926.27	3,753,054.40	30	125,101.81	125,101.81
	2010	31,121.14	99,692.30	130,813.44	30	4,360.45	129,462.26
	2011	6,000.00		6,000.00	30	200.00	129,662.26
	2012	0.00	0.00	0.00	30	0.00	129,662.26
Building & construction	2009			75,600,000.00	30	2,520,000.00	2,520,000.00
	2010			0.00	30	0.00	2,520,000.00
	2011			0.00	30	0.00	2,520,000.00
	2012			0.00	30	0.00	2,520,000.00
MSJMC Total	**2009**	**5,276,078.14**	**7,076,675.84**	**87,952,753.98**		**4,365,041.73**	**4,365,041.73**
	2010	**284,227.68**	**258,798.58**	**543,026.26**		**86,803.01**	**4,451,844.74**
	2011	**185,126.91**	**1,412,184.14**	**1,597,311.05**		**318,462.21**	**4,770,306.95**
	2012	**11,644.42**	**180,753.60**	**192,398.02**		**38,479.60**	**4,808,786.56**
	Total	**5,757,077.15**	**8,928,412.16**	**90,285,489.31**		**4,808,786.56**	

* MSJMC follows simple (undiscounted) approach to determining annual depreciation costs

ANNEX G: AREA/FLOOR SPACE AND CONSTRUCTION COSTS FOR MSJMC DEPARTMENTS

Admin & management departments	Area/ Floor space (Square Feet)	Building & cons-truction cost (EC$)	Outpatient clinical departments	Area/ Floor space (Square Feet)	Building & const-ruction cost (EC$)	Inpatient wards	Area/ Floor space (Square Feet)	Building & const-ruction cost (EC$)
Internal audit, etc.	534	366,431	Outpatient clinic	9,091	6,238,242	Male surgical	6,639	4,555,680
Human resource	680	466,616	Emergency	5,869	4,027,306	Female surgical	6,731	4,618,811
Finance	4,421	3,033,689	Laboratory	5,208	3,573,728	Male medicine	6,685	4,587,245
Operations	2,209	1,515,815	Radiology	5,743	3,940,845	Female medicine	6,685	4,587,245
Admin	3,269	2,243,187	Dialysis	2,403	1,648,938	Maternity	8,891	6,101,002
Quality	712	488,574	Operation theatre	13,345	9,157,336	Paediatrics	5,742	3,940,159
Nursing	220	150,964	Pharmacy	1,621	1,112,330	ICU	1,886	1,294,173
Dietary	7,436	5,102,581	Rehab/Physiotherapy	1,566	1,074,589	NICU	2,116	1,451,999
			Occupational health	470	322,514			
Sub-total	19, 481	13,367,857		45,316	31,095,829		45,375	31,136,314
MSJMC Total	**110,172**	**75,600,000**						

ANNEX H: RESULTS OF THE STEPDOWN ALLOCATION OF OVERHEAD/COMMON COSTS ACROSS THE CLINICAL (FINAL) DEPARTMENTS IN 2011 (IN EC$)

Clinical (Final) Departments	Costs of Overhead Departments Allocated Across Clinical (Final) Departments					Costs Specific to the Clinical (Final) Departments					Total Cost of the Clinical (Final) Departments
	Recurrent Costs				Capital Costs	Recurrent Costs				Capital Costs	
	Salary & benefits	Drugs/ Medicines	Med & non-med supplies	Utility & other operating costs	Total of annualized depreciation	Salary & benefits	Drugs/ Medi-cines	Med & non-med supplies	Utility & other operating costs	Total of annualized depreciation	
	EC$	EC$	EC$	EC$	EC$	EC$	EC$	EC$	EC$	EC$	EC$
Outpatient clinic	400,714	104,224	6,454	1,080,225	50,067	1,631,227	0	88,762	0	393,629	3,755,301
Emergency	500,231	238,489	6,132	735,803	57,385	1,778,612	0	340,439	0	254,120	3,911,211
Laboratory	874,833	681,361	7,984	727,916	83,129	1,087,512	0	61,974	0	225,500	3,750,210
Radiology	468,509	240,770	5,787	721,885	52,374	810,257	0	30,191	0	248,665	2,578,438
Dialysis	218,148	56,057	3,213	315,896	29,082	683,727	0	745,229	0	104,047	2,155,400
Operating theatre	425,950	16,445	8,065	1,548,490	58,066	2,572,618	0	522,217	0	577,821	5,729,673
Male surgical	396,035	47,871	12,210	1,245,229	109,840	1,390,982	0	179,559	0	287,460	3,669,186
Female surgical	392,777	43,909	11,702	1,217,718	105,027	1,773,584	0	184,271	0	291,444	4,020,433
Male medicine	386,954	44,822	11,750	1,221,245	105,131	1,352,721	0	118,539	0	289,452	3,530,615
Female medicine	397,043	48,231	12,277	1,253,883	110,357	1,352,721	0	149,337	0	289,452	3,613,302
Maternity	366,015	30,377	10,273	1,332,664	85,132	1,568,533	0	113,240	0	384,969	3,891,203
Pediatrics	288,689	19,846	7,422	875,387	63,599	1,103,440	0	21,242	0	248,621	2,628,247
ICU	198,524	10,131	4,375	345,896	41,351	1,135,815	0	155,903	0	81,661	1,973,657
NICU	224,706	15,741	5,391	425,638	51,306	1,195,467	0	87,137	0	91,620	2,097,006
TOTAL COST	**5,539,129**	**1,598,274**	**113,037**	**13,047,878**	**1,001,846**	**19,437,216**	**0**	**2,798,042**	**0**	**3,768,461**	**47,303,883**

ANNEX I: RESULTS OF THE STEPDOWN ALLOCATION OF OVERHEAD/COMMON COSTS ACROSS THE CLINICAL (FINAL) DEPARTMENTS IN 2012 (IN EC$)

Clinical (Final) Departments	Costs of Overhead Departments Allocated Across Clinical (Final) Departments					Costs Specific to the Clinical (Final) Departments					Total Cost of the Clinical (Final) Departments
	Recurrent Costs				Capital Costs	Recurrent Costs				Capital Costs	
	Salary & benefits	Drugs/ Medicines	Med & non-med supplies	Utility & other operating costs	Total of annualized depreciation	Salary & benefits	Drugs/ Medi-cines	Med & non-med supplies	Utility & other operating costs	Total of annualized depreciation	
	EC$	EC$	EC$	EC$	EC$	EC$	EC$	EC$	EC$	EC$	EC$
Outpatient clinic	473,818	156,585	112,603	1,205,285	54,341	1,760,785	0	204,853	0	396,804	4,365,075
Emergency	583,587	286,518	167,097	815,306	61,781	2,084,125	0	407,305	0	256,170	4,661,889
Laboratory	775,645	517,746	275,028	765,830	71,229	1,137,723	0	1,529,160	0	227,319	5,299,680
Radiology	581,777	321,227	181,485	804,476	58,310	963,490	0	137,057	0	250,670	3,298,493
Dialysis	244,893	73,538	49,468	343,150	29,791	709,697	0	741,361	0	104,886	2,296,783
Operating theatre	442,273	19,093	61,640	1,725,258	59,475	2,648,396	0	823,598	0	582,482	6,362,215
Male surgical	416,571	54,532	72,147	1,461,935	112,236	1,494,332	0	165,355	0	289,779	4,066,887
Female surgical	428,734	55,963	73,960	1,489,148	115,457	1,868,024	0	169,694	0	293,795	4,494,774
Male medicine	382,296	42,584	62,654	1,338,175	95,595	1,456,963	0	129,127	0	291,787	3,799,181
Female medicine	414,021	53,648	71,538	1,458,195	110,976	1,456,963	0	162,675	0	291,787	4,019,803
Maternity	379,127	34,133	61,919	1,526,776	85,800	1,588,038	0	84,667	0	388,074	4,148,533
Pediatrics	309,089	27,689	46,875	1,056,773	70,611	1,197,948	0	61,556	0	250,627	3,021,167
ICU	198,258	6,598	18,586	338,062	35,710	1,137,370	0	262,437	0	82,320	2,079,342
NICU	225,942	15,856	26,591	467,718	48,614	1,208,405	0	68,875	0	92,359	2,154,361
TOTAL COST	**5,856,031**	**1,665,711**	**1,281,589**	**14,796,086**	**1,009,927**	**20,712,260**	**0**	**4,947,720**	**0**	**3,798,859**	**54,068,183**

ANNEX J: BIBLIOGRAPHY

Health Systems 20/20 and SHOPS. March 2012. *Antigua and Barbuda Health Systems and Private Sector Assessment 2011*. Bethesda, MD: Health Systems 20/20 and SHOPS Projects, Abt Associates Inc.

MSJMC Financial Statements, December 2010

Antigua and Barbuda Ministry of Health, Social Transformation and Consumer Affairs (MOH). December 2011. *National Strategic Plan (NSP) for HIV/AIDS in Antigua and Barbuda (2012-2016)*. St. John's, Antigua.

Routh, Subrata, Josef Tayag. *Costing of Primary Health Care and HIV/AIDS Services in Antigua and Barbuda: A Preliminary Report.* Bethesda, MD: Health Systems 20/20 project, Abt Associates Inc. September 2012.

Tarantino, Lisa and Andrew Won. *Workshop Report: Antigua and Barbuda Health Systems and Private Sector Assessment.* Bethesda, MD: Health Systems 20/20 project and SHOPS Project, Abt Associates Inc. March 2012.