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SAINT LUCIA: HEALTH SERVICE DELIVERY COSTING AND OTHER ECONOMIC ANALYSES

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HEALTH SERVICE DELIVERY COSTING AND OTHER ECONOMIC ANALYSES

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LIST OF ACRONYMS

ART	Antiretroviral Therapy
CMH	Commission on Macroeconomics and Health
cMYP	Comprehensive Multi-Year Plan
DALYs	Disability Adjusted Life Years
EPHS	Essential Package of Health Services
GDP	Gross Domestic Product
HIS	Health Information Systems
HS20/20	Health Systems 20/20
IHP+	International Health Partnership
MBB	Marginal Budgeting for Bottlenecks
MOH	Ministry of Health, Human Services, and Family Affairs
MNH	Maternal and Neonatal Health
MSH	Management Sciences for Health
NGO	Non-Governmental Organization
OB/GYN	Obstetrics and Gynecology
OECS	Organization of Eastern Caribbean States
SARA	Situational and Response Analysis
UHC	Universal Health Care
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VDRL	Venereal Disease Research Laboratory
WHO	World Health Organization

I. INTRODUCTION

The Government of Saint Lucia has been considering a national health financing mechanism since the early 2000s. After initial work by a task force in 2002, this mechanism has become known as the Universal Health Care (UHC) plan. The UHC plan as currently envisioned would identify sources of additional revenue for expanding health services coverage at all levels of the health system beyond the services already covered under the current Ministry of Health, Human Services, and Family Affairs' (MOH) budget. The UHC's main goals are to increase the availability of resources for health; reduce the burden of out-of-pocket expenditures on households; and promote efficiency and equity in the use of resources for health.

The MOH is currently focused on defining an essential package of health services (EPHS) that will be covered by the UHC. In order to decide the services that should be included in the EPHS, it is important for the MOH to assemble evidence to support various options for coverage. The MOH has constituted a health financing committee to evaluate those options against Saint Lucia's health priorities, budget, and societal values. To guide this evaluation, the MOH Division of Corporate Planning has developed a framework for defining the package that relies on a global burden of disease analysis (Edmund 2013).

Among these priorities, cost is a major factor to consider in the implementation of UHC and the MOH needs to gather information to respond to questions such as:

- What are the current actual costs of delivering key health services at each level of service?
- What would the cost of delivering these services be if they were provided according to national or international standard treatment protocols ("normative" costs)?
- What services should be included in the UHC benefits package in Saint Lucia (using criteria such as affordability, cost-effectiveness, and disease burden)?
- What would be the cost of delivering this defined benefits package in Saint Lucia?
- What are the economic costs of illness to households considering the 'direct' costs to the patient of medical care (e.g. travel costs, fees paid to receive care, etc.) as well as the 'indirect' cost of lost production or income because of reduced working time? How would UHC help to reduce these costs?

After consultations with the United States Agency for International Development (USAID)-funded Health Systems 20/20 (HS20/20) Caribbean Project, the MOH agreed to prioritize a bottom-up normative costing to estimate the costs of service delivery. This approach was considered the most appropriate to estimate the budget required to afford any additional coverage of services in the UHC and a first step for future analyses.

During a field visit in April 2013, the MOH arranged meetings between HS20/20 consultants and key local staff who have information about health service utilization and financial data on the services that might be covered by the UHC program. In collaboration with senior staff of the MOH, HS20/20 evaluated the availability of data that would be useful for costing studies, the feasibility of different types of analysis given the available data, and the types of cost questions relevant to the discussion around designing the UHC package. The MOH has indicated that its first priority is to estimate the costs of

service delivery from the MOH's perspective in order to facilitate calculation of the budget required to finance services included in the UHC. It was also agreed with the MOH that the analysis should, in the future, be broadened to estimate costs and benefits from societal and patient perspectives, including information on the economic costs of illness, as this would be important for advocacy with the general population, Parliament, and the Ministry of Finance for resource allocation.

The purpose of this report is to provide technical advice to the MOH for conducting health service delivery costing. The MOH may decide to implement directly or engage other costing experts for this purpose. In this report, we outline considerations for designing an EPHS and various ways of evaluating the economic impact of illness. Section 2 includes a list of criteria to consider along with presenting a framework of evaluating cost questions based on the perspective taken for analysis and the intended use of the information. This section also includes a comprehensive list of existing costing tools (which are hyperlinked in the electronic version of this report) based on the intended use of the data. Section 3 provides a step-by-step overview of conducting the bottom-up costing approach along with how to resource the Costing Team as well as how to treat direct and indirect costs. Section 4 ends with a brief list of recommended next steps.

2. CONSIDERATIONS FOR DESIGNING AN ESSENTIAL PACKAGE OF HEALTH SERVICES

2.1 WHAT CRITERIA SHOULD GUIDE DESIGN OF THE ESSENTIAL PACKAGE OF HEALTH SERVICES?

In 2001, the Commission on Macroeconomics and Health (CMH) recommended four criteria to choose essential health interventions to be included in benefits packages: “(1) They should be technically efficacious and can be delivered successfully; (2) the targeted diseases should impose a heavy burden on society, taking into account individual illness as well as social spillovers (such as epidemics and adverse economic effects); (3) social benefits should exceed costs of the interventions (with benefits including life-years saved and spillovers such as fewer orphans or faster economic growth); and (4) the needs of the poor should be stressed (Commission on Macroeconomics and Health 2001).” Furthermore, according to *The Health Insurance Handbook* published by Health Systems 20/20 and the World Bank, policy makers must also consider the priorities of the population groups that are providing most of the financing, who may withdraw their political support for an insurance scheme that does not cover services that they value (Wang et al. 2010).

2.1.1 ECONOMIC COSTS OF ILLNESS

The criteria recommended by CMH and *The Health Insurance Handbook* as well as the criteria developed by the Government of Saint Lucia suggest that policy makers consider the economic costs of illness. The cost of illness is of interest for broader health financing purposes in terms of making the case for investing in the health sector. This case for health can be made at a macro-economic level by looking at the impact of a given health condition on productivity and hence on the country’s GDP. It can also be made by looking more narrowly (and perhaps more manageably) at a micro-economic level at the impact on household income.

According to the World Health Organization (WHO), there is increasing policy and research interest in the microeconomic impact of disease or injury, focusing in particular on the impoverishing effects that ill-health or injury can have on the consumption possibilities of households (WHO 2009). Illness typically leads to increased household expenditures on health services and goods, and may also reduce time spent generating income. Both effects reduce household income and increase vulnerability.

There are many approaches toward conducting a macro-economic or a micro-economic costing study. However, the Government of Saint Lucia is limited by the financial and human resources it may be able to allocate toward implementing the task. There is need therefore to prioritize the type of analysis required to fulfill the objectives of the MOH. Once the objectives are clarified, the Government of Saint Lucia must decide: (1) how to measure costs; and (2) which costs to measure.

Box 2.1. World Health Organization Guidelines on Economic Impact Studies

The WHO guidelines for economic impact studies offer advice on what questions need to be settled before such a study is conducted (World Health Organization 2009):

- What is the **perspective** or level of aggregation for the study? (e.g. microeconomic level of households/firms, or aggregate impact at macroeconomic/societal level?)
- What is the **scope** of the study? (e.g. overall economic welfare or one or more of its constituent elements, such as the consumption of non-health goods and services, leisure and health services itself?)
- What is the defined **quantity of interest** for the study? (e.g. if non-market losses such as unpaid care-giving by family members at the household level are measured, is it meaningful to combine these with market loss elements into a single estimate of economic loss?)
- What is the **counterfactual** /comparator situation against which economic losses are to be assessed? (e.g. prevalence-based or incidence-based approach?)
- What, if any, account is being taken of dynamic effects that may occur beyond the current period? (e.g. the impact of depleted capital accumulation on future economic growth)

2.2 OPTIONS FOR MEASURING COSTS IN THE DESIGN OF AN ESSENTIAL PACKAGE OF HEALTH SERVICES: PERSPECTIVE AND PURPOSE

In general, economic analysis involves the measurement of costs and their comparison against potential benefits. However, “costs” and “benefits” can mean different things depending on the perspective taken in the analysis. Table 2.1 organizes different types of economic analyses according to three different perspectives: the societal perspective, the health care provider perspective, and the patient perspective. Different types of cost questions are summarized under each perspective.

Different cost questions may be approached using a variety of methods and tools. Each varies in complexity and the resources required to appropriately execute the economic cost study. Methods that are less complex tend to draw from existing research to serve as reference points for making assumptions that would apply to the context in Saint Lucia. In contrast, more complex methods involve the collection of primary data through surveys, various costing templates, interviews, financial statement analysis or medical record reviews. Because the more complex approaches involve primary data, they are usually more accurate compared to approaches that rely on literature reviews and secondary data sources. However, primary data collection typically involves significant time (sometimes several years) and budget to implement. This is important for the Government of Saint Lucia to consider when deciding when and how it should fund implementation of the different studies.

TABLE 2.1 PERSPECTIVES FOR ECONOMIC ANALYSIS

Societal Perspective	Health Care Provider Perspective	Patient Perspective
<p>The societal perspective views all costs and benefits from the perspective of the patients, the health system, and all other relevant sectors of the economy.</p> <p>The societal perspective will take into account the opportunity costs of using healthcare not only within the health system but from the effects that it has on all the resources used in society.</p> <p>Cost analysis from a societal perspective may involve addressing questions such as:</p> <ul style="list-style-type: none"> • How do certain illnesses or conditions affect the overall productivity of a population? • What are the trade-offs for the Government of Saint Lucia in deciding to invest in health rather than in other public services? • What is the total number of DALYs lost due to a certain disease or condition and how is it affecting the whole population? <p>For example, a cost-benefit analysis from the societal perspective might include costs such as the opportunity cost of not implementing a particular program in education as a result of implementing a health program.</p>	<p>The health provider perspective focuses solely on the costs incurred by the health institutions that deliver care.</p> <p>Cost analysis from a health care provider perspective may involve addressing questions such as:</p> <ul style="list-style-type: none"> • What is the cost to provide treatment for a person living with diabetes for a year? • What is the cost per visit to an out-patient clinic? • How efficiently are services delivered? • How much would it cost for the government to provide care for a specific condition? <p>This is the perspective taken for the health service delivery costing exercise described in greater detail in Section 3. Cost analysis from the provider perspective can inform health sector budgeting and program planning.</p>	<p>The patient perspective focuses on the cost incurred by the patient or household only and does not account for resources utilized elsewhere. The patient perspective will include costs such as the loss of patients' income, direct costs to the patient to pay for services, transportation, etc.</p> <p>Cost analysis from a patient perspective may involve addressing questions such as:</p> <ul style="list-style-type: none"> • What is the cost of traveling to/from a healthcare facility to treat a certain condition? • What are the wages lost from having to take leave from work to go to the facility? • What fees does the patient pay related to prescriptions, diagnostic tests, and consultations to get treated for a given condition? • How does the cost of obtaining healthcare services impact the demand for healthcare? • What is the opportunity cost of care givers' time in terms of lost wages or production? <p>A patient perspective study may also evaluate the differences in cost to the patient for obtaining care between a public and private health facility.</p>

For example, one WHO study in Latin America and the Caribbean looked at the cost of diabetes. In the English Caribbean, the study took a societal perspective by defining the costs associated with diabetes as the potential value of lost productivity due to illness and mortality from diabetes in addition to direct medical costs for the provider. This study found that in the year 2000, the total indirect costs to society of diabetes mellitus among 317,200 people was US\$812.1 million, or \$25,612 in lost productivity per person over their lifetime (Barcelo, Aedo and Rajpathak 2003). However, another study in the Caribbean looking at the cost of HIV analyzed only the provider perspective of the cost of treatment to estimate the budget implications (Wolf et al. 2007). Tables 2.2 through 2.4 show data drawn from relevant studies that may be useful for the MOH in estimating cost and examining methodology used to undertake these economic assessments.

TABLE 2.2. ESTIMATED UNIT COSTS OF DIABETES FROM AVAILABLE LITERATURE

Cost of Diabetes (2000)*			
Country	per patient direct cost	per patient indirect costs	Total per capita
Bahamas	\$835	\$10,777	\$11,612
Barbados	\$551	\$ 5,958	\$ 6,509
Guyana	\$719	\$ 560	\$ 1,279
Jamaica	\$750	\$ 1,507	\$ 2,257
Trinidad and Tobago	\$533	\$ 3,457	\$ 3,990
*Costs include direct: Medication, hospitalization, consultations, complications; indirect: Potential value of lost production due to illness including mortality (lifetime, foregone earning due to mortality and disability due to diabetes) and disability costs (permanent and temporary)			
Reference: Barcelo, Alberto, Cristian Aedo, Swapnil Rajpathak, and Sylvia Robles. 2003. The cost of diabetes in Latin American and the Caribbean. Bulletin of the World Health Organization. 81(1):19-27. Available at: http://www.who.int/bulletin/Barcelo0103.pdf			

TABLE 2.3. ESTIMATED UNIT COST OF HIV FROM AVAILABLE LITERATURE

Cost of HIV with 2 lines or ART without generics (2006)**			
Country	# of identified cases	annual cost per capita	lifetime cost per capita
Antigua and Barbuda	209	\$639	\$16,982
Dominica	115	\$643	\$17,078
Grenada	104	\$643	\$1,711
St. Kitts and Nevis	95	\$641	\$17,025
St. Lucia	223	\$641	\$17,039
St. Vincent and The Grenadines	324	\$640	\$16,997
**Best practice includes 2 lines of ART when the CD4 count was <350cells/μL with cotrimoxazole when the CD4 count was <200 cells/μL, hospitalization and outpatient care other opportunistic diseases and HIV.			
Reference: Wolf, Lindsey, et al. 2007. The cost-effectiveness of antiretroviral therapy for treating HIV cases in the Caribbean. J. Acquir Immune Defic Syndr. 26(4):463-471. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2365902/			

TABLE 2.4. ESTIMATED UNIT COSTS OF DENGUE FROM AVAILABLE LITERATURE

Cost of Dengue per case (2010)***								
Country	Ambulatory cases				Hospitalized cases			
	Direct medical	Direct Non-medical	Indirect	Total cost	Direct medical	Direct Non-medical	Indirect	Total cost
Antigua and Barbuda	\$274	\$18	\$390	\$682	\$762	\$199	\$1,051	\$2,012
Dominica	\$213	\$12	\$145	\$370	\$325	\$134	\$390	\$849
Grenada	\$251	\$13	\$170	\$434	\$408	\$151	\$459	\$1,018
St. Kitts and Nevis	\$352	\$17	\$271	\$640	\$663	\$193	\$730	\$1,586
St. Lucia	\$237	\$13	\$162	\$412	\$361	\$148	\$437	\$947
St. Vincent and the Grenadines	\$74	\$13	\$157	\$244	\$377	\$147	\$424	\$948
Trinidad and Tobago	\$505	\$21	\$530	\$1,057	\$1,183	\$240	\$1,430	\$2,853

***Costs were drawn from available studies and found to be limited, indirect costs were calculated using DALYs based on international standards.

Reference: 5. Americas Dengue Fever: Donald S. Shepard, et al. "Economic Impact of Dengue Illness in the Americas". *Am. J. Trop. Med. Hyg.*, 84(2): 200-207. Available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3029168/>

Furthermore, even analyses with the same perspective may use different definitions of conditions and services. For example, for the Eastern Caribbean region, analysts taking a provider perspective calculated the annual cost of providing anti-retroviral therapy (ART) under two scenarios: for non-generic drugs and for generic drugs for each country. The same study then looked at the ART cost to the entire Eastern Caribbean using a provider perspective for defined annual costs in four different scenarios: (1) no treatment; (2) first-line ART; (3) first-line ART with cotrimoxazole; and (4) second-line ART with cotrimoxazole (Wolf et al. 2007).¹

¹ For more information on this study, see:
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2365902/>

Health Systems 20/20 released a framework categorizing various types of cost analysis according to the four “domains,” which are summarized in Table 2.5 below (Baruwa et al. 2012):

TABLE 2.5 TYPES OF COSTING STUDIES BY INTENDED USE

Types of Costing Studies by Intended Use	Examples of Costing Tools ² (Tool creator in parenthesis)
<p>1. Costing for Advocacy. Cost analysis for advocacy purposes targets in-country stakeholders and external funders to measure the amount of resources required to achieve specified broad health goals or the losses incurred if no reform measures are taken. For example, cost analyses for advocacy may convince a population that certain healthcare interventions are desired by measuring the cost of productivity losses due to illness. This data may be used to generate political momentum in support of specific reform strategies over others.</p>	<p>Marginal Budgeting for Bottlenecks (MBB) Toolkit (United Nations Children’s Fund [UNICEF] and World Bank)</p> <p>Comprehensive Multi-Year Plan (cMYP) for Immunization (WHO)</p> <p>OneHealth Tool International Health Partnership (IHP+)</p> <p>Malaria Cost Estimation Tool (WHO)</p> <p>Child Health Cost Estimation Tool (WHO)</p>
<p>2. Costing for Provider Payments. This type of cost analysis allows stakeholders to develop appropriate policies for paying health care providers based on health care provider cost structures. Costing for provider payments targets health insurance providers and government or donor parties that contract with health care providers to provide free services. These types of analyses are used to decide the amount to transfer to healthcare providers for the provision of services, changes in provider payment mechanisms, to project the resources required to deliver a specified health intervention through healthcare providers.</p>	<p>No one tool can answer these questions easily as it depends on the specific package of care that people are purchasing.</p> <p>SimIns (WHO) has been used in a few countries</p>
<p>3. Costing for Program Management. This type of cost analysis may measure the cost of delivering certain goods or services through a specified organization, so that managers can make informed decisions. For example, this type of analysis may involve comparing the cost of delivering the same service through different types of healthcare providers within the same hospital. This information may help hospital managers set new policies that promote greater efficiency or budget for potential increases in demand for that service. Costing for program</p>	<p>No one tool can answer these questions easily as it depends on the specific care being delivered and the manner of delivery.</p> <p>Output Based Financial Reporting (HS20/20)</p>

² Website to the tools are hyperlinked into the blue names of the tool.

Types of Costing Studies by Intended Use	Examples of Costing Tools ² (Tool creator in parenthesis)
<p>management targets non-governmental organizations (NGOs), health insurance providers, and individual facilities. Such analyses can help organizations become financially sustainable or measure the impact of different managerial or operational strategies.</p>	
<p>4. Costing for Government Planning. Baruwa et al. classifies the use of cost information for government planning in four ways:</p>	
<p>a. Measuring allocative efficiency (cost-effectiveness). Measuring allocative efficiency allows government planners to evaluate which health interventions deliver the most impact per unit of cost associated with implementation.</p>	<p>Spectrum: Preventing Mother to Child Transmission (PMTCT) Cost-Effectiveness (Futures Institute)</p>
<p>b. Technical efficiency (operating at the lowest costs or maximizing outputs for given inputs). An evaluation of technical efficiency evaluates how a given intervention may be delivered more efficiently given constrained inputs.</p>	<p>Output Based Financial Reporting (HS20/20)</p>
<p>c. Budgeting. Budgeting refers to measuring the operational costs and resources needed to implement a given plan.</p>	<p>Integrated Healthcare Technology Package (iHTP) Simulation Tool (WHO)</p> <p>Goals Model (Futures Institute)</p> <p>Planning, Costing and Budgeting Framework (PCBF) Management Sciences for Health (MSH)</p> <p>Core Plus (MSH)</p> <p>Planning and Budgeting for TB Control (WHO)</p> <p>Resource Needs Model HIV/AIDS (Futures Institute)</p>
<p>d. Benefit package costing. Benefit package costing evaluates the cost per service, cost per capita, or cost</p>	<p>OneHealth Tool (IHP+)</p>

Types of Costing Studies by Intended Use	Examples of Costing Tools ² (Tool creator in parenthesis)
per recipient for a given service or set of services. Such indicators are used to estimate the total resources required for the government or private payer to deliver the service or set of services across a population.	

Given the limited resources to conduct analyses that would feed into the design of the UHC, the Finance Committee will need to decide how much to invest in implementing the economic costing study(ies), as well as select the perspective of the analysis and its objectives. Once these issues are decided, the Finance Committee may consider how to approach each type of study based on the resources available to implement the analysis.

The tools noted in Table 2.2 rely upon primary data. Significant resources are required to gather these data and analyze the results of the different tools. However, the Finance Committee may also consider using secondary published literature as a basis for making estimations to the extent they are relevant to the Saint Lucian context. Tables 2.2 through 2.4 provide different examples of economic costing analyses from the region that might be relevant. Additional information in Box 2.2 may also be useful in developing a cost estimate for cancer.

The bottom-up health service delivery costing study that the MOH has prioritized would be classified as an analysis from the healthcare provider’s perspective for the purpose of benefit package costing. Beyond this, the MOH should carefully consider the level of analysis that will adequately respond to the expressed need for costing analysis, given that they can be expensive and time-consuming to conduct. Further defining the EPHS or setting parameters around the budget available for the MOH will help narrow the feasible scope of these studies, which may make them less resource intensive.

Box 2.2 Economic Cost of Cancer

For resources related to the cost of cancer, the MOH may want to reference the “**Economic Costs of Cancer Health Disparities**”. This is a manual for estimating cancer health disparities by the Center to Reduce Cancer Health Disparities in the US-based national Institute of Health. This guide considers the direct costs to provide the medical service and “core indirect costs” to look at the impact on the patient and other related indirect costs to measure the impact on friends and family of the patient. This document describes various ways to look at these costs and provides examples from relatively recent studies in the US. For example, one study noted here by Yabroff et al (2005) estimates that the average time costs to the patients for colorectal cancer treatment at the initial phase was 19.3% of direct costs (US\$4,592), 15.8% monthly in the continuing phases (US\$25) and 36.8% (US\$2,788) in the terminal stages. The documents also notes studies of breast cancer cost that note disparities in employment among breast cancer patients. Available at:
<http://crchd.cancer.gov/attachments/NCleconomiccosts.pdf>

3. STEPS FOR HEALTH SERVICE DELIVERY COSTING

Activities outlined here are designed to provide guidance for health service costing exercises in Saint Lucia in a step-by-step approach. The MOH has decided to adopt a bottom-up (ingredients-based) approach to the service costing, using normative costs. Normative costs reflect how services *should* be provided for an acceptable quality of health care. Current actual costs would likely underestimate needs because they will reflect any current resource shortfalls (e.g. staffing vacancies, diagnostics, stock-outs of medicines) that health facilities experience. Collecting data on actual costs also requires intensive labor, because the data would have to be extracted from paper records at the health facilities. Some aspects of the normative approach will also be labor intensive, e.g. agreeing on treatment protocols for conditions that do not currently have any. However, a normative approach would be more appropriate to measure the level of budget for the quality and scope of health care coverage that the MOH aspires to establish through their UHC.

To implement this approach, a Costing Team is required and may either be staffed by individuals from the MOH and/or external experts. The following section presents step-by-step instructions and tips for conducting this type of study.

3.1 STEP ONE: ASSEMBLE THE COSTING TEAM

A costing core team is important to guide the costing exercise even if outside technical assistance is procured. The Costing Team would be responsible for delivering the final product and would provide the variety of perspectives required to arrive at a balanced product. The team composition should include a variety of specialists who can access and interpret the different types of data that will be collected. The team may include the following:

- a health economist
- a medical doctor
- a nurse
- an accountant
- a health information expert
- a pharmacist
- a hospital administrator

The team should have skills in working with Excel spreadsheets as this would probably be the means of analyzing the data.

The Costing Team will need to have the expertise and familiarity with the Saint Lucian health system to be able to gather the following types of data:

- The list of services that the Government of Saint Lucia is considering to include in the UHC. This may be developed in consultation with the health finance committee.

- Data on current rates of utilization of each service (inpatient and outpatient). Primary care and outpatient information may be gathered from the health situation and response analysis (SARA). Inpatient utilization information must be compiled and summarized from each hospital in Saint Lucia.
- Treatment protocols defining how each service should be delivered according to clinical standards. Where treatment protocols are not specified or unavailable, the MOH should assemble a Treatment Protocols Team to define the inputs associated with each service.
- Quantities and prices of all direct inputs that go into each service, including staff salaries, medicines and other supplies. This may be developed by the Treatment Protocols Team or by consulting international standards of health care.

Information on indirect costs (e.g. utilities, maintenance, and other administrative costs) and capital costs (e.g. buildings, equipment, and vehicles) should be added to the direct costs to get the full cost of a service. This information may be gathered from existing studies, e.g. the cost analysis conducted by the HS 20/20 consultants on Victoria Hospital or by getting the expenditure information from a sample of healthcare facilities in Saint Lucia (Musau and Vogus 2012).

3.2 STEP TWO: DEFINE PRIORITY SERVICES OR CONDITIONS TO BE COSTED

As a first step, the MOH should define the range of public and clinical health services that should be costed. From this list of services, decisions will be made as to what should be included in the UHC, taking into account the objectives of improving and sustaining health outcomes while providing access to care in an equitable manner.

3.3 STEP THREE: ASSEMBLE THE TREATMENT PROTOCOLS TEAM

In addition to the Costing Team, a team of clinicians will likely be needed to define or refine the standard treatment protocols that would form the basis for estimating the resource inputs needed for each service. This team should be composed of clinicians who have the appropriate expertise relevant to the different priority services identified in Step Two. This should ideally include a small panel of reputable general practitioners and nurses who will define the general standard to apply to conditions identified by the MOH.

Depending on the level of specialization of the conditions chosen by the MOH to be costed, medical specialists may also be required. For example, if the MOH is considering the inclusion of different surgical procedures related to obstetrics and gynecology (OB/GYN), then a surgeon with an OB/GYN specialty should ideally be included in the Treatment Protocols Team. This is because the clinicians must be able to describe the different medicines, diagnostic tests, supplies, and time required by each type of resource in order to calculate the direct costs associated with each condition.

Engaging an individual doctor to do the first iteration of the treatment protocols may speed up the process. This would then reduce the role of the full Treatment Protocol Team to validate and refine the treatment protocols. Referring to international or regional best practice guidance could also serve this purpose.

3.4 STEP FOUR: DETAIL THE DIRECT COSTS ASSOCIATED WITH EACH CONDITION

The Treatment Protocols Team should be convened to detail the quantities of all the inputs (direct costs) associated with delivering each priority condition or service. For a bottom-up costing of the direct costs associated with each service, the following presents a list of each piece of data required. Direct costs are those costs that can be traced to a service directly, e.g. medicines used to treat a case of diabetes.

The following data should be considered by the Treatment Protocols Team for every condition considered in the costing study:

1. Amount of time/effort allocated for each staff member for each services (i.e. how much time is required for a nurse to tend to an out-patient pneumonia patient?).
2. Quantity of each kind of medicine required to treat the condition.
3. Quantity of each diagnostic and laboratory test supplies item required to treat the condition.
4. Quantity of medical supplies required to treat the condition.
5. Quantity of non-medical materials and office supplies item required to treat the condition.
6. Number of treatments normally required for the condition per year.

Where available, the Treatment Protocols Team should refer to a national or international standard to derive the average quantities of each of the above inputs for each condition being considered.

3.4.1 ACCOUNT FOR SEVERITY AND PATIENT AGE

In the process of discussing the various conditions, the Treatment Protocols Team will likely conclude that different types of patients who may have the same condition may require different quantities of medicines, diagnostics, and supplies. For example, a caesarean section may be included as part of a package of services for maternal and neonatal health (MNH) care. However, different caesarean section procedures may require differing regimens of antibiotics or further surgical procedures, depending on the severity of the case. Therefore, it may be wise to break the condition into multiple categories in order to account for differences in usage of medicines, staff time etc. It is important to note that if the volumes of patients in the different categories are very low, it may not make sense to do this separation as the overall average cost will not vary greatly. The Treatment Protocols Team should discuss such decisions with the Costing Team to determine if there are significant cost differences in reclassifying conditions in this manner.

A patient's age may also affect the way conditions are classified. For example, treating a patient who is less than five years old usually requires different inputs compared to treating an adult patient. Pediatric cases require different medicines and dosages compared to adults. Such differences may cause significant differences in the cost per condition. Thus, the treatment protocol team should consult with the Costing Team to determine whether they should classify conditions based on age. Reclassifying conditions based on age and severity will provide greater accuracy; however, the Costing Team will need to decide the level of detail at which they require the units to be defined.

For conditions requiring different kinds of treatment depending on the status of the patient, it may be possible to estimate the quantities by considering the proportion of cases that typically require that input. For example, for the condition "newborn complications," an estimated 20 percent of newborn complications may require the use of a feeding tube, while the other 80 percent of cases do not. For this case, the Treatment Protocols Team should list the quantity of feeding tubes required for an average case as "0.2". This is because the Treatment Protocols Team is responsible for quantifying the **average** case. The proportions could be drawn from service statistics, a review of medical records, or literature.

3.5 STEP FIVE: RELATE QUANTITIES OF THE DIRECT INPUTS WITH THE UNIT COST OF EACH INPUT

The unit cost for each input refers to the amount of money it will require the government to purchase a single unit. The Costing Team should be responsible for collecting these costs and relating them to the quantities noted by the Treatment Protocols Team. The following sections present tips for gathering and converting these unit prices based on the different types of direct inputs derived from the Treatment Protocols Team. The unit cost for staff time refers to the salaries and allowances paid to each person required to treat each condition. The Costing Team should work with a representative from the accounts division of the MOH to obtain salary and allowance information for various levels of health facility staff. After obtaining the yearly or monthly total of all expenditures related to salary and allowances for each level of staff, the Costing Team calculates the cost per minute based on the number of minutes worked in a year or month. This amount would then be multiplied by the time (in minutes) required from that staff category to deliver the service (e.g. the time required for a single outpatient consultation).

The unit cost for medicines and supplies may be derived from the Central Stores or the pricelist used to procure items from the Organisation of Eastern Caribbean States (OECS) Pharmaceutical Procurement Service (PPS) formulary. Items that may be acquired from private pharmaceutical outlets may be costed by taking the weighted average price paid for each item.

For example, tetracycline ointment used for the treatment of conjunctivitis may be sold for EC\$1.00 at Pharmacy A, EC\$1.25 at Pharmacy B, and EC\$1.30 at Pharmacy C. If the costing assumes that the MOH purchases from Pharmacy A 50 percent of the time, Pharmacy B 30 percent of the time, and Pharmacy C 20 percent of the time; the Costing Team may estimate the weighted average price of tetracycline ointment accordingly to derive a single unit price:

$$(EC\$1.00 * 0.5) + (EC\$1.25 * 0.3) + (EC\$1.30 * 0.2) = EC\$1.14$$

This single unit price projects the anticipated average price that the MOH will pay for tetracycline ointment over the long term.

In order to simplify the calculations of diagnostics needed, the team could consider calculating the cost of the major inputs for each test and then adding a small percentage to cover any other small consumables that may be hard to estimate. This may be done for common tests such as urine analysis, pregnancy tests, full blood counts, cross matching / grouping, chemistry tests, venereal disease research laboratory (VDRL) tests and other diagnostic tests that would commonly be delivered to treat the list of priority conditions.

The Costing Team will then be responsible for using spreadsheets to multiply the quantity of each input (e.g. staff time, medicines, and medical supplies) with the procurement cost of each input (e.g. salaries, price of medicines, and the price of medical supplies). These direct costs per service will be added to the indirect cost per service.

3.6 STEP SIX: CALCULATE THE INDIRECT COST PER SERVICE

Indirect costs are those costs incurred in the provision of health services but cannot be directly or easily traced to any individual service. Such indirect costs include: utility costs (e.g., electricity, water, gas, telephone), transport operating costs (e.g. fuel), maintenance costs for building, equipment, furniture,

depreciation of fixed assets, and other operating costs not included in the above cost categories. These costs may be treated in several ways depending on the resources available to conduct the analysis and the manner in which the health service units are defined by the Costing and Treatment Protocols Teams.

The direct costs described in section 3.5 comprise the vast majority of costs in the delivery of health services in relation to indirect costs. One method of estimating indirect costs is to measure the average proportion of indirect costs to direct costs to create a basis for adding a margin to the direct costs. The *Cost Analysis of Services in Victoria Hospital, Saint Lucia* conducted by HS20/20 and other costing studies in the region may be used as a reference to calculate this proportion (Musau and Vogus 2012). This proportion of direct to indirect costs can also be quickly calculated for a selection of facilities at different levels of the health system. An overhead rate can be calculated that would be applied to the direct costs calculated for services at each level. The approach would require taking the total costs of each facility and allocating them as accurately as possible into direct costs (clinical staff costs, drugs and other medical supplies, patient food, and any other significant direct costs) and the rest can be assumed to be indirect. For example, if direct costs are 80% and indirect costs are 20% of the total, the indirect cost rate would be $20/80$ – i.e. if the direct costs of a disease condition are calculated as EC\$50, we would add $20/80 \times \text{EC\$}50 = \text{EC\$}12.50$, therefore total cost would amount to $\text{EC\$}50 + \text{EC\$}12.50 = \text{EC\$}62.50$ for this service provided at a health facility of that level. The drawback to this approach is that it only gives a broad assumption of the overhead at the overall facility level. This means that this method does not differentiate between inpatient and outpatient care, but assumes that the indirect costs are similar.

A more detailed approach to get to the proportion of indirect costs to direct costs is to carry out a full top-down costing of different health facilities, from scratch, such as the one referred to above for Victoria Hospital. This would provide different indirect cost rates to use for outpatient and inpatient care as well as diagnostic services as it approaches the costing from a cost center (department) perspective to determine costs incurred in the different units that provide services to patients. Abt Associates Inc. published a detailed manual called *Management Accounting System for Hospitals (MASH) Manual* that fully describes how to treat different categories of indirect costs. The training that was offered to MOH staff and others after the Victoria Hospital costing in May 2012 followed the top-down approach described in this manual and all participants from the workshop were given a copy.

It is important to note that because indirect costs make up a small portion the total cost of delivering each service, the marginal benefit of using a top-down allocation method of treating indirect costs may not be worth the additional resources required to conduct the analysis.

3.7 STEP SEVEN: CALCULATE THE ANNUAL COST PER CONDITION

At this point, the Costing Team has calculated both the direct and indirect costs per condition or service being considered for the EPHS. This equates to the cost to treat a single case of that condition. To project for the budget required on an annual basis, the Costing Team must relate this cost to the projected utilization of those services or the projected incidence of that condition.

The predicted utilization of each service can be based on historical usage of the service; however, it would be prudent for the Costing Team to make assumptions about how they expect utilization to change with the increase in coverage by the UHC. It is expected that utilization will increase when services that once required a fee are offered free of charge under UHC. Utilization could also increase with epidemiological trends (such as a growing prevalence of non-communicable diseases) or the aging of the population.

The Costing Team may use utilization statistics as reported by hospitals and other primary health care facilities. The reporting of service statistics is common practice at the primary care level in Saint Lucia. However, hospitals currently do not report their service data centrally, apart from primary healthcare utilization at hospitals. Hospitals do not currently report the number of admissions and the discharge diagnosis in summary form to the MOH. The discharge diagnosis information is available in medical notes which need to be summarized and matched to the conditions and services identified by the Costing Team. Saint Jude Hospital has the capacity to produce summary statistics of inpatient utilization by discharge diagnosis electronically, but Victoria Hospital does not have this capacity. To capture utilization patterns at Victoria Hospital, the Costing Team may need to collect and summarize data from primary medical records to estimate annual incidence of various diagnoses.

Community health and primary health conditions are reported and regularly summarized by condition. The new health information system (HIS) will facilitate this reporting. As of March 2013, 21 out of the 45 primary health care facilities have implemented the new HIS. The polyclinic urgent care data does not report diagnosis in their summary utilization records. Thus, the Costing Team may encounter challenges in projecting utilization depending on the conditions or services being considered since many of the statistics related to inpatient care are documented only in the medical notes.

These utilization statistics could also be collected via the SARA being conducted by the MOH. Disease burden information may be useful as well. The Costing Team may work with the Epidemiology Division at the MOH to gather disease incidence information that would be most relevant to the services and conditions being considered. Epidemiological and surveillance data are regularly reported at the central level, but only for a limited list of conditions. The Costing Team may have to gather other statistics on disease burden from the literature.

3.8 STEP EIGHT: SUMMARIZE THE FINDINGS AND CREATE SCENARIOS

The preceding approach outlines how the Costing Team may conduct an analysis of the cost of health service to include in the EPHS. In sum, the costing approach can be summarized in the following equation for every condition A:

$$\text{(Direct Cost of Condition}_A \text{ + Indirect Cost of Condition}_A \text{)} \times \text{Predicted Annual Utilization}$$

Total Annual Cost of Condition A

The Costing Team must then create scenarios for different EPHS options. This will give the Government of Saint Lucia the opportunity to gauge if it can afford the cost required to deliver the package relative to other options. At this point, the Costing Team may refer to the MOH's *Framework for Defining the Essential Package of Health Services for the Ministry of Health of Saint Lucia* to deliver advice on which option the Government of Saint Lucia should pursue.

4. NEXT STEPS AND CONCLUSION

In terms of high-level next steps for the MOH, the following are recommended for the implementation of the costing analysis to design the UHC:

1. Form Costing Teams based on the recommended team composition noted in this document:
 - a. Core Costing Team
 - b. Treatment Protocols Team
2. Identify the priority conditions and services to be costed
3. Costing approach:
 - a. As a first priority, conduct a bottom-up, normative costing of all services in the proposed EHPS from the perspective of the provider (Ministry of Health)
 - b. As resources permit, consider engaging an independent expert to conduct a limited economic impact analysis of one or two key health conditions for advocacy purposes
4. Estimate budgetary impact of different packages of UHC service
5. Recommend a package of services to cover to the Finance Committee

A costing exercise of this magnitude will require a significant investment in time and a dedicated team to deliver credible results. Clear documentation of each step and of all assumptions made by the Core Costing Team will greatly assist the team to be able to respond to any questions that are raised concerning the validity of any of the costs calculated and will be necessary if a new consultant comes in to conduct further analyses.

5. WORKS CITED

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