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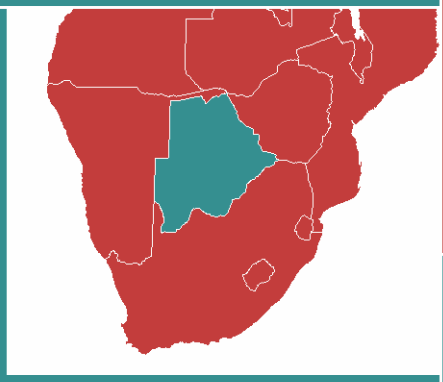
ESTIMATED RESOURCE NEEDS FOR KEY HEALTH INTERVENTIONS OFFERED UNDER BOTSWANA'S ESSENTIAL HEALTH SERVICES PLAN 2013–2018



This publication was prepared by Veena Menon, Elise Lang, Ricardo Silva, Priya Iyer, Wame Mosime of the Health Policy Project.

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Estimated Resource Needs for Key Health Interventions Offered Under Botswana's Essential Health Services Plan 2013–2018

SEPTEMBER 2015

This publication was prepared by Veena Menon,[1] Ricardo Silva,[1] Elise Lang,[1] Priya Iyer,[1] and Wame Mosime[2] of the Health Policy Project.

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ABBREVIATIONS

ART	antiretroviral therapy
ARV	antiretroviral
BAIS	Botswana AIDS Impact Survey
BCG	Bacille de Calmette et Guérin
BNTP	Botswana National Tuberculosis Program
CHOL	cholesterol
CML	chronic myeloid leukemia
CMS	Central Medical Stores
CTO	Central Transport Organization
CVD	cardiovascular disease
DHAPC	Department of HIV/AIDS Prevention and Care
DHMT	District Health Management Team
DPH	Department of Public Health
E&O	environmental and occupational health
EHSP	Essential Health Services Package
EMS	emergency medical services
EMTCT	elimination of mother-to-child transmission
ENT	ear, nose, and throat
EPI	Expanded Program on Immunization
GOB	Government of Botswana
GPH	Goodhope Primary Hospital
Hb	hemoglobin
HCW	healthcare worker
HDL	high-density lipoprotein
HPP	Health Policy Project
HPV	human papilloma virus
HR	human resources
HTC	HIV testing and counseling
IHSP	Integrated Health Service Plan
IPMS	Integrated Patient Management System
IRS	indoor residual spraying
ITN	Insecticide-treated bed nets
LDL	low-density lipoprotein
LFT	liver function test
LiST	Lives Saved Tool
LLIN	long-lasting insecticide-treated nets
M&E	monitoring and evaluation
MCH	maternal and child health
MDGs	Millennium Development Goals
MDR-TB	multi-drug resistant TB
MMR	maternal mortality ratio
MNR	maternal/newborn and reproductive
MNSAD	mental, neurological, and substance abuse disorder
MOH	Ministry of Health
NACA	National AIDS Coordinating Agency
NCD	noncommunicable disease
NGO	nongovernmental organization

NTD	neglected tropical disease
ORS	oral rehydration solution
PEP	post-exposure prophylaxis
PIN	population in need
PITC	provider-initiated testing and counseling
PLHIV	people living with HIV
PMH	Princess Marina Hospital
PMTCT	prevention of mother-to-child transmission
RBC	red blood count
RFT	renal function test
RHT	rapid HIV testing
RTA	road traffic accidents
SMC	safe male circumcision
STI	sexually transmitted infection
TB	tuberculosis
USAID	United States Agency for International Development
VCT	voluntary counseling and testing
WASH	water, sanitation, and hygiene
WBC	white blood count
WHO	World Health Organization

EXECUTIVE SUMMARY

As the Government of Botswana (GOB) moves forward with a plan to expand coverage of health services, increasing the "value for money" of current health service delivery and identifying new financing sources is critical. As part of the 2010 Integrated Health Service Plan, a 10-year strategic plan for the health sector, the Ministry of Health (MOH) will introduce the Essential Health Services Package (EHSP)—health interventions to be provided as part of a package to the entire population. Although understanding the costs of delivering health interventions and the major cost drivers is critical to expanding the health sector, current knowledge of these costs is limited. This study aims to shed light on the overall costs of key interventions that address the major disease burden in Botswana.

The study[1] comprised two parts. In Part I, the Health Policy Project (HPP) technical team assessed the unit costs of providing specific HIV interventions at two levels of service delivery. In Part II, the team used the OneHealth tool (Avenir Health, n.d.) to project the overall resources required between 2013 and 2018 to provide EHSP services, based on normative inputs.

Part I: Unit Costs for HIV Interventions

With an HIV prevalence of 22 percent among 15- to 49-year-olds, Botswana is one of the most highly affected countries in the world. HIV accounts for half of all disability-adjusted life years in the country (WHO, 2010). Life expectancy decreased from age 67 in 1990 to 64 in 2013 (WHO, 2013), in large part due to HIV; it would be significantly lower if not for early access to antiretroviral therapy (ART). For Part I of the analysis, a technical team from the USAID- and PEPFAR-funded HPP focused on obtaining facility-level costs for HIV-related interventions. Given Botswana's high HIV prevalence, maximum resources in the health sector are directed toward delivering HIV interventions.

The technical team assessed direct and indirect costs of delivering HIV-related interventions at two facilities. In turn, it collected costs for six interventions from these two facilities: (1) additional ART for tuberculosis (TB)/HIV patients, (2) safe male circumcision (SMC), (3) co-trimoxazole for TB/HIV patients, (4) post-exposure prophylaxis (PEP), (5) screening people living with HIV (PLHIV) for TB, and (6) condoms. Direct costs included personnel, drugs, and supplies; indirect costs included management and support staff, utilities, supply chain, equipment, and building and vehicle operational costs.

Within the past two years, costing studies of prevention of mother-to-child HIV transmission (PMTCT), HIV testing and counseling (HTC), and ART have been completed; hence the team, in consultation with USAID/Botswana, concentrated on assessing the costs of interventions that lacked cost data.

Table 1. Unit Cost of HIV Services per Patient per Year at Bontleng Clinic, US$

HIV Intervention	Direct Cost	Indirect Cost	Total Cost
Additional ART for HIV+ TB patients	87.6	30.4	117.9
Co-trimoxazole for HIV+ TB patients	178.8	31.0	209.8
Male circumcision	136.3	18.4	154.7
PEP	518.7	492.4	1011.1
Screening HIV patients for TB	28.5	29.0	57.5

[1] It is important to note that this study takes into account only the costs associated with service delivery at public health facilities.

Table 2. Unit Cost of HIV Services per Patient per Year at Goodhope Primary Hospital, US$

HIV Intervention	Direct Cost	Indirect Cost	Total Cost
Additional ART for HIV+ TB patients	87.6	119.3	206.9
Co-trimoxazole for HIV+ TB patients	759.2	166.8	926.0
Male circumcision	69.7	19.6	89.3
PEP	597.2	176.7	773.9
Screening HIV patients for TB	17.8	64.5	82.3

The team calculated the unit cost of condoms to be US$0.11 at Bontleng Clinic and US$0.09 at Goodhope Primary Hospital (GPH). These figures include the cost of the supply chain for condom distribution.

Overall, in both facilities, the primary drivers of the direct unit cost of HIV services were drugs and supplies and personnel. Among these services' indirect costs at the two facilities, building and vehicle and facility management costs contributed least to total costs. Poor record keeping led to difficulties in assessing patient volume data. In some cases, the technical team had to annualize figures based on available data to support cost calculations. Another limitation the team encountered was that the application of service guidelines was not standard across facilities. This lack could be attributed to a lack of skills, varying guideline interpretation, or a shortage of staff to deliver services.

Part II: Normative Costing Using the OneHealth Tool

In Part II of this study, the technical team conducted normative costing of the EHSP using the OneHealth tool (Avenir Health, n.d.). This tool was designed to help countries develop estimates of future financial requirements under various assumptions. OneHealth provides a framework for planning, costing, impact analysis, and financial scenario analysis. The tool is split into two sections: health services and health systems.

The team conducted this normative costing exercise in two phases—Phase I in 2013–2014 and Phase II in 2014–2015. For Phase I, the HPP team focused on eight disease areas: maternal health; child health; immunization; malaria; TB; HIV; noncommunicable diseases (NCDs); and mental, neurological, and substance abuse disorders (MNSADs). It assessed the disease areas that make up the remainder of the EHSP in Phase II (see Annex D for a complete list). The team obtained data on information such as targets, implementation, and costs of drugs and commodities from MOH program managers, key informant interviews, and principal facilities that function as sole providers for the particular disease area or centers of excellence. Owing to limitations in data availability and limited knowledge of interventions, the team was able to calculate program costs for only some of the programs.

The results of the analysis of the 45 disease areas covered under EHSP using OneHealth show that, at a minimum, US$4,656.3 million will be required to provide coverage for these diseases over six years (2013–2018). The totals reflected in Table 3 are costs that will be incurred over this six-year period. According to the MOH's framework for EHSP provision, this burden will be shared across public- and private-sector actors. These costs include drugs/supplies and program costs (nonservice delivery staff and training when available). Key cost drivers include HIV (at 16.5% of total costs), nutrition (at 29% of total costs), and NCDs (14.5%).

Table 3. Costs Disaggregated by Program Area, 2013–2018, US$ millions*

Disease Areas	2013	2014	2015	2016	2017	2018	Total
Maternal/ newborn and reproductive health	25.1	25.1	26.7	28.5	30.4	30.6	166.5
Malaria	41.8	42.7	44.2	46.2	47.4	48.1	270.5
TB	96.4	89.4	82.6	76.3	77.5	77.5	499.7
HIV/AIDS	99.4	110.6	125.9	135.8	145.1	150.0	766.8
Noncommunicable diseases	81.2	93.8	106.1	119.4	133.6	142.4	676.5
Nutrition: feeding and malnutrition	105.1	99.4	111.7	221.7	112.8	116.3	767.0
Nutrition and dietetics	73.6	77.4	85.2	94.1	103.2	113.3	546.7
Cancer: treatment and surgery	33.3	34.2	35.7	36.9	38.4	40.0	218.5
Other nutrition programs	8.4	8.3	9.2	9.9	9.7	11.8	57.2
Other program areas	70.9	84.3	109.8	130.2	127.1	164.5	686.8
Total	635.1	665.2	737.2	899.0	825.1	894.6	4,656.3

* Values have been rounded to integers. Totals may not be exact.

Challenges

For this iteration of the OneHealth application, the technical team focused on the costs of implementing individual disease interventions, activities, or services within a specific disease area. Program costs include human resources and some training costs. In some cases, program costs are under-represented due to the difficulty in sourcing data on monitoring and evaluation (M&E), infrastructure and equipment, communication media and outreach, and advocacy. Although several program areas had strategic documents aimed at achieving the Millennium Development Goals (not recently updated in some cases), the technical team had difficulty relating the stated goals to quantifiable and achievable targets.

Next steps

The technical team conducted two training sessions on the OneHealth model for MOH officials during the study, but the ministry should plan additional capacity-building measures for program staff in strategic planning and budgeting processes and data systems strengthening to increase the availability of reliable and accurate data. Capacity development should include training additional MOH staff on the OneHealth model so program staff can periodically update the populated model to revisit targets and assess resource needs and likely health impacts as EHSP implementation unfolds. This updating will allow for a more accurate projection of expected costs. For this reason, the populated tool needs to be updated with robust data on program and health systems costs to get a fuller picture of EHSP resource needs. The MOH should also consider investing in a stronger system to track financial expenditures and, in an effort to decentralize expenditure tracking, create a tracking system at the district health management team (DHMT) level to support oversight in the districts. As part of the second phase of this study, the MOH identified priority next steps and areas that need to be addressed for its reform agenda to be realized over the next few years. Some of these steps will also support concerns on issues around cost containment, cost utilization, and cost-effectiveness.

For service implementation, the MOH should reconsider its current plan to offer all services at all facilities and consider targeting specific facilities for specialized services. This approach would help

reduce waste due to low patient volumes, which results in higher costs. For example, the government could designate a few select facilities as focal points for less often-used services (such as PEP) to improve cost efficiency ratios.

INTRODUCTION

Overview of Botswana's Healthcare System

Botswana's healthcare system consists of public, private for-profit, and private nonprofit healthcare facilities, distributed over 29 health districts ranging from urban settings to rural and hard-to-reach areas of the country. Public sector facilities are the pillars of the health system, comprising 98 percent of the facilities.

After gaining independence in 1965, the Government of Botswana (GOB) made considerable efforts to ensure equitable distribution of health facilities throughout the country to promote greater access to health services. Currently, 84 percent of the population lives within a five-kilometer radius of a health facility; an additional 11 percent live between five and eight kilometers from a facility.

Although most of the population has access to health facilities and services, such access does not always translate into the use of high-impact interventions. A study conducted in 2012 to evaluate Norway's support of Botswana's health sector assessed the use and efficiencies of 33 hospitals in Botswana; the results showed some inequities in access to beds, quality of hospital services, and different patterns in the use of services (Health Research for Action [HERA], 2012). These factors could be attributed to shortages of staff, lack of equipment, inadequate management, an ineffective referral system, variations in care-seeking behavior, and the preferences of the general population accessing services.

The revised National Health Policy (MOH, GOB, 2011e) identifies the following five levels of care for Botswana as part of standardizing the delivery of healthcare services:

1. Mobile stops and health posts (collectively representing 52%)
2. Clinics with beds and without beds (43%)
3. Primary hospitals (3%)
4. District hospitals (2%)
5. Tertiary hospitals (0.5%)[2]

Public health services in Botswana are regulated by the Public Health Act of 2002. Services offered across these five levels of care are shown in Table 4.

[2] WHO African Health Observatory (AHO). n.d. Botswana Health System. Available at http://www.aho.afro.who.int/profiles_information/index.php/Botswana:Index

Table 4. Public Health Services in Botswana, Five Levels of Care

Facility Level	Services
Health posts and clinics	***Primary healthcare services*** • Immunizations and child care services • Sexual reproductive services • HIV and AIDS services • Mental health and rehabilitation • Health education and advice ***Medical services*** • Minor curative treatment and care services • Laboratory and diagnostic services • Pharmacy services • Dental services
Hospitals (primary, district, tertiary)	***Primary and district hospitals*** Primary hospitals are general hospitals equipped to deal with most diseases, injuries, and immediate threats to health. District hospitals are major district health facilities equipped with more beds than primary hospitals and capable of dealing with intensive and long-term care. These services include the following: • Outpatient and pediatric care • Emergency and urgent care, surgery, and intensive care • Pharmacy and laboratory services • X-rays and diagnosis and dental care • Eye and orthopedic care ***Tertiary hospitals*** These are specialized hospitals and health facilities equipped to deal with specific diseases, medical needs, and care. Some of these services include the following: • Psychiatric care • Rehabilitation services • Oncology and cancer services • Audiology services • Obstetrics and gynecology

Source: Ministry of Health. Available at: http://www.moh.gov.bw/.

Spending on healthcare in Botswana is higher than in most countries in sub-Saharan Africa. In 2010, the government spent roughly 18 percent of its budget on health—more than the 15 percent target recommended by the Abuja Declaration (MOH, GOB, 2012d). GOB's ability to sustain or increase financing is threatened by donor restructuring and macroeconomic changes in Botswana; a high burden of infectious diseases, primarily HIV; and a shift toward decentralized service delivery within the MOH (WHO, 2010). Despite these challenges, the MOH aims to provide a package of high-quality essential health services to the entire population (MOH, GOB, 2011e).

Policy Environment

As the government moves forward with a plan to expand coverage of health services, increasing the "value for money" of current health service delivery and identifying new financing sources will be critical. In 2010, Botswana developed the Integrated Health Service Plan (IHSP), a 10-year strategic plan for the entire health sector, including public and private actors as well as nongovernmental organizations

(NGOs) (MOH, GOB, 2010c). As part of this plan, the MOH will introduce the Essential Health Services Package (EHSP), whose primary purpose is to encourage the allocation of scarce resources to the most cost-effective interventions to address key diseases while considering available financial resources and the need for equity in health service delivery (MOH, GOB, 2010b). The overall goal is universal coverage with a package of high-quality essential health services. As such, EHSP has two main purposes:

1. To provide a standardized package of basic services that forms the core of service delivery in all primary healthcare facilities
2. To promote redistribution of health services by providing equitable access, especially in under-served areas

Achieving expanded health coverage has systemic cost implications and requires data to justify resource allocations. Understanding the costs of delivering health interventions and the major cost drivers is critical to expanding access to health services.

Study Objectives

This study[3] assessed the following:

1. Facility-level unit costs of providing five HIV interventions plus condoms at two different levels of service delivery
2. Overall normative unit costs of providing coverage for more than 45 disease areas over five (in some cases, six) years, using the OneHealth tool

[3] It is important to note that this study takes into account only those costs associated with service delivery at public health facilities.

FACILITY-LEVEL UNIT COSTS OF PROVIDING HIV INTERVENTIONS

Background

Botswana has one of the highest HIV prevalence rates in the world: 22 percent of adults 15 to 49 years old have HIV (Joint United Nations Programme on HIV/AIDS [UNAIDS], 2013). The country's life expectancy has decreased from age 67 in 1990 to 64 in 2013 (WHO, 2013), in large part due to HIV. The country's response has evolved into one of the world's model HIV programs. Unlike the governments of many other developing countries, the GOB has committed a large portion of its domestic resources to HIV programs and services.

From 2006 to 2011, HIV was the target of 35 percent of all government health expenditure (Amico et al., 2010). The public sector contributed 66 percent of total HIV funding, external funders contributed 32 percent, and the private sector contributed 2 percent (National AIDS Coordinating Agency [NACA], GOB, 2012). There are some concerns about the accuracy of this breakdown, but the larger picture holds true.

To address the disease burden in Botswana, the Ministry of Health (MOH), in conjunction with partners, has developed the IHSP, a 10-year strategic plan. Its purpose is to extend an EHSP to the entire population through public or private service delivery or a combination of the two. The EHSP will include cost-effective interventions that address disease areas in Botswana, such as HIV. Health coverage will be extended to a larger portion of the population, including its most vulnerable and hard-to-reach elements. Accordingly, the government is planning to implement health financing reforms and decentralization to better deliver the EHSP. Botswana's healthcare system has five distinct health service levels, including health posts (the lowest level of service), clinics with and without beds, and primary, district, and tertiary hospitals. Decentralizing services will allow additional services to be delivered at the lower levels of healthcare.

For this initial analysis, the HPP technical team focused on obtaining facility-level costs for HIV-related interventions. Given Botswana's high HIV prevalence, a gross majority of the resources in the health sector are directed at HIV interventions and associated commodities. The technical team assessed facility level unit costs for other interventions covered under the EHSP in a subsequent exercise.

During a February 2014 trip to Botswana, HPP staff held fruitful discussions with USAID colleagues and other stakeholders to outline the scope of this part of the study. Following the consultative process, participants collectively agreed to focus on the five HIV interventions listed below as those most in need of cost information and data. The rationale for choosing these five interventions (plus condoms) was the need to cost interventions that had not recently been costed. This rationale excluded antiretroviral therapy (ART), HIV testing and counseling (HTC), and prevention of mother-to-child transmission (PMTCT), all of which had been recently assessed. Additionally, because youth-focused prevention is not a stand-alone intervention in Botswana (it is delivered as part of general prevention programs such as safe male circumcision [SMC] and condoms), the technical team did not include it as a separate intervention to calculate unit costs.

The team assessed unit costs of delivering HIV-related interventions at two levels: primary hospital and clinic (without bed). It derived unit costs per patient per year for five interventions:

1. Additional ART for tuberculosis (TB) patients
2. SMC

3. Co-trimoxazole for TB/HIV patients
4. Post-exposure prophylaxis (PEP)
5. Screening PLHIV for TB

The team also derived unit costs per condom (not per patient as in the case of other interventions), which includes commodities costs and the supply chain costs of distribution.

Methodology

The team used an ingredients-based costing approach to derive unit costs per patient per year for each of five HIV interventions and the cost of condoms. Team members collected data on costs for service delivery personnel, drugs and supplies, utilities, buildings and vehicles, equipment, management, and the supply chain to derive the unit costs per service. They collected data at facility, district health management team (DHMT), district, and central levels (MOH, Central Transport Organization [CTO], Department of Building and Engineering Services, and other relevant ministries/departments supporting operations at public health facilities).

The team employed various methods to allocate costs based on the level at which data were collected and ingredients of the service. At the district level, the team recorded costs per facility or aggregated them as universal bills for all facilities within the district. If the costs were aggregated, the technical team would proportionally allocate a cost to each facility in that district and then further allocate a cost to each HIV intervention based on patient volumes. The team collected costs such as staff salaries and drugs costs at the central level. Whereas it needed no further allocation for drug costs, the team needed an allocation method for other costs. For example, salary allocation varied depending on the type of personnel (i.e., management or service delivery). These allocation methods are described in more detail below.

Study period

The costing study period, during which the team considered costs and other data for the five interventions and condoms, was from April 2013 through March 2014. This period is defined as one fiscal year.

Study perspective

Ideally, costing studies are conducted from the perspective of the primary party affected by the outcome. In this scenario, the team conducted the unit costing analysis taking into account all costs that the service provider incurred. The team excluded from this analysis the opportunity costs that clients incurred (e.g., clients' travel costs, clients' travel time, etc.).

Facility sampling

The MOH has rolled out extensive HIV service provision across its public health facilities. The rationale for selection of the sample facilities was as follows:

1. **Availability of HIV treatment and prevention interventions at the facility:** The study sought to cost those HIV services rendered in full at the facility. Some health facilities refer their clients to other facilities for services due to low demand or absence of healthcare workers (HCWs). As an example, only 15 public health facilities offer dedicated SMC services. Other facilities either refer their clients to sites that provide only SMC or offer SMC services based on scheduled outreach plans, using mobile teams. The team did not consider such facilities for selection.
2. **Ensuring cost variation across public health facility levels:** The cost of service delivery varies across the five levels of healthcare. For example, in higher-level health facilities, such as tertiary hospitals, specialized personnel may deliver the same service that general healthcare workers might provide at lower-level facilities, such as health posts. This discrepancy usually is due to a restricted number of specialized staff in country, leading to higher cost of service delivery at

higher levels of health. To capture these potential differences in cost across facility levels, we sampled facilities from two different health levels.

3. **Ensuring geographic variation:** The selection of sample facilities also took into account cost variations based on geographic location (i.e., rural or urban settings). For example, cost inputs such as supply chain can vary by geography, based on the cost differential to transport supplies and commodities from central medical stores (CMS) to different facilities.

Given the team's limited resources, it was not possible to get a statistically representative sample. However, the team determined that choosing two sites would assist in testing the data collection process to inform the larger scope of the planned unit cost data collection for other EHSP interventions. In light of the criteria above, we selected two public health facilities to derive the unit cost of HIV services: Bontleng Clinic, which has no beds, and GPH. We will describe each of them in detail in the "Findings" section of this report.

Data collection and management

Development of survey instruments

To derive the unit cost of HIV services, the technical team developed data forms to capture information on both cost and the way a service is delivered. An example of a cost input is the cost of drugs or supplies. Information on the way a service is delivered includes the typical number of units of a drug given to a patient for an HIV intervention per year.

The team developed four types of forms: (1) a general facility form, (2) service-specific forms, (3) a central MOH and CMS form, and (4) a development partner form. Copies of all data collection instruments are included in ***Annex B.*** The team collected data for all HIV services and condoms for the period April 2013 to March 2014 to mirror the GOB fiscal year and ensure availability of nonarchived data.

The technical team used the **general facility form** to capture information at the two selected facilities. The team collected information on the total number of inpatients and outpatients accessing the facility. This form also yielded data on the number and type of services offered at each facility, and the number and type of administration and support staff assisting service delivery staff. When possible, the team used the facility form to capture information on the utilities, building maintenance and operations, waste management, supply chain, and vehicle costs. When information was not available at the facility, the team sourced information from the DHMT or district level. Team members collected all of this information by facility, not by intervention.

The team used **six customized HIV service forms** to capture information on the amount, type, and percentage of time that cadres spent delivering a particular service; the amount, type, and percentage of time service managers spent on a particular service; the number of clients accessing services; the number of times clients accessed a service during one year; the type and quantity of drugs and commodities given to clients; and the type of equipment used to render the service. We used six forms—one for each of the five interventions and one for condoms. The team collected all of this information by intervention in both facilities. It assessed costs for the following:

1. **Condoms:** Male and female condoms either are placed in the condom dispensers or packaged for distribution to patients accessing prevention-based services, such as SMC or HTC. Any patient visiting the health facility can retrieve condoms, when available.
2. **Co-trimoxazole for HIV-positive TB patients:** Treatment is issued to TB/HIV patients daily for two weeks at the facilities If the client appropriately adheres to treatment, he or she is transferred to the community TB care program to complete the six-month treatment regimen. The client

presents at the facility three times (on initiation, month 2, and month 6) to provide a sputum sample.

3. **Screening HIV-positive patients for TB:** All HIV-positive patients are screened for TB as part of the intensified case-finding approach. HCWs conduct a physical assessment to screen clients for signs of persistent cough, fever, weight loss, failure to thrive, night sweat, and other relevant symptoms. If there are indications from the initial assessment that the client may have TB, sputum is sampled in addition to a CD4 count (CD4 T lymphocytes), full blood test, and chest X-ray. If the client is TB negative, he or she is treated for pneumonia or common cold or, if positive, enrolled in treatment for six months.
4. **Additional ART for HIV-positive TB patients:** Additional ART treatment is issued to HIV-positive patients who have TB. The client is prescribed an additional bottle of Alluvia for six months. This service is typically accessed by a client seven times during a year.
5. **PEP:** Treatment is issued to HCWs and rape victims after potential exposure to HIV. Patients typically access this service only once after initial contact.
6. **SMC:** This minor surgical procedure is provided to circumcise males. Three randomized controlled trials showed that male circumcision can reduce the risk of heterosexually acquired HIV infection in men by up to 60 percent. Patients typically access this service only once, and then return for follow-up postoperative care on the second and seventh days and six weeks after surgery.

Team members used data collected at the DHMT to verify and confirm data captured at the facility level. They also collected data missing at the facility level at the DHMTs. For example, to capture information on the utilities, building maintenance and operations, waste management, supply chain, and vehicle costs, they found it necessary to access data at the DHMT.

The team developed two data sheets to capture data at the central level: an **MOH and CMS central form** and a **development partner form**. The form for the central level was divided into three sections: one section captured data, including personnel salaries; a second section focused on drugs, commodities, and equipment pricing; and the third section focused on supply chain costs.

Health Research Division Committee clearance to undertake study

The team submitted the data collection tools and project plan to the MOH Health Research Development Committee for a research exemption permit, which was issued in April 2014.

Data collection team

A team of three data collectors and one lead consultant collected the data. Data collectors were trained on the data collection forms and term definitions.

Data collection timeline

In April 2014, the data collection team pilot tested the tools. The team selected Boseja II Clinic, located in a peri-urban setting, as the pilot facility. To facilitate a smooth data collection process, the lead consultant met with and oriented the heads of the sample facilities and DHMT as to the objectives of the study and discussed the data collection tools a week before the official data collection process started. The team conducted the data collection at the facility and central levels in April–May 2014.

Data analysis

Excel databases: The technical team designed Excel-based databases to derive unit costs for each of the HIV interventions. The data collectors first captured data through the forms described above; facility

coordinators validated the data before entering them into the respective databases. The team created databases according to HIV service, using customized calculations to derive the unit costs. The Excel databases captured unit cost per client per service per year by capturing data on the following categories:

- **Direct costs:** Personnel, drugs, and supplies
- **Indirect costs:** Utilities, building and vehicle, equipment, management, and supply chain

Cost analysis for HIV interventions: This section articulates the cost calculations employed to derive the unit cost per patient per year per service. The technical team calculated unit costs per patient per year for each of the five interventions in the same manner. The team calculated the cost of a condom based on the costs of commodities and the supply chain only. A description of each data point entered into the Excel databases, the associated calculation and assumptions, the source of information, and the data form used to collect that piece of data are outlined in Annex C. Below we describe a more general description of calculations by cost category.

Facility-level and above-facility-level costs

The objective of the analysis was to collect both facility-level and above-facility-level costs. The definition used to distinguish these costs was based on the location where the activity was being conducted, regardless of where the payment for the service was made. If an activity was being conducted predominantly within the gates of the facility, its costs were considered to be facility level, whereas the costs of an activity predominantly conducted outside of the facility gates were considered to be above-facility-level. Thus, the technical team included waste management and supply chain management in the analysis and considered these to be above-facility-level costs, since they were conducted predominantly outside of the facility gates.

Waste management and supply chain management costs were allocated to each of the two facilities in a somewhat different way. In the case of waste management, an ideal way of allocating these costs would have been to assess the volume of waste produced at each facility and then allocate the waste management costs based on the proportion produced by each. In reality, no data were available on the volume of waste produced per facility. Instead, each facility is charged a fixed amount to cover the costs required to collect and dispose of waste products. Thus, the team used these charges in this costing exercise.

As for supply chain, the team obtained these costs from the MOH Central (including the CMS, Ministry Management, and CTO). The GOB uses a per-kilometer rate of US$0.23 as a reimbursable charge for mileage and wear and tear of the vehicle. The technical team used this fixed rate to calculate the delivery of all materials and supplies from CMS to the facility. It was possible to calculate the supply chain costs per facility using information about the number of visits made to each facility per month, the distance covered from a CMS warehouse to the facility and return, the type of vehicle delivering goods, and the personnel involved in transporting goods.

Although the technical team made every effort to conduct a comprehensive costing of services at these two facilities, some above-facility-level costs could not be included in the estimation of unit costs for two reasons. First, these costs were not directly related to the volume of patients receiving the service and thus were not appropriate to include in the unit cost. For example, training costs generally do not vary in proportion to the volume of patients receiving a service. Second, the team could not allocate certain above-facility-level costs directly to the specific facilities. Thus, the team excluded from the costing supervisory visits from the district or national levels because these costs could not be attributed to specific services and facilities. As a result, the team did not include training and supervision costs in the unit costs for services at these two facilities, although they should be considered in any national budgeting effort.

General facility information

At the facility level, the team calculated the number of outpatients and inpatients by intervention per facility and the total number by facility. The team also calculated the weighted version of both these data points to ensure that the costing accounted for the additional resources consumed by inpatients as compared to outpatients when allocating cost to a particular intervention.

Personnel

The team allocated personnel costs based on the self-reported amount of time each cadre spent on an intervention. Below we list the steps used to calculate personnel costs for each service delivery cadre and each cadre managing service delivery personnel.

- **Step 1:** Staff salary (US$) × proportion of time personnel spends on intervention
- **Step 2:** Step 1 ÷ nonweighted number of inpatients and outpatients per year
- **Step 3:** Sum values of Step 2 for each cadre to derive a unit cost per patient per year for personnel

Drugs and supplies

The team allocated drugs and supplies costs based on the quantity used per patient per year as reported by facility service delivery personnel. Below we show how to calculate these costs, using Steps 1 and 2 for each nondrug consumable and Step 1 through Step 3 for each drug.

- **Step 1:** Divide the cost per pack (US$) by the quantity per pack
- **Step 2:** Step 1 × quantity per patient per year
- **Step 3:** Step 2 × (% of patients using the drug ÷100) only if a drug
- **Step 4:** Step 2 or Step 3 ÷ nonweighted number of inpatients and outpatients per year
- **Step 5:** Sum values of Step 4 to derive a unit cost per patient per year for drugs and supplies

Utilities

The team allocated utility costs based on the proportion of cost allocated to an HIV intervention. This proportion was determined by the weighted number of patients for an intervention at a facility divided by the weighted number of total patients at the facility. The team used Steps 1 and 2 to calculate the following for each utility: fuel, water, electricity, telephone, waste management, and building maintenance.

- **Step 1:** Cost of utility per year × proportion of cost allocated to HIV intervention
- **Step 2:** Step 1 ÷ nonweighted number of inpatients and outpatients per year
- **Step 3:** Sum of Step 2 values for each utility

Building

Building costs were also allocated based on the proportion of cost allocated to an HIV intervention.

- **Step 1:** Construction value (US$) × (1 + % supply chain costs based on geographic location ÷ 100)
- **Step 2:** Step 1 × proportion of cost allocated to HIV intervention
- **Step 3:** Step 2 ÷ replacement period
- **Step 4:** Step 3 ÷ nonweighted number of inpatients and outpatients per year

Vehicle

Vehicle costs were also allocated based on the proportion of cost allocated to an HIV intervention.

- **Step 1:** Vehicle value (US$) × proportion of cost allocated to HIV intervention

- **Step 2:** Step 1 ÷ replacement period
- **Step 3:** Step 2 ÷ nonweighted number of inpatients and outpatients per year
- **Step 4:** Sum Step 3 values

Equipment

Equipment costs were allocated based on the proportion of cost allocated to an HIV intervention.

- **Step 1:** Cost of equipment (US$) × number of equipment × proportion of cost allocated to HIV intervention
- **Step 2:** Step 1 ÷ replacement period
- **Step 3:** Step 2 ÷ nonweighted number of inpatients and outpatients per year
- **Step 4:** Sum Step 3 values

Management

Management costs were allocated based on the proportion of cost allocated to an HIV intervention. The team used Steps 1 and 2 to calculate costs for each management cadre.

- **Step 1:** Staff salary × number of staff × proportion of cost allocated to HIV intervention
- **Step 2**: Step 1 ÷ nonweighted number of inpatients and outpatients per year
- **Step 3:** Sum Step 2 values

Team members allocated all supply chain costs to a particular facility. They assumed that each service provided by the facility incurred equal supply chain costs and then divided these costs by the number of interventions to allocate costs to each HIV intervention and condoms.

Supply chain – fuel cost

- **Step 1:** Round-trip distance in km × number of round trips × fuel charge per km
- **Step 2:** Step 1 ÷ number of services offered at facility
- **Step 3**: Step 2 ÷ nonweighted number of inpatients and outpatients per year

Supply chain – driver cost

- **Step 1:** Salary (US$) × proportion of time spent driving to facility
- **Step 2:** Step 1 ÷ number of services offered at facility
- **Step 3:** Step 2 ÷ nonweighted number of inpatients and outpatients per year

Supply chain – vehicle cost

- **Step 1:** Vehicle value ÷ number of services offered at facility
- **Step 2:** Step 1 ÷ replacement value
- **Step 3:** Step 2 ÷ nonweighted number of inpatients and outpatients per year

Overall unit cost calculation

- **Personnel + drugs/supplies + utilities + building + vehicle + equipment + management + supply chain costs = total unit cost per patient per service per year**

Cost analysis for condoms

Team members calculated the cost of condoms by adding the cost of a condom to the supply chain costs, which they calculated in the manner described above, determined by the distance traveled to the facility. However, to calculate the number of people using condoms per year, team members made several assumptions.

Data on the number of condoms distributed were available, but not on the number of people who received condoms. According to the Botswana AIDS Impact Survey (BAIS) IV, 63 percent of Botswana's population is 15–64 years old; about 65 percent of people ages 15–24 reported using a condom consistently, and about 30 percent of people ages 25–64 did so (Statistics Botswana, GOB, 2013). The average of the latter two statistics is about 48 percent. Given this information, the team calculated the number of patients using condoms based on the following:

- **Step 1:** Total number of patients at facility × .63
- **Step 2:** Step 1 × .48

This sequence of calculations yielded an estimated total number of patients receiving condoms.

Missing data

In a few specific instances, data were not available. Table 5 below shows some of the specific missing information and the actions the team took to fill this gap.

Table 5. Actions Taken to Fill Data Collection Information Gaps

Missing Data	Action Taken
Building construction value	The team extrapolated this information from the HTC data, as these are current data from the Department of Building and Engineering Services and relevant to this costing exercise.
Utilities at Bontleng Clinic	Utility data for Bontleng Clinic were not available; no bills had been issued to the facility in a number of years. In light of the missing data, the Princess Marina Hospital (PMH) Corporate Service Department accordingly provided the team with data on utilities, using bills from a facility similar to Bontleng.
Waste management for Bontleng Clinic	The cost of waste management for the district was available; this cost was divided by the number of facilities in the district to yield a cost for Bontleng Clinic.

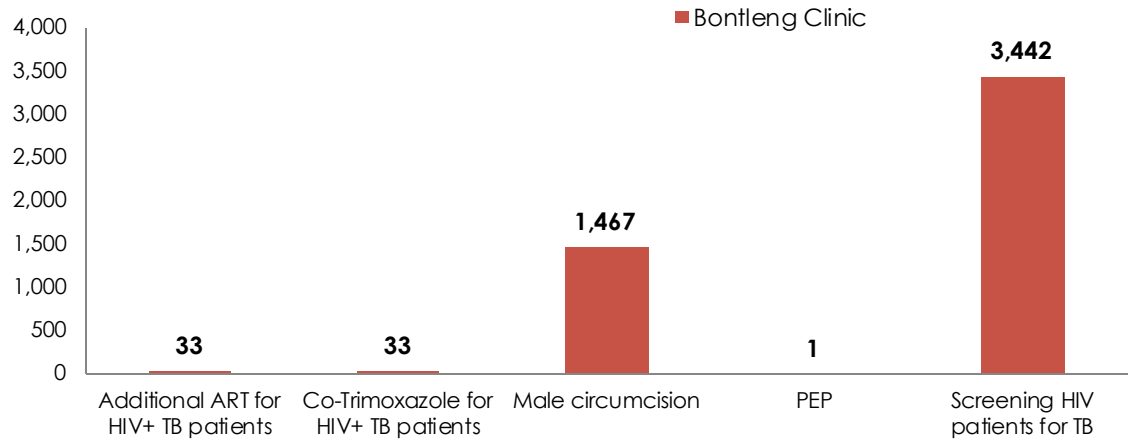
Findings

Site profiles

Bontleng Clinic

Bontleng Clinic is classified as a clinic without beds in an urban setting (Gaborone). It falls under the jurisdiction of the Greater Gaborone DHMT. Bontleng Clinic offers 14 direct health services and primarily refers clients to the Princess Marina Hospital (PMH) for management of complicated cases. Figure 1 below shows the number of patients at Bontleng Clinic from April 2013 to March 2014 who received each of the five HIV interventions.

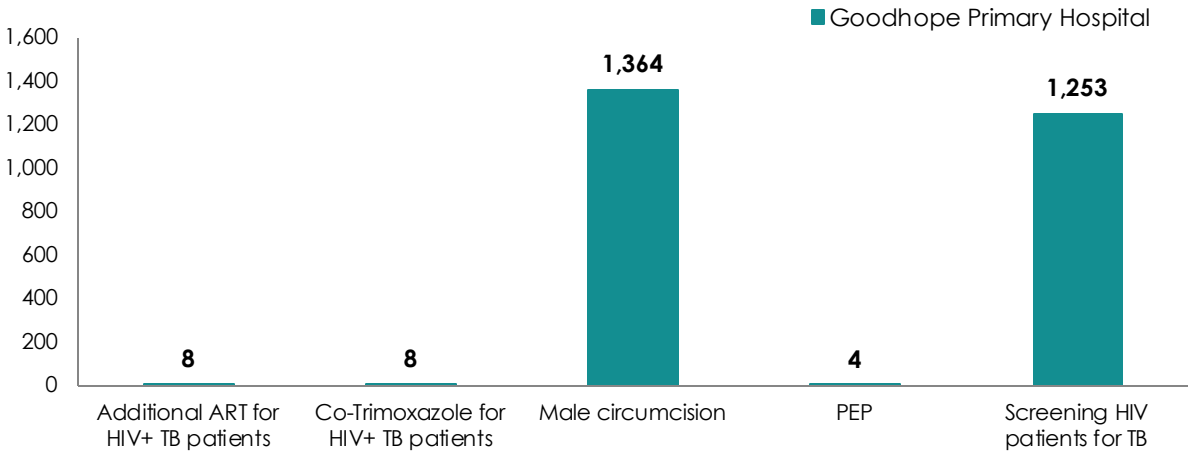
Figure 1. Total Number of Patients at Bontleng Clinic



Goodhope Primary Hospital (GPH)

GPH is classified as a primary hospital in a rural setting and is under the jurisdiction of the Goodhope DHMT. GPH offers 16 direct health services. Figure 2 below shows the number of patients at GPH from April 2013 to March 2014 who received each of the five HIV interventions plus condoms.

Figure 2. Total Number of Patients at Goodhope Primary Hospital



Unit cost analysis of HIV services

The team conducted unit cost analysis for five HIV interventions plus condoms. The costs for all services include direct costs (personnel, drugs, and supplies) and indirect costs (utilities; building; vehicle; equipment; management; and supply chain costs, excluding storage and warehouse staff). The team also calculated cost per condom. The calculation for condoms includes commodity and supply chain costs.

Unit cost of HIV service at Bontleng Clinic and GPH

Unit costs for the five HIV interventions plus condoms at Bontleng Clinic ranged from US$57 for screening HIV patients for TB to US$1,011 for PEP per patient per year, as indicated in Figure 3 below. Unit costs for the six HIV interventions at GPH ranged from US$82 for screening HIV patients for TB to US$926 for co-trimoxazole for HIV-positive TB patients, as indicated in the same figure.

There does not appear to be a clear trend when assessing costs at the clinic level compared with those at the primary hospital level. For example, additional ART for TB patients costs US$118 per patient per year at the clinic level and US$207 at the primary hospital level. On the other hand, SMC costs US$155 per patient per year at the clinic level and US$89 at the primary hospital level. Further discussion of these costs is included in the section on the next page, which analyzes cost drivers.

Figure 3. Unit Cost of HIV Services at Bontleng Clinic and GPH

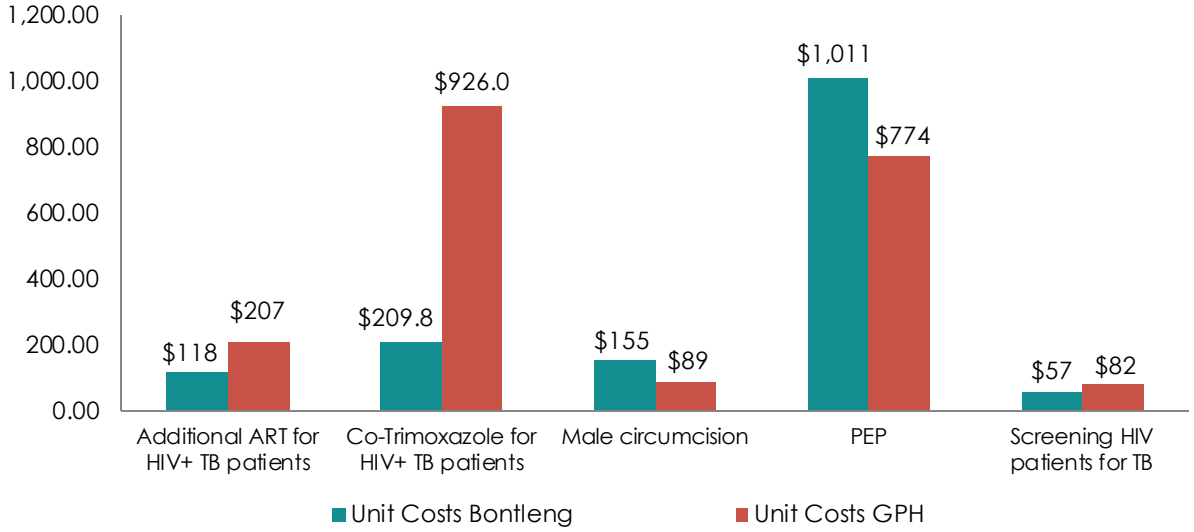


Table 6 below shows a breakdown of all unit costs by direct and indirect costs for each of the five HIV interventions delivered at Bontleng Clinic; Table 7 shows the same for GPH.

Table 6. Unit Cost of HIV Services at Bontleng Clinic, by Direct and Indirect Costs

HIV Intervention	Direct Cost	Indirect Cost	Total Unit Cost	Total Cost (Unit Cost × # Patients)
Additional ART for HIV+ TB patients	$87.56	$30.35	$117.91	$3,891
Co-trimoxazole for HIV+ TB patients	$178.78	$31.01	$209.80	$6923
SMC	$136.34	$18.38	$154.72	$226,974
PEP	$518.70	$492.36	$1,011.07	$1,011
Screening HIV patients for TB	$28.48	$28.99	$57.47	$197,811

* Values have been rounded to integers. Totals may not be exact.

Table 7. Unit Cost of HIV Services at GPH, by Direct and Indirect Costs

HIV Intervention	Direct Cost	Indirect Cost	Total Unit Cost	Total Cost (Unit Cost × # Patients)
Additional ART for HIV+ TB patients	$87.64	$119.29	$206.93	$1,655
Co-trimoxazole for HIV+ TB Patients	$759.18	$166.81	$925.99	$7,407
SMC	$69.65	$19.64	$89.30	$121,805
PEP	$597.19	$176.74	$773.92	$3,095
Screening HIV patients for TB	$17.80	$64.47	$82.27	$103,084

* Values have been rounded to integers. Totals may not be exact.

Cost drivers analysis of HIV services

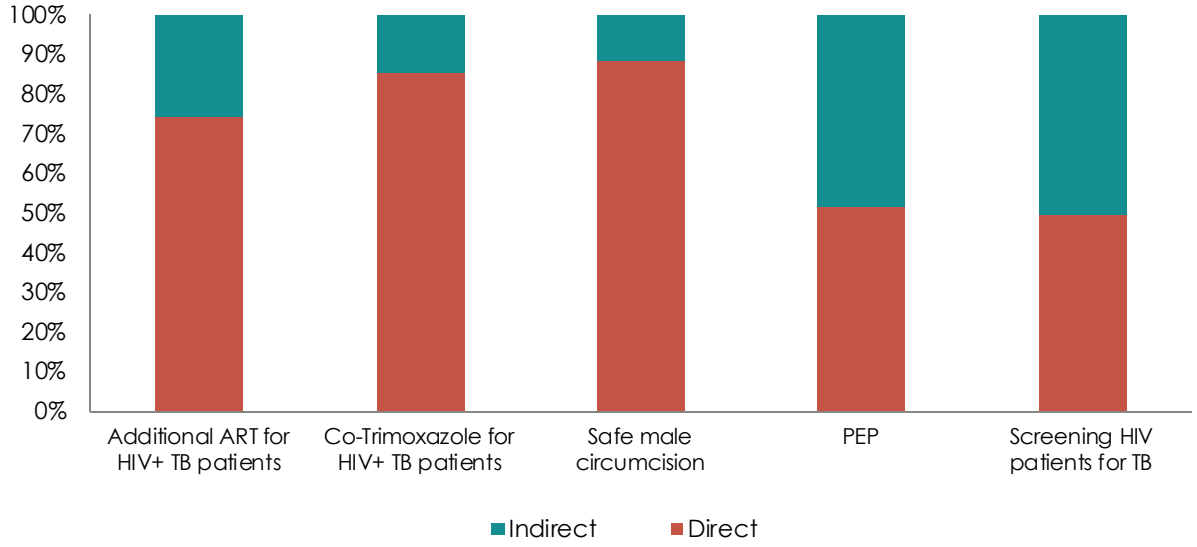
The team analyzed the cost drivers to shed light on the reasons for cost variations across interventions and levels of health, as well as the high unit costs for some HIV services. Understanding cost drivers can help the MOH facilitate systems reform to improve efficiencies in select areas.

Direct and indirect costs

Figures 4 and 5 show the direct and indirect costs for each service, by clinic and hospital, respectively. Direct costs include personnel, drugs, and supplies, whereas indirect costs include management and support staff, utilities, supply chain, equipment, and building and vehicle operational costs.

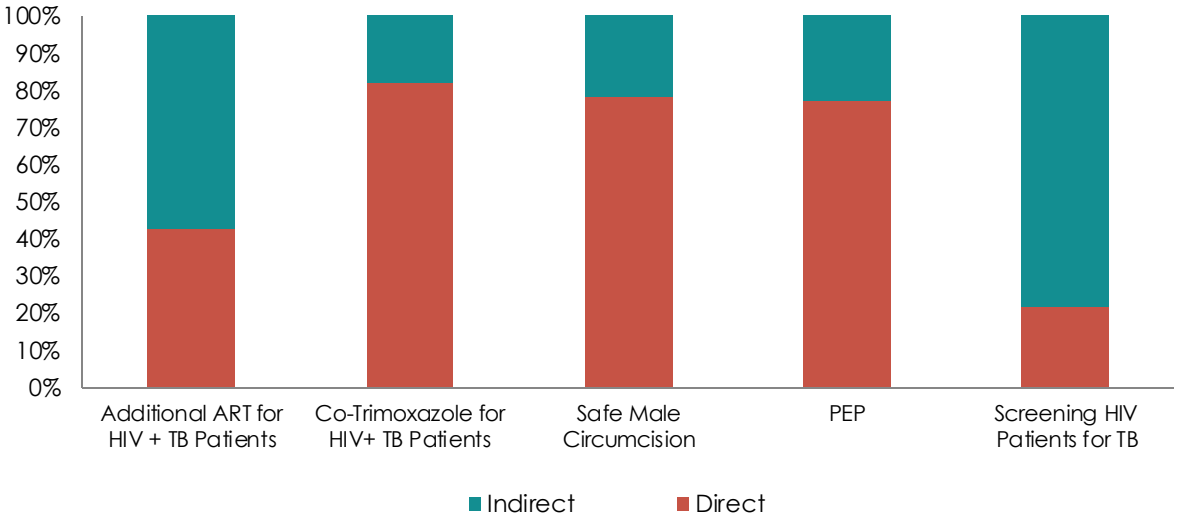
At Bontleng Clinic, the percentage of direct costs ranged from approximately 50 to 90 percent. PEP and screening for HIV patients yielded the lowest percentage of direct costs (50%). Approximately 70 percent of costs for ART for HIV-positive TB patients were direct costs. Co-trimoxazole yielded a little more than 80 percent of costs. SMC yielded direct costs of approximately 90 percent.

Figure 4. Percentage of Direct and Indirect Costs, Bontleng Clinic



At GPH, the percentage of direct costs ranged from approximately 22 percent to about 80 percent. Screening HIV patients for TB required the lowest percentage of direct costs (22%). Additional ART for HIV-positive TB patients was approximately 40 percent of direct costs. SMC, co-trimoxazole, and PEP had direct cost percentages of approximately 80 percent. All unit costs are further explained in the "Results" section.

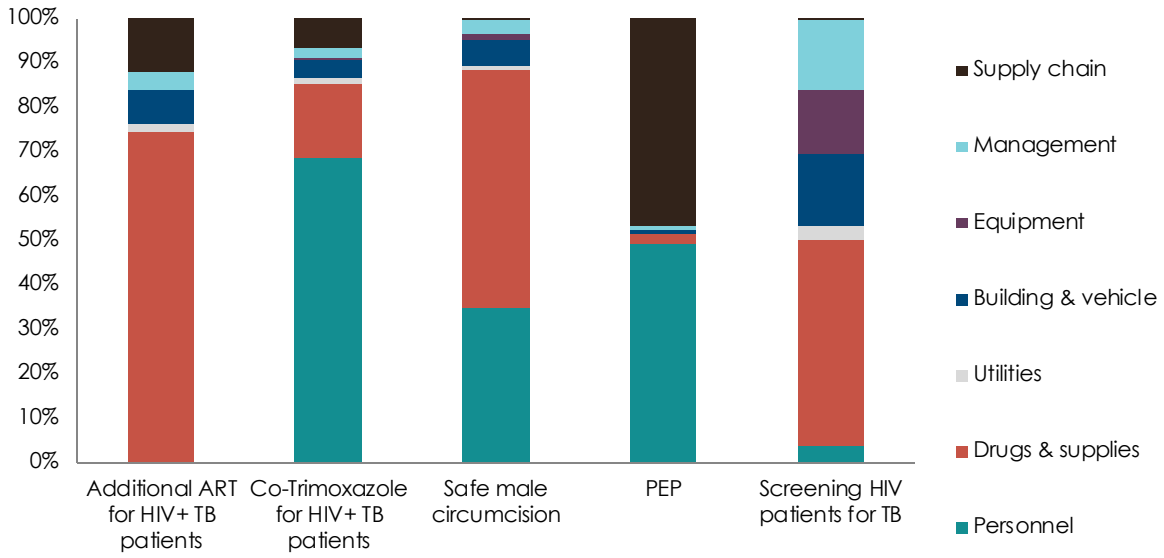
Figure 5. Percentage of Direct and Indirect Costs, GPH



Detailed breakdown of costs

Figure 6 provides a detailed breakdown of the unit cost for each HIV service at Bontleng Clinic. Categories are broken down into the percentages of costs for supply chain, management, equipment, building and vehicles, utilities, drugs and supplies, and personnel.

Figure 6. Cost Drivers, by HIV Service, Bontleng Clinic



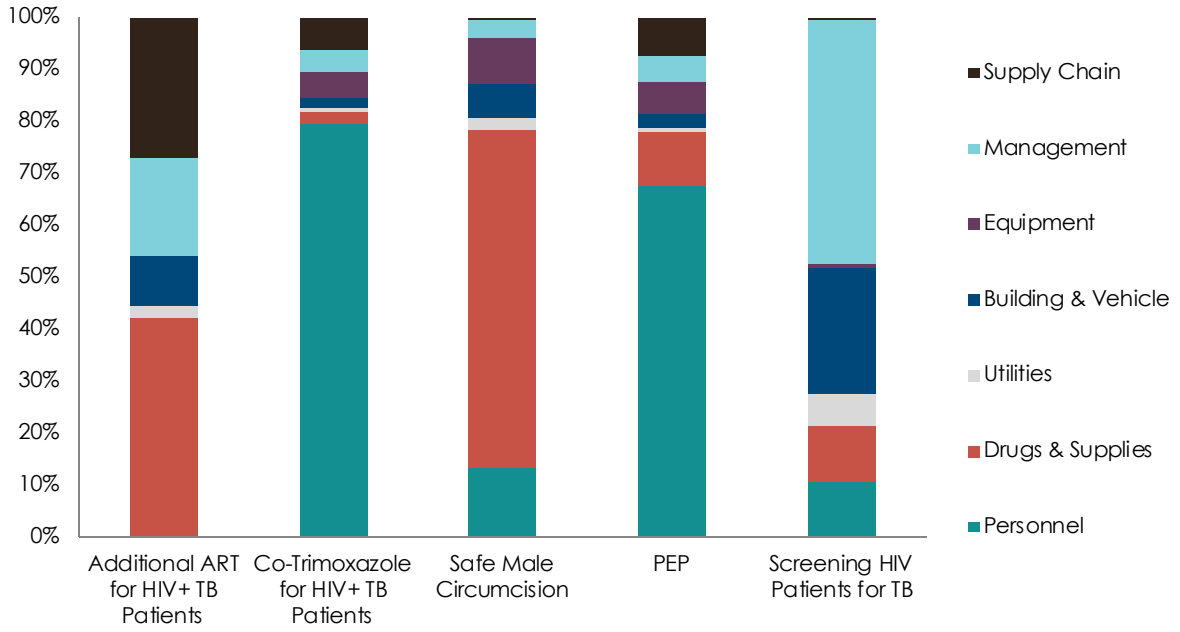
Primary and secondary cost drivers are identified for each HIV service in the Bontleng Clinic (see Table 8). The primary cost driver is the cost category that comprises the largest percentage of the overall cost for the HIV service, and the secondary cost driver is the cost category that comprises the second largest percentage. Drugs and supplies or personnel were the primary cost drivers for all five services. Secondary cost drivers were personnel, supply chain, drugs and supplies, or management.

Table 8. Primary and Secondary Cost Drivers, by HIV Service, Bontleng Clinic

HIV Service	Primary Cost Driver	Secondary Cost Driver
Additional ART for HIV+ TB patients	Drugs and supplies	Supply chain
Co-trimoxazole for HIV+ TB patients	Personnel	Drugs and supplies
SMC	Drugs and supplies	Personnel
PEP	Personnel	Supply chain
Screening HIV patients for TB	Drugs and supplies	Management

Figure 7 provides a detailed breakdown of the unit cost for each HIV service at GPH.

Figure 7. Cost Drivers, by HIV Service, GPH



Again, primary and secondary cost drivers are listed in Table 9 for each of the five HIV interventions at GPH. Personnel, drugs and supplies, and management are all primary cost drivers. Secondary cost drivers consisted of all categories except equipment and utilities.

Table 9. Primary and Secondary Cost Drivers, by HIV Service, GPH

HIV Service	Primary Cost Driver	Secondary Cost Driver
Additional ART for HIV+ TB patients	Drugs and supplies	Supply chain
Co-trimoxazole for HIV+ TB patients	Personnel	Management
SMC	Drugs and supplies	Personnel
PEP	Personnel	Drugs and supplies
Screening HIV patients for TB	Management	Building and vehicle

Condoms cost analysis

Condoms are a cross-cutting component of all HIV prevention services. Condoms can either be distributed as part and parcel of a minimum intervention package—for example, SMC or HTC—or placed in condom dispensers in facility waiting areas. This structure of condom distribution complicates the facility's ability to adequately track and keep stock of the number of patients accessing condoms. However, the facilities are able to account for the number of condoms ordered and received from CMS, as well as stockouts when they run out of condoms. The team calculated the unit cost per condom distributed based on two inputs: (1) the actual cost per condom and (2) the supply chain costs. Table 10 shows the unit cost per condom distributed at Bontleng Clinic and GPH.

Table 10: Cost per Condom (US$)

	Supply Costs	Supply Chain Costs	Total Unit Cost per Condom
Bontleng Clinic	$.03	$.08	$.11
GPH	$.03	$.06	$.09

Discussion

This study was conducted as a broader effort to understand resource needs in Botswana as the country decentralizes services and implements health reforms to ensure the delivery of EHSP. Health coverage will be extended to a larger portion of the population, including the most vulnerable and hard to reach. As HIV expenditure accounts for a majority of government health expenditure, it is critical for the MOH to quantify the costs of service provision while maintaining high-quality standards for service delivery. Thus, this study not only derived unit costs for five HIV interventions and the cost of condoms, but also determined cost drivers and potential reasons for high costs.

Additional ART for HIV-positive TB patients

It cost US$118 at Bontleng Clinic and US$207 at GPH per patient per year to deliver additional ART for HIV-positive TB patients. At the clinic level, drugs and supplies were 70 percent of all service delivery costs; supply chain costs were 12 percent. These were the primary and secondary cost drivers. At the hospital level, the main cost drivers were drugs and supplies, and supply chain costs, at 40 percent and 30 percent of total costs, respectively.

In comparing the two facilities, Bontleng Clinic had higher drugs and supplies costs than GPH as a result of having more HIV-positive TB patients (33 patients at Bontleng Clinic and eight patients at GPH). However, GPH would be expected to have a higher number of HIV-positive patients accessing services than Bontleng Clinic due to higher prevalence rates (20.3%) (Statistics Botswana, GOB, 2014c) in Borolong District, where GPH is located, than in Gaborone District (17%) (Statistics Botswana, GOB, 2014c), where Bontleng Clinic is located. Additionally, there is greater emphasis on HIV messaging and services in urban settings, which may contribute to better health-seeking behavior among urban than rural populations. At GPH, the fact of fewer HIV-positive patients could be attributed to patients accessing HIV services closer to their work locations in urban/peri-urban settings or perhaps lower interest/urgency in accessing services.

Co-trimoxazole for HIV-positive TB patients

The unit cost of co-trimoxazole provision was US$210 at the clinic level and US$926 at the hospital level per patient per year. Personnel accounted for 70 percent of the total unit cost at the clinic level; drugs and supplies accounted for about 15 percent. Personnel accounted for 80 percent of the total unit cost at the hospital level, and management accounted for approximately 2 percent. The cost was higher at the hospital level than the clinic level because more personnel are involved in hospital service delivery. Another reason is that only eight patients received co-trimoxazole over the course of the year at the hospital, compared with 33 patients at the clinic, raising the cost per patient.

The management staff involved in co-trimoxazole service delivery incur higher relative costs than service delivery personnel because the TB focal person and district TB coordinator (management staff) support only TB services at the facility levels. However, the service delivery personnel (e.g., medical doctor,

nurse) support all services at the clinic and hospital in addition to TB, thus spreading their costs across all services.

Safe male circumcision

The unit cost of SMC was US$155 at the clinic and US$89 per patient per year at the hospital level. At the clinic level, more than 50 percent of costs were due to drugs and supplies; approximately 35 percent were due to personnel. At the hospital level, drugs and supplies were 70 percent of the total unit costs; personnel about 10 percent.

At the clinic level, 1,467 patients received SMC; 1,364 patients received it at the hospital level. However, the unit cost for service delivery at the clinic level is higher than for the hospital level. This difference can be attributed to the SMC model employed at each facility. At the time of data collection, the SMC program at GPH involved a regular team of one doctor and two nurses to render services.

During SMC school and outreach campaigns, staff are expanded at the donor-supported public health facilities to cope with the demand the campaigns create. They typically expand the staff to one doctor and four nurses (modified MOVE model). At the time of data collection, this was the case at Bontleng Clinic, whereas GPH was operating in the "regular/routine" mode of one doctor and two nurses. Most of the team at the clinic was dedicated to SMC only, whereas the team at the hospital split its time across other services. This difference could be one reason for the higher unit cost of service delivery at the clinic level. SMC teams at Bontleng Clinic were also beefed up when SMC staff were relocated to Bontleng from the Block 8 Clinic, which closed during the 2014 African Youth Games.

Ideally, the unit cost at Bontleng Clinic should have been lower than at GPH because the campaign brings in more people. However, Bontleng had only 103 more clients than GPH. Thus, higher costs at Bontleng Clinic can be attributed to larger HR costs. Commodities costs were also higher at Bontleng Clinic because additional commodities being used there were not being used at GPH.

Post-exposure prophylaxis

The unit costs per person per year for PEP at the clinic and hospital levels were US$1,011 and US$774, respectively. Personnel accounted for almost 50 percent of PEP unit costs; supply chain costs were about 50 percent. At the hospital level, personnel accounted for approximately 65 percent of unit costs, and drugs and supplies accounted for about 10 percent. Only one patient required PEP at the clinic level, leading to extremely high unit costs—particularly supply chain costs. There were four patients at the hospital level. This is the main reason for the unusually large unit costs at the clinic level.

Screening HIV patients for TB

The unit cost of screening HIV patients for TB was US$57 and US$82 per patient per year at the clinic and hospital, respectively. Supplies accounted for almost 50 percent and management 15 percent of the total unit costs at the clinic level. At the hospital level, management was 50 percent of the total unit cost; building and vehicle costs were about 20 percent. Actual management costs were not higher for screening HIV patients for TB compared with other HIV interventions. However, the percentage of costs attributed to management was higher because actual personnel costs and drugs and supplies costs were lower.

Condoms

The unit cost of condoms was US$0.11 at Bontleng Clinic and US$0.09 at GPH per patient per year. Condom costs were extremely low because they included only the cost of supplies and the supply chain costs. Supply chain costs differed slightly between the two facilities—our assumption is that GPH had more patients per year receiving condoms than did Bontleng Clinic.

Limitations

Data availability and management

The team found the availability of data on patient volumes to be limited and, in some cases, not collected at all. The data required to inform the unit cost—such as the number of patients accessing a service or the total number of inpatients and outpatients at the facility level from the period April 2013 to March 2014—were difficult to gather during the data collection process. In some instances, routine monthly reports that facilities submitted to DHMT and MOH were missing or inconsistent. In other instances, poor record keeping led to lack of availability of data; thus, HCWs had to recount the registers to provide patient numbers. These challenges in some instances greatly affected the technical team's ability to establish patient volumes for HIV services. The team calculated patient volume by year so that the volumes were not subject to monthly fluctuations.

Another challenge the team encountered during the data collection process was the lack of uniformity in the data per district. Data available at the DHMTs in Gaborone and Goodhope were not standard or harmonized to allow for cross-comparisons. The team mainly attributed this finding to the lack of capacity to create and maintain data systems. The loose-leaf paper-based system appeared to contribute to poor record keeping.

Service delivery variance

Some of the HIV services had slight differences in their operational delivery at the facility level. These differences could be attributed to the situational context of the facility, such as the number of personnel available to render services or other factors. For example, in the case of additional ART for TB patients, the facilities reported the number of times patients visited the service annually in a different manner. This slight variance had an impact on the unit costs compared across the two facilities.

Costing the condom service within the facilities

The technical team faced several challenges when costing condoms. For one thing, the distribution channels for condoms varied. In some cases, they were distributed across several programs (such as family planning, other sexual and reproductive health services, HTC, PMTCT, and SMC, and other services) as part of an integrated minimum prevention package approach. In other cases, they were placed in facility dispensers. The team could not cost all variations of condom distribution. Rather, it assessed only the cost of condoms and the supply chain costs. Facilities also did not have information on the number of people who received condoms and the number of condoms distributed per patient, as there were no registers available to track these data.

The technical team was able to obtain information on the number of condoms ordered and received by the facilities. A key assumption was that the facilities distributed and used all condoms they procured. The costing team made several assumptions on the percentages of the age range of patients in need of condoms and the percentage of the general population who use condoms.

Self-report bias

Since the technical team asked service delivery providers to self-report the amount of time they spent on each intervention, there is the potential that these data may not be as accurate as operational research using time-motion study techniques.

Limited sample size

Due to resource constraints, the team was able to derive unit costs at only two facilities; thus, the data

gathered should not be considered statistically representative of all geographical or service levels. We recommend that a sample size of a minimum of 54 health facilities (representing all levels of care and three geographical classifications) be used to determine unit costs for each level of healthcare.

Recommendations

Data systems

This costing exercise relied heavily on the availability of patient and general facility data to deduce the unit cost per patient per service. However, as the Discussion and Limitations sections indicate, the team encountered several challenges associated with the availability and standards of the data across the facilities and DHMTs. Accordingly, we recommend consideration of the following to improve the data systems and inform future studies or policy decisions.

Upgrading and standardizing indicators and tools for recording general facility and patient data

There were vast differences in data systems across HIV services due to the level of resources invested in each service area. The more resources a program has, the better developed is its data system. HCWs routinely completed data services for some service areas, whereas for other services they rarely completed data forms, despite their availability.

Additionally, data systems show that data collection processes and indicators were not designed to be consistent across all sites delivering similar interventions. This issue has created inconsistency in data indicators. For example, the number of patients accessing a service is measured in different ways depending on the site's data systems, sometimes leading to double or triple counting.

Accordingly, there is an urgent need to **upgrade** the current data systems within the health facilities and at DHMT levels to **create a universal monitoring and evaluation (M&E) platform for all services**. This platform should allow a range of data input, from general facility patient statistics to service-specific indicators. The technical team also found that the data systems and indicators collected between districts differed. In addition, data quality was greatly dependent on the presence of personnel involved in data management. Thus, a universal data platform would also help standardize data indicators across districts.

Proper record keeping and archiving of data forms

Even when data were available within the facilities, the team noted poor record management of the data forms. The filing system was fragmented and did not provide a good source of data warehousing. It is imperative that a systematic approach be taken to consolidate the data forms in a central location within each facility. The system must be routinely audited to ensure that data forms for all months are available and complete. In lieu of a hard-copy system, consideration should be given to instituting simplified soft-copy data forms, which can be completed in Microsoft Word to ensure user friendliness.

Capacity building and data quality audits

In association with the upgrade of the data systems, there is an urgent need to train and mentor facility and DHMT personnel to manage and maintain these data systems. Data audits also must be conducted routinely to ensure the integrity of the data system and certify data quality.

Use of data forms collected as management tools by the facility management/HCWs

Often the data collected were not directly used by the facilities or respective HCWs to inform provision of services; thus, the HCWs who routinely provide the data do not see its value. Also, research findings generally are not fed back to the health facilities on a large enough scale for HCWs to appreciate the value of the data they collect. Thus, developing strategies to incorporate data in service management

processes should be considered. HCWs should own the data collected and ensure the data are representative of their service delivery efforts at the facility level.

Restructuring service plan per facility

The unit costing exercise uncovered a need for the MOH to reconsider the number of personnel involved in service delivery. The study's findings show a large number of personnel involved in delivery of some services. For example, the PEP program in Bontleng Clinic had only one case and GPH four cases in fiscal year 2013/2014. Yet at Bontleng Clinic, PEP had the highest unit cost of all HIV services; at GPH, it had the third highest cost of all HIV services. Consideration should be given to designating one or two facilities per district as focal points for certain low-demand services to reduce high costs. The remaining facilities would refer their clients to these designated sites.

Availability of expenditure data at DHMT level

The technical team was informed that expenditure data were highly centralized. To obtain the unit cost for each line item, the team was tasked to source data from various line ministries and departments. When found, data were often not aggregated at the facility level, making it difficult to obtain facility-specific costs. For example, some of the utility costs (specifically waste management) were grouped by district rather than by facility cost. In a few instances, the technical team had to derive "best case" assumptions to apply a cost value to the facility. To make the tracking of financial expenditures more robust, an expenditure tracking system could be created at DHMT levels, and staff could be trained accordingly to oversee budgeting and expenditure analysis by district. This approach would greatly improve the fiscal budgeting and planning processes.

COSTS OF COVERAGE FOR KEY DISEASE AREAS COVERED UNDER EHSP

Botswana's 2010 IHSP aims to reorganize the health sector by redefining existing service delivery levels and the types of health services to be offered at each. In early 2010, the MOH unveiled the EHSP as part of its 10-year IHSP. The EHSP is a set or collection of health interventions that seek to "address the main diseases, injuries and risk factors that affect the population" (MOH, GOB, 2010b, page 9). When launched, it will include a set of health interventions to address the main diseases that contribute to the bulk of the disease burden in Botswana; the aim is to make these interventions available universally through public and private facilities at different levels of healthcare. The results of this costing exercise will inform the future development and implementation of the EHSP by providing estimated costs for each service currently included in the EHSP. This costing will help the government to prioritize services, determine which should and should not be included under EHSP, and determine what to charge for each service to ensure sustainable funding for the health sector. Until the EHSP is launched, the government will continue providing all services, within or outside of EHSP, at the current rate.

In response to the MOH's request for technical assistance, the HPP team used the OneHealth model to assess the costs of an array of interventions to inform the design of the EHSP as a social health insurance mechanism and to provide evidence for budget requests. As part of the process of defining the scope of its support of the effort, HPP conducted a learning workshop on the OneHealth tool for the MOH's Technical Working Group for Costing the EHSP.

The team undertook a service mapping exercise to scope and unpack the health services to be assessed. In consultation with MOH, the team undertook costing in two phases. The team assessed eight disease areas in 2013–2014 and the remaining areas in 2014–2015.

MOH program officers and managers and clinicians from PMH, one of the tertiary hospitals in the country and a proxy source for data, were key informants and data sources during this process. To institutionalize the use of OneHealth and ensure that it will be updated regularly to inform the strategic plan development process, the MOH selected and seconded a team of personnel to be trained on its use and application. These trained personnel will serve as technical champions responsible for application of the tool and the annual budgeting process.

METHODOLOGY

OneHealth Tool

The OneHealth model is a tool for medium-term strategic planning in the health sector at the national level. OneHealth is integrated within the Spectrum suite of models, which includes demographic projections derived from United Nations Population Division estimates. It estimates the costs by disease program as well as the implications of using the health system building blocks for delivery of planned targets. OneHealth incorporates pre-existing costing tools and is linked to the other models included in the Spectrum suite: the AIDS Impact Model, the Lives Saved Tool (LiST) for child and maternal health, and other impact tools for TB and reproductive health.

There are several benefits to using the OneHealth Tool: it is flexible and adaptable to any country and context, links programmatic targets to health system costs, estimates costs to inform the strategic planning process, and links health outcomes to financial investments. The results produced by this tool can help Botswana not only to plan financially based on the cost of the activities it wants to implement as part of the EHSP, but also inform the country's strategic plan, objectives, and prioritization process based on the estimated health outcomes and cost per patient for each service. As already mentioned, the tool should be continually updated with actual coverage rates each year and current coverage targets, based on program prioritization.

Costing Methodology

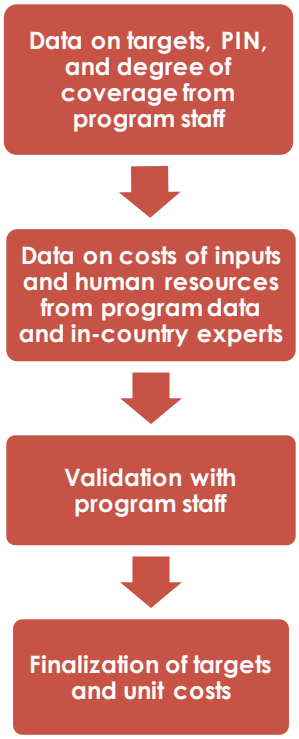
To populate the tool, the team used an ingredients-based approach. The team collected data for each intervention within disease areas for 2013–2018. Six areas had to be filled out for each intervention, as follows:

- Target population: Who MOH will target for the specified intervention (e.g., children ages 0–59 months for oral rehydration salts)
- Population in need (PIN): Percentage of target population requiring intervention
- Coverage: Percentage of PIN receiving or projected to receive intervention
- Treatment inputs:
    - Drugs and supplies at four levels of health
    - Medical personnel time at four levels of health
    - Outpatient and inpatient days at four levels of health
- Delivery channels:
    - Percentage of patient volume at each of four levels of health, by intervention, at baseline and for target years
- Program costs:
    - Program-specific human resources (HR) costs, including personnel salaries at the national, regional, and district levels
    - Number of staff required at the national, regional, and district levels
    - Training costs
    - Supervision costs

- M&E costs
- Infrastructure and equipment costs
- Transport costs (including the purchase of vehicles and their maintenance)
- Communication, media, and outreach costs
- Advocacy costs
- General program management costs

Throughout this report, the team will refer to two types of costs: intervention costs and program costs. Intervention costs include drugs and supplies costs as calculated by the OneHealth tool, based on the target, PIN, coverage, and delivery channels specified. Program costs include the areas outlined above for which data were available.

Figure 8. Data Collection Process



Data collection

A team of data collectors gathered inputs from an MOH-led expert working group of managers and program heads, program staff, and in-country experts (see Figure 8). In the absence of guidance from the working group or availability of country-specific data, the team used regional inputs. The data collection process spanned two periods: August–December 2013 and February–May 2015. For all disease programs, the team created customized data collection sheets. Designed around the OneHealth input process, the team completed the sheets with inputs from key respondents from the disease programs, supplemented with a literature review and data from national and international guidelines. The team assessed a total of 45 disease programs. Each disease area includes several interventions. The team calculated salary and benefits costs across the sector for human resources at the various levels of health, not at the level of each intervention. Due to data limitations, the team used standardized assumptions about the human resources needed across program areas.

The technical team gathered inputs at two levels:

1. **MOH headquarters program officer:** For programs and services offered nationally (at most healthcare facilities or districts across the country), an MOH focal person coordinates and monitors service delivery standards.
2. **Facility-level entities:** Highly specialized services offered at a single facility (tertiary-level hospital, centers of excellence, specialized or centralized services) and not centrally coordinated from MOH headquarters—in such cases, data were collected to assess costs at these specialized facilities: PMH, National Health Laboratory, and National Food Laboratory.

When applicable, the team used information derived from strategic plans to gather data on program/service targets, coverage, and PIN or disease prevalence.

Due to M&E challenges and lack of national representation at MOH headquarters, the team was unable to estimate national statistics, such as prevalence of disease condition or total national PIN for some disease programs. Some data (on targets, PIN, and coverage) represent national figures and disease prevalence; others represent data at a single facility (i.e., PMH). Table 11 below summarizes the service level at which the program is offered and which level the data represent.

Table 11. Program Level and Representation

Program/Service	Program Level	Data Representation	Population Definition
Maternal/Newborn and Reproductive Health	National, based at MOH headquarters	National	S
Child Health	National, based at MOH headquarters	National	S
Immunization (including for human papilloma virus **[HPV])**	National, based at MOH headquarters	National	S
Malaria	National, based at MOH headquarters	National	S
TB	National, based at MOH headquarters	National	S
HIV & AIDS	National, based at MOH headquarters	National	S
Noncommunicable diseases (NCDs)	National, based at MOH headquarters	National	S
Mental, neurological, and substance abuse disorders (MNSADs)	National, based at MOH headquarters	National	S
Environmental and occupational health (E&O)	National, based at MOH headquarters	n/a*	P
Nutrition: National Food Laboratory	National	National	A
Nutrition: rehabilitation program	National	National	A
Nutrition: feeding and malnutrition	National, based at MOH headquarters	National	S
Nutrition and dietetics: treatment and lab	PMH	Facility (PMH)	A
Accident and emergency	PMH	Facility (PMH)	A

Emergency medical services (EMS)	National, based at MOH headquarters	National	A
Cancer: treatment and lab	National, based at MOH headquarters and facility level	National	S
Disease control unit: integrated surveillance	National, based at MOH headquarters	n/a*	P
Disease control unit: neglected tropical diseases treatment and lab	National, based at MOH headquarters and facility level	National	S
Health promotion	National, based at MOH headquarters	n/a*	P
Meningitis	PMH	National	A
M&E	National, based at MOH headquarters	n/a*	P
Nephrology: treatment and lab	National, Center of Excellence	Facility (PMH)	A
Oral health: treatment, laboratory, and surgery	PMH	Facility (PMH)	A
Oral health: school health	National, based at MOH headquarters	n/a*	P
Organ transplant	National, Center of Excellence	National	A
Orthopedic	National, Center of Excellence	Facility (PMH)	A
Prevention of blindness	National, Center of Excellence	National	S
Referred cases	National, based at MOH headquarters	National	A
Dermatology: treatment and lab	PMH	Facility (PMH)	A
Spinalis	National, Center of Excellence	National	A
Surgery	PMH	Facility (PMH)	A

*n/a: Only program costs were collected for these service areas.

A: Number of patients based on admission rates or actuals.

S: Number of patients determined by the strategic plan or program objectives in consultation with program staff.

P: Programs with program management costs only.

Data validation: The technical team presented preliminary findings to experts and program heads within the MOH to ensure data accuracy. Experts highlighted several areas for revision and provided the team with more up-to-date information and sources, when available.

Currency and inflation: All costs were estimated in 2013 U.S. dollars. Due to a lack of data on the potential inflation in the prices of drugs and supplies, the team used costs that were fixed over the period of the cost analysis. The team used the average exchange rate (US$1: 9.14 Botswana Pula) for 2013 as a constant throughout the projected period.

Management Costs of Health Systems (Training, Supervisory Visits, etc.): Due to ongoing plans to restructure, MOH is still formulating strategic plans for several disease areas, as well as health system components. Hence, the team found it difficult to obtain data on some of these components. For example, facility furniture and equipment costs were available, but the number of new facilities and their costs, as

well as data on facilities in need of rehabilitation, were unavailable. The MOH and the technical team discussed updating health systems projections pending availability of strategic plans and data on health system components.

RESULTS AND DISCUSSION: OVERALL FINANCIAL RESOURCES REQUIRED

Total Costs of the EHSP, 2013–2018

Table 12 shows the results of the analysis of 45 disease areas that constitute the majority of the disease burden in Botswana. Complete coverage (including the gamut of interventions) is projected to require at least US$4,656.3 million for 2013–2018. This includes costs of drugs, supplies, and program-specific costs (i.e., staff, training, and supervision, if provided). Nutrition programs account for the largest percentage of total costs, at US$1,532 million over six years. HIV and NCDs make up the second and third largest costs under the EHSP. In sum, nutrition, HIV, and NCDs constitute around US$2,975.6 million, or about 60 percent of the total costs over the six-year period. All data were calculated by the the team, using the OneHealth model. Specific interventions under each disease area and data sources for all inputs are listed in Annex D.

Table 12. Costs Disaggregated by Program Area for 2013–2018, in 2013 US$ millions*

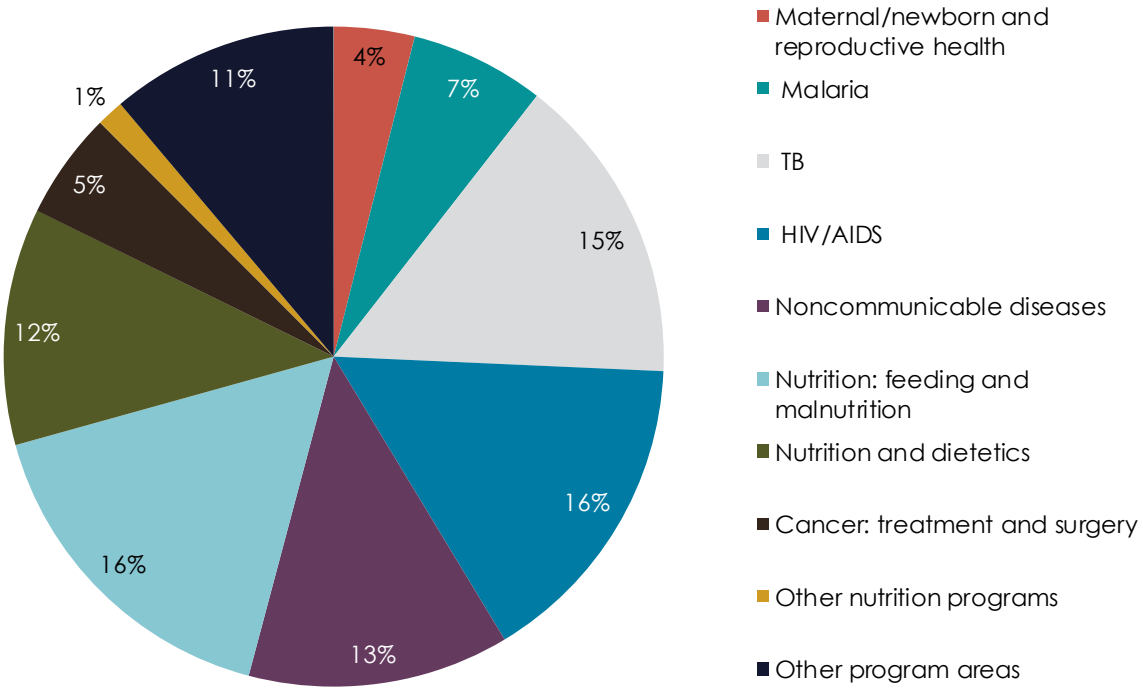
Disease Areas	2013	2014	2015	2016	2017	2018	Total
Maternal/newborn and reproductive health	$ 25.1	$ 25.1	$ 26.7	$ 28.5	$ 30.4	$ 30.6	$ 166.5
Malaria	$ 41.8	$ 42.7	$ 44.2	$ 46.2	$ 47.4	$ 48.1	$ 270.5
TB	$ 96.4	$ 89.4	$ 82.6	$ 76.3	$ 77.5	$ 77.5	$ 499.7
HIV/AIDS	$ 99.4	$ 110.6	$ 125.9	$ 135.8	$ 145.1	$ 150.0	$ 766.8
Noncommunicable diseases	$ 81.2	$ 93.8	$ 106.1	$ 119.4	$ 133.6	$ 142.4	$ 676.5
Nutrition: feeding and malnutrition	$ 105.1	$ 99.4	$ 111.7	$ 221.7	$ 112.8	$ 116.3	$ 767.0
Nutrition and dietetics	$ 73.6	$ 77.4	$ 85.2	$ 94.1	$ 103.2	$ 113.3	$ 546.7
Cancer: treatment and surgery	$ 33.3	$ 34.2	$ 35.7	$ 36.9	$ 38.4	$ 40.0	$ 218.5
Other nutrition programs[1]	$ 8.4	$ 8.3	$ 9.2	$ 9.9	$ 9.7	$ 11.8	$ 57.2
Other program areas[2]	$ 70.9	$ 84.3	$ 109.8	$ 130.2	$ 127.1	$ 164.5	$ 686.8
Total	$ 635.1	$ 665.2	$ 737.2	$ 899.0	$ 825.1	$ 894.6	$ 4,656.3

* Values have been rounded to integers. Totals may not be exact.

[1] Includes rehabilitation program, food lab, and nutrition and dietetics lab.

[2] Includes other programs in the study listed in Table 11.

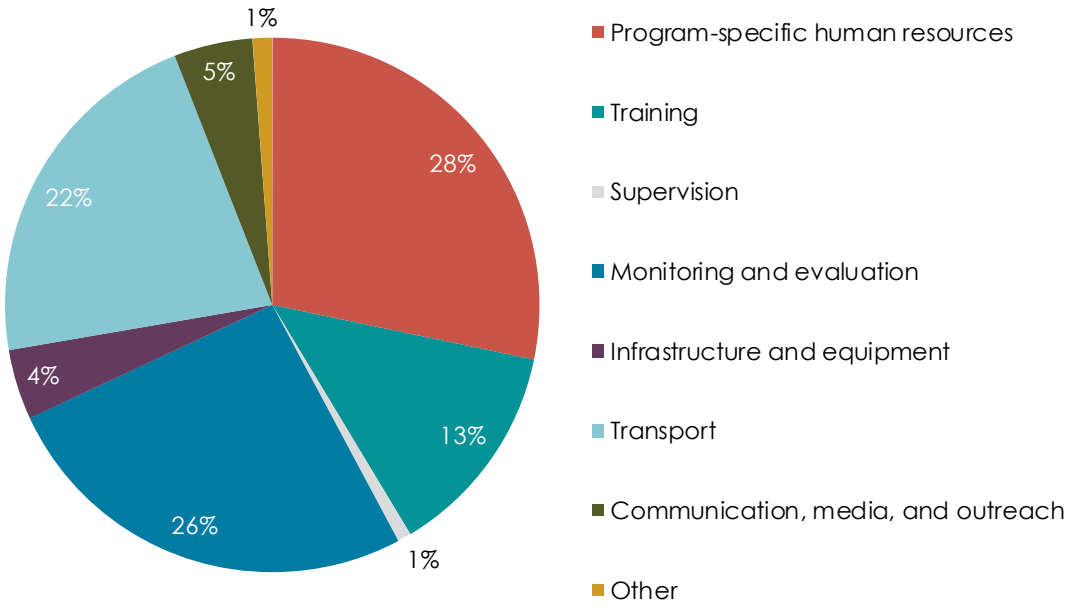
Figure 9. Percentage of Total Cost, by Program Area, 2013–2018



Programmatic costs, such as human resources, training, advocacy, transport, and M&E account for 9 percent of the total costs for EHSP. The major cost drivers are program-specific human resources, M&E, and transport (see Figure 10 below).

Program costs for the nutrition: malnutrition and feeding program account for 26 percent of the total. The data show a spike in M&E costs in 2016 and minimal costs for the other years. At 22 percent, EMS is the second largest contributor to overall program costs. Transport is the main cost driver in the EMS program; program officers expect these costs to increase from 2013–2018 due to the expansion of EMS in other areas of the country, including the costs to buy and maintain vehicles and equipment.

Figure 10. Percentage of Total Program Management Costs, by Major Area (2013–2018)



RESULTS AND DISCUSSION: RESOURCES BY DISEASE AREA

Maternal/Newborn and Reproductive (MNR) Health

Strategic objectives

Between 2011 and 2012, the maternal mortality ratio (MMR) in Botswana decreased by 21.7 percent, from 188.9 to 147.9 per 100,000 live births. Although HIV incidence is high, it is not the main cause of maternal deaths. The majority of such deaths are attributable to immediate postpartum hemorrhage, followed by gestational pregnancy-induced hypertension (Statistics Botswana, GOB, 2014b). Botswana's National Roadmap for Accelerating the Reduction of Maternal and Newborn Mortality and Morbidity (2008) outlined some key objectives for reducing maternal mortality rates by 2013:

- Strengthen utilization of policy guidelines, protocols, and service standards in maternal and newborn healthcare by all service providers
- Provide skilled attendance during pregnancy, childbirth, and the postnatal period at all levels of the healthcare system
- Equip all health facilities with the required equipment and supplies in accordance with national health standards
- Strengthen information, education, and communication/behavior change communication community-oriented strategies
- Strengthen M&E activities at the district and national levels

Data Sources

Targets: The maternal and reproductive health program office provided the technical team with the baseline coverage for family planning, safe abortion, pregnancy and childbirth care, postpartum care, and sexual health, with targets to be achieved by 2018. The team entered the numbers to be achieved, by intervention, directly into OneHealth.

Scale-up of interventions

MOH program officers outlined some ambitious targets in the case of some interventions. The MNR health program aims to increase coverage of hypertensive disease management from a current baseline of 6.2 percent of PIN to 30 percent by 2017. Similarly ambitious targets have been laid out for management of pre-eclampsia (from 4.7% baseline to 50% by 2018) and other pregnancy complications (33.5% baseline to 70% by 2017). Given that the majority of maternal deaths are attributable to these complications, careful monitoring is essential to ensure that scale-up is on track.

Cost results

Total costs: The MNR health program will likely cost a minimum of US$166 million over six years. Total costs by year are shown in Table 13.

Total 2013–2018 MNR health costs:

$166,489,261

Table 13. Total Costs for Maternal/Newborn and Reproductive Health, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$23,649,967	$23,671,907	$25,237,735	$27,086,476	$28,947,508	$29,175,325	$157,768,918
Program costs	$1,453,391	$1,453,391	$1,453,391	$1,453,391	$1,453,391	$1,453,391	$8,720,343
Total costs	$25,103,358	$25,125,298	$26,691,126	$28,539,866	$30,400,898	$30,628,716	$166,489,261

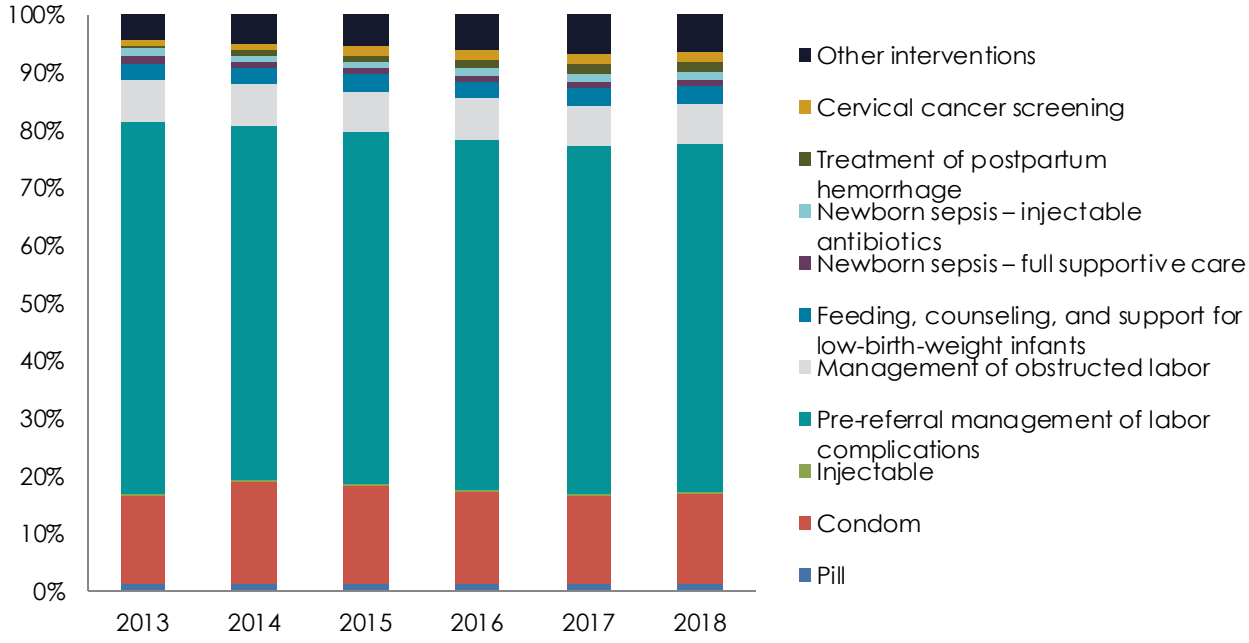
* Values have been rounded to integers. Totals may not be exact.

In this case (as in other disease areas), obtaining data on all program costs proved difficult. The program cost estimates cited below include only costs of MNR-specific human resources who do not provide direct service delivery. The team also included training costs when available. These costs represent the minimum investment required. Estimates will likely be higher when costs of M&E, infrastructure, advocacy, communication, and community mobilization are taken into account. In-service training and training of trainers are included in the program costs. This heading includes training workshops on emergency obstetric care, managing labor complications, managing pregnancy hypertension, and complications in newborns. Overall, program costs represent 5 percent of the total cost.

Program costs (human resources and training) are projected to be only 5 percent of the total MNR costs. This very likely is an underestimate, for the reasons mentioned earlier.

Of the 43 interventions covered under the MNR health program, pre-referral management of labor complications and condoms are the main cost drivers, projected to account for 61 percent and 16 percent of the total costs over the six-year time frame, respectively (see Figure 11). Increasing the focus on interventions targeted to postpartum care (such as postpartum hemorrhage), which are estimated to account for 4 percent of the total costs in 2013, could have a greater impact on maternal mortality rates.

Figure 11. Composition of MNR Health Drugs and Supplies Costs, 2013–2018



*33 other interventions add 5.8% of the costs.

Key issues and areas for further analysis

Quality of data: Although the technical team validated the baseline coverage figures, PIN, and targets with the program staff at MOH, these figures have not been assessed against population-level goals (i.e., actual numbers requiring coverage).

Areas for further analysis: A more detailed analysis of M&E, infrastructure, and communication costs could help program managers get a better estimate of program costs. An impact analysis that could help correlate reduction of the MMR with increases in spending on interventions might lead to a more efficient allocation of resources.

Child Health

Strategic objectives

The *National Health Service Situation Analysis Report* (MOH, GOB, 2009) details the major causes of infant (less than one year old) mortality, defined as the number of infants dying before reaching one year of age per 1,000 live births in a given year, and states that this number was around 41 in 2012 (World Bank, n.d.). Diarrhea and pneumonia account for a majority of the total child (less than five years old) deaths (16.2% and 16.6%, respectively). Table 14 shows the percentages attributable to the main illnesses. More than 40 percent of infant mortality occurs during the neonatal period, and more than 90 percent occurs within one day of birth (MOH, GOB, 2009). The Accelerated Child Survival and Development Strategic Plan 2009 identifies the interventions that would significantly reduce the impact of these diseases: expanding oral rehydration therapy provision, improving access to effective pneumonia treatment, providing greater immunization coverage, and expanding the use of insecticide-treated bed nets (ITNs). The GOB followed through on the strategies outlined in this document and committed resources to introduce zinc to treat diarrhea, add Hib vaccine to the pentavalent vaccine, provide vitamin A supplementation, and provide free ITNs to children under five and pregnant women in malaria-endemic areas. According to the Revised National Health Policy (2011), the target is to reduce the infant mortality rate from 56 (per 1,000) during the period 2002–2006 to 16 by 2015, and the under-five mortality rate from 74 (per 1,000) during the period 2002–2006 to 21 by 2015.

Table 14. Major Causes of Childhood Mortality in 2006, as a Percentage of Total Deaths

Disease/Condition	2006
Pneumonia and other respiratory infections	16.5%
Diarrheal diseases	27%
HIV	2%
Septicemia	4.9%

Source: National Health Service Situation Analysis Report (2009).

Scale-up of interventions

Coverage for the diseases that contribute to child mortality—pneumonia and diarrhea—appears to be low. Currently, around 37 percent of children needing pneumonia treatment are reached. Baseline coverage for oral rehydration therapy for diarrhea management is almost 43 percent, and 32 percent for zinc used in diarrhea management. Coverage for Vitamin A administered to children—both for measles and xerophthalmia—appears to be high, at more than 90 percent. In both cases, this rate is high because vitamin A supplementation is offered to children between ages six months and five years (for measles) and one to five years (for xerophthalmia) as a prevention mechanism, not a form of treatment. In all cases,

program managers aim to reach 100 percent coverage by 2017. Given that the majority of child deaths are attributable to two diseases (diarrhea and pneumonia), careful monitoring is essential to ensure that scale-up is on track.

Cost results

Total costs: The child health program will cost a minimum of US$6.9 million over six years. Total costs by year are shown in Table 15 below. Costs of intervention implementation (drugs and supplies) make up the largest share of total costs (78%). Program cost estimates include only human resources and in-service refresher training for nurses, pharmaceutical technicians, and assistants. More robust estimates on M&E costs, infrastructure, advocacy and communication, and community mobilization will yield a closer estimate of program costs.

Total 2013–2018 child health costs:

$6,987,268

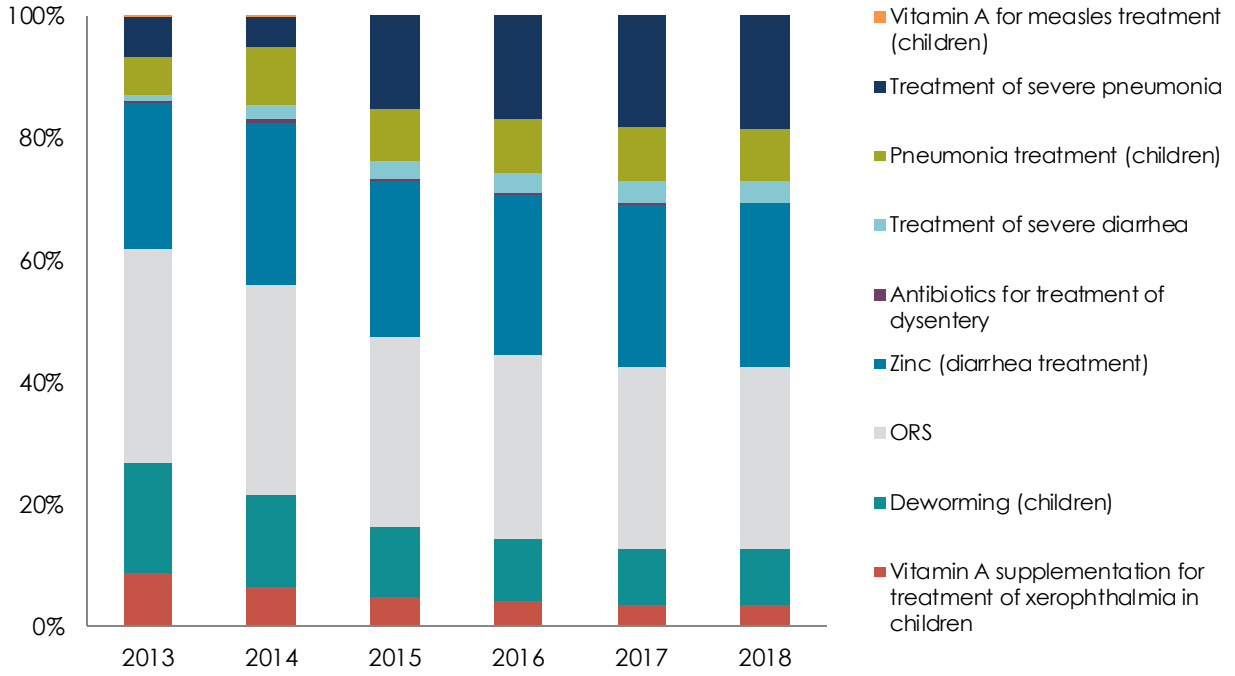
Table 15. Total Costs for Child Health, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$502,116	$634,594	$866,598	$1,043,616	$1,226,783	$1,206,269	$5,479,977
Program costs	$251,215	$251,215	$251,215	$251,215	$251,215	$251,215	$1,507,291
Total costs	$753,331	$885,809	$1,117,813	$1,294,831	$1,477,999	$1,457,485	$6,987,268

* Values have been rounded to integers. Totals may not be exact.

From Figure 12, it is clear that resources are being targeted toward the two biggest contributors to child mortality—pneumonia (23% of total costs) and diarrhea management (60.7%). The latter includes oral rehydration solution (ORS), zinc therapy, antibiotics for treatment of dysentery, and treatments for severe diarrhea. Costs for ORS (31% of total drug and supplies costs) and zinc therapy (26%) are the main cost drivers within the child health program, followed by treatment of severe pneumonia (15%) and deworming in children (11%). A continued focus on interventions targeted to diarrhea and pneumonia will have a greater impact on reducing child mortality rates.

Figure 12. Composition of Child Health Drugs and Supplies Costs, 2013–2018



Key issues and areas for further analysis

Quality of data: Data quality for some of the inputs in the child health program is not robust. The child health program provided the specific targets. These programmatic targets need to be reassessed, especially when additional information on program costs and intervention coverage is available. Thus, the technical team had difficulty in assessing clear strategic objectives for achieving improved child health.

Areas for further analysis: The program and technical partners should conduct a thorough assessment of all coverage numbers for the interventions listed under child health in the EHSP. Further clarity in the actual number of children requiring treatment will help the program office better assess whether diseases that contribute to a majority of mortality are being addressed aggressively.

Immunization

Strategic objectives

Per the Revised National Health Policy (2011), measles immunizations rates were around 74 percent during the period 2002–2006, with a targeted rate of 100 percent coverage by 2015. In 2009, GOB estimates pegged the overall immunization rate at 90 percent for a full course of vaccines between 12 and 23 months of age (MOH, GOB, 2009). The main issue identified had to do with quality—too many doses being given too early or within short intervals.

The MOH's 2010 report on the EHSP for Botswana recommends the following:

- All clinics provide immunizations for at least five days a week
- A child health coordinator monitors clinics' Expanded Program on Immunization (EPI) coverage, vaccine supplies, and cold chain every quarter

- A senior EPI-trained member of staff acts as a focal point for EPI programs

Data sources

Targets: Once again, the immunization program team provided the requisite inputs on current coverage levels of vaccines and targets to be achieved by 2017. The team entered the targets directly into OneHealth.

Scale-up of interventions

Current coverage estimates range between 90 percent for the tetanus vaccine and 99 percent for the Bacille de Calmette et Guérin (BCG) vaccine. Overall, coverage levels for immunization among children are very high. Once again, in all cases, program managers aim to achieve 100 percent by 2017.

Cost results

Total costs: The immunization program will cost a minimum of US$109 million over five years. The HPV vaccine service alone will likely cost a minimum of US$73.4 million over six years. Total costs by year are shown in Table 16. Intervention costs include 11 vaccines—measles, pentavalent, hepatitis B, polio, BCG, pneumococcal, HPV, yellow fever, rotavirus, tetanus, and diphtheria-pertussis-tetanus (DPT).

Total 2013–2018 immunization costs:

$109,367,101

Table 16. Total Costs for Vaccines and Supplies, in 2013 US$*

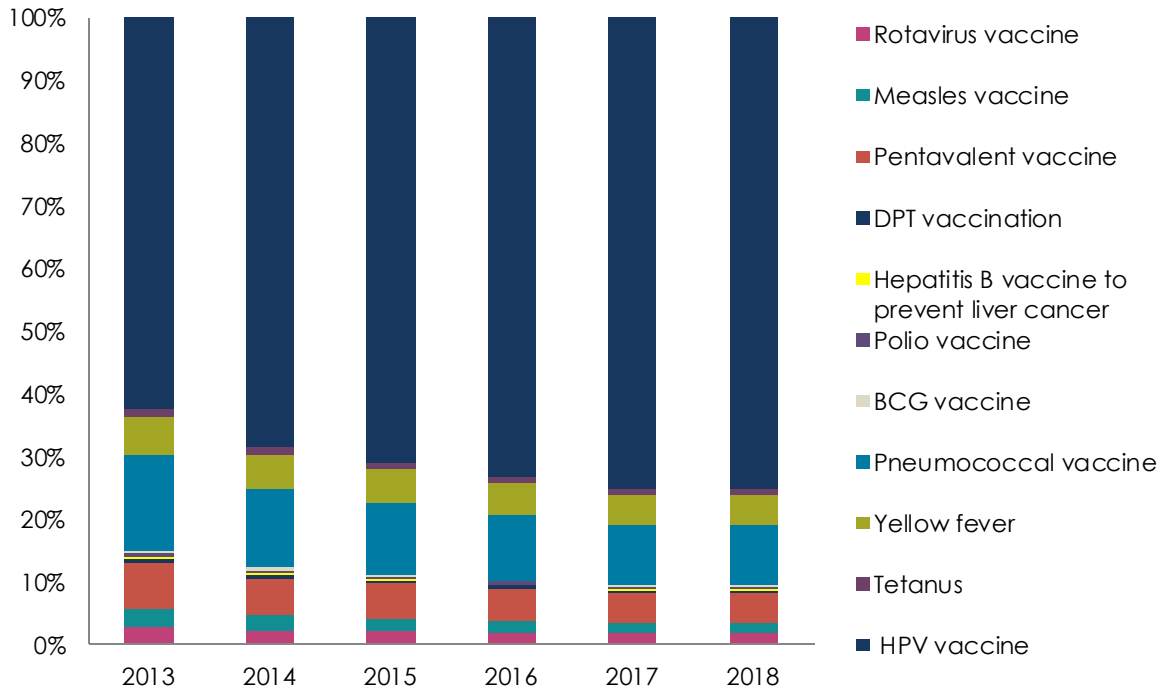
Immunization	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$13,617,189	$14,953,243	$16,398,318	$18,068,507	$19,713,659	$19,955,953	$102,706,869
Program costs	$1,110,039	$1,110,039	$1,110,039	$1,110,039	$1,110,039	$1,110,039	$6,660,231
Total costs	$14,727,228	$16,063,281	$17,508,357	$19,178,545	$20,823,698	$21,065,991	$109,367,101

* Values have been rounded to integers. Totals may not be exact.

Program management accounts for around 6 percent of total costs. This category includes only the costs of human resources—logistics experts, health education assistants, social workers, counselors, and nutrition officers. These costs will likely increase once estimates on M&E, infrastructure, advocacy and communication, and community mobilization are added.

Intervention costs for the HPV vaccine is the main cost driver. This fact is not surprising, since the HPV vaccine is relatively new and more expensive; it contributes to 71 percent of the total costs over six years. At 11 percent, pneumococcal vaccine is the second most expensive intervention. The pentavalent and yellow fever vaccines make up 5 percent each of the total costs. Measles vaccine costs make up only 2 percent of the costs over six years (see Figure 13).

Figure 13. Composition of Immunization Drugs and Supplies Costs, 2013–2018



Data sources

Targets: The team obtained data on immunization rates from the WHO Immunization Surveillance database (WHO, n.d.) and validated them with program managers. Cervical cancer is one of the priority disease targets for Botswana. As a result, in 2013, the MOH launched an HPV vaccine demonstration project, followed by national scale-up in 2015. It is the ministry's intention to target both school-going and out-of-school girls ages 9–13 years old. The cost estimates are indicative of the scale-up efforts. The program anticipates scale-up coverage from 65 percent in 2013 to 100 percent in 2017 to meet national targets over the next six years.

Areas for further analysis

Program managers could focus on reassessing targets to refocus attention on improving the quality of administration (tackling invalid dosing). Scaling up interventions will require many resources and an increased coordination with logistics and human resources to ensure that commodities and staff are available to undertake this increase in coverage. Currently, only intervention costs have been estimated for the HPV vaccine. Recognizing that the primary prevention of cervical cancer involves prevention of the HPV infection, program costs should be estimated to support scale-up of social mechanisms, such as education and awareness campaigns to reduce high-risk sexual behavior, and thus complement scale-up of HPV vaccination.

Malaria

Strategic objectives

Botswana's updated *Malaria Strategic Plan 2010–2018* defines key objectives for reducing malaria incidence by 2015:

- Develop the requisite capacity in the program at all levels to achieve malaria elimination

- Develop a robust information system for tracking of progress and decision making by 2015
- Achieve total coverage of all appropriate vector control interventions in all transmission foci; detect all malaria infection through appropriate diagnostic methods and provide effective treatment
- Reach at least 90 percent of the population with appropriate information on malaria prevention to effect behavior change so as to scale up elimination interventions

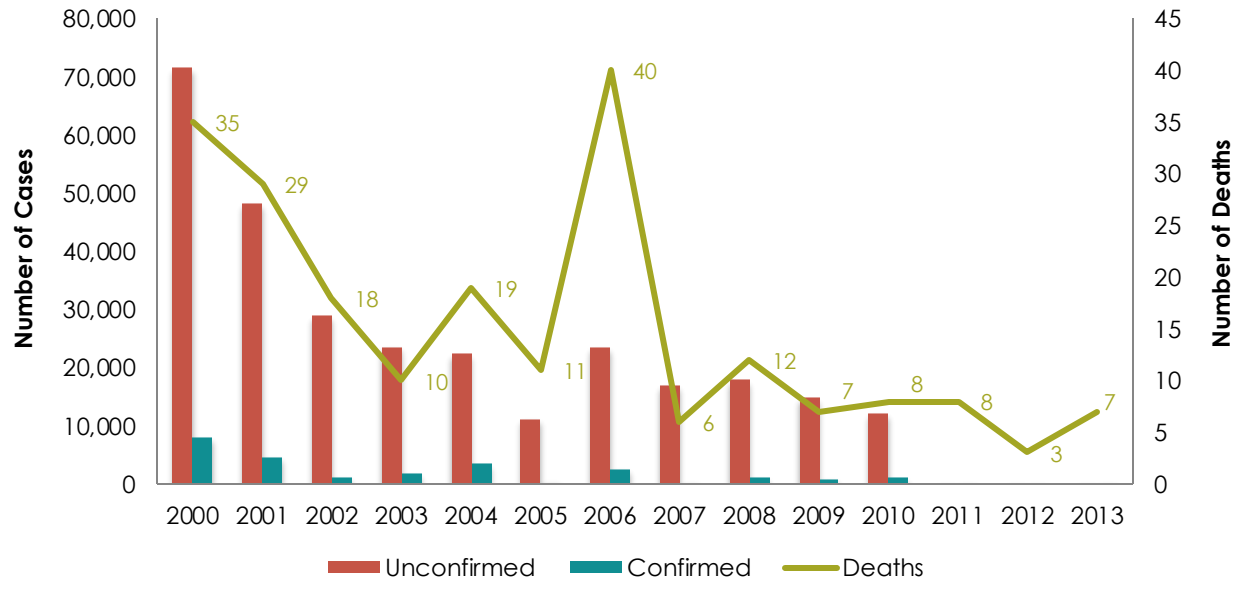
Data sources for the cost analysis

Targets: The team obtained data on baseline coverage and target numbers for insecticide-treated materials, pregnant women sleeping under an ITN, indoor residual spraying (IRS), surveillance, malaria treatment, larval control, and chemoprophylaxis from the program office, the *Botswana National Malaria Policy (2011)*, and the *Malaria Strategic Plan 2010–2018*. Team members entered the numbers to be achieved, by intervention, directly into OneHealth.

Scale-up of interventions

Malaria interventions are provided in six endemic districts: Okavango, Ngami, Chobe, Boteti, Tutume, and Bobirwa. Of note, malaria testing (in cases of fever) is provided nationally (endemic and non-endemic areas). To estimate the expected annual number of fever cases that would require testing, the malaria program office assesses the average number of malaria cases in the past five years (confirmed and unconfirmed) and adds an additional 20 percent as safety stock. The program implements active surveillance in all districts. When a case of malaria is reported, health workers screen all neighbors up to 100 meters surrounding the case. To calculate the number of tests needed for this surveillance, the program office multiplies the average number of positive cases in the past five years by 50—the average number of people expected to be screened against each case. The total number of tests required is the sum of tests required for screening fever cases plus tests required for active surveillance. Only patients who test positive for malaria have been treated since the adoption of the malaria elimination campaign in 2010. Figure 14 shows annual malaria cases since 2000. The number of cases has dropped dramatically since the early 2000s.

Figure 14. Malaria Cases and Deaths, 2000–2014



Source: Botswana MOH Malaria Program.

As with other program areas, the malaria program also has ambitious prevention-related targets. Three interventions in particular will require considerable resources to reach 100 percent implementation by 2017: surveillance (currently at 50%), insecticide-treated materials (70%), and larval control (75%). The two main vector control interventions are long-lasting insecticidal nets (LLINs) and IRS. LLINs are currently distributed and IRS is done in the six endemic districts, whereas winter larviciding is currently done in three districts (Bobirwa, Boteti, and Tutume). All suspected malaria cases are confirmed with microscopy and/or rapid diagnostic test.

Cost results

Total costs: The malaria program is expected to cost at least US$270 million over six years of the EHSP. Total costs by year are shown in Table 17. Costs are projected to remain relatively stable throughout this period. About 96 percent of total malaria program costs are for drugs and commodities. The team based estimates on program costs on inputs from program managers, the *Malaria Strategic Plan (2010–2018)*, and *Botswana National Malaria Policy (2011)*. Program costs include the costs of human resources; in-service refresher training; and development of a communication strategy, mass media campaigns, and social outreach activities. Program management costs, which include human resources and communication and training costs, account for around 4 percent of total costs. This will likely increase when costs of M&E and advocacy planning are added.

Total 2013–2018 malaria costs:

$270,501,376

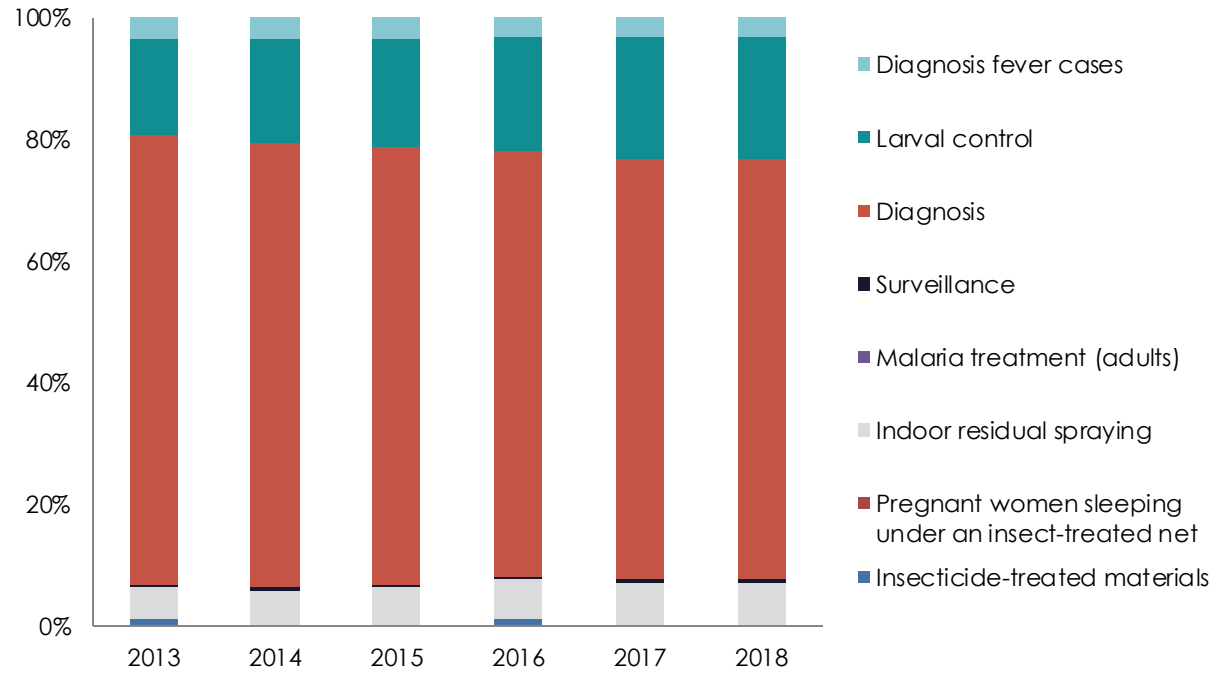
Table 17. Total Costs for Malaria Program, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$39,904,493	$40,775,680	$42,286,579	$44,284,900	$45,483,123	$46,205,737	$258,940,512
Program costs	$1,926,811	$1,926,811	$1,926,811	$1,926,811	$1,926,811	$1,926,811	$11,560,864
Total costs	$41,831,304	$42,702,491	$44,213,390	$46,211,711	$47,409,933	$48,132,548	$270,501,376

The bulk of malaria drugs and commodity costs over 2013 to 2018 are attributable to the costs of tests for diagnosis (71%) (see Figure 15), larval control at 18 percent, and around 6 percent for IRS, which is provided yearly between October and December in endemic areas. IRS is provided in other areas in cases of malaria outbreak.

During winter, breeding sites become more localized and limited in number. Winter larviciding was introduced in 2012 with a pilot in Bobirwa and since has been rolled out to Boteti and Tutume (MOH, GOB, 2010e). Insecticide-treated materials, which include LLINs, make up only around 1 percent of the total costs of drugs and supplies. LLINs currently are distributed in the six endemic districts, targeting transmission foci (MOH, GOB, 2010e). Current first-line treatment for malaria is artemisinin-based combination therapy, with quinine being the preferred second-line treatment.

Figure 15. Composition of Malaria Drugs and Supplies Costs, 2013–2018



Key issues and areas for further analysis

The malaria program provided specific targets on intervention coverage. It uses passive surveillance to detect malaria cases as the detection method (MOH, GOB, 2011c). A more active surveillance plan, including malaria surveillance officers in districts (MOH, GOB, 2010e), robust data collection, and mapping at the district level, would help early detection. Malaria treatment costs are almost negligible when compared with the costs for diagnostics, given the protocol for testing within and outside of the endemic areas. This could be due to a problem with the input numbers collected by the team or incorrect data compilation. The technical team recommends updating this model with correct treatment costs to get a more accurate estimate of resource needs. Further, an impact analysis of interventions would help to better target resources to those that actually result in reductions in the incidence of malaria.

Tuberculosis

Strategic objectives:

The *National TB Strategic Plan 2008–2012* outlines the following specific targets:

- Detecting 70 percent of new smear-positive index cases
- Achieving bacteriologic coverage of 80 percent
- Achieving HIV testing rates of 90 percent among all TB patients
- Getting 90 percent of HIV co-infected TB patients to start on ART
- Successfully treating 85 percent of all TB patients
- Reducing the death rate due to TB to less than 8 percent
- Reducing treatment failure and defaulter rates to less than 1 and 5 percent, respectively

Data sources for the cost analysis

Targets: Data sources for the inputs on the TB program included the TB program managers, the *2011 National Tuberculosis Programme Manual* (MOH, GOB, 2011d), and the *Botswana Tuberculosis and*

Leprosy Programme Annual Report 2012 (MOH, GOB, 2012b). These sources yielded baseline and target coverage information on TB notification and treatment (including first-line treatment for children and adults, contact tracing, and extrapulmonary TB), multi-drug resistant TB (MDR-TB), and collaborative TB plus HIV/AIDS interventions. The team entered the numbers to be achieved, by intervention, directly into OneHealth.

Scale-up of interventions

Despite a sustained decline in notification rates, TB incidence in Botswana is still high—408 per 100,000 people in 2012 (MOH, GOB, 2011a). Early diagnosis is done using sputum smear microscopy. Botswana's southwestern regions suffer the highest burden of the disease. Of the 6,829 cases of TB reported in 2012, 85 percent were new cases, whereas the rest were retreatment cases; 55 percent were males; and 8 percent of the total were children under the age of 14 (MOH, GOB, 2011a). The program office provided a scale-up target of 70 percent by 2017 for first-line TB treatment for children (at 45% in 2013). The program also aims to raise TB contact tracing from a baseline of 80 to 100 percent coverage by 2017 and MDR-TB notification among new and previously treated patients from 10 to 35 percent by 2017. Botswana has been successful in implementing universal "directly observed therapy, short course," or DOTS, treatment.

Cost results

Total costs: The TB program is the third most expensive under the EHSP, accounting for 10 percent of the total costs. Total costs by year are shown in Table 18 below. As with some other diseases, costs for drugs and supplies make up a bulk of total costs. The team based the estimates of program costs on inputs from program managers, the *TB/Leprosy Report 2011*, and the *Botswana National Tuberculosis Program Annual Report 2010–2011* (MOH, GOB, 2011a). Program costs (0.9%) include the costs of human resources—specifically a TB focal person, physician, manager, laboratory technician, pharmacy technician, health education officer, and nurses. The costs also include some in-service refresher training. Estimates will likely be higher when the costs of M&E, infrastructure, advocacy, communication, and community mobilization have been taken into account.

Total 2013–2018 TB costs:

$499,654,733

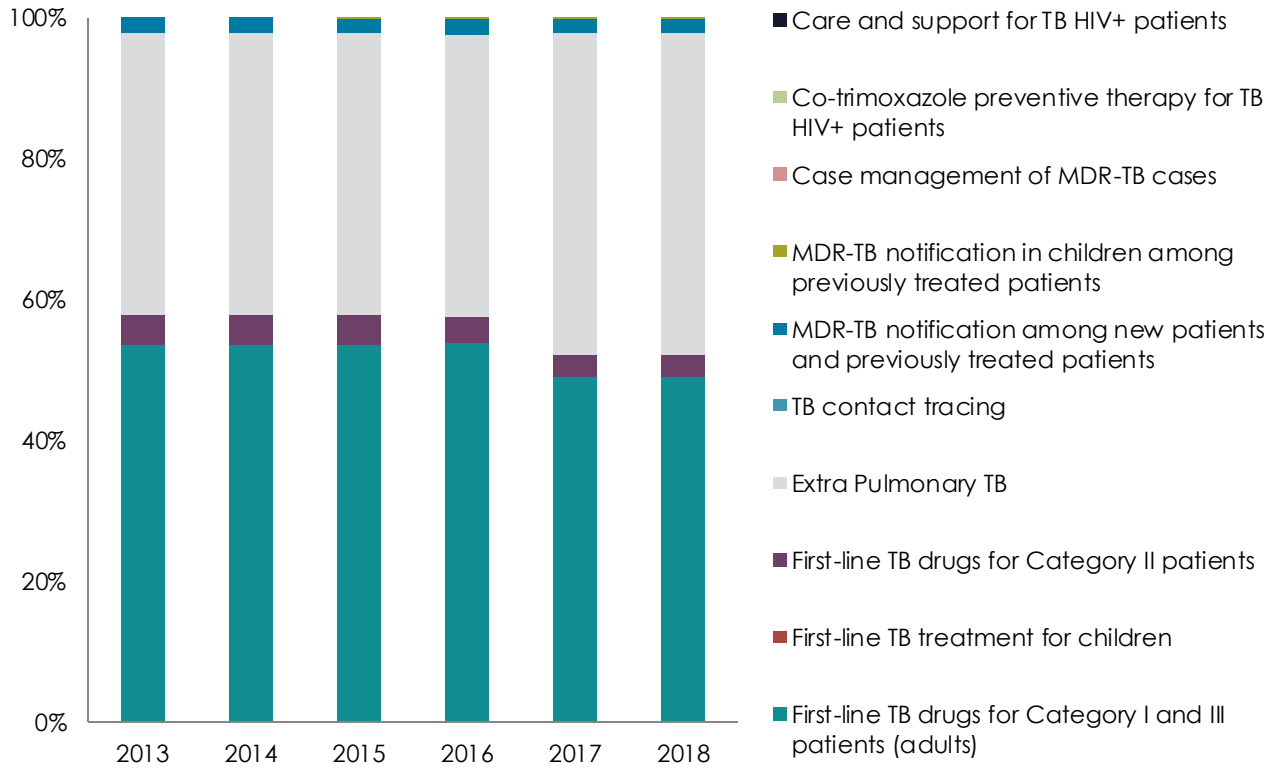
Table 18. Total Costs for TB, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$95,650,246	$88,628,461	$81,843,794	$75,519,229	$76,677,198	$76,677,198	$494,996,126
Program costs	$788,123	$774,097	$774,097	$774,097	$774,097	$774,097	$4,658,607
Total costs	$96,438,369	$89,402,557	$82,617,891	$76,293,325	$77,451,295	$77,451,295	$499,654,733

* Values have been rounded to integers. Totals may not be exact.

The bulk of resources (96%) are used for TB notification and treatment interventions (see Figure 16). This includes first-line drug treatment for patients; first-line treatment for children; treatment for extrapulmonary TB; and TB contact tracing. Only about 2 percent of the total intervention costs were devoted to MDR-TB, which is appropriate because of its low prevalence. Between 2006 and 2012, only 541 cases of MDR-TB were confirmed by the National Tuberculosis Reference Laboratory (MOH, GOB, 2012b). The main cost driver interventions are first-line TB drugs for categories I and III for adult patients and extrapulmonary TB, comprising 52 percent and 42 percent of the total costs, respectively.

Figure 16. Composition of TB Drugs and Supplies Costs, 2013–2018



Areas for further analysis

As in the case of other disease programs, assessing the impact of interventions, particularly those for TB notification and treatment, could help narrow the focus to those that have the most impact. Additionally, in the case of some interventions, further study is required to assess diagnosis rates. For example, 15 percent of total TB cases are coming in for retreatment—further analysis may indicate that MDR-TB cases are being under-diagnosed. Increasing coverage for TB contact tracing (from 80% to 100%) also will require much more investment, especially since achieving 100 percent will require considerable resources (logistics, infrastructure, and human resources) to reach cases in remote areas. In addition, as interventions are scaled up, there is a greater need for more specialized staff (laboratory, physicians, etc.), more equipment (X-ray machines, laboratory equipment), and transport of additional supplies. Better communication between the program and health systems is needed to ensure the success of these interventions.

HIV

Strategic objectives

Reducing Botswana's high HIV/AIDS burden is a national priority. The BAIS IV Summary 2014 estimates a national prevalence rate of 18.5 percent among the population ages 18 months and over, an increase from 17.6 percent in 2008. The HIV incidence rate is estimated at 1.35 percent (Statistics Botswana, 2013), compared with 1.45 percent in 2008 (CSO, GOB, 2008). The prevalence rate among females is higher, at 20.8 percent, compared to 15.6 percent for men. The *National Strategic Framework for HIV and AIDS 2010–2016* outlines the strategic objectives to be met by 2016:

- Reduce the incidence of sexual transmission of HIV among females and males ages 10–49 years
- Increase access to healthcare services for HIV prevention

- Strengthen community and health systems' capacity for universal access to quality, comprehensive, and sustainable HIV and AIDS services
- Effectively coordinate, harmonize, and align stakeholder support to the national response at all levels
- Strengthen and sustain political leadership and commitment on HIV and AIDS at all levels
- Improve the ethical and legal environment to support the national response
- Strengthen the information management system of the national response to enhance information sharing and utilization
- Increase access to HIV and AIDS comprehensive quality treatment, care, and support services

Data sources for the cost analysis

Targets: Data sources for inputs on the HIV program included the *2012 Botswana National HIV & AIDS Treatment Guidelines* (MOH, GOB, 2012a), BAIS III, BAIS 2014 Summary, AIDS experts in the country, and program managers. These sources yielded baseline and target coverage information on prevention interventions (PMTCT, male circumcision, voluntary counseling and testing [VCT], condoms); care and treatment (adult and pediatric ART, nutrition supplements, management of opportunistic infections [OIs]); and HIV plus TB interventions. The team entered the numbers to be achieved, by intervention, directly into OneHealth.

Scale-up of interventions

HIV prevalence rate is at its peak between ages 35 to 39 (43.7%) and 45 to 49 years (41.8%). Male and female infections peak at different ages: prevalence is at 50 percent for women ages 35–39 years. For men, prevalence peaks at 43.8 percent in the 40–44 age group. Prevalence is higher in urban areas (19.1%) than rural areas (17.4%). The program office provided the scale-up targets for interventions. Baseline coverage for care and treatment interventions is high—90 percent and above for adult and pediatric ART coverage and diagnostics—so achieving 100 percent by 2017 seems feasible. Coverage for some prevention interventions is low (e.g., male circumcision, currently at 26%, with a target of 80% coverage by 2017).

Cost results

Total costs: Given that the high incidence and prevalence of HIV is one of Botswana's key challenges, it is unsurprisingly the second most expensive disease area covered under the EHSP, at more than US$766 million. (These costs assume that eligibility remains at CD4 350 through 2018.) Total costs by year are shown in Table 19.

Total 2013–2018 HIV costs:

$766,836,037

The program costs (0.2% of total costs) reflected in Table 19 do not capture the full gamut of service provision. They include costs of program staff who do not deliver services and costs of in-service refresher training for doctors, nurses, and pharmacists on the fundamentals of HIV care, ART guidelines, medication adherence, and palliative care. Provision of care for HIV is more expensive when compared to these costs for other interventions; thus, inclusion of infrastructure and equipment costs, transport, communication and advocacy, and M&E, as well as a fuller accounting of the personnel involved, will help program managers arrive at a more accurate estimate of program costs.

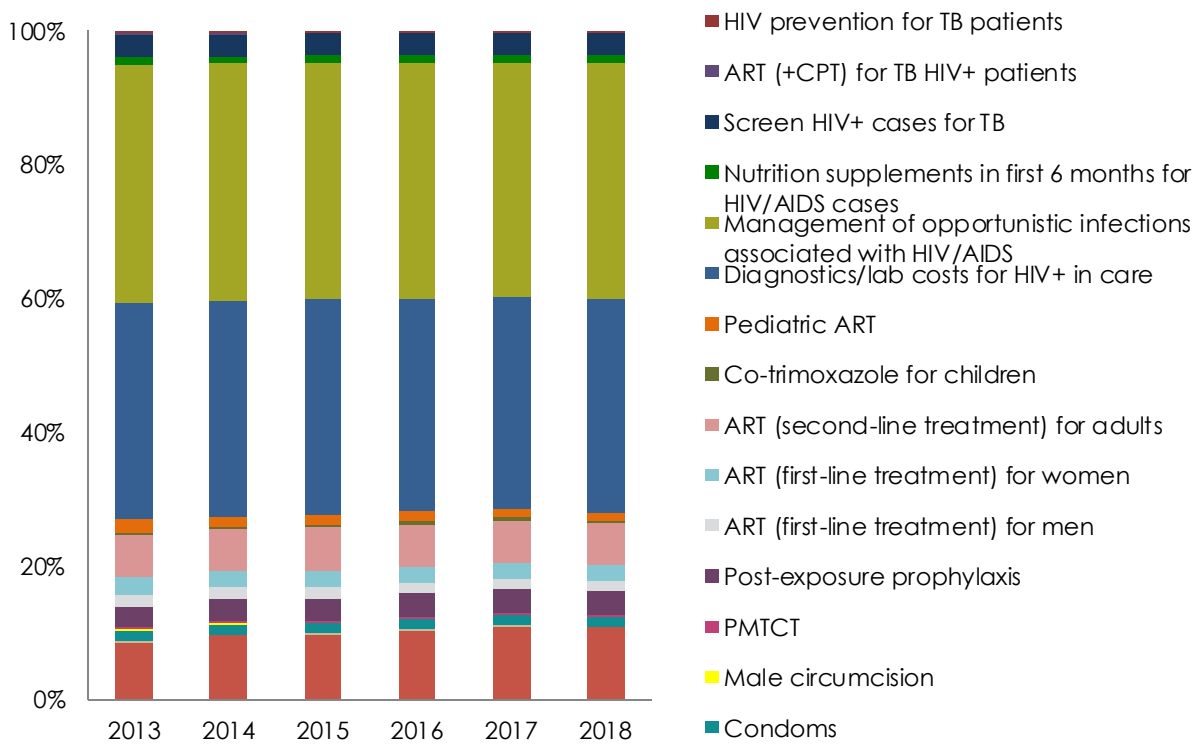
Table 19. Total Costs for HIV, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$99,054,444	$110,264,900	$125,575,464	$135,448,613	$144,736,375	$149,618,647	$764,698,444
Program costs	$356,265	$356,265	$356,265	$356,265	$356,265	$356,265	$2,137,593
Total costs	$99,410,710	$110,621,166	$125,931,729	$135,804,879	$145,092,640	$149,974,913	$766,836,037

* Values have been rounded to integers. Totals may not be exact.

As is evident from Figure 17, the bulk of expenditure is on care and treatment, which make up 81 percent of the costs; prevention interventions comprise 15 percent. The National Strategic Framework 2008–2010 midterm review underscores the need to focus efforts on prevention as the solution that could alter the course of the epidemic. Care and treatment interventions include costs of ART for adults and children, management of opportunistic infections, diagnostics/laboratory costs for HIV detection, and nutrition supplements for HIV cases.

Figure 17. Composition of HIV Intervention Costs, 2013–2018



Key issues and areas for further analysis

Quality of data: As explained earlier in this report, due to lack of harmonization between indicators and reporting systems for various interventions, the technical team faced challenges in assessing details such as the total number of patients and the numbers of patients accessing the different types of interventions.

Specific targets were sourced from and validated by the HIV program team and the *2012 Botswana National HIV & AIDS Treatment Guidelines*, BAIS IV, and *Health Statistics Report 2012*.

Areas for further analysis: A robust assessment of program costs to yield more accurate expenditure results is essential for further planning. A more detailed overview of the human resources involved and data on expenditures related to M&E and advocacy and communication will yield a truer estimate.

Noncommunicable Diseases

Strategic objectives

Although HIV/AIDS continues to be the major disease burden in Botswana, poor health due to NCDs such as cardiovascular disease (CVD) is on the rise, especially in the last decade. According to Botswana's Revised National Health Policy (2011), in 2006, CVD was the fourth leading cause of mortality, corresponding to 11 percent of the total, coming after other infectious diseases (22%), HIV (17%), and respiratory illnesses (13%). Cancers in 2006 corresponded to 5 percent of the total causes of mortality. The *National Health Service Situation Analysis Report* (MOH, GOB, 2009) notes that Kaposi's sarcoma increased due to HIV infections, whereas cervical cancer has increased fourfold in the last 20 years. Cancer of the digestive tract and lymphatic/endocrine systems has increased by several times in men over the same period.

To stem the causes of many of these daunting statistics, Revised National Health Policy (2011) outlined the following strategic objectives:

- Reduce the number of smokers
- Prevent young adults from trying tobacco
- Reduce smoking among pregnant women
- Reduce obesity
- Prevent obesity and malnutrition in children
- Increase accessibility to affordable, healthy foodstuffs by all people, particularly in deprived and rural areas
- Implement a physical exercise program, along with a health and wellness week, in all workplaces and schools

Data sources for the cost analysis

The technical team sourced requisite inputs on current coverage levels for each intervention and target from experts in country, the program team at MOH, and various documents. The team entered the targets to be achieved directly into OneHealth. In addition, the team also derived coverage rates from the following sources: Botswana Noncommunicable Disease Strategic Plan, the EHSP for Botswana (2010), and the *Botswana Health Statistics Report* (CSO, GOB, 2009).

Scale-up of interventions

The coverage for many of the interventions identified in this study was low (5%) at baseline (2013) and was set to increase to 20 percent in the target year (2017). The interventions that fall under this category are screening for risk of CVD/diabetes, follow-up care for those at low risk of CVD/diabetes, treatment for those with very high cholesterol but low absolute risk of CVD/diabetes, treatment for those with high blood pressure but low absolute risk of CVD/diabetes, and treatment for those with high absolute risk of CVD/diabetes. The coverage at baseline for treatment of cases with type I and type II diabetes were 80 and 60 percent, respectively, reaching 100 percent and 80 percent, respectively, by 2017.

Cost results

Total 2013–2017 NCD costs:

$676,504,369

Total costs: The NCD program is the third most expensive under the EHSP program, accounting for 14.5 percent of the total costs. Total costs by year are shown in Table 20. Once again, costs for drugs and supplies make up the bulk (99.6%). Estimates on program costs (only human resources) were based on inputs from program managers and available reports. Additional staff (e.g., physicians, nurses) would certainly be required to provide NCD services; however, the program costs included comprise only the HR categories of clerical officers and social workers. Estimates likely will be higher when costs of other HR staff categories, M&E, infrastructure, advocacy, communication, and community mobilization have been taken into account.

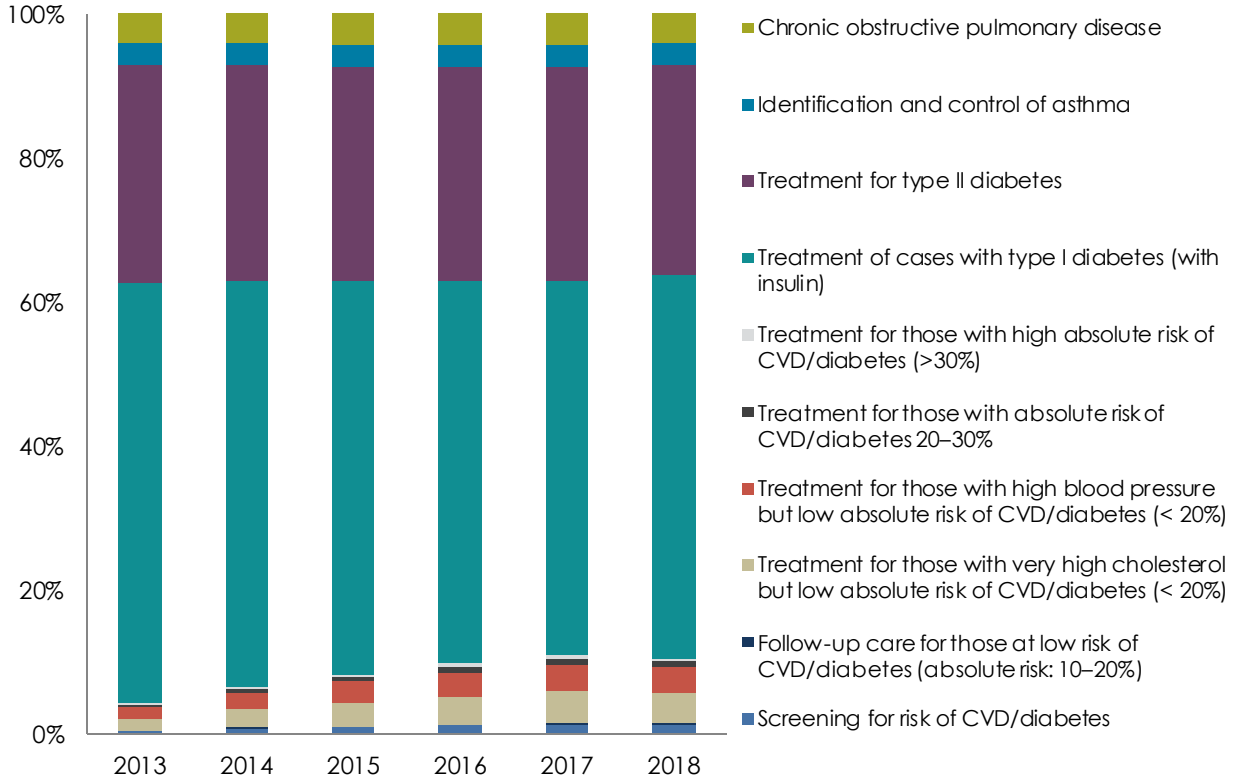
Table 20. Total Costs for NCDs, in 2013 US$*

Noncommunicable diseases	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$80,758,055	$93,325,498	$105,673,863	$118,904,194	$133,099,571	$141,957,038	$673,718,218
Program costs	$464,358	$464,358	$464,358	$464,358	$464,358	$464,358	$2,786,151
Total costs	$81,222,413	$93,789,856	$106,138,222	$119,368,552	$133,563,929	$142,421,396	$676,504,369

* Values have been rounded to integers. Totals may not be exact.

Figure 18 shows that the majority of the expenditures have been incurred for treatment—specifically the treatment of all types of diabetes (84%). Within this category, treatment of cases with type I diabetes (with insulin) accounts for the majority of the costs (54%) and treatment for type II diabetes comprises 30 percent. CVD/diabetes follow-up and screening (for all risk levels) accounts for around 1 percent of the total costs.

Figure 18. Composition of NCD Intervention Costs, 2013–2018



AR: Absolute risk, CVD: cardiovascular disease, HAR: High absolute risk, HBP: High blood pressure, LAR: Low absolute risk, LR: Low risk, and VHC: Very high cholesterol.

Key issues and areas for further analysis

The Revised National Health Policy (2011) recognizes the importance of increasing the availability of healthier food choices and increasing physical activity to improve health outcomes; however, to accomplish this task, a holistic and multi-ministry approach will be needed. Increasing healthier food alternatives and improving physical activity will involve not only cooperation across MOH departments (nutrition, child health, etc.) but also will cooperation from different ministries (e.g., the Ministry of Agriculture and Ministry of Local Government). Greater availability of healthier food alternatives will require increased cooperation between private and public food distributors while at the same time necessitating increased infrastructure to get the produce to the final consumers at reasonable prices. In addition, the development of safe and green areas would encourage more people to undertake leisure activity that can lead to health benefits. The complexities inherent in such an undertaking are certainly beyond the scope of this costing exercise; however, the examples illustrated above might help to pave the way for more comprehensive discussions on this theme, thus leading to positive health outcomes.

The allocation of resources alone will likely not solve many of the problems associated with the NCD burden, but some prioritization of resources and increases in coverage might be needed to ensure that strategic objectives are being targeted. Interventions targeting smoking cessation might need to receive increased resources, given that respiratory diseases and screening of CVD/diabetes risk factors currently receive less than 6 percent of the total resources. Greater focus on screening and interventions focusing on healthier food choices and increased physical activity should help decrease the required resources for type II diabetes treatment. The fact that NCDs do not as yet constitute the highest burden of morbidity and mortality presents a great opportunity for higher investments in prevention. Investments at this early stage

will certainly increase early detection and thus subsequently could prevent higher disease burdens that cost more to treat.

Cancer

Treatment and surgery

Cost results

Total costs: The cancer treatment and surgery program is projected to cost a minimum of US$218 million over six years. Total costs by year are shown in Table 21 below.

Total 2013–2018 cancer treatment costs:

$218,487,264

Table 21. Total Costs for Cancer Treatment, in 2013 US$*

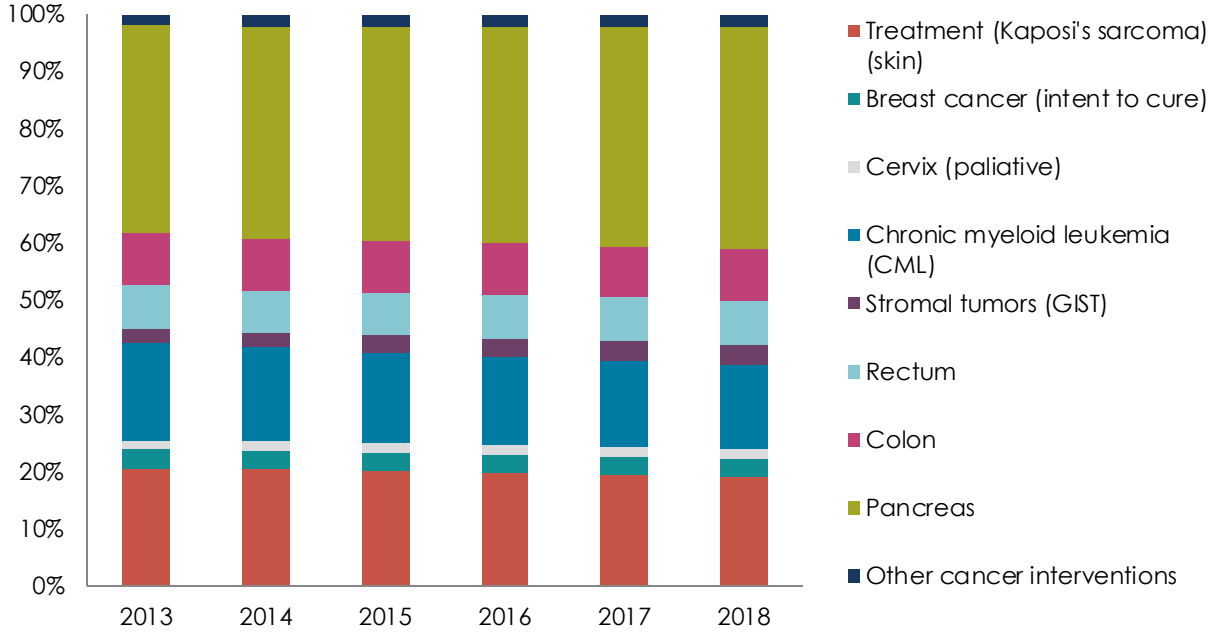
	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$32,833,209	$33,822,111	$35,142,675	$36,378,787	$37,801,791	$39,088,079	$215,066,653
Program costs	$421,678	$386,667	$542,467	$554,865	$561,396	$953,537	$3,420,611
Total costs	$33,254,887	$34,208,778	$35,685,143	$36,933,652	$38,363,188	$40,041,617	$218,487,264

* Values have been rounded to integers. Totals may not be exact.

Data sources

Targets: The cancer program office within MOH provided the technical team with the baseline coverage for the various interventions, with targets to be achieved by 2018.

Figure 19. Composition of Cancer Treatment Drugs and Supplies Costs, 2013–2018



This program includes six broad categories of cancer interventions by type. The biggest expenditures are incurred for treatment of pancreatic cancer (38%), skin cancer/Kaposi's sarcoma (20%), and chronic myeloid leukemia (16%). Incidence rates of Kaposi's sarcoma, which is linked to HIV, are on the rise.

Cancer laboratory

Cost results

Total costs: The cancer laboratory service is projected to cost a minimum of US$4.7 million over six years (Table 22).

Total 2013–2018 cancer lab costs:

$4,734,568

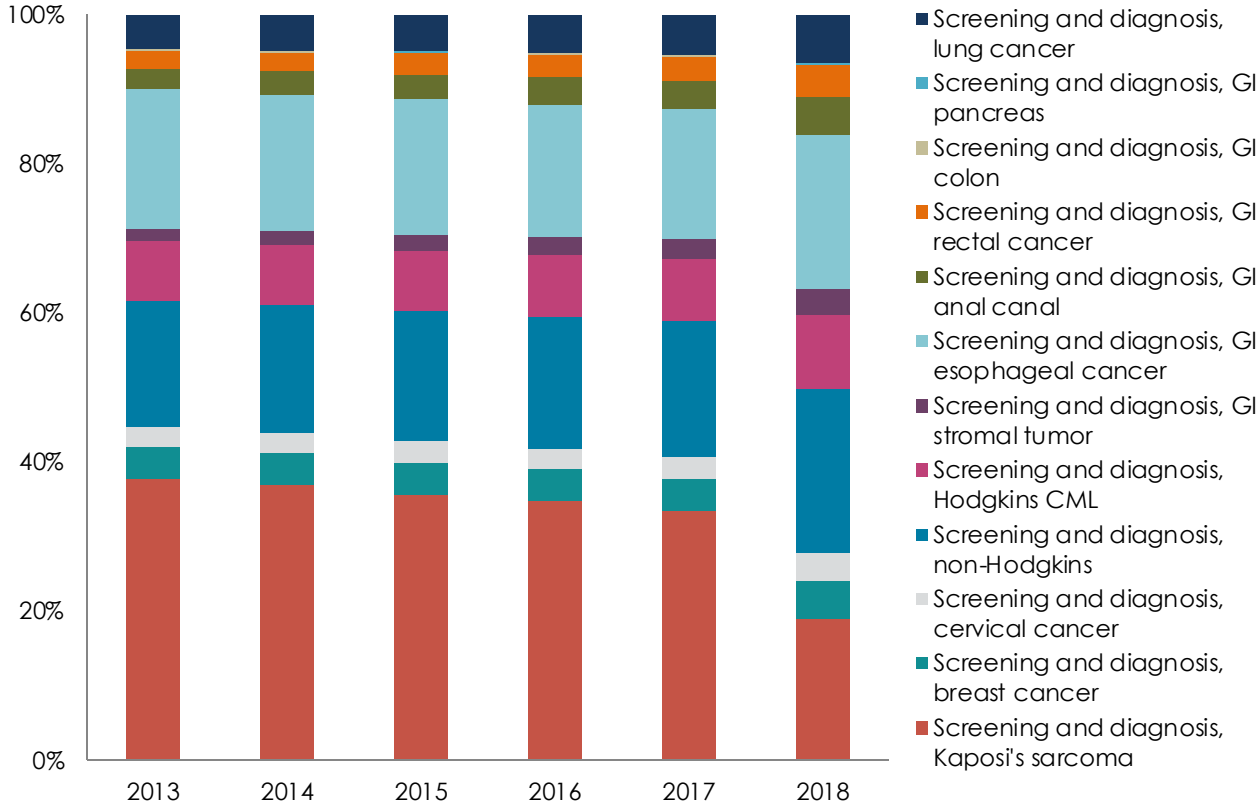
Table 22. Total Costs for Cancer Laboratory, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$147,917	$147,745	$148,318	$148,509	$148,968	$124,177	$865,632
Program costs	$408,839	$456,363	$476,934	$549,850	$1,431,137	$545,813	$3,868,936
Total costs	$556,756	$604,108	$625,252	$698,359	$1,580,105	$669,990	$4,734,568

* Values have been rounded to integers. Totals may not be exact.

Screening and diagnosis of three types of cancers make up the bulk of the costs: cancer of the esophagus (18%), non-Hodgkin's lymphoma (18%), and Kaposi's sarcoma (33%).

Figure 20. Composition of Cancer Laboratory Reagents and Supplies Costs, 2013–2018



Mental, Neurological, and Substance Abuse Disorders (MNSADs)

Strategic objectives

The epidemiological transition from communicable diseases to NCDs is beginning to take place in Botswana, although the full transition may still be a few years in the future. Several lifestyle behaviors have a huge impact on morbidity and mortality. Drug and alcohol abuse take a heavy toll via illness, accidents, antisocial behavior, and criminal acts of violence, including domestic violence. According to WHO's Botswana Country Profile, alcohol was the most common primary substance of abuse reported by patients, accounting for 84 percent of the 72 patients from four treatment centers in 2003. Per the *National Health Service Situation Analysis Report* (MOH, GOB, 2009), the percentage in 2008 of current drinkers (those who drank alcohol in the past 30 days) was estimated at 18.7 percent (men, 30.3%; women, 8.8%). The percentage among current drinkers who binge drink was found to be 54.1 percent for men and 51.8 percent for women. Binge drinking was defined as men who had five or more drinks and women who had four or more drinks on any day in the last week.

The Revised National Health Policy (2011) outlines the following general objectives for this program area:

- Promote and monitor public education and awareness creation on the harmful effects of alcohol and substance abuse, and guide the management of alcohol- and substance-related harm
- Strengthen the health sector response to alcohol and drug abuse through increased accessibility to user-friendly healthcare facilities

- Regulate and monitor the formal and informal liquor sector/industry
- Reduce the incidence of adults exceeding generally acceptable limits of alcohol consumption
- Provide health education and mental health awareness
- Support chronic patients
- Provide holistic patient management, including rehabilitation

Data sources for the cost analysis

The technical team had considerable difficulty in assessing current coverage levels and the targets to be achieved by 2017. Ultimately, the team based the inputs on available documents and validated them with program staff.

Scale-up of interventions

The coverage for many of the interventions identified in this study had different low ranges at baseline (2013) but most increased to 40 percent in the target year (2017). Of all of the interventions within this program, basic psychosocial treatment and antidepressant medication was the intervention with the highest baseline (2013) coverage, starting at 40 percent, and the highest target year (2017) coverage, at 100 percent. The three interventions listed under depression varied from 5 percent to 10 percent in 2013, up to 25 percent to 50 percent by 2017. Other interventions (11 in total) varied from 3 percent to 15 percent in 2013, with the aim of reaching a constant 40 percent by 2017.

Cost results

Total 2013–2018 MNSAD costs:

$14,900,930

Total costs: Costs for this program are under-represented primarily because a number of interventions have not been fully developed and implemented. Total costs by year are shown in Table 23. Once again, costs for drugs and supplies make up the bulk of total costs (85%). Estimates of program costs (human resources only) were based on inputs from program managers and available reports. Additional staff (e.g., psychologists, psychiatrists, nurses) certainly would be required to provide these services. However, the program costs included comprise only the staff categories of administration officer, cleaner, and data clerk. Estimates will be higher when the costs of other HR staff categories, M&E, infrastructure, advocacy, communication, and community mobilization have been taken into account.

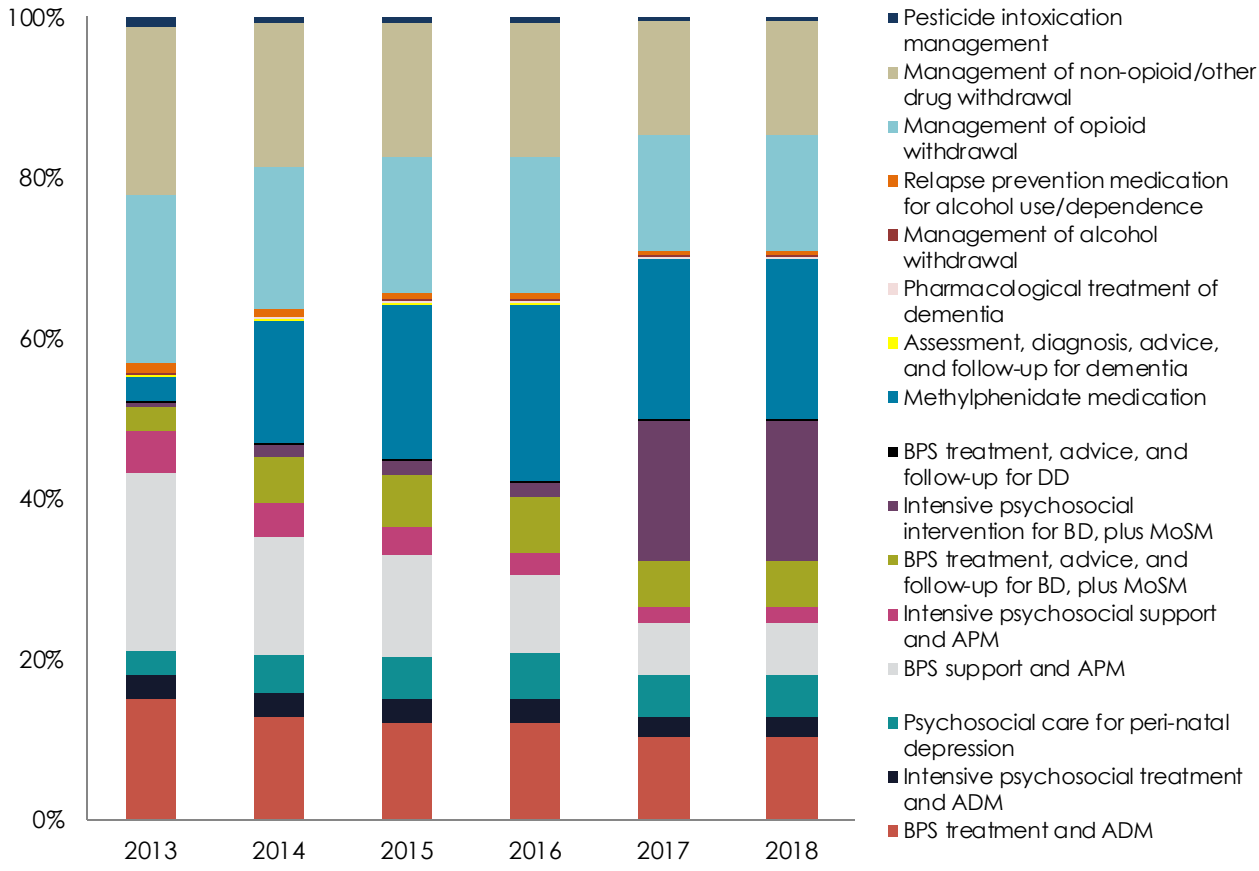
Table 23. Total Costs for MNSADs, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$547,410	$1,140,994	$1,749,326	$2,311,728	$3,420,645	$3,478,909	$12,649,012
Program costs	$375,320	$375,320	$375,320	$375,320	$375,320	$375,320	$2,251,918
Total costs	$922,729	$1,516,314	$2,124,645	$2,687,048	$3,795,965	$3,854,228	$14,900,930

* Values have been rounded to integers. Totals may not be exact.

Figure 21 shows that the majority of the expenditures have been incurred for five interventions accounting for 73 percent of the total costs, which also are the main cost drivers within the MNSAD program. These interventions are the following: methylphenidate medication, 19 percent; management of opioid withdrawal, 16 percent; management of non-opioid/other drug withdrawal, 16 percent; basic psychosocial support and anti-psychotic medication, 11 percent; and intensive psychosocial intervention for bipolar disorder, plus mood-stabilizing medication, 10 percent.

Figure 21. Composition of MNSAD Intervention Costs, 2013–2018



BPS - basic psychosocial; DD - dev elopmental disorders.

Key issues and areas for further analysis

The Revised National Health Policy (2011) recognizes the importance of combating substance abuse and providing holistic services to those in need of treatment. From the data above, it is evident that many of the resources are being allocated toward drug use and dependence interventions (32%). Alcohol use and dependence interventions account for 1 percent of the total costs. If this is the case, the resources for alcohol use and dependence need to be increased, given that it is a priority area for the country. On the other hand, it is very likely that some of the resources allocated toward drug use and dependence may also be used for interventions geared toward alcohol use/dependence; however, this possibility is difficult to ascertain from this cost analysis study. Further discussions with the program managers will be necessary.

The MNSAD services seem to be part of the integrated primary healthcare services, and many preventive measures for mental disabilities are included in all services, such as antenatal, infant, child, reproductive health, and curative care. The fact that these services are being provided via several health sectors implies that the costs included in this section may not represent the actual need for these services. The actual need may be higher, and the costs included here may be an underestimation. The other challenge faced during this analysis is the lack of specific prevalence rates for MNSADs listed here, which makes it difficult to verify whether the allocated costs correspond to the situation on the ground. The team consulted the program staff to determine the rates used. However, further discussions between program staff and other department staff will be necessary to achieve agreement on these rates and develop a relevant strategy to ensure that the cost analysis replicates the actual need for these services.

Nutrition

Rehabilitation program

Cost results

Total costs: The nutrition rehabilitation program will likely cost a minimum of US$4.5 million over six years. Total costs for the interventions and program costs by year are shown in Table 24.

Total 2013–2018 nutrition rehabilitation costs:

$4,532,169

Table 24. Total Costs for the Nutrition Rehabilitation Program, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$139,912	$149,359	$448,930	$426,416	$404,866	$382,996	$1,952,478
Program costs	$285,788	$248,838	$433,980	$680,921	$375,711	$554,454	$2,579,692
Total costs	$425,699	$398,197	$882,910	$1,107,336	$780,578	$937,449	$4,532,169

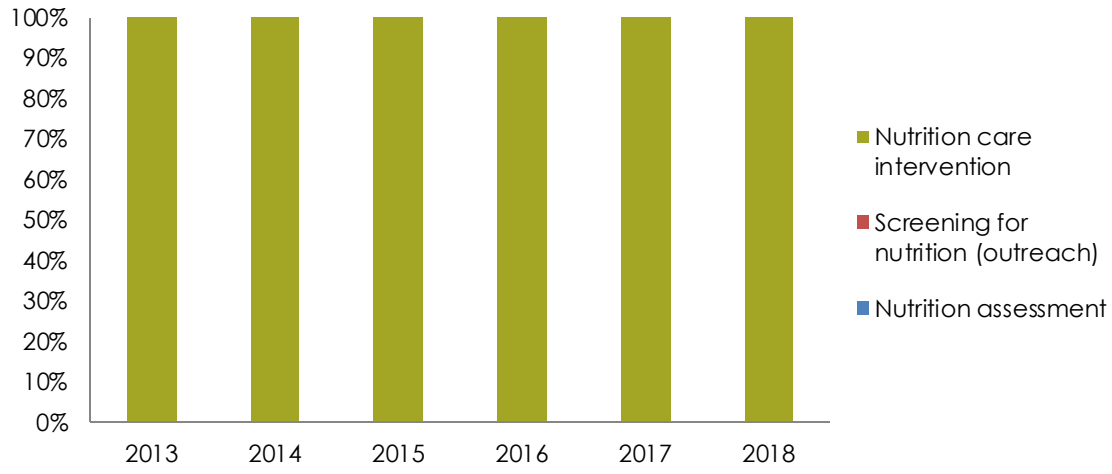
* Values have been rounded to integers. Totals may not be exact.

Data sources

Targets: The data source is the National Rehabilitation Centre (based at PMH); its data are representative of national targets and coverage. It is the only rehabilitation center in Botswana and provides outreach services across the country.

This program includes three interventions—nutrition assessment, screening for nutrition (outreach), and nutrition care intervention—which account for more than 99 percent of the total costs.

Figure 22. Composition of Nutrition: Rehabilitation Program Drugs and Supplies Costs, 2013–2018



Feeding and malnutrition

Cost results

Total costs: The nutrition feeding and malnutrition program will likely cost a minimum of US$767 million over six years. Total costs for the interventions and program costs by

Total 2013–2018 feeding and malnutrition costs:

$767,024,786

year are shown in Table 25. This is the most expensive sub-program within the nutrition program, primarily because of expensive food supplements. Feeding and malnutrition interventions account for 16.5 percent of the total costs for all program areas assessed in this exercise. Program costs include program-specific human resources, training, supervision, M&E evaluation, equipment, transport, communication, media and outreach, and advocacy costs.

Table 25. Total Costs for Nutrition: Feeding and Malnutrition, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$104,396,090	$98,664,821	$110,339,110	$110,708,133	$111,274,466	$114,822,720	$650,205,340
Program costs[4]	$714,109	$702,562	$1,368,984	$110,975,293	$1,566,847	$1,491,651	$116,819,446
Total costs	$105,110,199	$99,367,384	$111,708,093	$221,683,426	$112,841,313	$116,314,371	$767,024,786

* Values have been rounded to integers. Totals may not be exact.

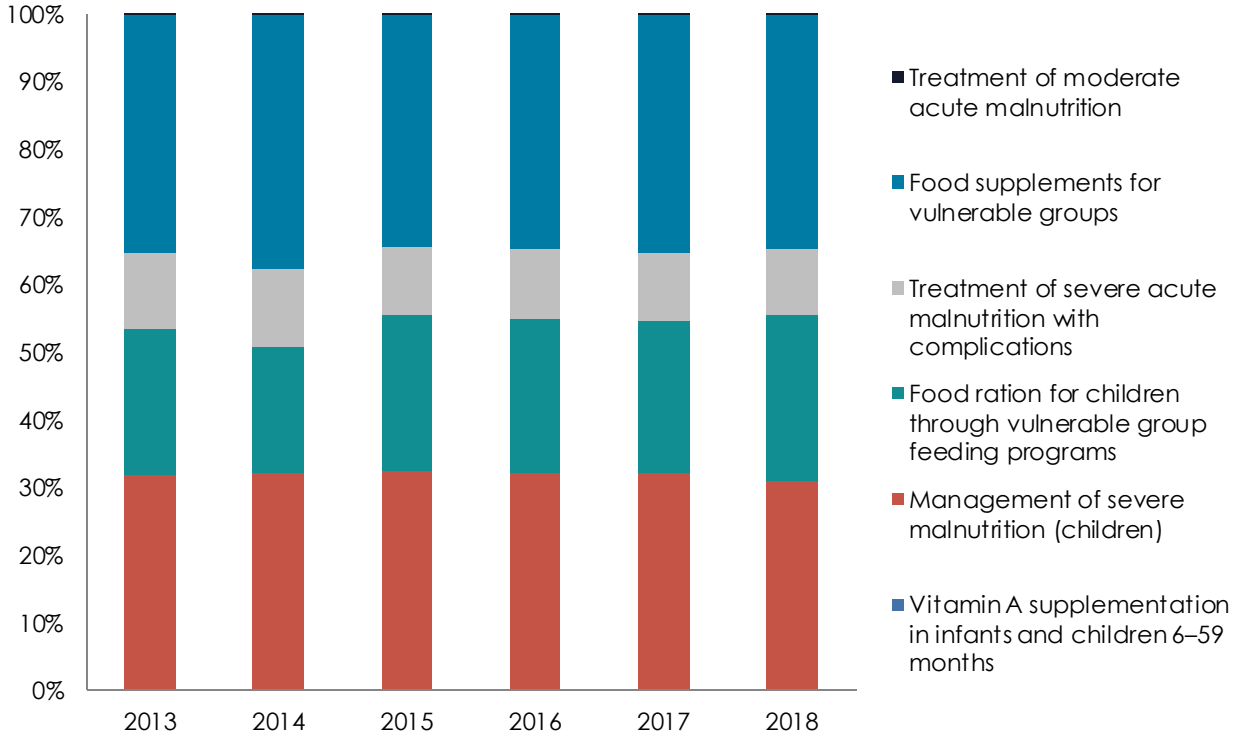
Data sources

Targets: The data source is the MOH's program office. This is a national program coordinated centrally at the MOH and its data are representative of national targets and coverage. The team entered targets, by intervention, directly into OneHealth.

Food supplements for vulnerable groups and management of severe malnutrition are the major cost drivers in this program, at 35 percent and 32 percent, respectively. A key reason for these high costs is likely the wide eligibility criteria and length of period for accessing nutrition supplements without means testing.

[4] Depending on what data are available and what categories apply to each disease area, program costs include program-specific human resources, training, supervision, monitoring and evaluation, equipment, transport, communication, media and outreach, advocacy, and general program management costs.

Figure 23. Composition of Nutrition: Feeding and Malnutrition Drugs and Supplies Costs, 2013–2018



Because Botswana is a drought-prone country, the GOB has focused on alleviating the high numbers of malnutrition cases in the country. Nutritional supplements are provided to the following groups:

- All children from birth to five years of age
- All pregnant women at presentation for antenatal care services. In some cases, supplementation continues even after birth if the mother is breastfeeding or suffers from poor nutrition
- All TB patients at initiation of treatment, continued at the discretion of the physician based on patient condition

Food laboratory

Cost results

Total costs: The nutrition food laboratory service will likely cost a minimum of US$33 million over six years. Total costs for the interventions and program costs by year are shown in Table 26. Program costs include human resources, training, equipment, and communication costs.

Total 2013–2018 food lab costs:

$33,644,184

Table 26. Total Costs for Nutrition: Food Labs, in 2013 US$*

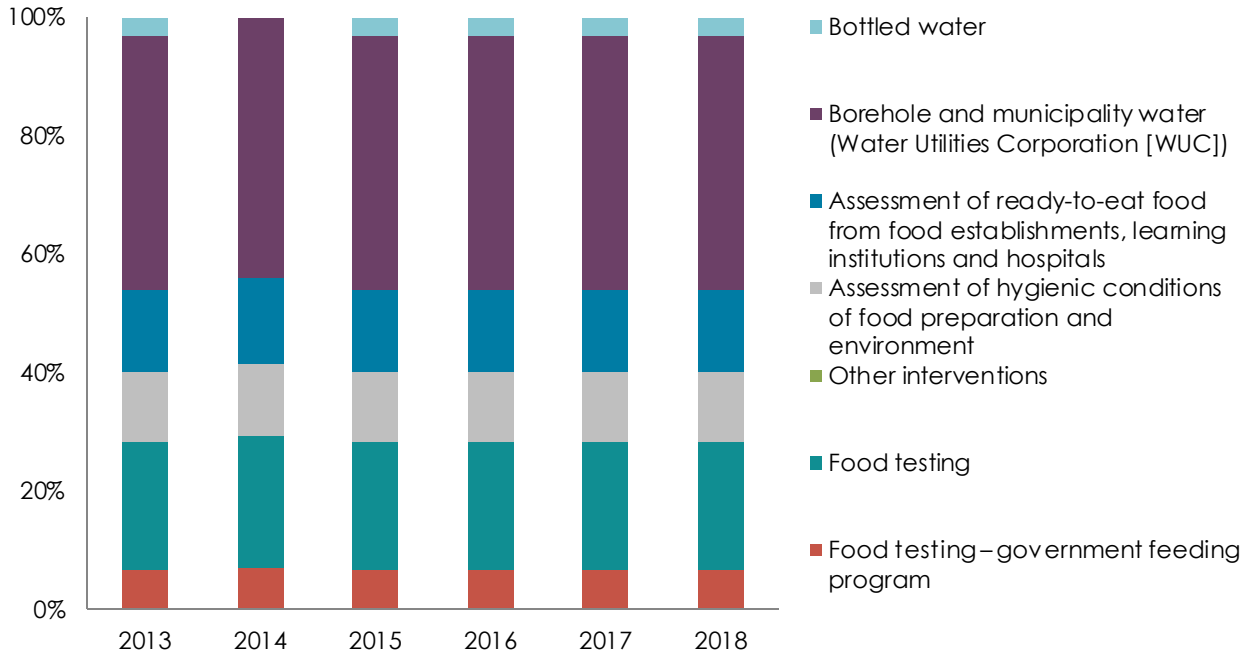
	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$5,412,437	$5,233,299	$5,412,437	$5,412,437	$5,412,437	$5,412,437	$32,295,484
Program costs	$13,120	$14,617	$92,474	$221,788	$97,215	$909,487	$1,348,700
Total costs	$5,425,557	$5,247,915	$5,504,911	$5,634,225	$5,509,652	$6,321,924	$33,644,184

* Values have been rounded to integers. Totals may not be exact.

Data sources

Targets: The MOH program office provided the technical team with the baseline coverage for the various interventions, with targets to be achieved by 2018. The team entered targets, by intervention, directly into OneHealth.

Figure 24. Composition of Nutrition: Food Laboratory Reagents and Supplies Costs, 2013–2018



Key interventions include food testing for the government feeding program; food testing for consumer foods; assessment of hygienic conditions; assessment of ready-to-eat foods from food establishments, learning institutions, and hospitals; and potable water testing. Among these interventions, the major cost driver is the testing of water from boreholes and municipality water (which falls under potable water testing), at 43 percent. Costs for food testing (daily consumables), assessment of hygienic conditions for food preparation, and testing of ready-to-eat foods make up around 22, 12, and 14 percent, respectively, of the total costs for this program.

Nutrition and dietetics

Cost results

Total 2013–2018 nutrition and dietetics costs:

$546,736,374

Total costs: Costs for the nutrition and dietetics program will likely exceed US$546 million. Total costs for the interventions and program costs by year are shown in Table 27. This is the second most expensive sub-program within nutrition, after feeding and malnutrition. Nutrition and dietetics interventions account for around 11 percent of the total costs for all program areas assessed. Program costs include human resources, training, supervision, and communication costs.

Table 27. Total Costs for Nutrition and Dietetics, in 2013 US$*

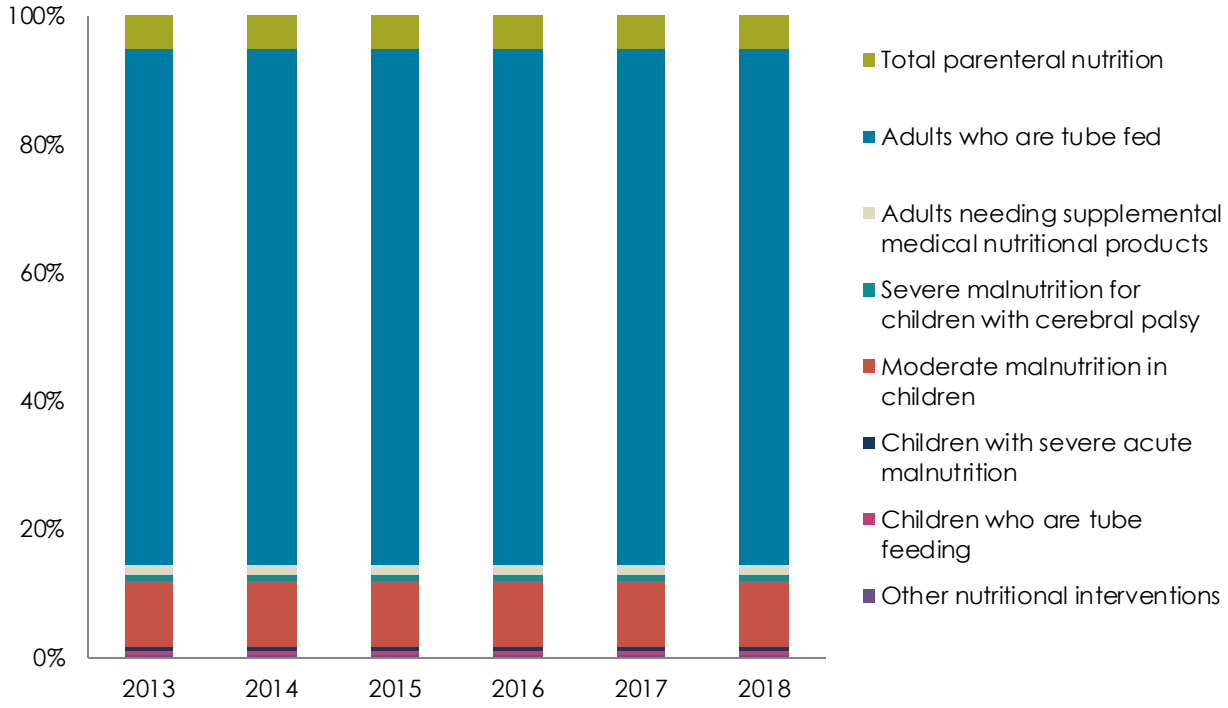
	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$73,390,178	$77,252,054	$84,977,713	$93,459,763	$102,831,805	$113,094,860	$545,006,373
Program costs	$159,856	$156,536	$215,201	$600,584	$344,032	$253,793	$1,730,001
Total costs	$73,550,034	$77,408,589	$85,192,913	$94,060,348	$103,175,837	$113,348,653	$546,736,374

* Values have been rounded to integers. Totals may not be exact.

Data sources

Targets: Since national statistics and prevalence numbers for the nutrition and dietetics program were difficult to obtain, the team based estimates of population-in-need and targets to be achieved on feedback from physicians and patient numbers at PMH. These program targets are hospital-specific estimates based on patient inflow and are not representative of national targets and coverage.

Figure 25. Composition of Nutrition and Dietetics Drugs and Supplies Costs, 2013–2018



This is a clinical nutrition intervention offered only at a facility. The high costs are driven by tube-feeding interventions for inpatient adults (around 80% of total costs), followed by outpatient treatment for moderate malnutrition among children who need continued care and monitoring—specifically, children with cerebral palsy. These children are typically seen and treated at the clinical level and not through the national feeding and malnutrition program. Tube-fed adults are typically patients with cancer (patients in the oncology and surgical wards); intensive care unit (ICU) patients; trauma patients (head injuries, burns, etc.); and those with other conditions, such as complicated HIV/OI cases.

Nutrition and dietetics laboratory

Cost results

Total costs: Costs for the nutrition and dietetics laboratory services are estimated to be around US$19 million, as shown in Table 28. Lab interventions account for less than 1 percent of the total costs for all program areas assessed.

Total 2013–2018 nutrition and dietetics lab costs:
$19,070,856

Table 28. Total Costs for Nutrition and Dietetics Labs, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$2,183,996	$2,298,926	$2,528,720	$2,781,756	$3,059,997	$3,366,062	$16,219,456
Program costs (HR only)	$327,731	$327,731	$327,731	$327,731	$327,731	$1,212,743	$2,851,400
Total costs	$2,511,727	$2,626,657	$2,856,451	$3,109,487	$3,387,728	$4,578,805	$19,070,856

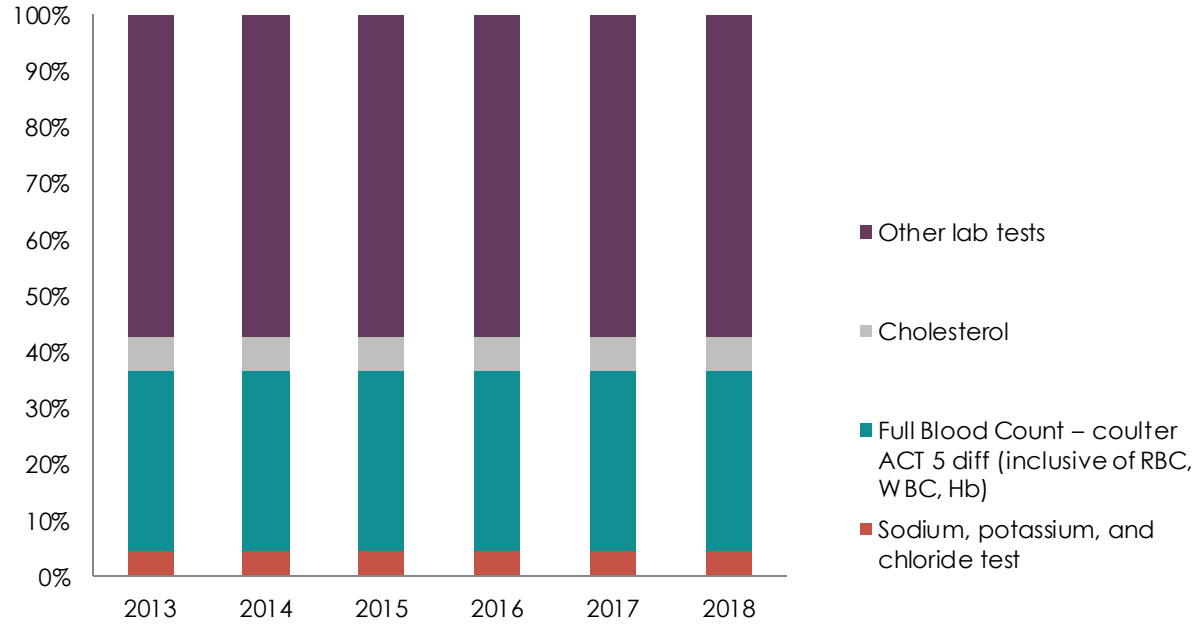
* Values have been rounded to integers. Totals may not be exact.

Data sources

Targets: The MOH program office provided the technical team with the baseline coverage for the various interventions, with targets to be achieved by 2018. The team entered targets, by intervention, directly into OneHealth.

The Full Blood Count – Coulter ACT 5 Diff (inclusive of red blood count [RBC], white blood count [WBC], and hemoglobin [Hb]) test accounts for 32 percent of the total drug costs.

Figure 26. Composition of Nutrition and Dietetics Laboratory Reagents and Supplies Costs, 2013–2018



Accident and Emergency

Cost results

Total costs: The accident and emergency program will likely cost a minimum of US$11.8 million over six years. Total costs by year are shown in Table 29.

Total 2013–2018 accident and emergency costs:

$11,824,377

Table 29. Total Costs for Accident and Emergency, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$703,073	$738,242	$775,149	$813,895	$854,596	$897,321	$4,782,277
Program costs (HR only)	$1,040,816	$1,040,816	$1,040,816	$1,184,781	$1,184,781	$1,550,091	$7,042,100
Total costs	$1,743,889	$1,779,058	$1,815,965	$1,998,676	$2,039,377	$2,447,412	$11,824,377

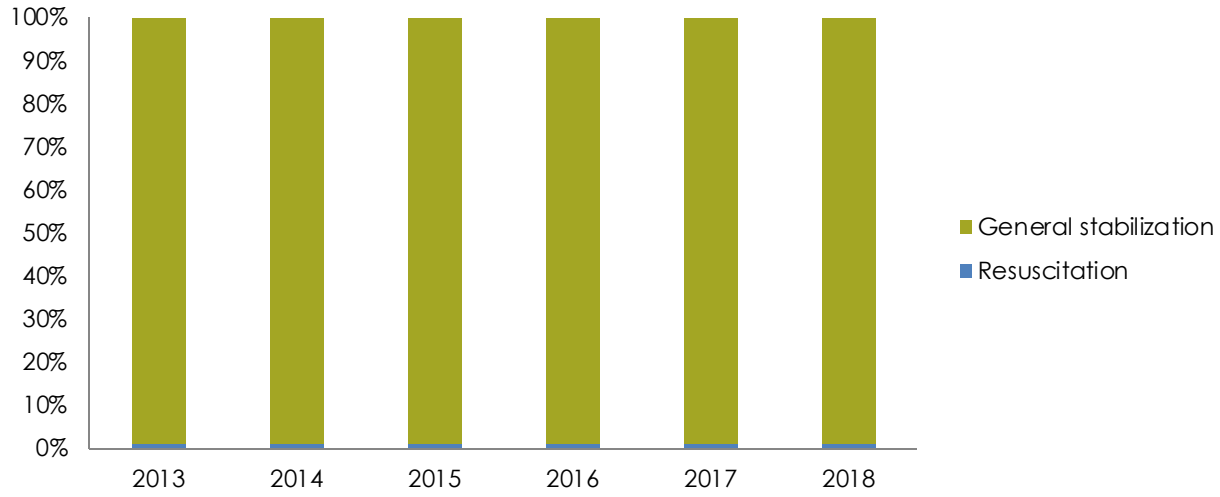
* Values have been rounded to integers. Totals may not be exact.

Data sources

Targets: Since national statistics and prevalence numbers for the accident and emergency program were difficult to obtain, the team based estimates of population-in-need and targets to be achieved on feedback from physicians and patient numbers at PMH. These program targets are hospital-specific estimates based on patient inflow and are not representative of national targets and coverage.

This program includes two interventions—resuscitation and general stabilization—with the latter accounting for well over 95 percent of total costs over the program timeframe (see Figure 27).

Figure 27. Composition of Accident and Emergency Drugs and Supplies Costs, 2013–2018



Emergency Medical Services

Cost results

Total costs: The EMS program will likely cost a minimum of US$129 million over six years. Total costs by year are shown in Table 30 below. EMS program costs include human resources, training, supervision, equipment, transport, communication, advocacy, and management costs.

Total 2013–2018 EMS costs:

$129,743,725

Table 30. Total Costs for EMS, in 2013 US$*

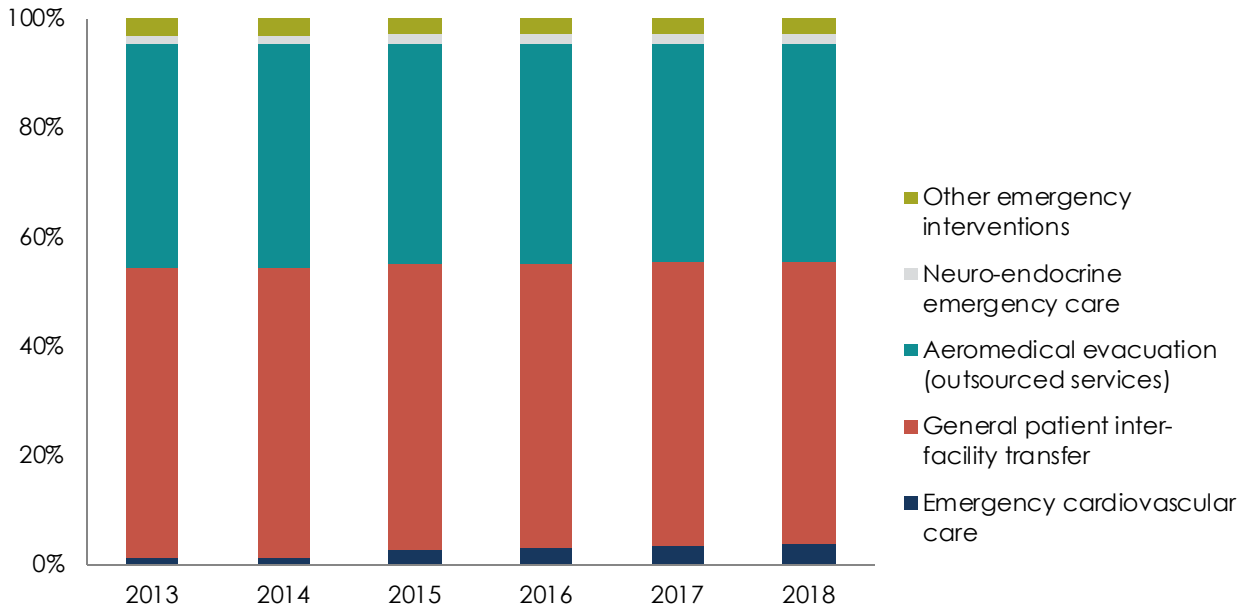
	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$4,066,167	$4,515,780	$5,036,085	$5,568,968	$6,159,196	$6,790,976	$32,137,174
Programcosts	$10,027,057	$9,824,891	$11,363,003	$15,625,336	$16,546,283	$34,219,981	$97,606,551
Total costs	$14,093,224	$14,340,671	$16,399,088	$21,194,304	$22,705,479	$41,010,958	$129,743,725

* Values hav e beenrounded to integers. Totals may not be exact.

Data sources

Targets: The EMS program office within MOH provided the technical team with the baseline coverage for the various interventions, with targets to be achieved by 2018. The team entered targets, by intervention, directly into OneHealth.

Figure 28. Composition of EMS Drugs and Supplies Costs, 2013–2018



Areas for further analysis

As is evident from Figure 28 above, patient evacuation by air and inter-facility transfer account for nearly 90 percent of costs; this percentage is consistent through the years. A deeper dive into the key cost drivers—high patient numbers or high costs of transferring patients—would be the first step in assessing ways to reduce costs. Sharing expensive resources (i.e., medic helicopters) between ministries and other departments (i.e., police and fire) could help mitigate maintenance and upkeep costs.

Neglected Tropical Diseases (NTDs)

Cost results

Total costs: Costs for this program (mainly leprosy screening and treatment) are primarily reflected in program management costs, which make up 99 percent of the total costs of over six years, as

Total 2013–2018 NTDs costs:

$11,936,267

shown in Table 31. Program management costs include program-specific human resources, training, supervision, M&E, transport, communication, advocacy, and management costs.

Table 31. Total Costs for NTDs, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$4,789	$3,978	$3,969	$ -	$-	$ -	$12,736
Program costs	$905,969	$738,502	$2,673,859	$2,551,377	$2,518,123	$2,535,702	$11,923,531
Total costs	$910,758	$742,480	$2,677,828	$2,551,377	$2,518,123	$2,535,702	$11,936,267

* Values have been rounded to integers. Totals may not be exact.

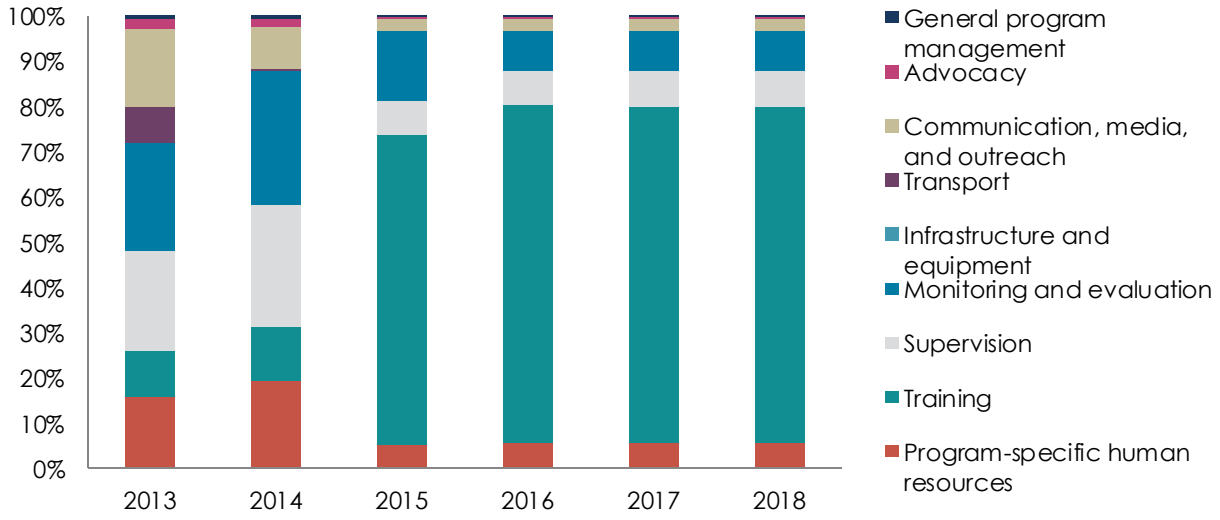
Data sources

The NTD program office within MOH provided the technical team with the baseline coverage for the various interventions, with targets to be achieved by 2018. The current data largely reflect program costs likely to be incurred in tackling just one NTD—leprosy. Owing to the limited understanding about the disease prevalence of NTDs, the MOH, with the support of WHO, currently is conducting a mapping exercise to determine the types of NTDs prevalent in the country.

Leprosy has been the most frequently addressed NTD at public health facilities, especially in association with TB. However, the country has had incidences/cases of the following conditions as well: schistosomiasis, soil-transmitted helminths, trachoma, and lymphatic filariasis. Once mapping is complete, the program office plans to develop an NTD strategy to address response and treatment.

As shown in Figure 29, training costs for staff constitute the biggest cost driver, followed by M&E and supervision.

Figure 29. Composition of Neglected Tropical Diseases Program Management Costs, 2013–2018



The only laboratory testing currently undertaken for NTDs is the leprosy biopsy test – Zeil Nielseen stain, which costs approximately US$15 per patient. The National Laboratory will offer other NTD tests on completion of the NTD service package.

Meningitis

Cost results

Total costs: At US$10 million over six years, the meningitis program will be less than 1 percent of the total costs of EHSP. Program costs comprise 30 percent of the costs, which include HR and training costs. See Table 32 below.

Total 2013–2018 meningitis costs:

$10,577,311

Table 32. Total Costs for Meningitis, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$1,436,528	$1,353,032	$1,268,865	$1,191,285	$1,119,674	$1,053,409	$7,422,793
Program costs	$305,921	$305,921	$319,597	$305,921	$322,333	$1,594,825	$3,154,518
Total costs	$1,742,449	$1,658,954	$1,588,462	$1,497,207	$1,442,006	$2,648,233	$10,577,311

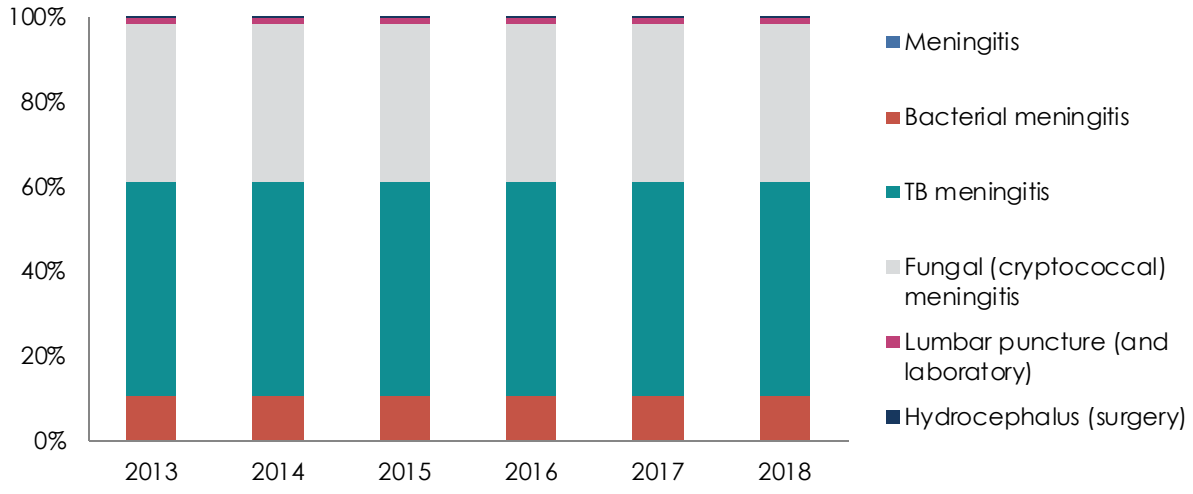
* Values have been rounded to integers. Totals may not be exact.

Data sources and key issues

The team obtained data from physicians based at PMH; they are representative of national targets and coverage.

This program includes five interventions: bacterial meningitis, TB meningitis, fungal meningitis, lumbar puncture, and surgery. Of these five, treatment costs for fungal meningitis form the bulk of the costs (85%). Incidence of fungal (cryptococcal) meningitis incidence is high—it is also an opportunistic infection among PLHIV. The MOH is considering two pathways to reduce costs: (1) offering prophylactic treatment for cryptococcal meningitis to all HIV+ patients before they receive ART treatment and (2) scaling up screening of cryptococcal antigens for HIV+ patients with low CD4 counts to initiate early treatment.

Figure 30. Composition of Meningitis Drugs and Supplies Costs, 2013–2018



Nephrology

Treatment

Cost results

Over the six-year period, the nephrology program, which includes hospital care and laboratory services, will cost just under US$90 million. The hospital interventions make up the majority of the cost—US$87 million (Table 33). Twenty-eight percent of these costs are related to program management, including human resources, training, supervision, transport, communication, advocacy, and management costs. Overall, nephrology accounts for less than 2 percent of total EHSP costs.

Total 2013–2018 nephrology hospital treatment costs:

$87,115,870

Table 33. Total Hospital Costs for Nephrology, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$6,343,853	$7,596,524	$9,111,478	$10,947,778	$13,124,627	$15,769,660	$62,893,920
Programcosts	$145,541	$145,541	$521,801	$11,929,454	$569,954	$10,909,658	$24,221,950
Total costs	$6,489,394	$7,742,065	$9,633,280	$22,877,232	$13,694,582	$26,679,318	$87,115,870

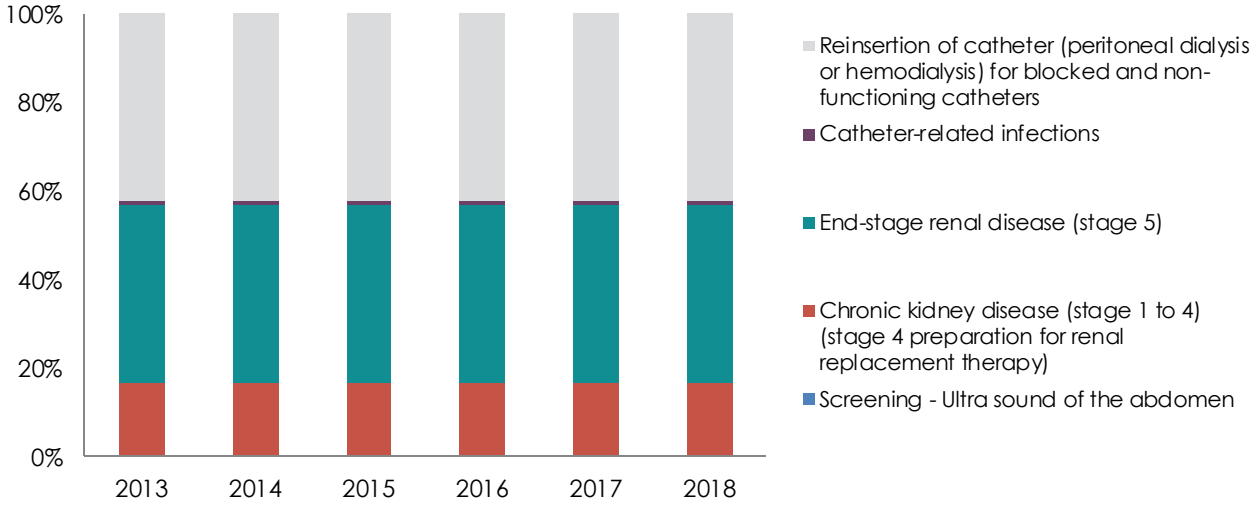
* Values hav e beenrounded to integers. Totals may not be exact.

Data sources

Targets: Since national statistics and prevalence numbers for the nephrology program were difficult to obtain, the team based estimates of the population in need and targets to be achieved on feedback from physicians and patient numbers at PMH. These program targets are hospital-specific estimates based on patient inflow. The program is currently reaching only a fraction of the PIN due to limited coverage.

Nephrology includes six interventions, two of which account for more than 80 percent of the drugs and supplies costs: end-stage renal disease (40%) and reinsertion of catheter (PD or hemo) for blocked and non-functioning catheters (42%) (see Figure 31).

Figure 31. Composition of Nephrology Drugs and Supplies Costs, 2013–2018



Nephrology laboratory

Cost results

The laboratory costs for nephrology include the required lab tests and equipment needed to sustain the laboratory; the program costs are solely HR costs. This program likely will cost US$3.4 million over six years (Table 34).

Total 2013–2018 nephrology lab costs:

$3,437,366

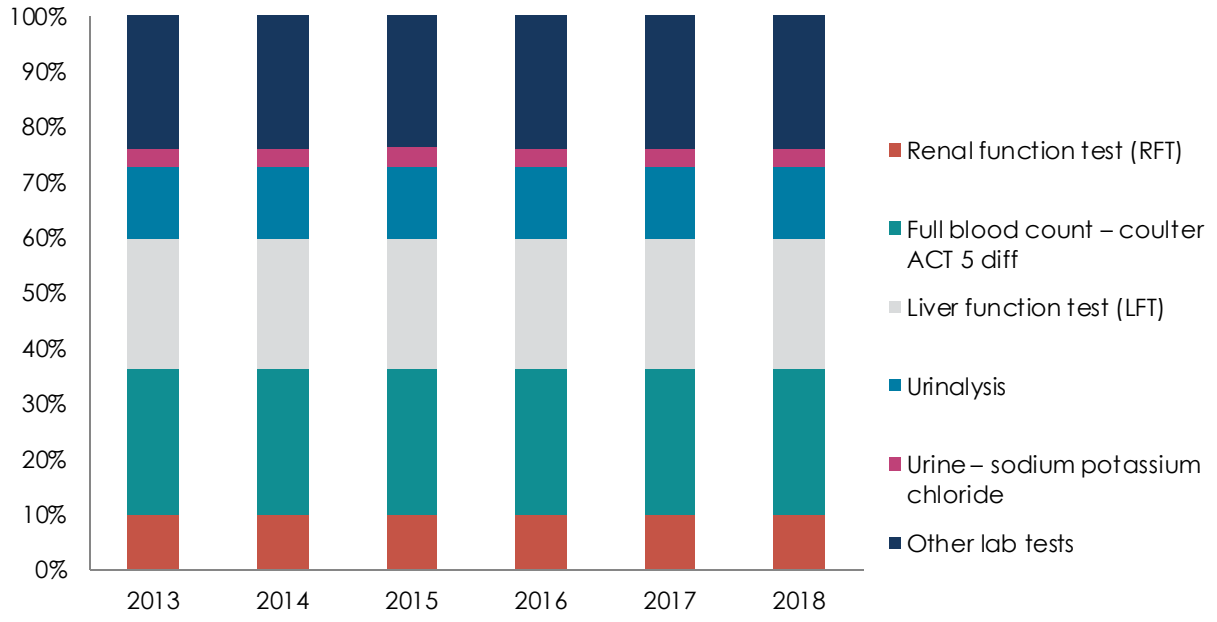
Table 34. Total Costs for Nephrology Laboratory, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$58,974	$70,928	$84,984	$102,009	$122,433	$146,638	$585,966
Program costs (HR only)	$327,731	$327,731	$327,731	$327,731	$327,731	$1,212,743	$2,851,400
Total costs	$386,705	$398,660	$412,715	$429,740	$450,164	$1,359,382	$3,437,366

* Values have been rounded to integers. Totals may not be exact.

The nephrology laboratory includes 17 tests related to glucose, electrolytes, and cholesterol levels, as well as the liver function test and urinalysis. Full Blood Count – Coulter ACT 5 Diff accounts for 26 percent of the supply cost. The second highest cost is for the liver function test, which comprises 24 percent of the total supply cost (Figure 32).

Figure 32. Composition of Nephrology Laboratory Reagents and Supplies Costs, 2013–2018



Key issues and areas for further analysis

As the targets for nephrology are based on expected patient numbers as opposed to a calculated percentage of people in need, these coverage numbers should be updated each year to ensure the accuracy of projected costs.

Oral Health

Treatment and surgery

Cost results

The oral health program consists of prescription, surgery, laboratory, and X-ray components; it comprises less than 2 percent of EHSP costs. In total, the program likely will cost US$72.8 million over six years.

Total 2013–2018 oral health treatment and surgery costs:

$27,073,296

The treatment and surgery component likely will cost US$27 million over the six years, with 26 percent being HR costs (Table 35).

Table 35. Total Costs for Oral Health: Treatment and Surgery, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$3,594,121	$3,594,121	$3,594,121	$3,594,121	$2,875,805	$2,875,805	$20,128,096
Programcosts (HR only)	$976,596	$976,596	$976,596	$1,209,852	$1,143,112	$1,662,447	$6,945,200
Total costs	$4,570,718	$4,570,718	$4,570,718	$4,803,973	$4,018,917	$4,538,253	$27,073,296

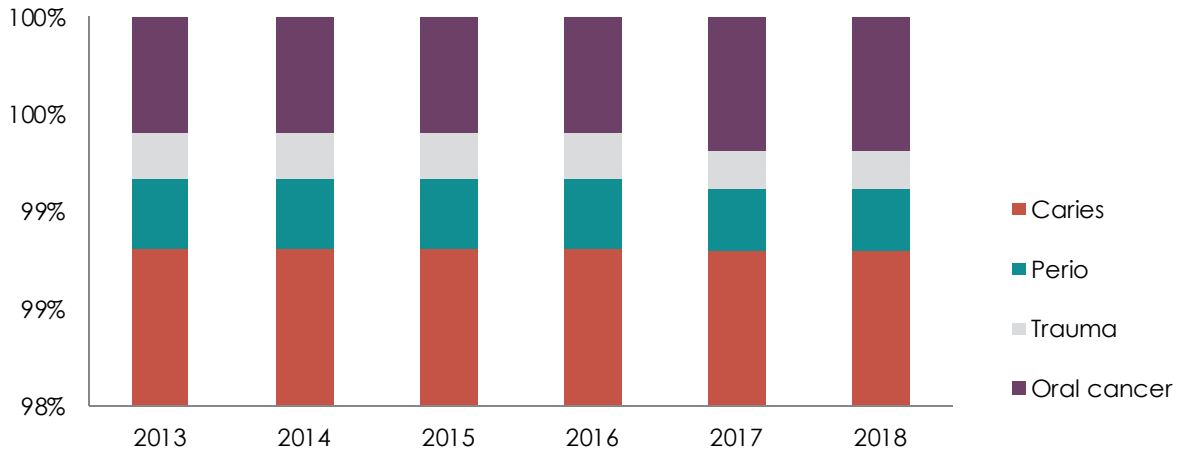
* Values hav e beenrounded to integers. Totals may not be exact.

Data sources

Targets: Since national statistics and prevalence numbers for the oral health program were difficult to obtain, the team based estimates of the population in need and targets to be achieved on feedback from physicians and patient numbers at PMH. These program targets are hospital-specific estimates based on patient inflow.

This component of oral health includes four categories of interventions: caries (extraction and restoration), periodontal work, trauma, and oral cancer (including dental surgery). Caries account for more than 98 percent of the drugs and supplies costs (Figure 33).

Figure 33. Composition of Oral Health Treatment and Surgery Drugs and Supplies Costs, 2013–2018



Oral health laboratory

Cost results

The laboratory component of the oral health program includes tests required before surgery or other procedures. Between 2013 and 2018, the total cost of the lab likely will be US$39 million, of which 87 percent will be drugs and supplies costs (Table 36).

Total 2013–2018 oral health lab costs:

$39,059,772

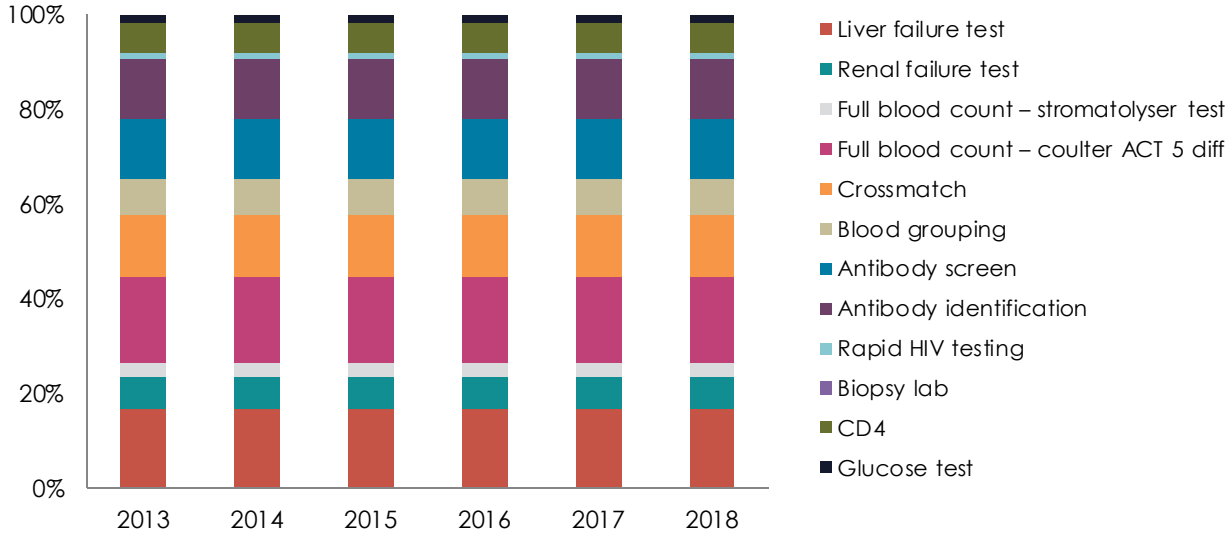
Table 36. Total Costs for Oral Health lab, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$6,108,722	$6,108,722	$6,108,722	$6,108,722	$4,803,312	$4,803,312	$34,041,512
Program costs (HR only)	$327,731	$327,731	$327,731	$327,731	$327,731	$3,379,603	$5,018,260
Total costs	$6,436,453	$6,436,453	$6,436,453	$6,436,453	$5,131,044	$8,182,916	$39,059,772

* Values have been rounded to integers. Totals may not be exact.

Many of the lab tests are relatively comparable in price. However, as seen in the nephrology lab, the Full Blood Count – Coulter ACT 5 Diff and liver function tests are the major cost drivers, representing 19 percent and 17 percent of the drugs and supplies costs, respectively (Figure 34).

Figure 34. Composition of Oral Health Laboratory Reagents and Supplies Costs, 2013–2018



Key issues and areas for further analysis

Considering that caries-related interventions contribute to 30 percent of total oral health program costs (healthcare and lab work), a deeper analysis of the drug costs could help reduce costs. It is very likely that upfront investments in dental health campaigns (i.e., at schools) are likely to decrease future costs for cavity treatment. Oral health is also dependent on nutritional habits; thus, it would make sense to have this program work on its strategy concomitantly with other programs, such as nutrition, to improve not only oral health but also nutritional outcomes.

Organ Transplants

Cost results

The total cost of this program likely will be US$7 million over six years, as shown in Table 37—a very minimal cost to the EHSP. The drugs and supplies contribute to 84 percent of the total costs. Program costs (16%) include HR and training costs.

Total 2013–2018 organ transplant costs:

$7,078,874

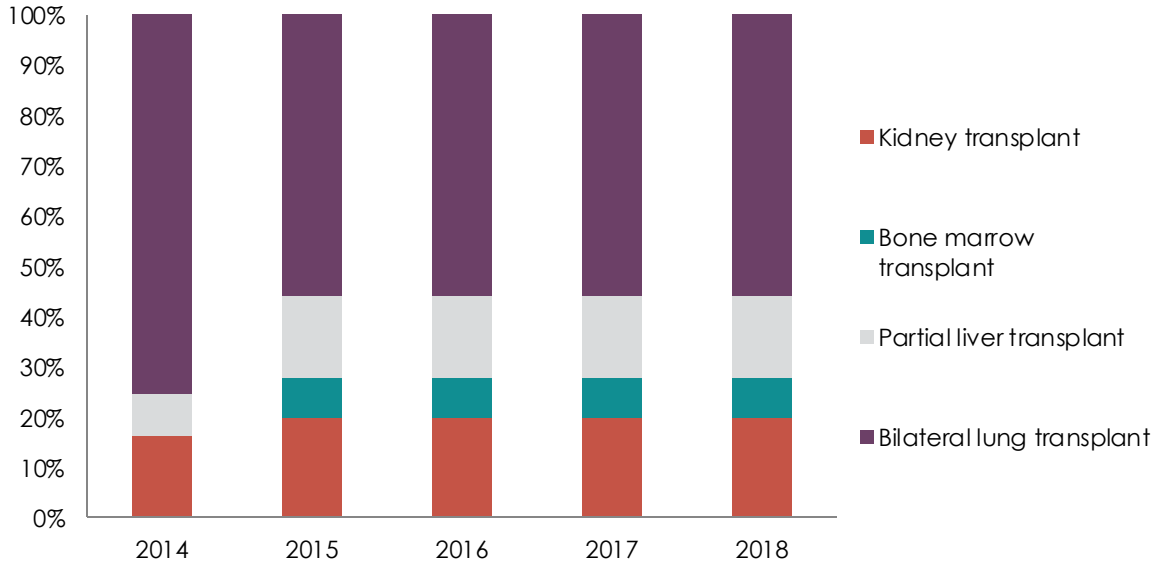
Table 37. Total Costs for Organ Transplants, in 2013 US$*

Organ Transplants	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$0	$508,753	$1,367,615	$1,367,615	$1,367,615	$1,367,615	$5,979,212
Program costs	$0	$207,999	$226,636	$249,028	$207,999	$207,999	$1,099,662
Total costs	$0	$716,752	$1,594,251	$1,616,643	$1,575,614	$1,575,614	$7,078,874

* Values have been rounded to integers. Totals may not be exact.

The program consists of four interventions: kidney transplant, bone marrow transplant, partial liver transplant and bilateral lung transplant. The last makes up 58 percent of the drugs and supplies cost (Figure 35).

Figure 35. Composition of Organ Transplant Drugs and Supplies Costs, 2013–2018



Key issues and areas for further analysis

As it is difficult to determine the population in need of a transplant, these costs are based on projected patient admissions and procedures. These numbers should be revised each year. The bilateral lung transplant costs are more than eight times the costs of other transplant operations. Prevention initiatives could be prioritized to prevent a need for this operation. Currently, organ transplant patients are referred for service outside of the country. The costs above capture only the costs of treatment, not those of after care.

Orthopedics

Cost results

Orthopedic interventions are part of a national center of excellence; the team derived the costs from discussions with clinicians at PMH. The total cost likely will be US$16 million from 2013 to 2018 (Table 38). Overall, they account for less than 0.5 percent of total EHSP costs. The program management costs are solely program-specific HR costs and total 45 percent of the overall cost for orthopedics.

Total 2013–2018 orthopedics costs:

$16,006,525

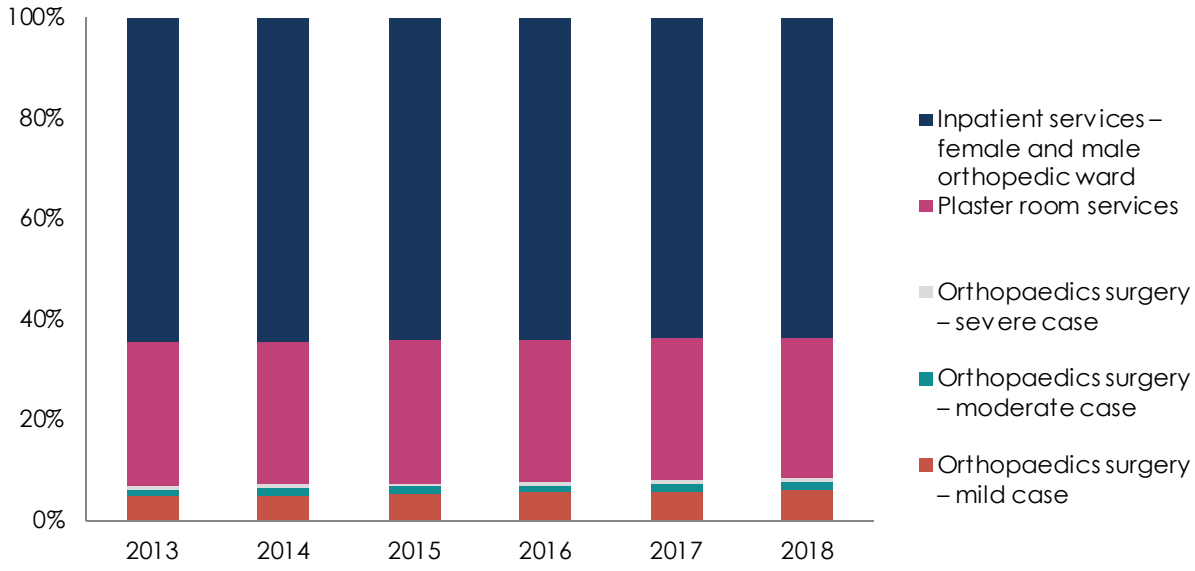
Table 38. Total Costs for Orthopedics, in 2013 US$*

Orthopedics – Rx & Surgery	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$1,273,043	$1,341,206	$1,412,735	$1,488,689	$1,568,778	$1,653,290	$8,737,740
Program costs	$1,217,323	$1,217,323	$1,256,358	$1,295,393	$872,903	$1,409,484	$7,268,784
Total costs	$2,490,366	$2,558,529	$2,669,093	$2,784,082	$2,441,681	$3,062,774	$16,006,525

* Values have been rounded to integers. Totals may not be exact.

The total drugs and supplies costs will be US$8.7 million over six years. Inpatient orthopedic services are 64 percent of the drugs and supplies costs, followed by plaster room services, which account for 28 percent of the cost (Figure 36).

Figure 36. Composition of Orthopedics Drugs and Supplies Costs, 2013–2018



Key issues and areas for further analysis

Inpatient services consist of multiple different types of cases at various degrees of severity. It is possible that the inpatient services drugs and supplies costs could be reduced by considering the average case and updating the patient admission numbers each year.

Prevention of Blindness

Cost results

The prevention of blindness program based at the MOH likely will cost approximately US$22 million from 2013 to 2018. The majority of the costs (87%) will be program management costs, consisting of 70 percent program-specific HR costs and 19 percent hospital and clinic equipment costs. The other 10 percent includes those costs related to training, supervision, communication, advocacy, and management (Table 39).

Total 2013–2018 prevention of blindness costs:

$22,498,681

Table 39. Total Costs for Prevention of Blindness, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$304,504	$387,106	$444,174	$520,454	$594,140	$723,982	$2,974,360
Program costs	$1,865,000	$2,294,644	$2,371,069	$3,509,724	$4,783,536	$4,700,348	$19,524,321
Total costs	$2,169,503	$2,681,750	$2,815,242	$4,030,178	$5,377,676	$5,424,331	$22,498,681

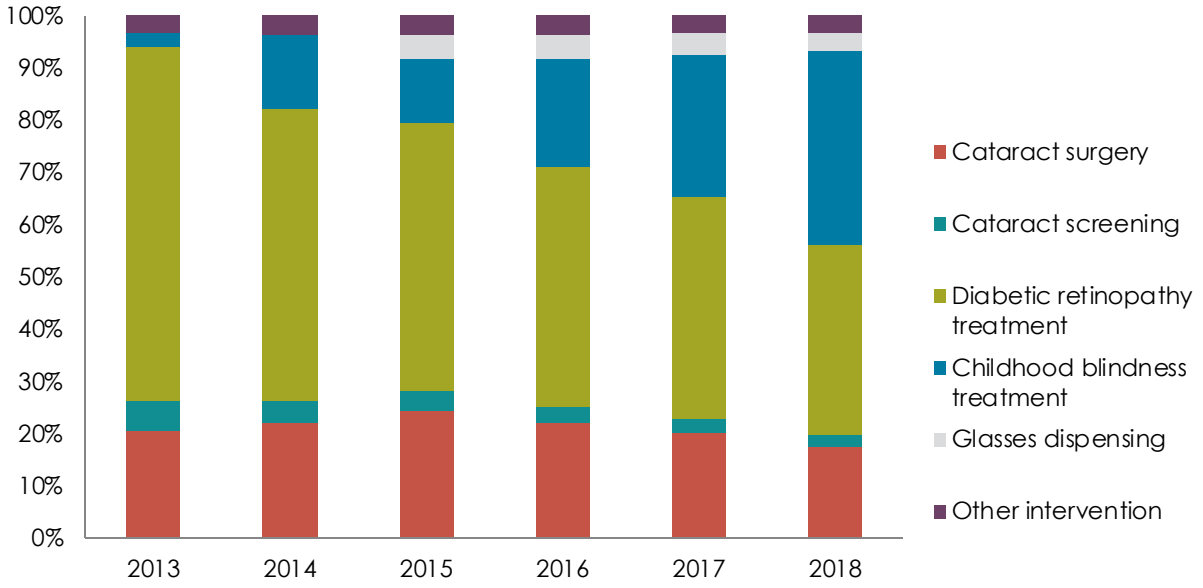
* Values have been rounded to integers. Totals may not be exact.

Data sources

Targets: The prevention of blindness program office within MOH provided the technical team with the baseline coverage for the various interventions, with targets to be achieved by 2018. The team entered targets, by intervention, directly into OneHealth.

Prevention of blindness includes 17 interventions, from surgery to screening to glasses dispensing. The majority of the costs (47%) are needed for diabetic retinopathy treatment. Although only a small number of individuals are projected to need this treatment (fewer than 200 people per year), the cost of the laser for treatment is very expensive. Childhood blindness treatment and cataract surgery represent the second and third highest costs (22% and 21%, respectively) (Figure 37).

Figure 37. Composition of Prevention of Blindness Drugs and Supplies Costs, 2013–2018



Key issues and areas for further analysis

Since this program comprises only 0.5% of the overall EHSP cost, it is not a financial burden on the MOH budget. The services are essential, especially given increases in the prevalence of diabetes. The program should continue to review its coverage targets based on available resources and needs, which could increase or decrease the costs over time.

Referred Cases

Cost results

Referred cases are services referred outside of the public healthcare system and paid for by the GOB. Depending on the type and severity of the case, patients may be referred locally or internationally. The average cost per year is projected to be US$13.8 million, and over the six-year period total costs likely will be approximately US$82.9 million (Table 40).

Total 2013–2018 referred cases costs:

$82,978,202

Table 40. Total Costs for Referred Cases, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$5,768,225	$13,292,093	$15,650,433	$15,854,480	$16,072,146	$16,340,825	$82,978,202
Program costs	$0	$0	$0	$0	$0	$0	$0
Total costs	$5,768,225	$13,292,093	$15,650,433	$15,854,480	$16,072,146	$16,340,825	$82,978,202

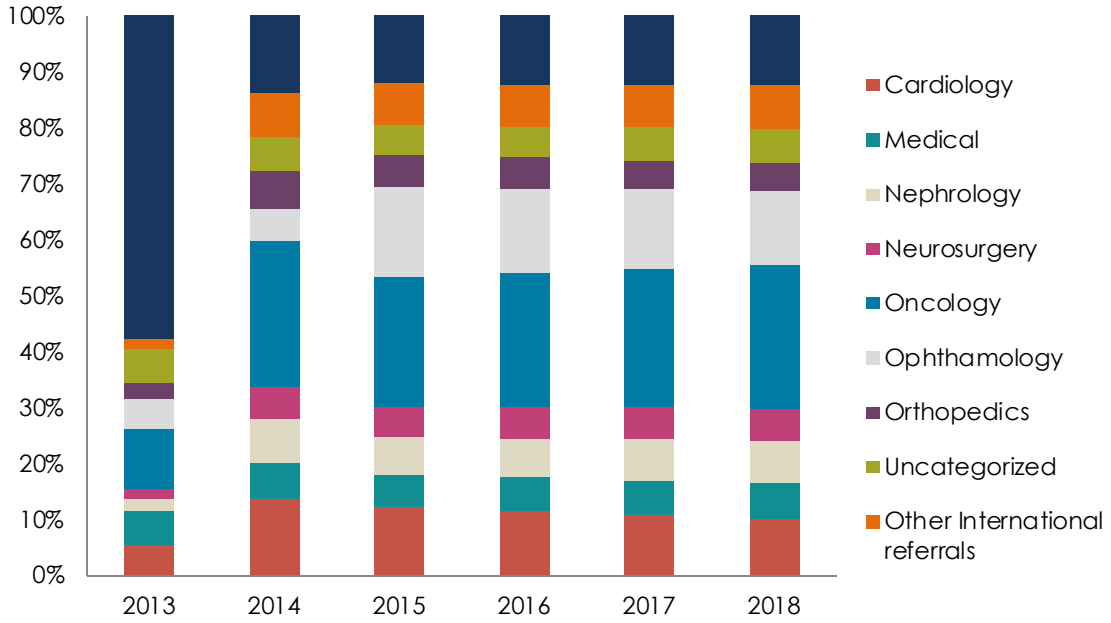
* Values have been rounded to integers. Totals may not be exact.

Data sources

Targets: The MOH provided the technical team with the expected number of local and international referrals by disease area. The team entered these estimates directly into OneHealth.

The referred cases cover a number of disease areas, including the following: cardiology; dental; ear, nose, and throat (ENT); gastroenterology; hematology; nephrology; neurosurgery; obstetrics and gynecology; oncology; ophthalmology; orthopedics; pediatrics; rheumatology; surgery; and urology. The international referral cost is 84 percent of the total cost. International oncology (24%), ophthalmology (13%), and cardiology (11%) are the three most expensive types of referral cases (Figure 38).

Figure 38. Composition of Referred Cases Drugs and Supplies Costs, 2013–2018



Key issues and areas for further analysis

Overall, referred cases account for 1.7 percent of overall EHSP costs. Although these are not extraordinarily high costs, they could be reduced if treatment and procedures were offered within the public health system, which also would negate the need for international follow-up in case of complications due to the initial procedure.

Dermatology

Cost results for dermatology treatment and surgery

Total costs: Dermatology treatment and surgery services will likely cost a minimum of US$819,769 over six years. Total costs by year are shown in Table 41.

Total 2013–2018 dermatology treatment and surgery costs:

$819,769

Table 41. Total Costs for Dermatology Treatment and Surgery, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$ -	$ 51,486	$ 67,225	$ 87,587	$ 113,985	$ 148,175	$ 468,458
Program costs (HR only)	$ 39,035	$ 39,035	$ 39,035	$ 78,069	$ 78,069	$ 78,069	$ 351,311
Total costs	$ 39,035	$ 90,521	$ 106,260	$ 165,656	$ 192,054	$ 226,244	$ 819,769

* Values have been rounded to integers. Totals may not be exact.

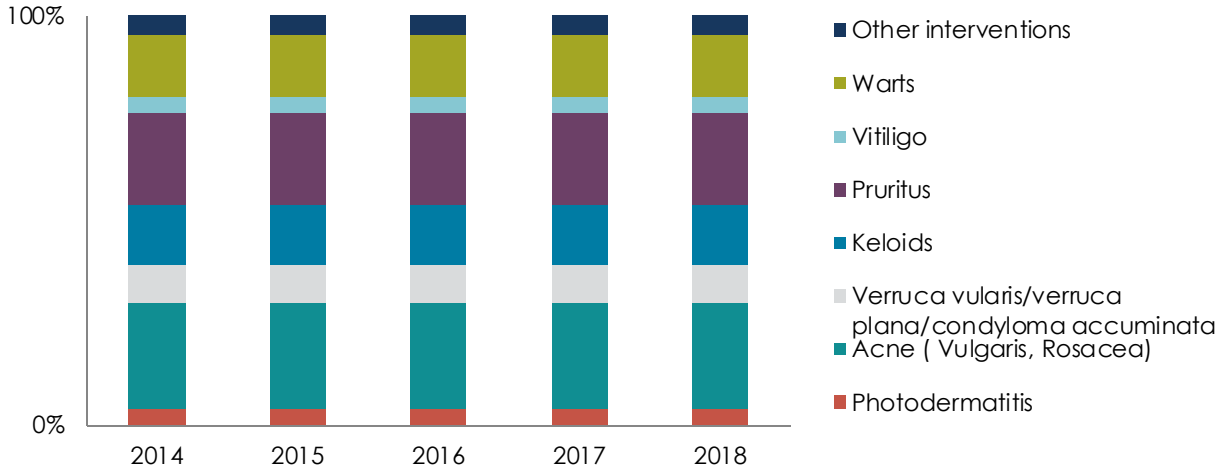
Data sources

Targets: Dermatology is a service provided in only a few health facilities per district. Complicated dermatology cases are treated only at tertiary-level facilities. Cost estimates here are representative of PMH only, which provides the full breadth of dermatological services. This program is not centrally coordinated, so estimates of the population in need and targets are difficult to establish on a national scale.

Feedback from physicians and patient numbers at PMH were the data sources the team used for estimates of the population in need and targets to be achieved. These program targets are PMH-specific estimates based on patient inflow. Data on patient statistics in 2013 were not available to determine the intervention cost, as patient records commenced only from 2014 onward.

This program includes 26 interventions, accounting for 95 percent of the total costs over the program timeframe (see Figure 39).

Figure 39. Composition of Dermatology Drugs and Supplies Costs, 2013–2018



Cost results for dermatology laboratory

Total 2013–2018 dermatology laboratory costs:

$7,043,491

Total costs: Dermatology laboratory services will likely cost a minimum of US$7 million over six years. Total costs by year are shown in Table 42.

Table 42. Total Costs for Dermatology Laboratory, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$ -	$ 462,573	$ 602,153	$ 783,863	$ 1,018,766	$ 1,324,737	$ 4,192,091
Program costs (HR only)	$ 327,731	$ 327,731	$ 327,731	$ 327,731	$ 327,731	$ 1,212,743	$ 2,851,400
Total costs	$ 327,731	$ 790,304	$ 929,884	$ 1,111,594	$ 1,346,498	$ 2,537,480	$ 7,043,491

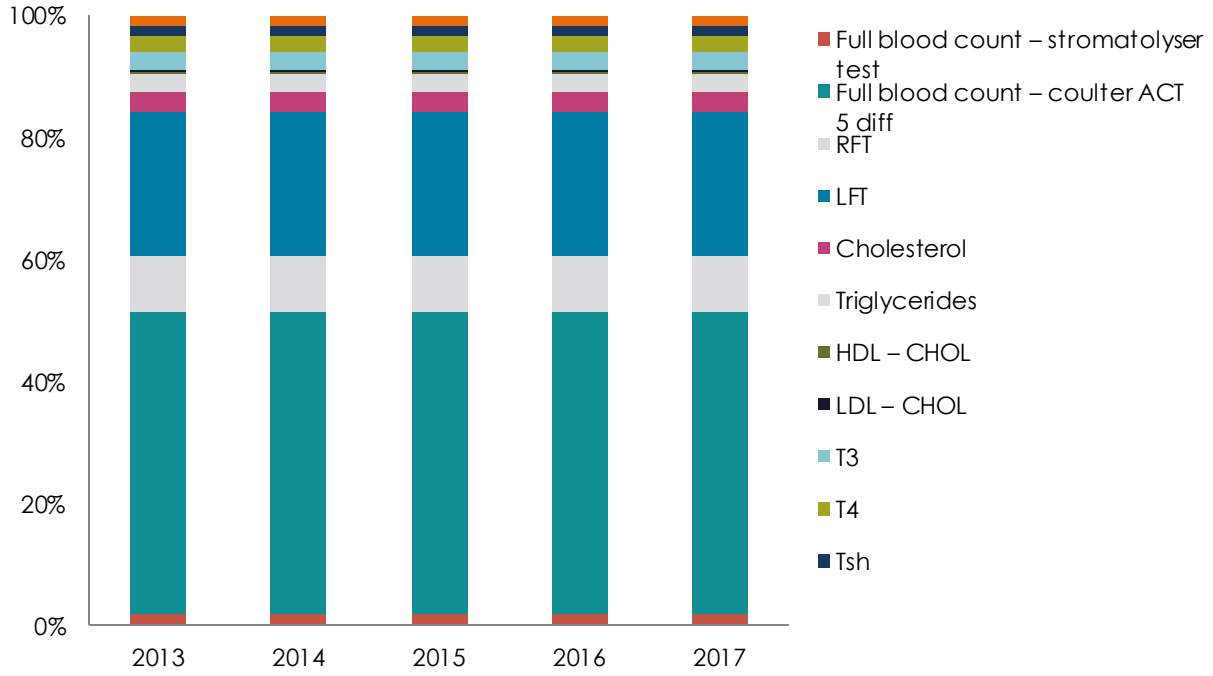
* Values have been rounded to integers. Totals may not be exact.

Data sources

Targets: The data sources used by the team on estimates of the population in need and targets to be achieved were feedback from physicians and patient numbers at PMH. (The numbers came from the referred cases from the dermatology patient registers at the hospital.) These program targets are PMH-specific estimates based on patient inflow. Before receiving treatment and surgery, patients are referred for a series of laboratory tests to validate their diagnosis.

There are 21 tests in total; however, the full blood count, renal function test (RFT), and liver function test (LFT) account for more than 80 percent of the total costs over the program timeframe (see Figure 40).

Figure 40. Composition of Dermatology Laboratory Reagents and Supplies Costs, 2013–2018



Key issues and areas for further analysis

The results in Tables 41 and 42 demonstrate a significantly higher cost in delivery of laboratory services per patient than the cost of treating dermatological cases (treatment and surgery). This difference may be attributable to the broad range of laboratory tests with which each patient is provided at different stages of illness. During the data collection phase, the team found it difficult to achieve clarity on the types and number of tests issued to patients based on service guidelines.

Quality of data: Similar to a number of service areas, the dermatology program also lacks adequate data management systems. The data sets are numerous and do not accurately reflect the patient inflow by condition at the facility and national levels. Further research and analysis is needed to quantify disease prevalence and targets.

Spinalis

Cost results

Total 2013–2018 spinalis costs:

$9,235,340

Total costs: The spinalis program will likely cost a minimum of US$9.2 million over six years. Program management costs consist of training costs (67%) and HR costs (31%). The remaining 2 percent comprises supervision, equipment, transport, and communication costs. Total costs by year are shown in Table 43.

Table 43. Total Costs for Spinalis, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$ 286,448	$ 330,691	$ 297,640	$ 275,585	$ 231,474	$ 231,474	$ 1,653,313
Program costs	$ 296,529	$ 293,969	$ 470,581	$ 1,666,225	$ 2,525,088	$ 2,329,636	$ 7,582,028
Total costs	$ 582,978	$ 624,660	$ 768,221	$ 1,941,810	$ 2,756,562	$ 2,561,110	$ 9,235,340

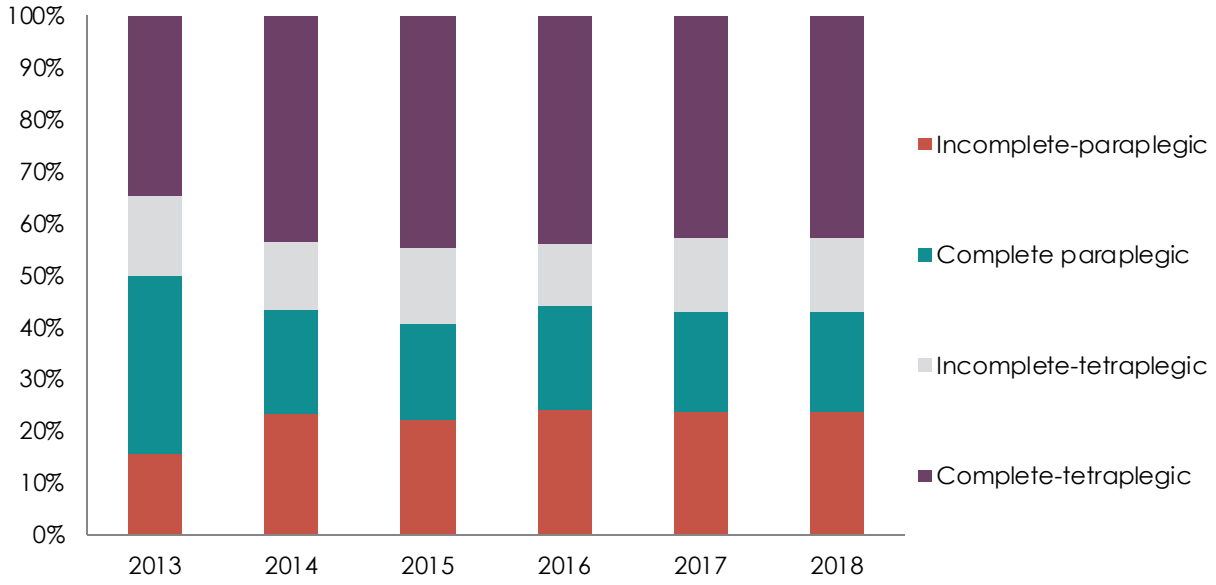
* Values have been rounded to integers. Totals may not be exact.

Data sources

Targets: Spinalis is a national program and center of excellence housed within PMH. Patients across the country are referred to PMH to access spinalis care. The program provides outreach services to educate the general public on spinalis conditions and conduct home visits/outreach care to patients who are either complete or incomplete tetraplegics. Most spinalis cases are caused by major road traffic accidents (RTAs); thus, the team based the estimates for the population in need on annual estimates of major RTAs and patient inflows.

Spinalis has four interventions: incomplete paraplegic, complete paraplegic, incomplete tetraplegic, and complete tetraplegic. Complete tetraplegic cases account for more than 40 percent of the total costs over the program timeframe (see Figure 41).

Figure 41. Composition of Spinalis Drugs and Supplies Costs, 2013–2018



Key issues and areas for further analysis

The reduction in intervention costs over the six years is attributed to the scale-up of health education and promotion of road safety, which are anticipated to decrease the number of RTAs and spinalis cases by 10 percent.

The major cost driver in delivery of the spinalis service is a focus on systems strengthening in the period 2016–2018. Program costs are projected to triple from 2015 to 2016 as a result of training and capacity-building activities identified to support HCWs in improving service delivery and handling complicated spinalis cases, such as spinal cord injury care.

Surgery

Cost results

Total costs: The surgery service area will likely cost a minimum of US$1.9 million over six years. Total costs by year are shown in Table 44.

Total 2013–2018 surgery costs:

$1,931,159

Table 44. Total Costs for Surgery, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$ 249,078	$ 275,391	$ 302,934	$ 333,479	$ 366,947	$ 403,330	$ 1,931,159
Total costs	$ 249,078	$ 275,391	$ 302,934	$ 333,479	$ 366,947	$ 403,330	$ 1,931,159

* Values have been rounded to integers. Totals may not be exact.

Data sources

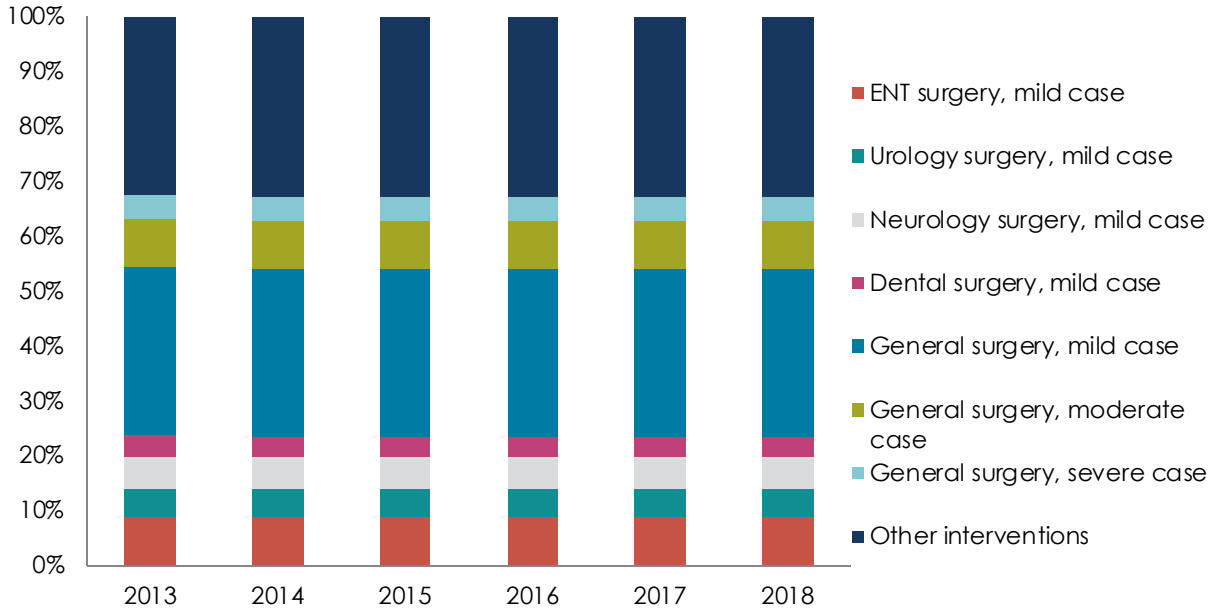
Targets: Surgery is predominately offered at hospital levels (primary, district, and tertiary); however, only tertiary-level hospitals offer a broad range of surgical services. The team used data from PMH to

appropriately capture the cost of surgical services. Patients are referred from other service areas to surgery, so estimates of the population in need and targets are difficult to establish on a national scale.

The data sources used by the team for estimates of the population in need and targets to be achieved were feedback from physicians and patient numbers at PMH. These program targets are hospital-specific estimates based on patient inflow.

There are 11 categories of surgery offered at PMH: orthopedics, spinal, cardio-thoracic, ENT, plastic, urology, neurology, dental, gynecology laparoscopy, pediatrics, and general. Each area is further divided into mild, moderate, and severe cases of surgery conducted, based on patient conditions and diagnosis. General surgery (mild and moderate) accounts for 40 percent of the total costs over the program timeframe (see Figure 41).

Figure 41. Composition of Surgery Drugs and Supplies Costs, 2013–2018



Key issues and areas for further analysis

The surgery service area consists only of intervention costs, as it is a referred service. Continuum of care for its patients is provided at the source of referral. Unlike other disease areas, the cost allocation of drugs and supplies per patient is 100 percent. Most of the drugs and supplies are single use and disposable, which drives the cost per patient higher, especially in the category of mild surgical cases, for which most patients are seen.

Quality of data: Although the technical team validated baseline coverage figures, PIN, and targets with the program staff at the MOH, these figures have not been assessed against population-level goals.

RESOURCES FOR PROGRAM AREAS WITH MANAGEMENT COSTS ONLY

Total Cost of Program Management Areas

Although EHSP program costs overall account for 9 percent of the total six-year cost, these 12 program areas and sub-areas account for only 1.6 percent of total ESHP cost. These areas support care and treatment services through training, supervision, advocacy, education, and M&E.

Environmental and Occupational Health: Port Health

Cost results

Total costs: The E&O port health program includes only programmatic costs, totaling US$6.7 million over six years. Total costs by year are shown in Table 44.

The mandate of the port health program is to monitor disease prevalence among travelers across all border posts and points of entry/exit into the country, especially when disease outbreaks or pandemics occur. Port officers are posted at every point of entry/exit to screen travelers from high-risk areas or countries experiencing outbreaks of such diseases as Ebola, H1N1, and yellow fever.

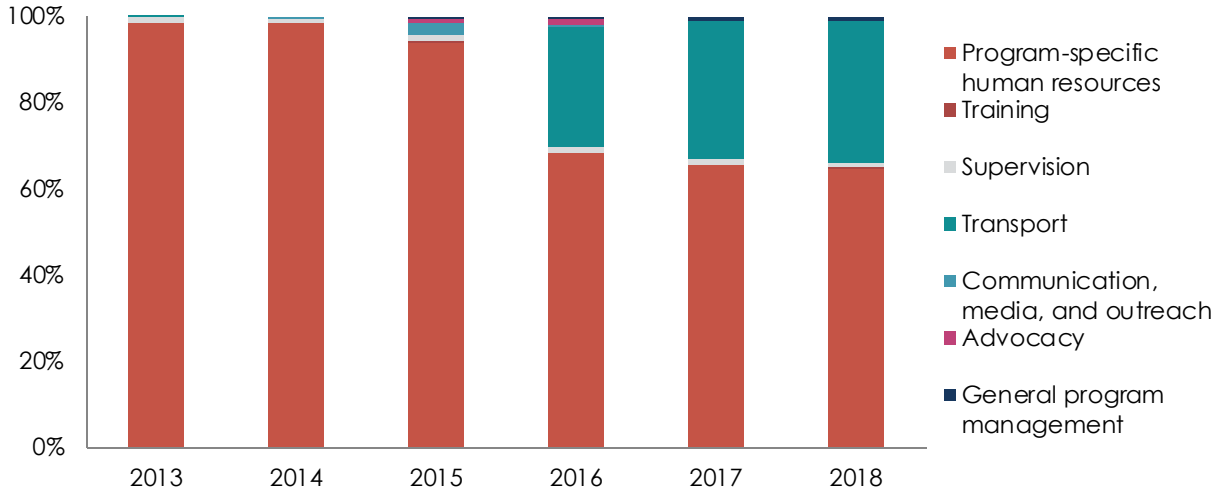
Table 44. Total Costs of Environmental and Occupational Health: Port Health, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$0	$0	$0	$0	$0	$0	$0
Programcost	$531,312	$ 814,532	$ 990,340	$1,540,059	$1,405,873	$1,418,902	$ 6,701,018
Total costs	$531,312	$ 814,532	$ 990,340	$1,540,059	$1,405,873	$1,418,902	$ 6,701,018

* Values hav e beenrounded to integers. Totals may not be exact.

As is evident from Figure 42, the major costs drivers for this program are human resources and transport, accounting for 77 percent and 20 percent, respectively. Most of the increases in human resources are attributed to the additional hiring of environmental health officers, while the majority of the transport costs reflect the purchase of 18 new vehicles in 2016, 2017, and 2018.

Figure 42. Composition of Environmental and Occupational Health: Port Health Programmatic Costs, 2013–2018



Environmental and Occupational Health: Water, Sanitation, and Hygiene (WASH)

Cost results

Total costs: The E&O WASH program includes only programmatic costs, totaling a projected US$1.9 million over six years. Total costs by year are shown in Table 45.

The core mandate of the WASH program is to support rural and remote communities and schools in their scale-up and maintenance of good hygiene standards. The program supports the National Food Laboratory in screening and monitoring water conditions. It also sets regulations on water use and processing. In cases where outbreaks (i.e., diarrhea) emerge, the program will test and declare an emergency response to reduce the impact of the outbreak. Regarding sanitation and hygiene, the program is responsible for ensuring that good hygiene and sanitation standards are maintained in schools and communities, such as elimination of open-pit latrine systems.

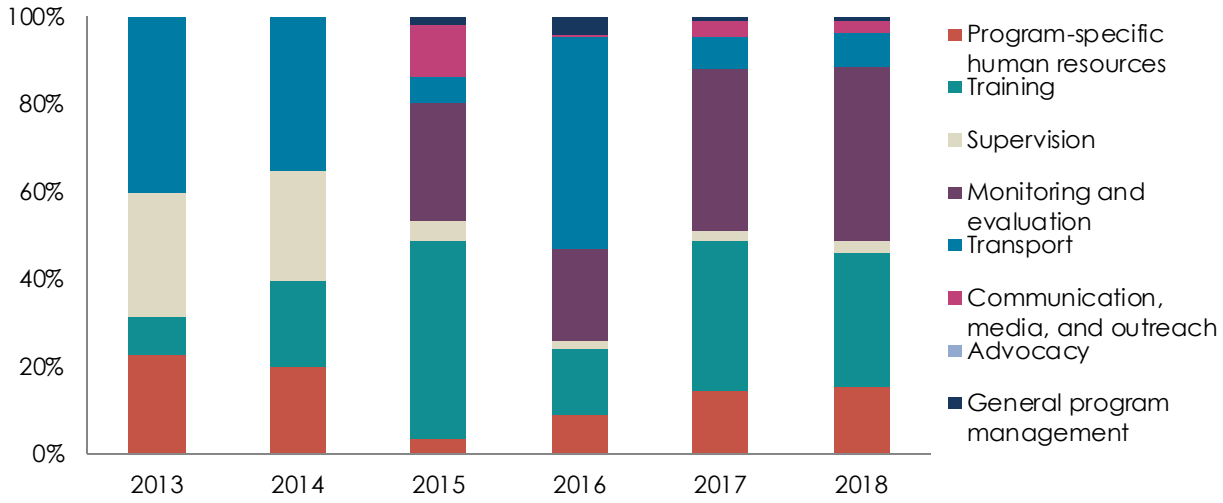
Table 45. Total Costs of Environmental and Occupational Health: WASH, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$0	$0	$0	$0	$0	$0	$0
Program cost	$38,339	$43,810	$248,358	$741,535	$428,570	$400,178	$1,900,789
Total costs	$38,339	$43,810	$248,358	$741,535	$428,570	$400,178	$1,900,789

* Values have been rounded to integers. Totals may not be exact.

The key cost drivers are M&E (29%) and training (27%). The bulk of the training costs are for in-service/refresher training (see Figure 43).

Figure 43. Composition of Programmatic Costs of Environmental and Occupational Health: WASH, 2013–2018



Environmental and Occupational Health: Occupational Health

Cost results

Total costs: The E&O occupational health program includes only programmatic costs, totaling a projected US$3.2 million over six years. Total costs by year are shown in Table 46.

This program ensures that health and safety standards at workplaces (public and private) are maintained based on national regulations and policies. Officers conduct spot checks at workplaces (especially food-handling establishments), and workers undergo medical check-ups. These assessments are linked to company registration and operating licensing processes.

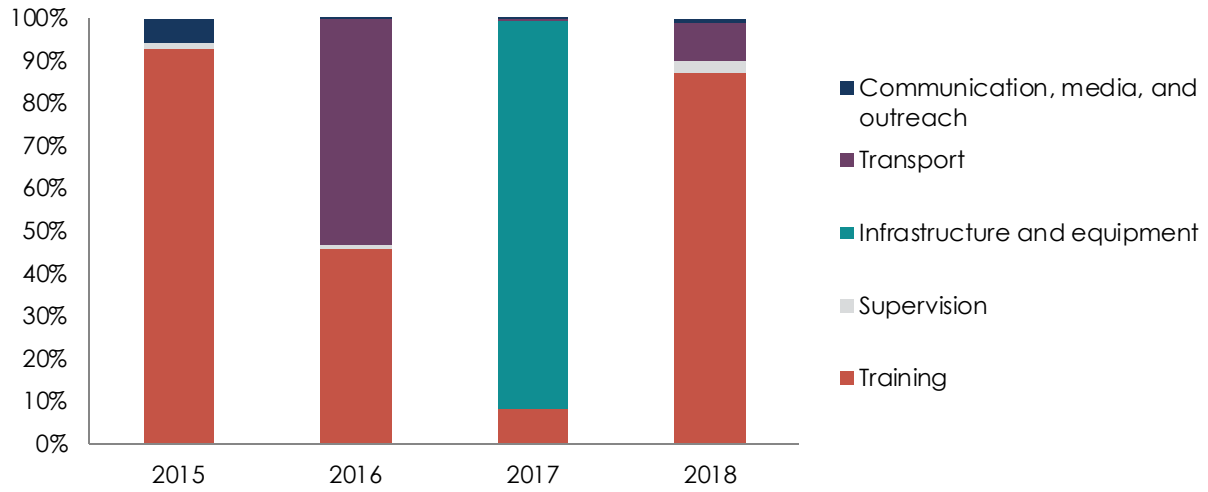
Table 46. Total Costs of Environmental and Occupational Health: Occupational Health, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$0	$0	$0	$0	$0	$0	$0
Program costs	$-	$-	$212,473	$430,613	$2,407,060	$113,326	$3,163,472
Total costs	$-	$-	$212,473	$430,613	$2,407,060	$113,326	$3,163,472

* Values have been rounded to integers. Totals may not be exact.

The main costs drivers (starting in 2015) are infrastructure and equipment (69%) and trainings (22%). The infrastructure and equipment costs are due mainly to equipment upgrades to health centers, whereas the training costs are due to in-service/refresher trainings (see Figure 44).

Figure 44. Composition of Programmatic Costs of Environmental and Occupational Health: Occupational Health, 2013–2018



Environmental and Occupational Health: Waste Management

Cost results

Total costs: The E&O waste management program includes only programmatic costs, totaling a projected US$501,339 over six years, as shown in Table 47. This program monitors the disposal and handling of clinical waste across all private and public health facilities.

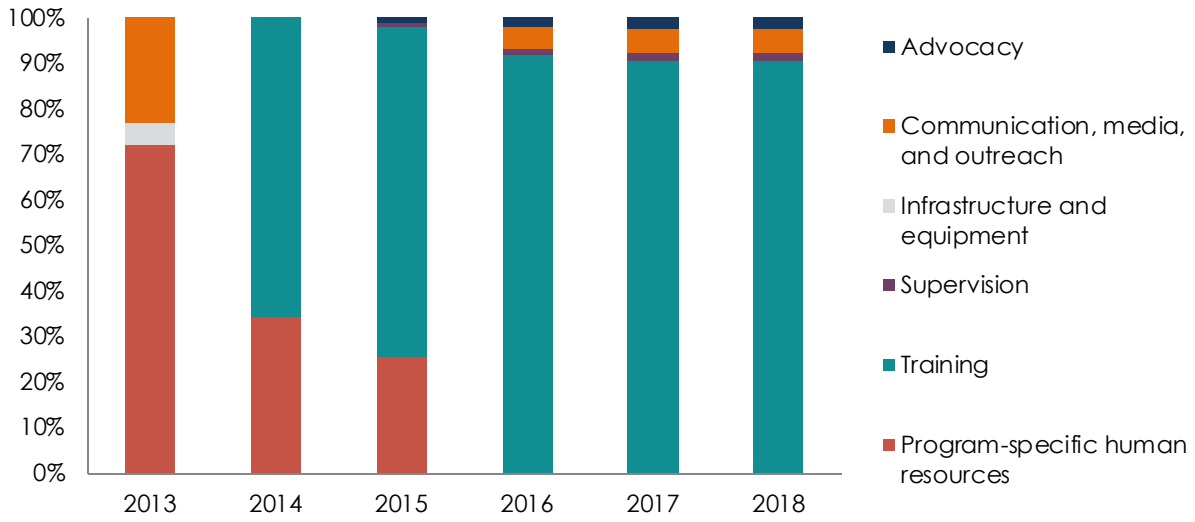
Table 47. Total Costs of Environmental and Occupational Health: Waste Management, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$0	$0	$0	$0	$0	$0	$0
Program cost	$46,944	$99,297	$133,126	$80,847	$70,562	$70,562	$501,339
Total costs	$46,944	$99,297	$133,126	$80,847	$70,562	$70,562	$501,339

* Values have been rounded to integers. Totals may not be exact.

Training and program-specific human resources make up 93 percent of the costs (see Figure 45). The training costs are due to in-service/refresher trainings and supportive follow-ups to health districts.

Figure 45. Composition of Programmatic Costs of Environmental and Occupational Health: Waste Management, 2013–2018



Environmental and Occupational Health: Chemical Management

Cost results

Total costs: The E&O chemical management program includes only programmatic costs. totaling a projected US$311,330 over six years, as shown in Table 48. Several ministries support the management of chemical licensing in Botswana, that is, ensuring the safety of use and sale of domestic chemicals (e.g., household poisons for pest control) and commercial chemicals (e.g., pesticides, herbicides, animal dips, and animal vaccines). The MOH is responsible for the assessment of environmental and occupational health hazards associated with the use of the chemicals, and issues clearances to companies for chemical licensing.

Total costs by year are shown in Table 48.

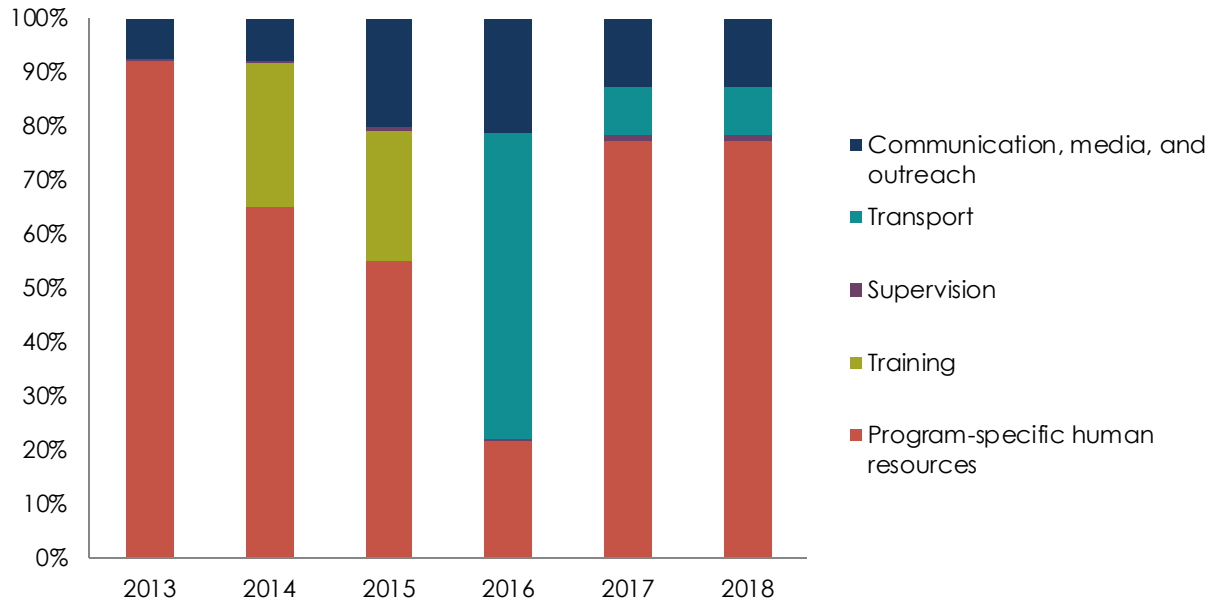
Table 48. Total Costs of Environmental and Occupational Health: Chemical Management, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$0	$0	$0	$0	$0	$0	$0
Program cost	$29,072	$41,107	$48,492	$123,519	$34,570	$34,570	$311,330
Total costs	$29,072	$41,107	$48,492	$123,519	$34,570	$34,570	$311,330

* Values have been rounded to integers. Totals may not be exact.

Key cost drivers are program-specific human resources (51%); transport (25%); and communication, media, and outreach (16%). (See Figure 46.) The training costs are due mainly to the development of training programs and materials, whereas the transport costs are associated with the purchase of two vehicles in 2016.

Figure 46. Composition of Programmatic Costs of Environmental and Occupational Health: Chemical Management, 2013–2018



Environmental and Occupational Health: Tobacco Control

Cost results

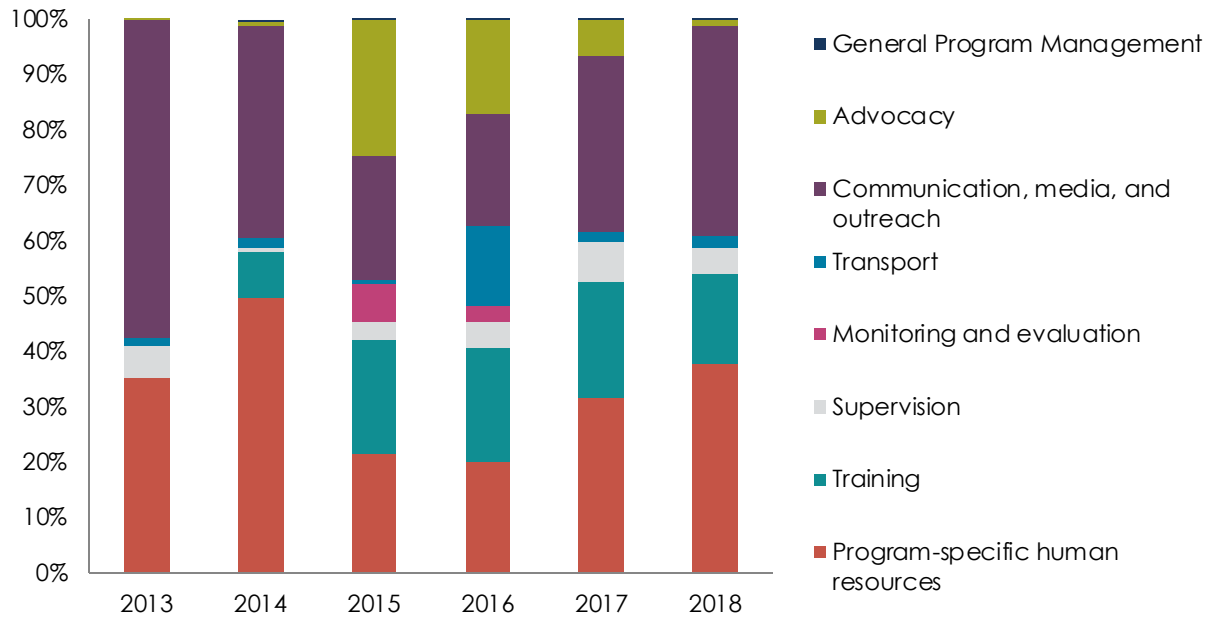
Total costs: The E&O tobacco control program includes only programmatic costs, totaling a projected US$1.4 million over six years, as shown in Table 49. This program regulates the sales and consumption of tobacco (i.e., prohibiting smoking in public spaces) to promote the clean air act in the country and scale up health promotion activities and public awareness of the health risks of smoking.

Table 49. Total Costs of Environmental and Occupational Health: Tobacco Control, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$0	$0	$0	$0	$0	$0	$0
Program cost	$180,165	$128,168	$323,930	$345,454	$220,344	$184,404	$1,382,465
Total costs	$180,165	$128,168	$323,930	$345,454	$220,344	$184,404	$1,382,465

Key cost drivers are communication, media, and outreach (32%); and human resources for the program (29%). (See Figure 47). Advocacy costs (11%) are related to advocacy strategy, activities, and materials.

Figure 47. Composition of Programmatic Costs of Environmental and Occupational Health: Tobacco Control, 2013–2018



Disease Control Unit: Integrated Disease Surveillance

Cost results

Total costs: Within the Disease Control Unit, the integrated disease surveillance program provides data on emerging new infections and high-prevalence diseases. Over six years, the program will require a projected total of US$1.2 million to sustain it (Table 50).

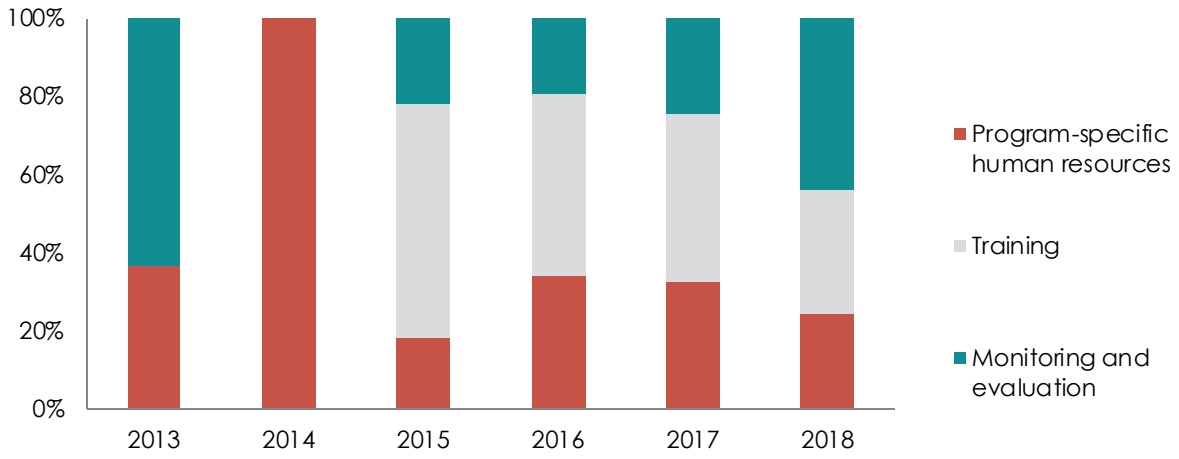
Table 50. Total Costs of Disease Control Unit: Integrated Surveillance, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$0	$0	$0	$0	$0	$0	$0
Program costs	$93,870	$34,242	$188,181	$267,606	$263,331	$354,841	$1,202,071
Total costs	**$93,870**	**$34,242**	**$188,181**	**$267,606**	**$263,331**	**$354,841**	**$1,202,071**

* Values have been rounded to integers. Totals may not be exact.

This program area distributes its funding almost evenly across three areas: human resources (30%), training (39%), and M&E (31%). Figure 48 shows that the training activities were not planned until 2015, and the distribution of cost remains fairly even between 2015 and 2018.

Figure 48. Composition of Programmatic Costs of the Disease Control Unit: Integrated Disease Surveillance, 2013–2018



Health Promotion: Content Management

Cost results

Total costs: The health promotion content management program includes only programmatic costs, totaling a projected US$6.3 million over six years. Total costs by year are shown in Table 51.

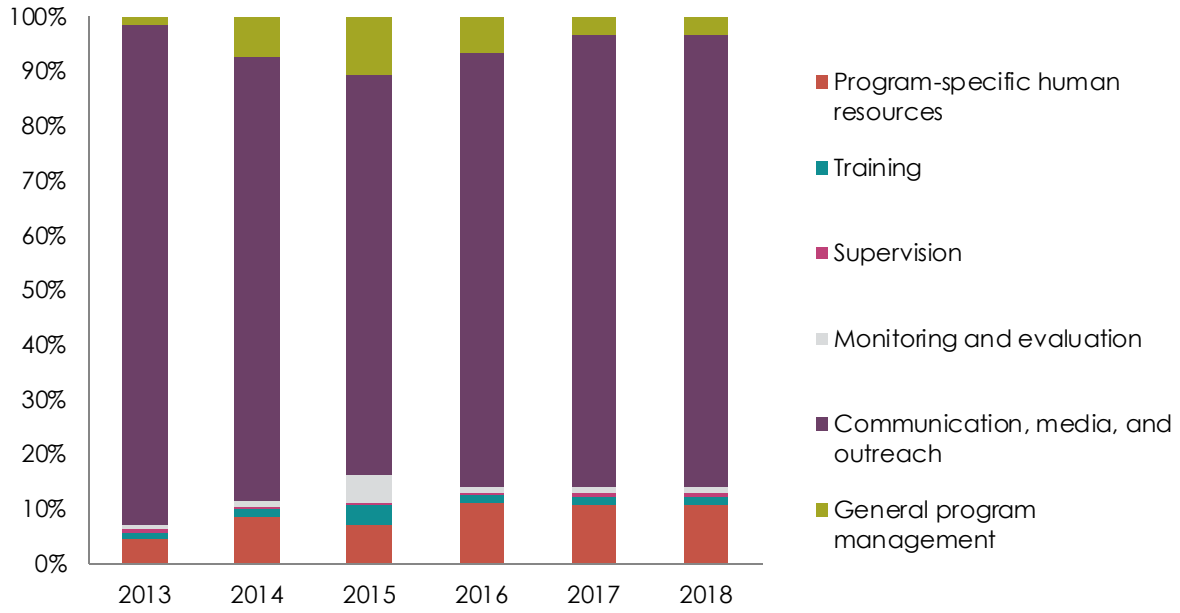
Table 51. Total Costs of Health Promotion: Content Management, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$0	$0	$0	$0	$0	$0	$0
Program cost	$1,104,381	$1,012,362	$1,124,161	$1,034,869	$991,258	$991,258	$6,258,290
Total costs	$1,104,381	$1,012,362	$1,124,161	$1,034,869	$991,258	$991,258	$6,258,290

* Values have been rounded to integers. Totals may not be exact.

The chief cost driver of this program is communication, media, and outreach (82%). Other cost contributors are program-specific human resources (9%) and general program management (5%). (See Figure 49.) All of the costs associated with communication, media, and outreach are for the printing of materials and/or brochures.

Figure 49. Composition of Programmatic Costs of Health Promotion: Content Management, 2013–2018



Health Promotion: School Health

Cost results

Total costs: The health promotion school health program includes only programmatic costs, totaling a projected US$13.4 million over six years. Total costs by year are shown in Table 52.

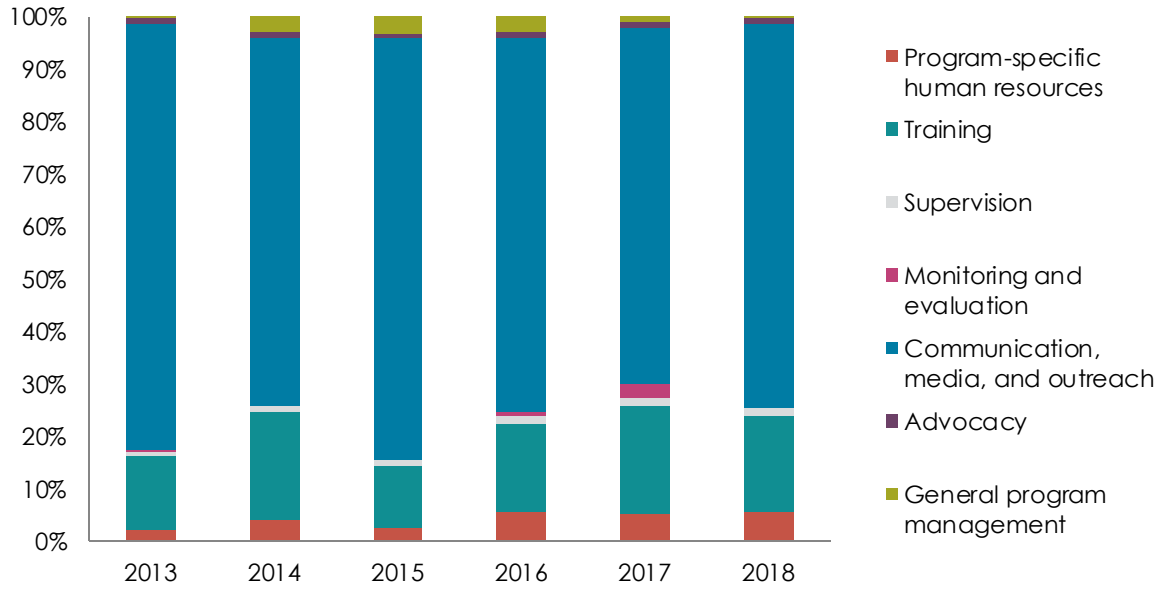
Table 52. Total Costs of Health Promotion: School Health, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$0	$0	$0	$0	$0	$0	$0
Programcost	$2,232,193	$2,076,607	$2,943,080	$2,044,847	$2,150,974	$1,985,000	$13,432,701
Total costs	$2,232,193	$2,076,607	$2,943,080	$2,044,847	$2,150,974	$1,985,000	$13,432,701

* Values have been rounded to integers. Totals may not be exact.

Figure 50 shows that the main cost driver is communication, media, and outreach (74%), followed by trainings (17%). All of the costs associated with communication, media, and outreach are for mass media campaigns, printed materials, and social outreach activities. The costs associated with trainings are due to in-service/refresher trainings and training of trainers.

Figure 50. Composition of Programmatic Costs of Health Promotion: School Health, 2013–2018



Health Promotion: Advocacy

Cost results

Total costs: The health promotion advocacy program includes only programmatic costs, totaling a projected US$2.7 million over six years. Total costs by year are shown in Table 53.

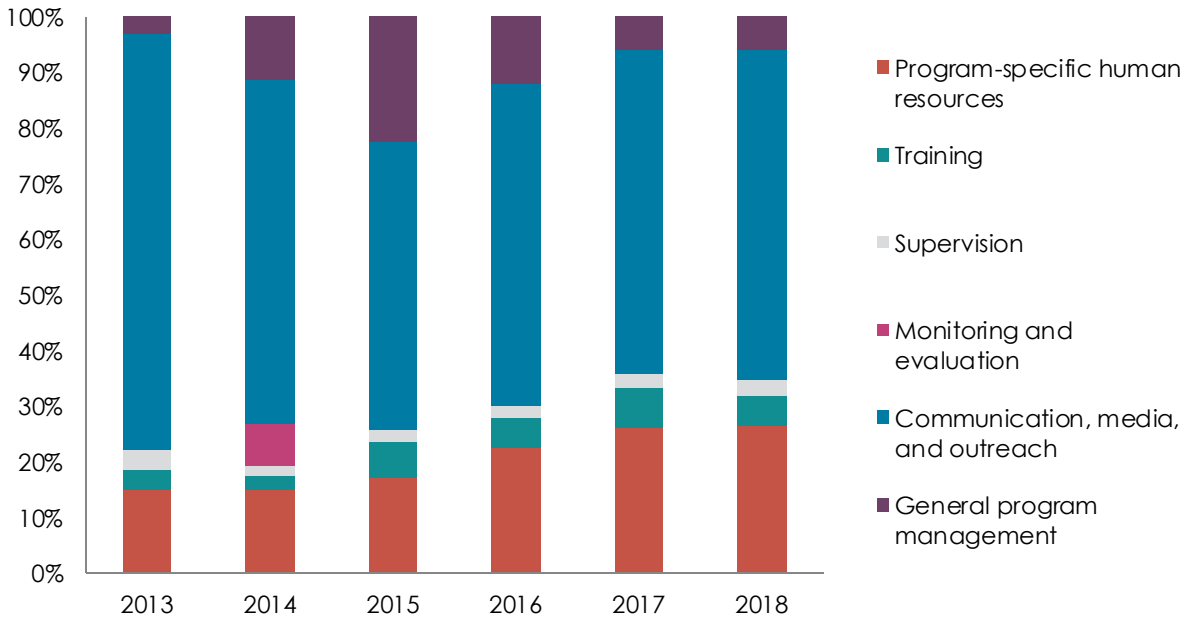
Table 53. Total Costs of Health Promotion: Advocacy, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$0	$0	$0	$0	$0	$0	$0
Program cost	$329,518	$577,871	$464,036	$510,662	$412,084	$404,425	$2,698,596
Total costs	$329,518	$577,871	$464,036	$510,662	$412,084	$404,425	$2,698,596

* Values have been rounded to integers. Totals may not be exact.

As is evident in Figure 51, the major costs drivers for this program are communication, media, and outreach (60%); program-specific human resources (20%); and general program management (11%). All of the costs associated with communication, media, and outreach are for developing a communication strategy, printed materials, and social outreach activities. The increase in staff costs is due to the hiring of additional staff by 2016.

Figure 51. Composition of Programmatic Costs of Health Promotion: Advocacy, 2013–2018



Monitoring and Evaluation

Cost results

Total costs: The M&E program includes only programmatic costs, totaling a projected US$31.6 million over six years, as shown in Table 54.

Table 54. Total Costs of Monitoring and Evaluation, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$0	$0	$0	$0	$0	$0	$0
Program cost	$657,961	$581,923	$10,695,014	$6,436,566	$6,629,271	$6,571,735	$31,572,470
Total costs	$657,961	$581,923	$10,695,014	6,436,566	$6,629,271	$6,571,735	$31,572,470

* Values have been rounded to integers. Totals may not be exact.

Figure 52 shows that the major costs drivers for this program are program-specific human resources (54%) and trainings (36%). The increase in human resources in 2015 demonstrates the need for this department to hire additional staff to ensure proper M&E of current activities. The in-service/refresher training costs rise considerably to take new staff into account and ensure they have the skills needed to properly perform their tasks.

Figure 52. Composition of Monitoring and Evaluation Programmatic Costs, 2013–2018

Oral Health: School Health

Cost results

Total costs: The oral health–school health program includes only programmatic costs, totaling a projected US$9 million over six years, as shown in Table 55.

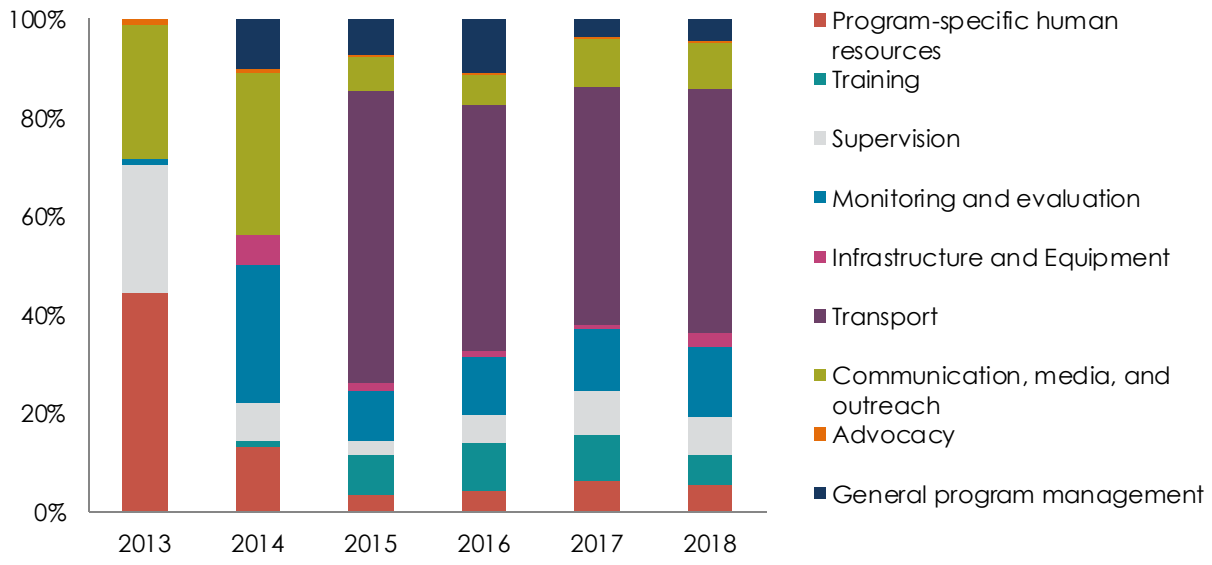
Table 55. Total Costs of Oral Health: School Health, in 2013 US$*

	2013	2014	2015	2016	2017	2018	Total
Drugs and supplies costs	$0	$0	$0	$0	$0	$0	$0
Program cost	$170,480	583,005	$2,150,837	2,602,155	1,662,568	$1,877,227	$9,046,273
Total costs	$170,480	583,005	$2,150,837	$2,602,155	$1,662,568	$1,877,227	$9,046,273

* Values have been rounded to integers. Totals may not be exact.

As is evident from Figure 53, the major cost drivers for this program are transport (48%); M&E (13%); and communication, media, and outreach (10%). The majority of the transport costs are related to the purchase of 43 vehicles from 2015 to 2018. The M&E costs are linked to quality control/assurance, whereas the cost drivers in communications are related to mass media campaigns.

Figure 53. Composition of Programmatic Costs of Oral Health: School Health, 2013–2018



Human Resources

Although available information on costs of human resources is not complete, the team was able to calculate the total cost of salaries for medical personnel delivering services at the facility level. Table 56 reflects these results, a projected US$1 billion over six years.

Table 56: Costs of HR, Medical Personnel at the Facility Level, in 2013 US$

	2013	2014	2015	2016	2017	2018	Total
Salaries	$120,067,693	$176,736,235	$182,038,322	$187,499,472	$193,124,456	$198,918,189	$1,058,384,367

LIMITATIONS AND CHALLENGES

This analysis is limited by the lack of quality data available for certain disease programs or health systems components. For example, there have been few studies in Botswana to ascertain the burden of disease for specific NCDs, mental health, oral health, and other conditions. In these instances, the OneHealth team used studies from other countries or expert opinion to develop cost assumptions. As this is Botswana's first application of OneHealth, there may be potentially missing or duplicative costs. Administrative, HR, and even M&E costs are missing from this analysis. The assumptions and data inputs can be further refined during future applications of OneHealth in Botswana.

Comprehensive List of Services Offered at Public Health Facilities

The absence of a comprehensive list of health services offered at public health facilities presented a challenge for this analysis. Although the EHSP documents those services deemed essential to be rendered to the public, not all of them are offered at all facility levels. Additionally, several services lack adequate documentation. The team spent a considerable amount of time mapping services that were not clearly defined.

Strategic Plan for Programs

A key element used to support planning and the projection of resource needs for programs is a strategic plan. In most cases, strategic plans define the program's goal and objectives, targets, PIN or prevalence by condition, and service coverage by year. These inputs help determine cost projections (current and future). During the data collection process, the team encountered a number of programs/services that lacked strategic plans but did have service guidelines.

Some targets outlined for individual disease areas may be difficult to achieve, especially in situations in which current coverage is low and program managers aim to reach 100 percent coverage within five years. As such, targets beyond a three- to five-year timeframe are prone to uncertainty. We recommend a periodic review of the service delivery targets for these disease areas to assess and revise them as necessary, based on progress made.

The absence of strategic plans challenged planning and budgeting at the service levels as follows:

- *Limited the program's ability to adequately plan service delivery*

  When program aims and targets are not defined, planning to scale up service and resource needs (i.e., ensuring adequate drug stocks and commodities, developing staffing plans) becomes challenging. Services then are operating ad hoc or in crisis mode, which limits their responsiveness to patient needs or numbers. Further, these services are catering to patients able to access the services (walk-ins), not those that require services but are unable to access them. During the data collection exercise, respondents working within these services noted that lack of targets often resulted in a curative rather than preventative focus.

- *Limited ability to determine prevalence of condition/disease (population in need)*

  In the absence of reliable PIN numbers, the HPP team extrapolated future costs based on feedback from technical and program service experts. The information the team received was subjective to the respondent; also, although the respondents were technical experts, it is unclear if their assumptions were aligned to the ministry's goals and agenda.

Notably, the programs that lacked strategic plans also did not have a focal person at MOH headquarters to coordinate the program nationally.

Capacity Building and Institutionalization of OneHealth

In this iteration of OneHealth in Botswana, 17 MOH officers across various programs and departments were trained on the use of the tool. HPP consultants were seconded to MOH to ensure skills transfer on costing study methodologies. However, due to a heavy core workload and time limitations, only four MOH officials participated in the full breadth of the study.

Data Availability and Management

Data management remains a great challenge at both the central and facility levels. There is an absence of adequate data (patient statistics and user-friendly data systems) to guide decision making and policy direction in effecting improvements in service delivery. Notably, data reported at the central level often differed from the data sources at the district or facility levels.

The data collection team faced challenges in assessing basic patient statistics per service, due to inconsistency in data standards across the services. A major contributing factor was the state of data management. In some services, personnel had entered data into the Integrated Patient Management System (IPMS) or Excel-based files (self-created), whereas others were using paper-based systems. In some instances, service data were fragmented and unlinked; that is, different points of service maintained their own data files. Thus, to ascertain the total patient statistics per service, the team had to triangulate data from different points of service delivery.

Data in IPMS did not reflect the actual patient statistics. HCWs did not enter patient numbers per service into IPMS consistently; many of them noted that it is often an onerous and time-consuming process to enter data after every patient they see. IPMS also has limitations in capturing patient overflow—that is, the number of patients on floor beds after the ward has reached full bed occupancy.

To ensure data accuracy for cost estimates, the team sourced data directly from service personnel, attained through a manual count of the registers. Data standards often reflected the resources made available for the service (i.e., trained M&E HCWs), donor reporting requirements, or those individuals keen to collect and store the data.

Survey Fatigue and Limited Participation by Respondents

Although a number of respondents were enthusiastic about the intention and benefits of the costing study, many expressed concern that the studies constantly being undertaken in Botswana seemingly have not yielded any positive changes in the operations of health services. Many respondents expressed survey fatigue, partly due to a limited understanding of the benefits of the information solicited; many HCWs also noted that results of the surveys are never widely disseminated or fed back to them.

Centralized Pricing System

A critical gap is the absence of a centralized repository for the inventory and pricing of commodities, drugs, and equipment. For example, the team faced significant challenges in sourcing equipment prices. The team had to obtain several prices from various private manufacturers and suppliers due to lack of records at MOH headquarters. In some instances, programs/services had conducted their own procurements at a high cost, thus limiting the ministry's ability to negotiate better prices based on economies of scale.

RECOMMENDATIONS

Despite limitations around data and resources, the technical team calculated normative costs for the various disease areas identified. Below, we have detailed a few areas for further development that will enhance the resource estimation and planning process.

Improve Data Availability

The technical team recommends a concerted effort to standardize interventions and HR requirements, along with an assessment of attendant requirements for service provision—such as M&E, infrastructure, and logistics—that will help inform health systems costs. In this case, the team sourced most data at the central level, and information about coverage numbers and patient access data was not up to date. Additionally, some programs have not developed an active screening component, so assessing the PIN was challenging. In some cases, the MOH has not yet developed a strategy for implementation.

During this exercise, we observed that various types of data collection systems are currently in use (IPMS, PIMS, and paper-based patient registers) across service delivery channels. These different data catchment systems do not interface with each other and operate independently, thus making comparison/verification of information and compilation of data difficult. In addition, the staff at the facility level may lack the training to properly utilize these systems, thus limiting the quantity of data entered and the quality of the outputs. Further evidence at the facility level suggests that these systems are periodically offline, thus making it impossible for data to be entered for several days. Adequate human resources are needed to ensure that data are properly captured, entered, verified, and analyzed to ensure their accuracy and timeliness. Data gathering would be improved by the following:

- A user-friendly data system that captures pricing of commodities and equipment at the central level, along with an inventory of available and needed equipment
- Increased attention to training staff on the centrality of data and its uses for a robust M&E program
- Increased HR capacity to include data clerks to enter and receive data at the facility level and reduce administrative burden on clinicians

Operationalize Strategic Objectives; Tie Resource Allocation to Quantifiable Targets

Any strategic planning and budgeting exercise requires multiyear targets, defined by technical experts and policymakers based on need and keeping in mind the available resources. Although several program areas had strategic documents aimed at achieving Millennium Development Goals (MDGs) (in some cases, not recently updated), the technical team had difficulty in relating the stated goals with quantifiable and achievable targets. The MOH should undertake operational planning to achieve program targets tied to MDGs. Updating current coverage numbers for disease programs that are missing this information is a first step, followed by a planning exercise to update targets and develop measurable metrics for yearly program achievement. The technical team developed targets based on inputs from program staff and available coverage numbers, and subsequently validated them with program staff. Additionally, the team faced challenges in assessing costs for some programs (such as NCDs and MNSADs) because a roll-out strategy has not been developed for all areas. The MOH should introduce a paper or Excel-based system for developing annual program targets and objectives. These targets and the MOH's priorities should be reviewed regularly and workplans adjusted to accommodate the growing need for interventions in different areas, such as NCDs.

Standardize Delivery of Interventions

The technical team faced difficulty in assessing interventions, due to lack of standardization in service provision across levels of health service delivery. Standard guidelines for service delivery do exist—they are used to train HCWs—but delivery could differ between different health levels. The mismatch in application is due to lack of skills, misinterpretation, or shortage of staff delivering the service. The variations in standards of service can range from slight to major, based on the HR situation at the facility and staff ability. In our view, these variations could be compounded by lack of follow-up mentorship and monitoring after training.

The other factor that would affect the standard application of guidelines is patient treatment adherence. If patients adhere to treatment, HCWs tend to follow the service guidelines more closely. For example, as standard practice, HIV-positive TB patients initiated into co-trimoxazole treatment need to make daily visits to the health facility for 30 days to receive treatment. They are then allowed to take home the medications for the remaining five-month course. Co-trimozaxole is a six-month treatment program, and patients are required to give sputum samples three times during the treatment process. However, depending on patient adherence and HCW discretion, the HCW may decide to administer medications for just two weeks at the health facility instead of the usual 30 days. The HCW may decide to give the rest of the medications to a reliable caregiver to continue treating the patient. Alternatively, the HCW may transfer the patient to a community TB care program where they receive treatment at home. Given this variation, assessing the amount of staff time spent on the intervention, and its attendant costs, can be difficult.

Accordingly, the technical team recommends that the MOH take a systematic approach to routinely audit delivery of services at health facilities to (1) assess execution of services based on the service guidelines, (2) mentor and retrain HCWs on the guidelines, and (3) assess opportunities to improve service efficiency and subsequently inform revisions to service policy and guidelines.

Increase Coordination Between Disease Programs and the Central Planning Office

Coordination between the various disease programs and the health systems (such as human resources, infrastructure, M&E, and logistics) is essential when establishing targets and increasing coverages. Individual program targets should be decided based on realistic assumptions with regard to health systems capacity.

In cases of overlapping interventions between two or more disease areas, better coordination will help mitigate wasteful expenditure and allow accurate tracking of resources as required by the programs. For example, both the malaria and child health programs partially cover malaria interventions for children. Better planning would help delineate which program incurs costs for specific interventions. In this instance, the child health program could cover the costs of staff time for delivering malaria interventions, whereas the drugs and supplies could be covered under the malaria program.

Create an MOH Technical Working Group to Update OneHealth Projections on a Regular Basis

In this iteration, the technical team focused on the costs of implementing individual disease interventions. Program staff provided data on human resources that do not deliver services directly for all disease areas, and training expenditures for some areas. The technical team had significant difficulty in obtaining disaggregated costs for M&E, infrastructure and equipment, communication media and outreach, and

advocacy; hence, these costs are under-represented in the total intervention costs. The team also found it challenging to obtain information for emerging programs with unpublished strategies, such as NCDs and MNSADs. The team was also unable to source data for several pieces of the health systems components (governance, infrastructure operating costs, facility construction, rehabilitation and maintenance, parts of health financing, and parts of logistics). An MOH working group of program officers should plan to update the tool with data on program and health systems costs to get a fuller picture. Additionally, as EHSP implementation unfolds, periodic updates to revisit targets and assess resource needs and likely health impacts will allow for a more accurate projection of expected costs. The OneHealth model represents an analytical tool and a consultative, reasoned process for arriving at an ideal mix of interventions, scale-up plans, and estimates of resource needs and likely health impacts. Once the model has been populated with the targets and unit costs, as well as the background demographic and epidemiological data, it should be periodically updated in a consultative process led by a coordinating unit.

Focus on Most Cost-Effective Interventions

Several interventions are offered under the various disease programs, but information on their cost-effectiveness and impact is limited. The MOH should consider doing an analysis of those interventions with the most impact, based on their ability to reduce incidence of diseases that contribute to a high cost burden. This analysis would allow program officers to better align their strategies and get the most value from limited resources. For example, prevention activities such as routine screening for cancer or cardiovascular disease can prevent disease and/or allow patients to start treatment earlier, thus averting patient treatment and case management costs over the long term.

NEXT STEPS

The ministry identified priority next steps and areas that must be critically addressed to effectively realize its reform agenda over the next few years. Some of these steps will also support concerns on issues around cost containment, cost utilization, and cost-effectiveness. The priority next steps outlined below are time sensitive and require immediate support, as the reform is gaining impetus.

1. **Health Systems Strengthening at the district level to support the decentralization plan:** Once the new MOH structure becomes operationalized, support will be required to build the capacity of the DHMTs, especially in areas of health information systems, strategic planning, and institutionalization of OneHealth to support better planning and budgeting processes, and improve accountability at district levels.

2. **Conduct health systems analysis:** OneHealth calculates costs by year, program, inputs, level of care, and so on. This analysis can be completed to assess additional health system requirements to meet service outputs—for example, additional full-time equivalents (FTEs).

3. **Facility-based unit costing:** The normative unit costs generated through the EHSP costing study provide the average cost of rendering services per patient per year. The normative costs are based on service and treatment guidelines, and do not reflect actual cost spent at the facility level. Expenditure at a facility may be greater or lower than the normative cost due to a number of structural contexts, such as geographical location, number of patients accessing service, types of cadre involved in providing service and percentage of their time spent on service delivery, and others. Accordingly, it is imperative for the ministry to gain insight into the expenditure patterns across all levels of care and geographical categories to judge where areas of efficiency gains can be realized and understand cost drivers at the facility level.

4. **Assessment of out-of-pocket expenditure on health and barriers to accessing health services:** Through the EHSP costing exercise, the ministry was able to obtain costs for rendering its health services. To improve patient access and utilization of public health services in the country, it is imperative to conduct an assessment of patient out-of-pocket expenditure and key barriers to accessing health services. Through this exercise, the ministry will better understand health-seeking patterns among its population and assess patient costs in accessing health services across various categories, such as public healthcare, private care, traditional healers, or self-care (pharmacy).

5. **Catastrophic expenditure analysis:** Through the assessment of out-of-pocket expenditure, the MOH should conduct further analysis on catastrophic expenditure across the different levels of income. A universal health coverage goal requires that a country should ensure financial protection of its population to negate high levels of poverty and financial barriers to care.

6. **Further capacity building and support in the institutionalization of OneHealth:** Although great strides have been made during the costing process to institutionalize OneHealth, the ministry's continued support is still warranted in accomplishing its reform. The facilitation of two workshops would support this aim:

    a. *Further training in OneHealth and scenario modeling*: This training is needed to build capacity in policy/scenario modeling, strategic planning/target setting, and full roll-out of OneHealth to the districts. When used maximally, data generated from One Health will prove

essential in helping to guide the MOH in making evidence-based decisions, developing sound strategic plans, improving resource allocation, and increasing efficiencies in service delivery.

b. *Prioritization exercise for the EHSP*: This exercise will help to align high-impact interventions with health priorities and available resources.

ANNEX A: BACKGROUND ON AVAILABLE ART, PMTCT, AND HTC DATA

Previously completed ART and PMTCT studies provide an overview of the resource needs for continuing to provide high-quality care. The *Botswana Investment Case* analysis assesses the normative unit costs to deliver ART and PMTCT. The HTC costing study provides a better understanding of the current unit costs of delivering HTC services at the facility level.

An overview of four existing HIV/AIDS costing studies is provided below.

ART

The Cost and Impact of ART Guideline Changes and HIV Prevention Efforts in Botswana (MOH, GOB, 2012c) report was published in March 2012. This study assessed the cost-effectiveness of potential changes in the treatment guidelines and prevention strategies in Botswana. It compared increasing treatment eligibility to a CD4 count of less than 350 rather than less than 250; treatment as prevention; high-impact prevention interventions in combination with current treatment guidelines; high-impact prevention interventions in combination with a CD4 count of less than 350 as the treatment eligibility guideline; universal treatment access; the test-and-treat strategy (to employ regular testing to identify HIV-positive individuals), and SMC alone. Table A.1 describes projected costs for each of these scenarios, deaths averted, cost per death averted, infections averted, and cost per infection averted.

Table A.1. ART Guideline Change and HIV Prevention Effort Scenarios (all costs US$)

	First-Year Costs	Five-Year Costs	Deaths Averted	Cost per Death Averted	Infections Averted	Cost per Infection Averted
***ARV C4D<350**	$440m	$2,430m	7,400 (24%)	$34,800	12,700 (20%)	$20,200
****Treatment as prevention**	$2.4m	$11m	40(2.5%)	$230,000	530(20%)	$17,600
***High-impact + CD4 250**	$410m	$2,270m	230(1%)	$450,000	16,100(25%)	$6,300
***High-impact + CD4 350**	$460m	$2,530	7,500(27%)	$48K	25,500(40%)	$14,000
***Universal access**	$470m	$2,750m	7,500(33%)	$76K	31,300(49%)	$18,300
***Test and treat**	$740m	$3,640m	15,100(50%)	$99,500	44,700(70%)	$35,500
*****SMC**	$4.6m–$15m	$25.3m–$67.5m	80–260 (0.3%-0.85%)	$300K–$250K	9%–28%	$4,000–$3,600

* Estimates based on total cost: the cost of treatment, all other interventions (behavioral and SMC), and program support functions (e.g., administration, human resources, M&E, policy and research).
** Estimates based on costs within the PMTCT program.
*** Estimates based on SMC costs.

The study did not recommend any one of the scenarios detailed above. Rather, it assessed all of them and suggested that implementing a practical approach, such as increasing treatment eligibility to a CD4 count of less than 350 and implementing prevention guidelines, would require more resources than are currently available.

The *Botswana Investment Case* (NACA, 2014) study outlines normative unit costs for ART. It was a GOB (National AIDS Coordinating Agency) activity supported by the Joint United Nations Program on HIV/AIDS (UNAIDS), undertaken to actualize the investment approach in Botswana. It establishes the "optimal" HIV/AIDS programs and, as much as possible, looks at the critical enablers for supporting program implementation. This study is the basis for developing Botswana's concept note for the new Global Fund funding mechanism. The modeling for the investment case involved revising existing Spectrum files with the most up-to-date information available from HIV/AIDS programs, the BAIS, and the national census. The study created a baseline projection as a counterfactual scenario and modeled normative costs of individual interventions for the period 2014–2030. Table A.2 provides detailed unit costs for several ART interventions for 2013–2017 because that aligns with our current study's time period.

Table A.2. Detailed Unit Costs for Several ART interventions, 2013–2017

ART Unit Costs for HIV Patients (US$)	2013	2014	2015	2016	2017
Adults (costs per patient per year)					
First-line ART drugs	$155	$155	$155	$155	$155
Second-line ART drugs	$464	$464	$464	$464	$464
Lab costs for ART treatment	$151	$151	$151	$151	$151
Drug and lab costs for OIs	$378	$378	$378	$378	$378
Co-trimoxazole prophylaxis	$10	$10	$10	$10	$10
Children (costs per patient per year)					
ARV drugs	$235	$235	$235	$235	$235
Lab costs for ART treatment	$155	$157	$159	$161	$163

PMTCT

More than 90 percent of women in Botswana receive antenatal care at a health facility, highlighting that the provision of PMTCT at the facility level is a service within EHSP. Currently, more than 95 percent of women who test HIV positive receive antiretrovirals (ARVs), and fewer than 3 percent of HIV-exposed babies are born HIV positive. *The Costing of EMTCT Botswana 2012–2015* study was completed in 2013. The costing assessed the resources needed to eliminate maternal-child transmission in Botswana by 2015 as per the *Strategic Plan Towards the Elimination of Mother-to-child Transmission of HIV and Keeping Their Mothers Alive 2012–2015* (MOH, GOB, 2011f). Results show that US$77.3 million would be required to achieve elimination and improve maternal, newborn, and child survival and health in the stated years. Table A.3 summarizes the costs by strategic area.

Table A.3. Summary of EMTCT Costs, 2012–2015

Summary Budget by Strategic Area	Total for 4 Years, 2012–2015 (US$)
Strategic Area 1: Primary prevention of HIV infection among women of childbearing age	1,793,428
Strategic Area 2: Prevention of unintended pregnancies among women living with HIV	859, 354

Strategic Area 3: Prevention of HIV transmission from a woman living with HIV to her infant	59,089,384
Strategic Area 4: Appropriate treatment, care, and support for mothers living with HIV and their children and families	9,857,928
Strategic Area 5: PMTCT response management and coordination	2,860,684
Strategic Area 6: PMTCT program monitoring, evaluation, and research	2,835,159
TOTAL	**$77,295,939**

To achieve elimination, the largest portion of costs—US$59,089,384 (76%)—needs to be invested in Strategic Area 3, prevention of HIV transmission from a woman living with HIV to her infant. The second largest investment—US$9,857,928 (13%)—would be Strategic Area 4, appropriate treatment, care, and support for mothers living with HIV and their children and families.

Botswana's investment Case Study (described above) also outlines normative unit costs for PMTCT, as shown in Table A.4.

Table A.4. Normative Costs for PMTCT, 2013–2017, US$

PMTCT Costs (US$)	2013	2014	2015	2016	2017
Counseling (per mother)					
Pre-test	$2	$2	$2	$2	$2
Post-test for HIV+	$2	$2	$2	$2	$2
Postnatal (including breastfeeding)	$14	$14	$14	$14	$14
HIV testing (per test)					
Mother	$2	$2	$2	$2	$2
PCR test for infant after birth	$19	$19	$19	$19	$19
Infant after cessation of breastfeeding	$2	$2	$2	$2	$2
ARVs (cost per person per day)					
Nevirapine, 200mg for mother	$0.04	$0.04	$0.04	$0.04	$0.04
Nevirapine, for infant	$0.04	$0.04	$0.04	$0.04	$0.04
AZT	$0.11	$0.11	$0.11	$0.11	$0.11
3TC	$0.11	$0.11	$0.11	$0.11	$0.11
Triple treatment (AZT+3TC+NVP/EVF)	$0.42	$0.42	$0.42	$0.42	$0.42
Triple prophylaxis	$0.42	$0.42	$0.42	$0.42	$0.42
Service delivery (per mother)	$2	$2	$2	$2	$2
Formula (per child)	$536	$536	$536	$536	$536

HTC

The Costs of HIV Testing and Counseling Services in Botswana (Stegman, 2013) study was completed in 2013. The study results detail unit costs for delivering HTC services through a variety of modalities

(outreach, facility based, integrated, campaign) at different levels of the healthcare system and in different locations throughout the country. This analysis also provides assistance in explaining the components of HTC that drive the unit costs, as well as information about the number of HIV-positive individuals identified through each of the service delivery modalities.

The study calculated the unit cost by level of facility, type of service delivery, type of facility, and the geographical location of the facility. HTC has four models of service delivery:

1. Integrated testing offered through adjacent HIV programs such as PMTCT, TB, and provider-initiated testing and counseling (PITC)
2. Stand-alone VCT offered at NGO sites and/or public health facilities on a walk-in basis
3. Mobile testing offered during outreach activities conducted by HCWs within communities
4. Campaign testing offered during national campaign drives such as "Know Your Status"

A review of the study's HTC costing data by service delivery modality in public facilities indicates that HTC delivered via mobile sites (US$8 per client) and VCT (US$32 per client) were the least expensive services; HTC delivered at TB clinics was the most expensive (US$371 per client). This wide discrepancy in costs is due to variation in testing volumes between service delivery modalities, as well as direct costs, the largest of which was for human resources. This finding was particularly true for integrated service delivery (i.e., HTC delivered through other programs, such as the TB program, for which HR costs are relatively high).

The study found VCT at NGO facilities (US$67 per client) to be more expensive than at public sector facilities (US$32 per client). However, the unit cost of mobile HTC tended to be quite comparable between NGO programs (US$7 per client) and government programs (US$8 per client). Within the study sample, 49,221 HIV tests were performed in 2012. This represented 5 percent of all tests performed in the public sector and by NGOs. The largest proportion of tests (41%) was performed at VCT facilities run by NGOs (this finding is consistent with national estimates indicating that about 46 percent of all HIV tests are performed by NGOs), followed by PITC (31%) and PMTCT (16%) modalities. Compared to many of the other unit costs, VCT appears to be a quite efficient way to deliver HTC services. However, the number of clients seen at public sites was much lower than in the NGO facilities, which seems to suggest that clients prefer the latter. To maximize impact while spending the least amount of money per client, Botswana may wish to emphasize VCT services offered at NGO facilities (and may wish to place greater emphasis on mobile testing).

In effectiveness at identifying HIV-positive clients, the TB program was, not surprisingly, the most effective (49 percent of all clients were HIV positive). The second highest prevalence among HTC clients (36%) was at NGO VCT facilities, and the third highest (14%) was at government VCT facilities. The lowest prevalence rates of HIV were at PITC (3%), campaign events (4%), and government mobile testing sites (6%).

ANNEX B: ASSUMPTIONS FOR HIV UNIT COST ANALYSIS

Type Of Data	Calculation/ Assumption	Source Of Information	Form Used To Collect Data
General Info			
Inpatients for intervention	No calculation	Facility	General facility form
Outpatients for intervention	No calculation	Facility	General facility form
Total inpatients and outpatients for intervention, not weighted	Number of inpatients for intervention + number of outpatients for intervention	HPP team	HPP team
Total inpatients and outpatients for intervention, weighted	(Number of inpatients for intervention * 4.6) + number of outpatients for intervention	The WHO Choice Database suggested that inpatients use 4.6 times the resources as inpatients	Not applicable
Inpatients	No calculation	Facility	General facility form
Outpatients	No calculation	Facility	General facility form
Total inpatients and outpatients, not weighted	Number of inpatients + number of outpatients	HPP team	General facility form
Total inpatients and outpatients, weighted	(Number of inpatients * 4.6) + number of outpatients	The WHO Choice Database suggested that inpatients use 4.6 times the resources as inpatients	Not applicable
Personnel			
Column A: Staff type	No calculation involved	Interviews with key personnel at two selected facilities	General facility form
Column B: % of total time staff spends on intervention	No calculation involved	Self-reported by key personnel interviewed at the facility	General facility form
Column C: Salary (Pula)	Salary band provided for each cadre; average salary used	Annual salaries obtained from MOH staffing and salary structures for the health service; external or	MOH and CMS Central form

		contracted staff costs obtained through donor/partner records	
Column D: Salary (US$)	Exchange rate of 8.5 Pula = US$1	Oanda	Not applicable
Column E: Unit cost for personnel per patient per year	• Calculate unit cost for each cadre: [Column D * (Column B)/100)] / [total number of inpatients and outpatients] • Sum unit cost of each cadre	HPP team	Not applicable
Drugs and Non-drug Consumables			
Column B: Pack price (Pula)	No calculation involved	Central Medical Stores (CMS), development partners, or private hospital suppliers	MOH and CMS Central form and development partners form
Column C: Pack price (US$)	Exchange rate of 8.5 Pula = US$1	Oanda	Not applicable
Column D: Quantity per pack	No calculation involved	CMS, development partners, or private hospital suppliers	MOH and CMS Central form and development partners form
Column E: Quantity used per patient per year	No calculation involved	Interviews with key personnel at two selected facilities	General facility form
Column G: % of patients who use this drug	No calculation involved; only for drugs, not for non-drug consumables	Interviews with key personnel at two selected facilities	General facility form
Column H: Unit cost drugs/ non-drug consumables per patient per year	(Column C / Column D) × (Column E) × (Column G for drugs only / 100)	HPP team	Not applicable
Utilities			
Column C: % Cost allocated to	(Weighted number of total patients by intervention ÷ weighted number of total patients in facility) ×100	HPP team	General facility form

HIV intervention			
Column D: Cost of utility per year (Pula)	• Waste management: Each facility in a district receives an equal bill; charge not based on the volume of waste generated by each facility • Bontleng Clinic has not received a utility bill for telephone, electricity, or water for a number of years, so PMH used utility bills from a facility similar in level and patient volume to derive estimated values for Bontleng Clinic; costs were proportioned based on patient volumes per service • GPH had actual bills for electricity, water, and telephone bills; costs were proportioned based on patient volumes per service • Stobech and GPH provided building maintenance costs for Bontleng Clinic; Stobech tallied the monthly maintenance bills for the facilities from April 2013 to March 2014; costs were proportioned based on patient volumes per service • The team received license plate numbers for vehicles used by the facilities (GPH and Bontleng Clinic); submitted them to CTO to obtain the fuel bills of respective vehicles; costs were proportioned based on patient volumes per service	DHMT and Stobech[5] – Waste management and building maintenance DHMT and amenity parastatals—water, telephone, and electricity CTO – Fuel	General facility form

[5] Stobech is a private sector company that has been awarded an outsourced service contract by the GOB to conduct maintenance for all health facilities.

Column E: Cost of utility per year (US$)	Exchange rate of 8.5 Pula = US$1	Oanda	Not applicable
Column F: Unit cost by utility per patient per year	[(Column C ÷ 100) × (Column E)] ÷ total number of patients per intervention		
Building			
Column C: % cost allocated to HIV intervention	(Weighted number of total patients by intervention ÷ weighted number of total patients in facility) × 100	HPP team	General facility form
Column D: Geographic Location, %	Percentages for supply chain costs associated with construction value based on the geographic location of the facility and additional expenses (i.e., distance, availability of building goods and services, and accessibility to nearest tarred road/urban setting) associated with a building in the type of location: • Urban – 0% • Peri-urban – 10% • Rural – 15%	Department of Building and Engineering Services	General facility form
Column E: Construction value (Pula)	Estimates of construction values of the public health facilities are as follows: • Referral Hospital = BWP 539,500,000.00 / US$72,029,372.50 • District Hospital = BWP 415,000,000.00 / US$55,407,209.61 • Primary Hospital = BWP 80,000,000.00 / US$10,680,907.88 • Clinic = BWP 30,000,000.00/ US$4,005,340.45 • Health Post = BWP 3,000,000.00 / US$400,534.05	Department of Building and Engineering Services	General facility form
Column F: Construction value, accounting for geographic location	(Column E) × (1 + (Column D ÷ 100))	HPP team	Not applicable

(Pula)			
Column G: Construction value, accounting for geographic location (US$)	Exchange rate of 8.5 Pula = US$1	Oanda	Not applicable
Column H: Replacement period	No calculation	Department of Building and Engineering Services	General facility form
Column I: Unit cost per patient per year for building	[[(Column F ÷ (Column C ÷ 100)] ÷ (Column H)] ÷ total number of patients per year for the HIV intervention	HPP team	Not applicable
Vehicle			
Column C: % Cost allocated to HIV intervention	(Weighted number of total patients by intervention ÷ weighted number of total patients in facility) × 100	HPP team	General facility form
Column D: Vehicle value (Pula)	No calculation	CTO	General facility form
Column E: Vehicle value (US$)	Exchange rate of 8.5 Pula = US$1	Oanda	Not applicable
Column F: Replacement period	No calculation	WHO Choice Database	Not applicable
Column G: Unit cost per patient per year for vehicle	[((Column C ÷ 100) × Column E) ÷ Column F] ÷ total number of patients for HIV intervention	HPP team	Not applicable
Equipment			
Column C: % Cost allocated to HIV intervention	(Weighted number of total patients by intervention ÷ weighted number of total patients in facility) × 100	HPP team	General facility form
Column D: Cost of	No calculation	CMS, development partner, private	General facility form

equipment (Pula)		hospital suppliers, and furniture retailers	
Column E: Cost of equipment (US$)	Exchange rate of 8.5 Pula = $US 1	Oanda	Not applicable
Column F: Number of units of equipment	No calculation	MOH	General facility forms
Column G: Cost of equipment allocated to this service	(Column C) × (Column E) × (Column F)	HPP team	Not applicable
Column H: Replacement period	No calculation	OneHealth tool	Not applicable
Column I: Unit cost per patient per year for equipment	[(Column G) ÷ (Column H)] ÷ total number of patients per intervention per year	HPP team	Not applicable
Management			
Column C: % Cost allocated to HIV intervention	(Weighted number of total patients by intervention ÷ weighted number of total patients in facility) × 100	HPP team	General facility form
Column D: Annual salary (Pula)	No calculation	MOH	MOH and CMS Central form
Column E: Annual salary (US$)	Exchange rate of 8.5 Pula = US$1	Oanda	Not applicable
Column F: Number of staff	No calculation	Interviews with facility personnel	General facility form
Column G: Unit cost per patient per year for management	(Column C ÷ 100) × (Column E) × (Column F)	HPP team	Not applicable
Supply Chain—Fuel Cost			
Column B: Round-trip distance to	One-way distance multiplied by 2	CMS and facility	MOH and CMS Central form

and from warehouse			
Column C: Number of round trips	24 trips to a facility per year	CMS	MOH and CMS Central form
Column D: Fuel cost	(BWP 1.75 per KM / US$O.23 per KM) × Column B × Column C	CMS	MOH and CMS Central form
Column E: Number of services	No calculation	Facility	General facility form
Column F: Unit cost per patient per year for fuel	[Column D ÷ Column E] ÷ total number of patients per service per year	HPP team	Not applicable
Supply Chain—Driver			
Column B: Annual salary for driver (Pula)	No calculation	MOH	MOH and CMS Central form
Column C: Annual salary for driver (US$)	Exchange rate of 8.5 Pula = US$1	Oanda	Not applicable
Column D: % of time spent at this facility	Divided the driver's time equally across number of facilities in the district—in Gaborone District, 29 public health facilities; in Goodhope, 39 public health facilities	CMS and HTC report	MOH and CMS Central form
Column E: # of services offered at facility	Interviewed the hospital superintendent or matron to list the number of services offered at facility	Matron or hospital superintendent	General facility form
Column F: Unit cost per patient per year for supply chain – driver	[(Column C × (Column D ÷ 100)) ÷ Column E] ÷ total number of patients per HIV intervention at facility	HPP team	Not applicable
Supply Chain—Vehicle Costs			
Column B: Vehicle value (Pula)	No calculation	CTO	MOH and CMS Central form
Column C: Vehicle value (US$)	Exchange rate of 8.5 Pula = US$1	Oanda	Not applicable
Column D: Average number of	Interviewed the hospital superintendent or matron to list the number of	Matron or hospital superintendent	General Facility form

services at facility	services offered at facility		
Column E: Replacement period	No calculation	WHO Choice Database	Not applicable
Column F: Annual operating cost per vehicle per service	Column C ÷ (Column D × Column E)	HPP team	Not applicable
Column G: Unit cost per patient per year for vehicles	Column F ÷ total number of patients per HIV intervention by facility	HPP team	Not applicable

ANNEX C: HIV UNIT COST ANALYSIS—DATA TOOLS

1. SERVICE/INTERVENTION-LEVEL DATA FORM

The following survey is being conducted for the purpose of calculating the unit cost of services at the facility level. We are asking your assistance as one of the selected sites where the cost of providing ART services for TB patients are being assessed. Your help with this survey is greatly appreciated. Please note that the information about the identification of this service will be kept confidential.

Name of Facility: _____

Type of Facility *(circle applicable):* District Hospital / Clinic with Bed / Clinic without Bed

Other (specify): _____

Record Code: _____
(Data Collector initials _ Facility Name _Form number)

District: _____

Town/Village: _____

Date of Interviews:

Day	Month	Year	Name of Interviewer(s)

Persons Interviewed:

Name	
Title/Designation	
Telephone (Office)	
Telephone (Cell)	
Email Address	
Fax Number	

Name	
Title/Designation	
Telephone (Office)	
Telephone (Cell)	
Email Address	
Fax Number	

Name	
Title/Designation	
Telephone (Office)	
Telephone (Cell)	
Email Address	
Fax Number	

General: Facility and Program

1. **Name of Service: Additional ART for TB patients**
   Note: Notify the respondent that all the following questions and answers required should only relate to this particular service.

2. **Number of clients who have received this service from April 2013 to March 2014:** _____

3. **On average, how many times does a patient access/visit this service in a year?**_____

Notes:

_____
_____
_____
_____
_____
_____
_____
_____

Recurrent Costs: Personnel

1. Number and type of **Program/Service Delivery Management staff** involved in the delivery of this **particular service** *Notes: 1) please write staff position in the blank spaces provided 2) If there is more than 1 of the same cadre, please list them separately 3) Note across each of the cadre what % of time is spent in the service. E.g., A Senior Registered Nurse spends 20% of her total time at facility on this particular service. 4) Indicate on notes column if any of the staff members are rotational to the program and the frequency of the rotation. 5) Indicate on notes column the official title of the cadre if different from facility title (e.g., official title of a Midwife is Senior Registered Nurse) 6) Note the range of hours or percentage of time spent during peak and off-peak seasons per service (if applicable).*

Program/Service Delivery Management Cadre	Number of hours spent on management & administration per week	Percentage of hours spent on management & administration per week	Number of hours spent on service delivery (*if applicable)* per week)	Percentage of hours spent on service delivery (*if applicable)* per week)	Total number of hours worked per week
District TB Coordinator					
District ART Coordinator					
Matron					
Hospital Superintendent					
Other (specify below):					

Notes:

_____
_____
_____
_____
_____

2. Number and type of **Permanent staff** involved in the delivery of **service per patient** *Notes: 1) please write staff position in the blank spaces provided; list all staff members below delivering the service 2) If there is more than 1 of the same cadre, please list them separately 3) Note across each of the cadre what % of time is spent in the service. E.g., A Senior Registered Nurse spends 20% of her total time at facility on this particular service. 4) Indicate on notes column if any of the staff members are rotational to the program and the frequency of the rotation. 5) Indicate on notes column the official title of the cadre if different from facility title (e.g., official title of a Midwife is Senior Registered Nurse) 6) Note the range of hours or percentage of time spent during peak and off peak seasons per service (if applicable)*

Permanent Cadre	Number of Cadre	Percentage of time spent on service	Total number of hours worked per week	Notes on cadre
Assistant Nursing Officer				
Chief Nursing Officer				
Chief Registered Nurse				
Healthcare Auxiliary				
Lay Counselor				
Medical Officer				
Nurse Officer I				
Nurse Officer II				
Nurse Superintendent				
Principal Nursing Officer I				

Permanent Cadre	Number of Cadre	Percentage of time spent on service	Total number of hours worked per week	Notes on cadre
Principal Nursing Officer II				
Principal Registered Nurse				
Registered Nurse				
Senior Nursing Officer				
Senior Registered Nurse				
Other (specify below):				

Notes:

_____
_____
_____
_____

3. **Contracted/External staff**

Number and type of **Contract/External staff** involved in the delivery of **service per patient** *Notes: 1) please write staff position in the blank spaces provided; list all staff members below delivering the service 2) If there is more than 1 of the same cadre, please list them separately 3) Note across each of the cadre what % of time is spent in the service. E.g., A Senior Registered Nurse spends 20% of her total time at facility on this particular service. 4) Indicate on notes column if any of the staff members are rotational to the program and the frequency of the rotation. 5) Indicate on notes column the official title of the cadre if different from facility title (e.g., official title of a Midwife is Senior Registered Nurse) 6) Note the range of hours or percentage of time spent during peak and off peak seasons per service (if applicable)*

Contracted/External Cadre	Number of Cadre	Percentage of time spent on service	Total number of hours worked per week	Notes on cadre
Assistant Nursing Officer				
Chief Nursing Officer				
Chief Registered Nurse				
Healthcare Auxiliary				
Lay Counselor				
Medical Officer				
Nurse Officer I				
Nurse Officer II				
Nurse Superintendent				
Principal Nursing Officer I				

Contracted/External Cadre	Number of Cadre	Percentage of time spent on service	Total number of hours worked per week	Notes on cadre
Principal Nursing Officer II				
Principal Registered Nurse				
Registered Nurse				
Senior Nursing Officer				
Senior Registered Nurse				
Tirelo Sechaba Participant				
Other (specify below):				

Notes:

_____
_____
_____
_____

Recurrent Costs: Drugs, Consumables, & Supplies

1. **Type and quantities of <u>drugs</u> are used at this service per patient per year?** *Notes: 1) if there are other drugs being used that do not appear here, please write them in the blank spaces provided 2) quantities should be estimated at the lowest unit, i.e., 5 grams or 2 mls per patient 3) Where applicable, please denote the quantity or description of the drug*

Drug	Portion/Quantity used per patient per year	Notes on drug *(quantity or description)*
ART Drugs – Pediatrics (First Line)		
ART Drugs – Pediatrics (Second Line)		
ART Drugs – Adult (First Line)		
ART Drugs – Adult (Second Line)		
Atriplar		
CBV		
EFV		
Truvada		
Aluvia		
Nevirapine		
ABC		
3TC		
Other (specify below):		

Notes:

_____
_____
_____
_____
_____
_____

2. **Type and quantities of <u>non-drug consumables</u> are used at this service per patient per year?** *Notes: 1) if there are other supplies or consumables being used that do not appear here, please write them in the blank spaces provided 2) quantities should be estimated at the lowest unit, i.e., 5grams or 2mls per patient 3) Where applicable, please denote the quantity or description of the consumable*

Non-drug consumables	**Portion/Quantity used per patient per year**	**Notes on supply** *(quantity or description)*
Bags for drugs, plain (drug dispensing bags)		
Bandage (elastic)		
Biohazard trash bag (large)		
Biohazard trash bag (small)		
Bleach for soaking instruments		
Chlorine powder		
Continental sheet (disposable)/mackintosh rubber		
Cotton wool rolls		
Detergent soap (sunlight or Omo) Bucket		
Dettol solution		
Drug bags labels		
EDTA tubes		
Elastoplast/Dermaplast 25mm/9m		
Files		
Gauze pad, Inadine		
Gauze pad, Jelonet (paraffin Vaseline)		
Gauze pad, sterile, 12ply 100x100mm		
Gauze pad, sterile, 12ply 76x76mm		
Gauze pad, sterile, 8ply 100x100mm		
Gauze roll		
Gloves, examination, non-sterile, disposable, pair		
Gloves, surgeons, sterile disposable, pair		
Glucose 5% in water + set		
Heavy duty gloves		
Hibiscrub		
HIV TEST – Determine		
HIV TEST – KHB		
HIV TEST – UNIGOLD		

Non-drug consumables	**Portion/Quantity used per patient per year**	**Notes on supply** *(quantity or description)*
IV fluid (dextrose) 10%		
IV fluid (ringer lactate)		
Lancet		
Marker		
Methylated spirit 70%		
Micropore		
Needle, 18 gauge		
Needle, 21 gauge		
Pipets, plastic		
Plain paper		
Povidone antiseptic solution (Iodine)		
Refuse bags, black, large		
Saline		
Savlon		
Soap bars		
Soap for scrubbing instruments (liquid soap)		
Sodium chloride, 0.9%		
Solu cortef		
Specimen bottle/sputum		
Stationery		
Sterilization tapes		
Syringe, 10ml, disposable		
Syringe, 2ml, disposable		
Syringe, 5ml, disposable		
Tegaderm (3M) 1624		
Other (specify below):		

Notes:

_____

_____

_____
_____

3. **Equipment**

Enter the quantity of equipment, appliance and furniture used to deliver this service. *Note: 1) If there are any additional equipment not listed, please write them in blank spaces 2) enter quantity of equipment, appliance and furniture used per patient.*

	Quantity of equipment used per patient for the delivery of ART for TB patients	**Notes on Equipment**
B.P. machine		
Bed		
Chairs		
Clinical dishes		
Clinical thermometer		
Desk		
Refrigerator		
Scissors		
Sharps container		
Standard trolley with 2 shelves		
Stethoscope		
Stretcher		
Weighing machine/scale		
X-ray		
Other (specify below):		

2. GENERAL FACILITY LEVEL DATA FORM

The following survey is being conducted for the purpose of calculating the unit cost of services at the facility level. We are asking your assistance as one of selected sites where the cost of providing services is being assessed. Your help with this survey is greatly appreciated. Please note that the information about the identification of this program will be kept confidential.

Name of Facility: _____

Type of Facility *(circle applicable):* District Hospital / Clinic with Bed / Clinic without Bed

Other (specify): _____

Record Code: _____
(Data Collector initials _ Facility Name _Form number)

District: _____

Town/Village: _____

	Facility hours of operation (24-hour format)
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
Sunday	
Public holidays	

Date of Interviews:

Day	Month	Year	Name of Interviewer(s)

Persons Interviewed:

Name	
Title/Designation	
Telephone (Office)	
Telephone (Cell)	
Email Address	
Fax Number	

Name	
Title/Designation	
Telephone (Office)	
Telephone (Cell)	
Email Address	
Fax Number	

Name	
Title/Designation	
Telephone (Office)	
Telephone (Cell)	
Email Address	
Fax Number	

General: Facility

1. **a) Total number of in-patient and out-patient clients per service from April 2013 to March 2014:** *Note: Enter the total number of patients who have received service. In-patient refers to clients that are admitted into a facility for services; out-patient refers to clients who receive day-service.*

Service	# of in-patient	# of out-patients
Safe Male Circumcision		
Post-Exposure Prophylaxis		
Additional ART for TB Patients		
Co-Trimox for TB HIV+ Patients		
Screening HIV+ Patients for TB		

b) Total number of in-patient and out-patient clients per service from April 2013 to March 2014: *Note: Enter the total number of patients that have received service. In-patient refers to clients that are admitted into a facility for services; Out-patient refers to clients who receive day-service.*

General Facility Service	# of in-patient	# of out-patients
General Outpatient Services		
Paediatrics Care		
Emergency & Urgent Care & Intensive Care		
Surgery (Urology, General Theatre, ENT)		
X-ray and Diagnosis		
General Medicine		
Dental Care Services		
Eye Care Services		
Orthopaedic Services		
Psychological/Psychiatric Care/Mental Health		
Rehabilitation Services		
Oncology & Cancer Services		
Audiology Services		
Obstetrics and Gynaecology (MCH, PMTCT)		
Immunizations & Child Care Services		
Sexual and Reproduction Services (FP, ANC, STI)		
HIV & AIDS Services/IDCC		
Nutrition		
Health Education and Advice		
Minor Curative Treatment and Care Services		
Noncommunicable Diseases (Hypertension, Diabetes, etc.)		
Routine HIV Testing/HIV Testing and Counselling		

Community Home-Based Care		
Other (specify):		
Other (specify):		
Other (specify):		

2. Total number of in-patient clients at this facility from April 2013 to March 2014:_____

3. Total number of out-patient clients at this facility from April 2013 to March 2014:
_____

Notes:
_____
_____
_____
_____
_____
_____

Recurrent Costs: Personnel

1. Number and type of **Management staff** involved in managing facility and all services *Notes: 1) If there are additional cadre not listed, please write them in blank spaces 2) Indicate on notes column the official title of the cadre if different from facility title (e.g., official title of a Midwife is Senior Registered Nurse) 3) Enter the total number of hours worked by the cadre per week. Based on the total number of hours worked per week by cadre, denote the number of hours dedicated to management of facility services & administration, and service delivery (if applicable).*

Management Cadre	Total number of hours worked per week	Percentage of hours spent on management & administration per week	Number of hours spent on management & administration per week	Percentage of hours spent on service delivery (*if applicable)* per week)	Number of hours spent on service delivery (*if applicable)* per week)
Hospital Superintendent/Manager					
Public Health Specialist					
Matron/Chief Registered Nurse					
Nurse Superintendent					
Senior Nursing Officer					
Principal Registered Nurse					
Other (specify below):					

Notes:

_____
_____
_____
_____
_____
_____

1. **Number and type of Support and Administrative Staff**

   a. **Indicate the number and type of <u>Permanent staff</u> (entire facility)** *Notes: 1) Indicate on notes column if any of the staff members are rotational to the facility and the frequency of the rotation. 2) If there are additional cadre not listed, please write them in blank spaces. 3) Indicate on notes column the official title of the cadre if different from facility title (e.g., official title of a Midwife is Senior Registered Nurse)*

Cadre	Number Of Cadre	Total Number Of Hours Worked Per Week	Notes
Accountant/Revenue Collector			
Accounts Clerk			
Assistant Accountant			
Assistant Human Resource Officer			
Clerical Assistant			
Data Clerk			
Data Manager			
Driver			
Health Education Assistant			
Housekeeping/Cleaner			
Human Resource Officer			
Lab Scientist			
Lab Technician			
Maintenance Officer			
Nurse Orderly			
Nutritionist/Dietician			
Pharmacy Technician/Pharmacist			
Porter			
Receptionist/Telephone Operator			
Social Worker			
Store Keeper			
Supplies Officer/Logistician			
Watchmen/Security Guard			
X-ray Technician			
Other (specify below):			

Notes:

_____
_____
_____
_____
_____
_____

b. **Indicate the number and type of <u>Contract/External Support Staff</u> (entire facility)** *Notes: 1) Indicate on notes column if any of the staff members are rotational to the facility and the frequency of the rotation. 2) If there are additional cadre not listed, please write them in blank spaces. 3) Indicate on notes column the official title of the cadre if different from facility title (e.g., official title of a Midwife is Senior Registered Nurse)*

Cadre	Number Of Cadre	Total Number Of Hours Worked Per Week	Notes
Accountant/Revenue Collector			
Accounts Clerk			
Assistant Accountant			
Assistant Human Resource Officer			
Clerical Assistant			
Data Clerk			
Data Manager			
Driver			
Health Education Assistant			
Housekeeping/Cleaner			
Human Resource Officer			
Lab Scientist			
Lab Technician			
Maintenance Officer			
Nurse Orderly			
Nutritionist/Dietician			
Pharmacy Technician/Pharmacist			
Porter			
Receptionist/Telephone Operator			
Social Worker			
Store Keeper			
Supplies Officer/Logistician			
Tirelo Sechaba Participant			
Watchmen/Security Guard			
X-ray Technician			
Other (specify below):			

Notes:

_____
_____
_____
_____
_____

Recurrent Costs: Utilities

1. **Facility Building Operating Cost** *Notes: 1) Enter the (actual or estimated) annual operating cost for the building. Include costs such as routine building maintenance (fixing lights, wall cracks, pipework, broken doors windows, paintings, etc.). Exclude building renovation costs or building extension costs. 3) List additional maintenance utilities and associated costs in the blank spaces.*

Building Maintenance Cost	Annual Operating Costs (local currency)	Notes on Building Maintenance
Building Operating/Maintenance Cost		
Other (specify):		

2. **Facility Waste Management Cost** *Notes: 1) Enter the (actual or estimated) annual waste management cost for the facility. Enter the cost where applicable, either the facility has an incinerator to dispose of clinical waste or waste is collected routinely for disposal. 2) List additional waste management and associated costs in the blank spaces*

Waste Management	Annual Operating Costs (local currency)	Notes on Waste Management
Waste Management Cost		
Incinerator		
Other (specify):		

3. **Facility Utility Costs** *Notes: 1) Enter the (actual or estimated) annual operating cost for each utility for the facility. 2) List additional utilities and associated costs in the blank spaces*

Utility	Annual Operating Cost (local currency)	Notes on Utility
Fuel		
Telephone		
Electricity		
Water		
Other (specify):		

4. Facility Vehicle Costs *Notes: 1) Enter the (actual or estimated) cost of replacing the vehicle based on model and year. 2) Please list additional vehicles in the blank spaces*

Vehicle	Description/Model & Year	Number Purchased	Replacement Value	Notes on Vehicle
Car				
Car				
Car				
Car				
Trailer				
Trailer				
Ambulance				
Ambulance				
Ambulance				
4-Wheel Drive				
4-Wheel Drive				
4-Wheel Drive				
Bus				
Bus				
Bus				
Motorcycle				
Motorcycle				
Motorcycle				
Bicycle				
Bicycle				
Other 1: (Please Describe)				
Other 2: (Please Describe)				

3. CENTRAL & SUPPLY CHAIN LEVEL – MINISTRY OF HEALTH AND CENTRAL MEDICAL STORES DATA FORM

The following survey is being conducted for the purpose of calculating the cost of services. We are asking your assistance as one of many partners in the provision of services within public health facilities in Botswana. Your help with this survey is greatly appreciated. Please note that the information about the organization's support will be kept confidential.

Department/Unit: _____

Day	Month	Year	Name of Interviewer(s)

Persons Interviewed:

Name	
Title/Designation	
Telephone (Office)	
Telephone (Cell)	
Email Address	
Fax Number	

Name	
Title/Designation	
Telephone (Office)	
Telephone (Cell)	
Email Address	
Fax Number	

Name	
Title/Designation	
Telephone (Office)	
Telephone (Cell)	
Email Address	
Fax Number	

Costs: Management & Service Delivery Personnel

1. **The following information is being collected based on staff who are employed in the selected study facilities. We would therefore like to determine the salaries (or range of salaries) which correspond to the cadres identified at these study facilities.** *Notes: 1) Fill in the list of cadre based on inputs from service and facility tools (managerial staff, as well as those working directly in the delivery of services) and insert annual salary per cadre, inclusive of benefits & gratuity? 2) If there is scale per cadre, insert the range (i.e. Band B BWP 5,000 to Band E BWP 20,000)*

Cadre *(list based on staff from facility and service level)*	**Range of Annual Salary (including benefits and gratuity) (local currency)**
Assistant Nursing Officer	
Chief Nursing Officer	
Chief Registered Nurse	
District ART Coordinator	
District Rapid HIV Testing RHT/HTC Coordinator	
District SMC Focal Person/Coordinator	
District TB Coordinator	
Facility SMC Focal Person/Coordinator	
Family Nurse Practitioner	
Healthcare Auxiliary	
Healthcare Auxiliary	
Hospital Superintendent	
Lay Counselor	
Matron	
Medical Officer	
Nurse Officer I	
Nurse Officer II	
Nurse Superintendent	
Principal Nursing Officer I	
Principal Nursing Officer II	
Principal Registered Nurse	
Registered Nurse	
Senior Nursing Officer	
Senior Registered Nurse	
SMC Medical Officer/Site Manager	
TB Focal Person/Coordinator	
Tirelo Sechaba Participant	
Other (specify below):	

Cadre ***(list based on staff from facility and service level)***	**Range of Annual Salary (including benefits and gratuity) (local currency)**

Notes:

_____
_____
_____
_____
_____
_____

Costs: Commodities

1. What is the **unit cost of drugs** that your organization procured to support service delivery from **April 2013 to March 2014**? *Note: 1) Refer to the notes on the quantity and description of the drugs (from service level data form) to get best estimate of the unit of cost*

Drugs	Price per pack (in local currency)	Units per pack	Notes on estimated unit cost of drugs
3TC			
ABC			
Adrenaline			
Aluvia			
Amoxicillin			
ART Drugs – Adult (First Line)			
ART Drugs – Adult (Second Line)			
ART Drugs – Pediatrics (First Line)			
ART Drugs – Pediatrics (Second Line)			
Atriplar			
Atropine			
Betadine, ointment			
CBV			
Ciprofloxacin			
Cloxacillin			
Co-trimoxazole			
Diazepam			
Doxycycline			
EFV			
Erythromycin			
Hibitane			
Ibuprofen, Brufen			
Ketamine			
Lignocaine			

Drugs	Price per pack (in local currency)	Units per pack	Notes on estimated unit cost of drugs
Metronidazole			
Multivitamins			
Nevirapine			
Paracetamol, syrup			
Paracetamol, tablets			
Thiopenta			
Truvada			
Vitamin C			
Other (specify below):			

2. What is the **unit cost of non-drug consumables** that your organization procured to support service delivery from **April 2013 to March 2014**? *Notes: 1) If there are other commodities procured that do not appear on this list, please write it in the blank spaces; 2) Refer to the notes on the quantity and description of the commodity (from service level data form) to get best estimate of the unit of cost*

Non-Drug Consumables	Price per pack (in local currency)	Units per pack	Notes on estimated unit cost of commodity
Bags for drugs, plain (drug dispensing bags)			
Bandage (elastic)			
Biohazard trash bag (large)			
Biohazard trash bag (small)			
Bleach for soaking instruments			
Chlorine powder			
Continental sheet (disposable)/mackintosh rubber			
Cotton wool rolls			
Detergent soap (Sunlight or Omo) bucket			
Dettol solution			
Drug bags labels			
EDTA tubes			
Elastoplast/Dermaplast 25mm/9m			
Files			
Gauze pad, Inadine			
Gauze pad, Jelonet (paraffin Vaseline)			
Gauze pad, sterile, 12ply 100x100mm			
Gauze pad, sterile, 12ply 76x76mm			
Gauze pad, sterile, 8ply 100x100mm			
Gauze roll			
Gloves, examination, non-sterile, disposable, pair			
Gloves, surgeons, sterile disposable, pair			
Glucose 5% in water + set			
Goggles (for surgery)			

Non-Drug Consumables	Price per pack (in local currency)	Units per pack	Notes on estimated unit cost of commodity
Heavy duty gloves			
Hibiscrub			
HIV TEST – Determine			
HIV TEST – KHB			
HIV TEST – UNIGOLD			
INDICATOR TAPES, steam			
IV fluid (dextrose), 10%			
IV fluid (ringer lactate)			
Lancet			
Marker			
Methylated spirit, 70%			
Micropore			
Needle, 18 gauge			
Needle, 21 gauge			
Pipets, plastic			
Povidone antiseptic solution (Iodine)			
Refuse bags, black, large			
Saline			
Savlon			
SMC KIT (needle holder/vacutainer press release (safety), curved mosquito artery forceps, small, and dissecting forceps (toothed)			
Soap bars			
Soap for scrubbing instruments (liquid soap)			
Sodium Chloride, 0.9%			
Solu Cortef			
Stationery			
Sterilization tapes			
Surgical blade, Size 22, 23, or 24			

Non-Drug Consumables	Price per pack (in local currency)	Units per pack	Notes on estimated unit cost of commodity
Surgical cap (disposable)			
Surgical mask			
Surgical scrub, Betadine			
Suture, catgut chromic 3/0, 150cm			
Suture, catgut chromic 4/0, 150cm			
Suture, catgut plain 2/0, 150cm			
Suture, silk, 2 x 0.75m			
Syringe, 10ml, disposable			
Syringe, 2ml, disposable			
Syringe, 5ml, disposable			
Tegaderm (3M) 1624			
Theater caps			
Theatre masks			

3. What is the **unit cost of equipment** that your organization procured to support service delivery from **April 2013 to March 2014**? *Notes: 1) If there are other equipment procured that do not appear on this list please write it in the blank spaces; 2) Refer to the notes on the quantity and description of the equipment (from service level data form) to get best estimate of the unit of cost*

Equipment	Price/replacement value per item	Notes on equipment
Adson fine non-toothed dissecting forceps		
Artery forceps, large, straight		
B.P. machine		
Bed		
Bistouri scalpel blade holder #4		
Chairs		
Clinical dishes		
Clinical thermometer		
Desk		
Dissecting tray and lid, small		
Emergency tray		
Forceps needle-holding (Mayo-Hegar, 14–16cm)		
Galli pot		
Incinerator		
IV canula (Jelo radiopaque), 18 gauge		
Kidney dishes		
Mayo scissors		
Needle, vacutainer, 21G		
Refrigerator		
Safety box/sharps box		
Scalpel knife handle/surgical handle		
Scissors		
Sharps container		
Solution administration set		
Sponge holding forceps, 18cm		
Standard trolley with 2 shelves		
Stethoscope		
Straight mosquito artery forceps, small		
Stretcher		
Surgical/stitch scissors BL ST		
Velcro tourniquets		
Weighing machine/scale		
X-ray		
Other (specify below):		

Equipment	Price/replacement value per item	Notes on equipment

Notes:

_____
_____
_____
_____
_____
_____

Costs: Supply Chain

1. **Number and type of employees involved in the supply chain (procurement, warehousing/storage, distribution, quality controls, etc.) of drugs and commodities.** *(Notes: 1) please write staff position in the blank spaces provided; list all staff members)*

Cadre	Number of cadre	Total number of hours worked per week	Notes on cadre
Admin Assistant			
Assistant Scientific Officer			
Assistant Supplies Officer			
Chief Admin Officer I			
Chief Lab Technician			
Chief Pharmacist			
Chief Pharmacy Tech			
Chief Supplies Officer			
Deputy Manager			
Driver I			
Gatekeepers			
Groundsman			
Healthcare Auxiliary			
Manager			
Medical Lab Tech			
Messenger			
Office Cleaner L/H			
Pharmacy Tech			
Principal Lab Technician			
Principal Pharmacist I			
Principal Pharmacist II			
Principal Systems Analyst			
Principal Admin Officer			

Cadre	Number of cadre	Total number of hours worked per week	Notes on cadre
Scientific Officer			
Scientific Officer II			
Senior Admin Officer			
Senior Med. Lab Tech			
Senior Pharm Tech			
Senior Pharmacist			
Senior Supplies Officer			
Storekeeper I			
Storekeeper II			
Storekeeper III			
Sup. Medical Lab Tech			
Superintendent			
Superintendent			
Superintendent, Workshop			
Supplies Officer			
Switchboard Operator			
Transport Officer			
Turret Driver			

Cadre	Number of cadre	Total number of hours worked per week	Notes on cadre

2. **Warehouse Building Operating Cost** *Notes: 1) Enter the (actual or estimated) annual operating cost for the building. Include costs such as routine building maintenance (fixing lights, wall cracks, pipework, broken doors windows, painting, etc.). Exclude building renovation costs or building extension costs. 3) List additional building maintenance utilities and associated costs in the blank spaces.*

Building Maintenance Cost	Annual Operating Costs (local currency)	Notes on Building Maintenance
Building Operating/Maintenance Cost		
Other (specify):		

3. **Warehouse Waste Management Cost** *Notes: 1) Enter the (actual or estimated) annual waste management cost for the warehouse. Enter the cost where applicable, either the warehouse has an incinerator to dispose of clinical products and drugs or the expired products are collected routinely for disposal. 2) List additional waste management and associated costs in the blank spaces*

Waste Management	Annual Operating Costs (local currency)	Notes on Waste Management
Waste Management Cost		
Incinerator		
Other (specify):		

4. **Warehouse Utility Costs** *Notes: 1) Enter the (actual or estimated) annual operating cost for each utility for the warehouse. 2) List additional utilities and associated costs in the blank spaces*

Utility	Annual Operating Cost (local currency)	Notes on Utility
Fuel		
Telephone		
Electricity		
Water		
Other (specify):		

5. **Warehouse Vehicles Costs** *Notes: 1) Enter the (actual or estimated) cost of replacing the vehicle based on model and year. 2) Please list additional vehicles in the blank spaces*

Vehicle	Description/Model & Year	Number Purchased	Replacement Value	Notes on Vehicle
Car				
Car				
Car				
Car				
Trailer				
Trailer				
Ambulance				
Ambulance				
Ambulance				
4-Wheel Drive				
4-Wheel Drive				
4-Wheel Drive				
Bus				
Bus				
Bus				
Motorcycle				
Motorcycle				
Motorcycle				
Bicycle				
Bicycle				
Other 1: (Please Describe)				
Other 2: (Please Describe)				

6. ***On average, how many times do supplies get delivered to public health facilities from the your warehouse or the Central Medical Stores warehouse per month:*** _____

7. **What is the mileage charge for per km travelled from depot to the facility?** _____

Note: Government mileage charge for tarred roads is BWP 1.75 per km.

ANNEX D: ONEHEALTH INTERVENTIONS BY DISEASE AREA AND DATA SOURCES BY DISEASE AREA

Interventions by Disease Area

Disease area	Interventions
Maternal/newborn and reproductive health	
	Family planning
	Pill
	Condom
	Injectable
	IUD
	Implant
	Female sterilization
	Male sterilization
	Lactational amenorrhea method (LAM)
	Vaginal barrier method
	Vaginal tablets
	Other contraceptives
	Safe abortion
	Safe abortion
	Management of abortion complications
	Post-abortion case management
	Management of ectopic pregnancy care
	Ectopic case management
	Pregnancy care – ANC
	Tetanus toxoid (pregnant women)
	Syphilis detection and treatment (pregnant women)
	Basic ANC
	Pregnancy care – Treatment of pregnancy complications
	Hypertensive disorder case management

Disease area	Interventions
	Management of pre-eclampsia (Magnesium Sulfate)
	Management of other pregnancy complications
	Childbirth care – Facility births
	Labor and delivery management
	Active management of the 3rd stage of labor
	Pre-referral management of labor complications
	Management of eclampsia (Magnesium Sulfate)
	Neonatal resuscitation (institutional)
	Management of obstructed labor
	Treatment of local infections (newborn)
	Kangaroo mother care
	Feeding counseling and support for low-birthweight infants
	Childbirth care – Home births
	Clean practices and immediate essential newborn care (home)
	Childbirth care – Other
	Antenatal corticosteroids for pre-term labor
	Antibiotics for pre-term premature rupture of membranes (pPRoM)
	Induction of labor (beyond 41 weeks)
	Postpartum care – Treatment of sepsis
	Maternal sepsis case management
	Postpartum care – Treatment of newborn sepsis
	Newborn sepsis – Full supportive care
	Newborn sepsis – Injectable antibiotics
	Postpartum care – Other
	Mastitis
	Treatment of postpartum hemorrhage
	Other sexual and reproductive health
	Treatment of syphilis
	Treatment of PID (Pelvic Inflammatory Disease)

Disease area	Interventions
	Treatment of urinary tract infection (UTI)
	Cervical cancer screening
	Treatment of vaginal discharge
Child health	
	Vitamin A supplementation for treatment of xerophthalmia in children
	Deworming (children)
	Diarrhea management
	ORS
	Zinc (diarrhea treatment)
	Antibiotics for treatment of dysentery
	Treatment of severe diarrhea
	Pneumonia
	Pneumonia treatment (children)
	Treatment of severe pneumonia
	Measles
	Vitamin A for measles treatment (children)
Immunization	
	Rotavirus vaccine
	Measles vaccine
	Pentavalent vaccine
	DPT vaccination
	Hep B vaccine to prevent liver cancer
	Polio vaccine
	BCG vaccine
	Pneumococcal vaccine
	Yellow fever
	Tetanus
Malaria	
	Insecticide-treated materials
	Pregnant women sleeping under an ITN
	Indoor residual spraying (IRS)

Disease area	Interventions
	Malaria treatment (adults)
	Surveillance
	Diagnosis
	Larval Control
	Diagnosis fever cases
TB	
	TB – notification and treatment
	First-line TB drugs for Category I & III patients (adults)
	First-line TB treatment for children
	First-line TB drugs for Category II patients
	Extra-pulmonary TB
	TB contact tracing
	MDR – notification and treatment
	MDR-TB notification among new patients and previously treated patients
	MDR-TB notification in children among previously treated patients
	Case management of MDR-TB cases
	Collaborative TB and HIV/AIDS interventions
	Co-trimoxazole preventive therapy for TB HIV+ patients
	Care & support for TB HIV+ patients
HIV/AIDS	
	Prevention – Other
	Youth-focused interventions – Out-of-school
	VCT
	Condoms
	Male circumcision
	PMTCT
	Post-exposure prophylaxis
	Care and treatment
	ART (first-line treatment) for men
	ART (first-line treatment) for women

Disease area	Interventions
	ART (second-line treatment) for adults
	Co-trimoxazole for children
	Pediatric ART
	Diagnostics/lab costs for HIV+ in care
	Management of opportunistic infections associated with HIV/AIDS
	Nutrition supplements in first 6 months for HIV/AIDS cases
	Collaborative HIV/AIDS and TB interventions
	Screen HIV+ cases for TB
	ART (+CPT) for TB HIV+ patients
	HIV prevention for TB patients
Noncommunicable diseases	
	CVD & diabetes
	Screening for risk of CVD/diabetes
	Follow-up care for those at low risk of CVD/diabetes (absolute risk: 10– 20%)
	Treatment for those with very high cholesterol but low absolute risk of CVD/diabetes (< 20%)
	Treatment for those with high blood pressure but low absolute risk of CVD/diabetes (< 20%)
	Treatment for those with absolute risk of CVD/diabetes (20– 30%)
	Treatment for those with high absolute risk of CVD/diabetes (>30%)
	Treatment of cases with Type I diabetes (with insulin)
	Treatment for Type II diabetes
	Respiratory disease
	Identification and control of asthma
	Chronic Obstructive Pulmonary Disease (COPD)
Mental, neurological, and substance use disorders	
	Depression
	Basic psychosocial treatment and anti-depressant medication of first episode moderate-severe cases
	Intensive psychosocial treatment and anti-

Disease area	Interventions
	depressant medication of first episode moderate-severe cases
	Psychosocial care for peri-natal depression
	Psychosis
	Basic psychosocial support and anti-psychotic medication
	Intensive psychosocial support and anti-psychotic medication
	Bipolar disorder
	Basic psychosocial treatment, advice, and follow-up for bipolar disorder, plus mood-stabilizing medication
	Intensive psychosocial intervention for bipolar disorder, plus mood-stabilizing medication
	Developmental disorders
	Basic psychosocial treatment, advice, and follow-up for developmental disorders
	Intensive psychosocial intervention for developmental disorders
	Behavioral disorders
	Basic psychosocial treatment, advice, and follow-up for behavioral disorders
	Intensive psychosocial intervention for behavioral disorders
	Methylphenidate medication
	Dementia
	Assessment, diagnosis, advice, and follow-up for dementia
	Pharmacological treatment of dementia
	Alcohol use/dependence
	Identification and assessment of new cases of alcohol use/dependence
	Brief interventions and follow-up for alcohol use/dependence
	Management of alcohol withdrawal
	Relapse prevention medication for alcohol use/dependence
	Drug use/dependence
	Identification and assessment of new cases of drug use/dependence
	Brief interventions and follow-up for drug

Disease area	Interventions
	use/dependence
	Management of opioid withdrawal
	Management of non-opioid/other drug withdrawal
	Self-harm/suicide
	Assess and care for person with self-harm
	Basic psychosocial treatment, advice, and follow-up for self-harm/suicide
	Pesticide intoxication management
E&O: WASH	
	Use of improved water source within 30 minutes
	Use of water connection in the home
	Improved excreta disposal (latrine/toilet)
	Handwashing with soap
	Hygienic disposal of children's stools
E&O: Occupational Health	
	Blood pressure monitoring
	Sugar diabetes
	General occupational conditions
Nutrition: Rehabilitation Program	
	Nutrition assessment
	Screening for nutrition (outreach)
	Nutrition care intervention
Nutrition: Feeding & Malnutrition	
	Vitamin A supplementation in infants and children 6–59 months
	Management of severe malnutrition (children)
	Food ration for children through vulnerable group feeding (VGF) programs
	Treatment of severe acute malnutrition with complications
	Food supplements for vulnerable groups
	Treatment of moderate acute malnutrition
Nutrition: Food lab	

Disease area	Interventions
	Food testing – Government feeding programme
	Tsabana
	Malutu
	Ultra-high-temperature (UHT) milk
	Jam
	Tinned beef
	Oil
	Beans
	Mabele
	Samp
	Peanut nut
	Powdered drink
	Food testing
	Carbonated beverages
	Biltong
	Bakery and confectionary
	Cereal grains
	Cheese
	Sauces and pickles
	Dairy, mixed juice
	Dried/powdered milk
	Edible ices/ice pops
	Infant and children biscuit-type products
	Dried foods requiring heating before consumption
	Fruit juice
	Madila, buttermilk. and yogurt
	Pasteurized milk
	Processed meats
	Raw meat
	Soups and dried products
	Dried, ready to eat (nuts, seeds, and dried fish)

Disease area	Interventions
	Spices
	Tea leaves
	Fresh fruit and vegetables
	Honey
	Energy drinks
	Alcoholic beverages
	Canned goods (vegetables and fish)
	Table salt
	Soya
	Other
	Food testing for infants and young children
	Assessment of hygienic conditions of food preparation and environment
	Assessment of ready-to-eat food from food establishments, learning institutions, and hospitals
	National Food Technology Centre (NAFTC) – Outsourced service for food testing
	UB – Outsourced service for testing food samples
	Botswana Bureau of Standards (BOBS) – outsourced service for testing food samples
	Potable water testing
	Borehole and municipality water (Water Utilities Corporation [WUC])
	Bottled water
Nutrition and Dietetics	
	Inpatient – Nutrition intervention for children
	Inpatient – Nutrition intervention for neonates (pre-term)
	Inpatient – Nutrition intervention for children with allergies
	Inpatient – Nutrition intervention for children with lactose intolerance
	Inpatient – Nutrition intervention for children with malabsorption
	Inpatient – Nutrition intervention for children with gag reflux

Disease area	Interventions
	Inpatient – Nutrition intervention for children in need of weight gain supplements
	Inpatient – Nutrition intervention for children who are tube fed
	Inpatient – Nutrition intervention for children with chylothorax
	Inpatient – Nutrition intervention for children with severe acute malnutrition
	Outpatient – Moderate malnutrition in children
	Outpatient – Severe malnutrition for children with cerebral palsy
	Inpatient – Nutrition intervention for adults needing supplemental medical nutritional products
	Inpatient – Nutrition intervention for adults who are tube fed
	Inpatient – Total parenteral nutrition
Nutrition and Dietetics LAB	
	Sodium, Potassium, and Chloride Test
	Calcium Test
	Magnesium Test
	Phosphate Test
	ALT
	AST
	ALP
	GGT
	Total Bilirubin
	Direct Bilirubin
	Total Protein
	Albumin
	Glucose Test
	Urea Test
	Creatinine Test
	Full Blood Count – Stromatolyser Test (inclusive of RBC, WBC, Hb)
	Full Blood Count – Coulter ACT 5 Diff (inclusive of

Disease area	Interventions
	RBC, WBC, Hb)
	HBA1C
	Cholesterol (CHOL)
	Triglycerides
	High-density lipoprotein (HDL)
	Low-density lipoprotein (LDL)
	Blood Collection
Accident and Emergency	
	Resuscitation
	General stabilization
EMS	
	Emergency cardiovascular care
	Pain management
	Nebulization
	Rapid sequence induction
	Intravenous fluid therapy
	Hemorrhage control
	Splinting
	Spinal immobilization
	Obstetric management
	Patient assessment
	Airway management
	Oxygenation and ventilation
	ECG rhythm analysis
	Intensive care transfer
	General patient inter-facility transfer
	Neonatal transfer
	Aeromedical evacuation (outsourced services)
	Emergency ground ambulance transport (outsourced services)
	Wound care and dressing
	Urinary catheterization

Disease area	Interventions
	Insertion of Intraosseous needle
	Respiratory emergency care
	Neuro-endocrine emergency care
	Poison antidote care
Cancer: Rx & Surgery	
	Treatment: (Kaposi's sarcoma) (skin)
	Treatment; (Kaposi's sarcoma) (skin)
	Treatment: Reproductive
	Breast Cancer (intent to cure)
	Breast Cancer (intent to cure) – General Surgery – Moderate Case
	Breast Cancer (palliative)
	Treatment: Reproductive II
	Cervix (intent to cure)
	Cervix (intent to cure) – General Surgery – Moderate Case
	Cervix (palliative)
	Treatment: Hematological
	Non-Hodgkin's Lymphoma
	Hodgkin's Lymphoma
	Chronic Myeloid Leukemia (CML)
	Lymphocytic Leukemia
	Treatment: Gastrointestinal
	Stromal Tumors (GIST)
	Stromal Tumors (GIST) – General Surgery – Moderate Case
	Esophagus – Cardio-thoracic Surgery – Moderate Case
	Esophagus
	Anal canal
	Rectum
	Rectum – General Surgery – Moderate Case
	Colon

Disease area	Interventions
	Colon – General Surgery – Moderate Case
	Pancreas
	Pancreas – General Surgery – Moderate Case
	Treatment: Respiratory
	Lung
	Lung – Cardio-thoracic Surgery – Moderate Case
Cancer: Lab	
	Screening & diagnosis of Kaposi's sarcoma: Surgical Biopsy
	Screening & diagnosis of Kaposi's sarcoma: Bluing (Scott's Tap Water)
	Screening & Diagnosis of Kaposi's Sarcoma: Full Blood Count – Stromatolyser Test
	Screening & Diagnosis of Kaposi's Sarcoma: Full Blood Count – Coulter ACT 5 Diff
	Screening & Diagnosis of Kaposi's Sarcoma: RFT– Urea Test
	Screening & Diagnosis of Kaposi's Sarcoma: RFT– Creatinine Test
	Screening & Diagnosis of Kaposi's Sarcoma: RFT– Renal Function Test – Sodium, Potassium, and Chloride Test
	Screening & Diagnosis of Kaposi's Sarcoma: Liver Function Test – ALT
	Screening & Diagnosis of Kaposi's Sarcoma: Liver Function Test – AST
	Screening & Diagnosis of Kaposi's Sarcoma: Liver Function Test – ALP
	Screening & Diagnosis of Kaposi's Sarcoma: Liver Function Test – GGT
	Screening & Diagnosis of Kaposi's Sarcoma: Liver Function Test – Direct Bilirubin
	Screening & Diagnosis of Kaposi's Sarcoma: Liver Function Test – Total Protein
	Screening & Diagnosis of Kaposi's Sarcoma: Liver Function Test – Albumin
	Screening & Diagnosis of Breast Cancer: Fine Needle Aspirate (FNA) biopsy
	Screening & Diagnosis of Breast Cancer: Hematoxylin

Disease area	Interventions
	and Eosin Stain
	Screening & Diagnosis of Breast Cancer: May-Grunwald and Giemsa
	Screening & Diagnosis of Breast Cancer: Surgical Biopsy
	Screening & Diagnosis of Breast Cancer: Bluing (Scott's Tap Water)
	Screening & Diagnosis of Cervix: Surgical Biopsy
	Screening & Diagnosis of Cervix: Bluing (Scott's Tap Water)
	Screening & Diagnosis of Cervix: Ultrasound of abdomen and pelvis
	Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): Fine Needle Aspirate (FNA) biopsy
	Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): Hematoxylin and Eosin Stain
	Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): May-Grunwald and Giemsa
	Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): Surgical Biopsy
	Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): Bluing (Scott's Tap Water)
	Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): CT Scan
	Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): Full Blood Count – StromatolyserTest
	Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): Full Blood Count – Coulter ACT 5 Diff
	Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): Echo
	Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): Lactase Dehydrogenase (LDH)
	Screening & Diagnosis of Hematological (Hodgkin's CML): Bone Marrow Biopsy
	Screening & Diagnosis of Hematological (Hodgkin's CML): Full Blood Count – Stromatolyser Test
	Screening & Diagnosis of Hematological (Hodgkin's CML): Full Blood Count – Coulter ACT 5 Diff

Disease area	Interventions
	Screening & Diagnosis of Hematological (Hodgkin's CML): Peripheral Smear
	Screening & Diagnosis of Hematological (Hodgkin's CML): Ultrasound Abdomen
	Screening & Diagnosis of Gastrointestinal Stromal Tumor: Surgical Biopsy
	Screening & Diagnosis of Gastrointestinal Stromal Tumor: Bluing (Scott's Tap Water)
	Screening & Diagnosis of Gastrointestinal Stromal Tumor: CT scan
	Screening & Diagnosis of Gastrointestinal Stromal Tumor: Full Blood Count – Stromatolyser Test
	Screening & Diagnosis of Gastrointestinal Stromal Tumor: Full Blood Count – Coulter ACT 5 Diff
	Screening & Diagnosis of Gastrointestinal Stromal Tumor: Liver Function Test – ALT
	Screening & Diagnosis of Gastrointestinal Stromal Tumor: Liver Function Test – AST
	Screening & Diagnosis of Gastrointestinal Stromal Tumor: Liver Function Test – ALP
	Screening & Diagnosis of Gastrointestinal Stromal Tumor: Liver Function Test – GGT
	Screening & Diagnosis of Gastrointestinal Stromal Tumor: Liver Function Test – Direct Bilirubin
	Screening & Diagnosis of Gastrointestinal Stromal Tumor: Liver Function Test – Total Protein
	Screening & Diagnosis of Gastrointestinal Stromal Tumor: Liver Function Test – Albumin
	Screening & Diagnosis of Gastrointestinal Stromal Tumor: Renal Function Test – Urea Test
	Screening & Diagnosis of Gastrointestinal Stromal Tumor: Renal Function Test – Creatinine Test
	Screening & Diagnosis of Gastrointestinal Stromal Tumor: Renal Function Test – Sodium, Potassium, and Chloride Test
	Screening & Diagnosis of Gastrointestinal Esophagus: Surgical Biopsy
	Screening & Diagnosis of Gastrointestinal Esophagus: Bluing (Scott's Tap Water)
	Screening & Diagnosis of Gastrointestinal Esophagus: Barium Swallow
	Screening & Diagnosis of Gastrointestinal Esophagus: Endoscopy

Disease area	Interventions
	Screening & Diagnosis of Gastrointestinal Esophagus: CT Scan
	Screening & Diagnosis of Gastrointestinal Esophagus: Full Blood Count – Stromatolyser Test
	Screening & Diagnosis of Gastrointestinal Esophagus: Full Blood Count – Coulter ACT 5 Diff
	Screening & Diagnosis of Gastrointestinal Esophagus: Liver Function Test – ALT
	Screening & Diagnosis of Gastrointestinal Esophagus: Liver Function Test – AST
	Screening & Diagnosis of Gastrointestinal Esophagus: Liver Function Test – ALP
	Screening & Diagnosis of Gastrointestinal Esophagus: Liver Function Test – GGT
	Screening & Diagnosis of Gastrointestinal Esophagus: Liver Function Test – Direct Bilirubin
	Screening & Diagnosis of Gastrointestinal Esophagus: Liver Function Test – Total Protein
	Screening & Diagnosis of Gastrointestinal Esophagus: Liver Function Test – Albumin
	Screening & Diagnosis of Gastrointestinal Esophagus: Renal Function Test – Urea Test
	Screening & Diagnosis of Gastrointestinal Esophagus: Renal Function Test – Creatinine Test
	Screening & Diagnosis of Gastrointestinal Esophagus: Renal Function Test – Sodium, Potassium, and Chloride Test
	Screening & Diagnosis of Gastrointestinal Anal Canal: Surgical Biopsy
	Screening & Diagnosis of Gastrointestinal Anal Canal: Bluing (Scott's Tap Water)
	Screening & Diagnosis of Gastrointestinal Anal Canal: Proctoscopy
	Screening & Diagnosis of Gastrointestinal Anal Canal: Lower Endoscopy
	Screening & Diagnosis of Gastrointestinal Anal Canal: CT Scan
	Screening & Diagnosis of Gastrointestinal Anal Canal: Barium Enema
	Screening & Diagnosis of Gastrointestinal Anal Canal: Full Blood Count – Stromatolyser Test
	Screening & Diagnosis of Gastrointestinal Anal Canal: Full Blood Count – Coulter ACT 5 Diff

Disease area	Interventions
	Screening & Diagnosis of Gastrointestinal Anal Canal: Liver Function Test – ALT
	Screening & Diagnosis of Gastrointestinal Anal Canal: Liver Function Test – AST
	Screening & Diagnosis of Gastrointestinal Anal Canal: Liver Function Test – ALP
	Screening & Diagnosis of Gastrointestinal Anal Canal: Liver Function Test – GGT
	Screening & Diagnosis of Gastrointestinal Anal Canal: Liver Function Test – Direct Bilirubin
	Screening & Diagnosis of Gastrointestinal Anal Canal: Liver Function Test – Total Protein
	Screening & Diagnosis of Gastrointestinal Anal Canal: Liver Function Test – Albumin
	Screening & Diagnosis of Gastrointestinal Anal Canal: Renal Function Test – Urea Test
	Screening & Diagnosis of Gastrointestinal Anal Canal: Renal Function Test – Creatinine Test
	Screening & Diagnosis of Gastrointestinal Anal Canal: Renal Function Test – Sodium, Potassium, and Chloride Test
	Screening & Diagnosis of Gastrointestinal Rectum: Surgical Biopsy
	Screening & Diagnosis of Gastrointestinal Rectum: Bluing (Scott's Tap Water)
	Screening & Diagnosis of Gastrointestinal Rectum: Proctoscopy
	Screening & Diagnosis of Gastrointestinal Rectum: Lower Endoscopy
	Screening & Diagnosis of Gastrointestinal Rectum: CT Scan
	Screening & Diagnosis of Gastrointestinal Rectum: Colonoscopy
	Screening & Diagnosis of Gastrointestinal Rectum: Ultrasound Abdomen
	Screening & Diagnosis of Gastrointestinal Rectum: Full Blood Count – Stromatolyser Test
	Screening & Diagnosis of Gastrointestinal Rectum: Full Blood Count – Coulter ACT 5 Diff
	Screening & Diagnosis of Gastrointestinal Rectum: Liver Function Test – ALT
	Screening & Diagnosis of Gastrointestinal Rectum: Liver Function Test – AST

Disease area	Interventions
	Screening & Diagnosis of Gastrointestinal Rectum: Liver Function Test – ALP
	Screening & Diagnosis of Gastrointestinal Rectum: Liver Function Test – GGT
	Screening & Diagnosis of Gastrointestinal Rectum: Liver Function Test – Direct Bilirubin
	Screening & Diagnosis of Gastrointestinal Rectum: Liver Function Test – Total Protein
	Screening & Diagnosis of Gastrointestinal Rectum: Liver Function Test – Albumin
	Screening & Diagnosis of Gastrointestinal Rectum: Renal Function Test – Urea Test
	Screening & Diagnosis of Gastrointestinal Rectum: Renal Function Test – Creatinine Test
	Screening & Diagnosis of Gastrointestinal Rectum: Renal Function Test – Sodium, Potassium, and Chloride Test
	Screening & Diagnosis of Gastrointestinal Colon: Colonoscopy
	Screening & Diagnosis of Gastrointestinal Colon: Surgical Biopsy
	Screening & Diagnosis of Gastrointestinal Colon: Bluing (Scott's Tap Water)
	Screening & Diagnosis of Gastrointestinal Pancreas: Surgical Biopsy
	Screening & Diagnosis of Gastrointestinal Pancreas: Bluing (Scott's Tap Water)
	Screening & Diagnosis of Respiratory Lung: Fine Needle Aspirate (FNA)
	Screening & Diagnosis of Respiratory Lung: Hematoxylin and Eosin Stain
	Screening & Diagnosis of Respiratory Lung: May-Grunwald and Giemsa
	Screening & Diagnosis of Respiratory Lung: Surgical Biopsy
	Screening & Diagnosis of Respiratory Lung: Bluing (Scott's Tap Water)
	Screening & Diagnosis of Respiratory Lung: Chest X-ray
	Screening & Diagnosis of Respiratory Lung: Bronchoscopy
	Screening & Diagnosis of Respiratory Lung: CT Scan for Chest and Abdomen
	Screening & Diagnosis of Respiratory Lung: Full Blood Count – Stromatolyser Test
	Screening & Diagnosis of Respiratory Lung: Liver

Disease area	Interventions
	Function Test – ALT
	Screening & Diagnosis of Respiratory Lung: Liver Function Test – AST
	Screening & Diagnosis of Respiratory Lung: Liver Function Test – ALP
	Screening & Diagnosis of Respiratory Lung: Liver Function Test – GGT
	Screening & Diagnosis of Respiratory Lung: Liver Function Test – Direct Bilirubin
	Screening & Diagnosis of Respiratory Lung: Liver Function Test – Total Protein
	Screening & Diagnosis of Respiratory Lung: Liver Function Test – Albumin
	Screening & Diagnosis of Respiratory Lung: Renal Function Test – Urea Test
	Screening & Diagnosis of Respiratory Lung: Renal Function Test – Sodium, Potassium, and Chloride Test
Disease Control Unit: NTDs – Rx	
	Leprosy screening
	Leprosy treatment
Disease Control Unit: NTDs – Lab	
	Leprosy biopsy test – Zeil Nielseen stain
Meningitis	
	Bacterial Meningitis
	TB Meningitis
	Fungal (Cryptococcal) Meningitis
	Lumbar Puncture (& Laboratory)
	Hydrocephalus (surgery)
Nephrology	
	Screening – RFT; Full Blood Count Test; Calcium, Magnesium, and Phosphate Tests; LFT; Uric Acid; Urinalysis; Glucose
	Screening – Ultrasound of the abdomen
	Chronic Kidney Disease (Stages 1 to 4) (Stage 4 preparation for renal replacement therapy)
	End-stage Renal Disease (Stage 5)
	Catheter-related infections
	Reinsertion of catheter (PD or Hemo) for blocked & nonfunctioning catheters

Disease area	Interventions
Nephrology LAB	
	RFT
	Full Blood Count – Stromatolyser Test
	Full Blood Count – Coulter ACT 5 Diff
	Calcium Test
	Magnesium Test
	Phosphate Test
	LFT
	Glucose Test
	Uric Acid Test
	Urinalysis
	Cholesterol
	Triglycerides
	HDL – CHOL
	LDL – CHOL
	Urine – Total Protein
	Urine – Sodium Potassium Chloride
	Blood Collection
Oral Health – Rx & Surgery	
	Caries
	Perio
	Trauma
	Oral Cancer
Oral Health – Lab & X-ray	
	LFT
	Liver Failure Test
	RFT
	Renal Failure Test
	Other Tests
	Full Blood Count – Stromatolyser Test
	Full Blood Count – Coulter ACT 5 Diff

Disease area	Interventions
	Crossmatch
	Blood Grouping
	Antibody Screen
	Antibody Identification
	Rapid HIV Testing (RHT)
	Biopsy Lab
	CD4
	Glucose Test
Organ Transplant	
	Kidney Transplant
	Bone Marrow Transplant
	Partial Liver Transplant
	Bilateral Lung Transplant
Orthopedics – Rx & Surgery	
	Orthopedic Surgery – Mild Case
	Orthopedic Surgery – Moderate Case
	Orthopedic Surgery – Severe Case
	Plaster room services
	Inpatient Services – Female and Male Orthopedic Ward
Prevention of Blindness	
	Cataract Surgery
	Cataract Screening
	Treatment of Glaucoma
	Glaucoma Screening
	Glaucoma Surgery
	Diabetic Retinopathy Treatment
	Treatment of Diabetic Retinopathy Screening
	Refractive Error Screening
	Childhood Blindness Screening
	Childhood Blindness Treatment
	Corneal Repairs – Surgery

Disease area	Interventions
	Conjunctival Growth And Pterygium Surgery
	Eye Removal
	Strabismus Surgery
	Foreign Body
	Production of Lenses
	Glasses Dispensing
Referred Cases	
	International Referral
	Cardiology
	Dental
	ENT
	Gastroenterology
	Hematology
	Medical
	Nephrology
	Neurosurgery
	Ob + Gyn
	Oncology
	Ophthalmology
	Orthopedics
	Other
	Pediatrics
	Rheumatology
	Surgery
	Urology
	Local Referral
	Cardiology
	Dental
	ENT
	Gastroenterology
	Hematology

Disease area	Interventions
	Medical
	Nephrology
	Neurosurgery
	Neurology
	Ob + Gyn
	Oncology
	Ophthalmology
	Orthopedics
	Other
	Pediatrics
	Rheumatology
	Surgery
	Urology
Dermatology Rx & Surgery	
	Photodermatitis
	Alopecia
	Atopic Dermatitis/Eczema/LSC/Prurigo Nodularis
	Acne (Vulgaris, Rosacea)
	Fungal infections
	Tinea Capiti
	Tinea Corpori, Pedis Topical
	Psoriasis Topical
	Herpes (Simplex & Zoster)
	Bullous Pemphigoid/Autoimmune blistering disorders
	Pyodermas, Impetigo, Folliculitis, Furanculusis
	Molluscum Contagiosum
	Verruca Vularis/Verruca Plana/Condyloma Accuminata
	Keloids
	Callous/Palmoplantar Keratoderma
	Tinea Versicolor
	Pruritus

Disease area	Interventions
	Urticaria
	Candidiasis
	Scabies
	Seborrcic Dermatitis
	Vitiligo
	Warts
	Lichen Planus
	Kaposi's Sarcoma
	Biopsy
Dermatology – Lab	
	Full Blood Count – Stromatolyser Test
	Full Blood Count – Coulter ACT 5 Diff
	RFT – Urea Test
	RFT – Creatinine Test
	RFT – Sodium, Potassium, and Chloride Test
	LFT
	Cholesterol
	Triglycerides
	HDL – CHOL
	LDL – CHOL
	T3
	T4
	Tsh
	Rapid HIV Test
Spinalis	
	Incomplete – Paraplegic
	Complete – Paraplegic
	Incomplete – Tetraplegic
	Complete – Tetraplegic
Surgery	
	Spine Surgery – Severe Case

Disease area	Interventions
	Cardio-thoracic Surgery– Mild Case
	Cardio-thoracic Surgery– Moderate Case
	Cardio-thoracic Surgery– Severe Case
	Plastic Surgery– Mild Case
	Plastic Surgery– Moderate Case
	Plastic Surgery– Severe Case
	ENT Surgery– Mild Case
	ENT Surgery– Moderate Case
	ENT Surgery– Severe Case
	Urology Surgery– Mild Case
	Urology Surgery– Moderate Case
	Urology Surgery– Severe Case
	Neurology Surgery– Mild Case
	Neurology Surgery– Moderate Case
	Neurology Surgery– Severe Case
	Dental Surgery– Mild Case
	Dental Surgery– Moderate Case
	Dental Surgery– Severe Case
	Gyn Laparoscopy Surgery – Mild Case
	Gyn Laparoscopy Surgery – Moderate Case
	Gyn Laparoscopy Surgery – Severe Case
	Pediatric Surgery– Mild Case
	Pediatric Surgery– Moderate Case
	Pediatric Surgery– Severe Case
	General Surgery– Mild Case
	General Surgery– Moderate Case
	General Surgery– Severe Case
	Spine Surgery– Mild Case
	Spine Surgery– Moderate Case
HPV Vaccine	
	HPV vaccine

Disease area	Interventions

Data Sources

Disease Area	Data Source	Affiliation (if person)
Maternal and Child Health	Dr. Ava Avalos	Careena Centre
	Ms. Thipe	MCH Program, MOH
	Ms. Leburu	MCH Program, MOH
	Mr. Tshiamo Keakabetse	MCH Program, MOH
	Health Statistics Report 2007 (Botswana) – National	
	Guidelines for Antenatal Care and the Management of Obstetric Emergencies and Prevention of Mother-to-Child Transmission of HIV – National	
	Health Statistics Report 2009 (Botswana) – National	
	Operational Guidelines on Maternal and Newborn Health – National	
	Maternal and Child Health Service Guidelines – National	
	Essential Interventions, Commodities and Guidelines for Reproductive, Maternal, Newborn and Child Health (WHO) (International)	
	2012 Sexual Reproductive Health Standards & Guidelines – National	
	2012 White Paper: Salary Scales – National	
	2012 MHC Costing (waiting from Health Research Unit)	
	http://emedicine.medscape.com/ (International)	
	http://www.who.int/maternal_child_adolescent/documents/who_frh_msm_9624/en/ (International)	
	http://www.who.int (International)	
	http://www.cdc.gov/std/syphilis/treatment.htm (International)	
	Complete Listing of Drugs and Medical Supplies from Central Medical Stores 2011–2013 – National	
Child Health	Dr. Avalos Dr. Gobez	Careena Centre
	National Measles Supplementation Immunisation Activities, Mebendazole and Vitamin A Campaign (4th to 8th November 2013, Botswana) – National	
	Accelerated Child Survival And Development (ACSD) Strategy 2009/10–2015/16 (May 2009) – National	
	http://siteresources.worldbank.org/NUTRITION/Resources/281846-1271963823772/botswana1711screen.pdf	
	The Essential Health Service Package for Botswana 2010 – National	
	Health Statistics Report 2009 – National	
	Ms. Lenna Fosagi	Child Health Program Officer, MOH
	Costing for EMTCT program 2012–2013 (Workshop Costs) – National	
	Complete Listing of Drugs and Medical Supplies from Central Medical Stores 2011–2013 – National	
	Integrated management of childhood illness	
	2012 White Paper: Salary Scales – National	

Disease Area	Data Source	Affiliation (if person)
Immunizations	http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragedtp3.html (International)	
	http://www.cdc.gov/vaccines/programs/vfc/awardees/vaccine-management/price-list/ (International)	
Malaria	Dr. Chihanga Dr. Ntebele	Malaria, MOH Malaria, MOH
	Health Statistics Report 2009 (Botswana) – National	
	Malaria Strategic Plan 2010–2015 – National	
	Malaria Policy 2011 (National Malaria Program) – National	
	Guidelines for the Diagnosis and Treatment of Malaria in Botswana 2007 – National	
	Mrs. Mosweunyane Mrs. Motlaleng	
	Malaria Surveillance Guidelines 2011 – National	
	Complete Listing of Drugs and Medical Supplies from Central Medical Stores 2011–2013 – National	
	Malaria Strategic Plan 2010–2018 – National	
	2012 White Paper: Salary Scales – National	
TB	Dr. Agegnehu Diriba Dr. Mudiaya Dr. Ava Avalos Dr. Miriam Haverkamp Dr. Chowa Modongo	TB, MOH TB, MOH Careena Centre Botswana UPenn Partnership Botswana UPenn Partnership
	2011 National Tuberculosis Programme Manual – National	
	TB/Leprosy Report 2010–2011 – National	
	TB/Leprosy Program Annual Report 2012 – National	
	Botswana National Tuberculosis Report (BNTP) Annual Report 2010–2011 – National	
	2012 BNTP National Report – National	
	BNTP 2009 Annual Report – National	
	National Guideline for the Management of Drug-Resistant TB,2009, Second Edition – National	
	Infection Control Guidelines, 1st Edition, February 2009 – National	
	National Tuberculosis Control Program – Strategic Plan 2013–2017 – National	
	Global Fund Application Program 2012 – National	
	Mrs. Caiphus, BNTP nurse PMH-IDCC/TB Clinic	
HIV	Dr. Ava Avalos Dr. Miriam Haverkamp Dr. Tendani Gaolathe Dr. Mogomotsi Mashaba	Careena Centre Botswana-UPenn Partnership Botswana Harvard Partnership Botswana Baylor Centre of Excellence
	2009 National Guidelines HIV Testing and Counseling – National	
	2010 National Guidelines for Children & Adolescents – National	
	2011 Botswana National Guidelines PMTCT – National	
	2012 Botswana National HIV/AIDS Treatment Guidelines – National	

Disease Area	Data Source	Affiliation (if person)
	2013 Adolescent Clinical Care Guidelines – National	
	2012 Sexual and Reproductive Health Guidelines – National	
	2012 White Paper: Salary Scales – National	
	Botswana National Strategic Framework II (2010–2016)- National	
	Botswana National Policy on HIV and AIDS 2013 – National	
	2012 ART Guideline Change – National	
	2012 White Paper: Salary Scales – National	
	The Essential Health Service Package for Botswana 2010 – National	
	Health Statistics Report 2009 – National	
	2012 Botswana National HIV & AIDS Treatment Guidelines – National	
	Botswana AIDS Impact Survey III – National	
	Costing for EMTCT program 2012–2013 (Workshop Costs) – National	
	Complete Listing of Drugs and Medical Supplies from Central Medical Stores 2011–2013 – National	
	BAIS 2014 Summary – National	
NCDs	Dr. Avalos Dr. Havercamp	Careena Centre and Botswana U Penn Partnership
	Botswana Non-Communicable Diseases Strategic Plan – National	
	The Essential Health Service Package for Botswana 2010 – National	
	Health Statistics Report 2009 – National	
	Costing for EMTCT program 2012–2013 (Workshop Costs) – National	
	Complete Listing of Drugs and Medical Supplies from Central Medical Stores 2011–2013 – National	
	Treatment Guidelines for Type II Diabetes – National	
	2012 White Paper: Salary Scales – National	
	UB/U Penn Outpatient Guidelines – National	
	WHO Guidelines (International)	
Mental Health	Mental Health Program	MOH
	2012 White Paper: Salary Scales – National	
	UB and U Penn Guidelines – National	
Health Systems	2012 White Paper: Salary Scales – National	
	CMS Complete Costing 2011–2013 – National	
	EMTCT Costing – National	
	Internet prices online – International	

ANNEX E. KEY INFORMANTS AND TRAINEES

Study informants and technical consultations

Name	Program/Institution
Tshamo Keakabetse	Maternal and Newborn Health Program, MOH
Ms. Mapeu Gaolaolwe Ms. Mabel Mbewe	Child Health Program, MOH
Ms. Boitumelo Thipe Ms. Veronica Leburu	MCH Program, Department of Public Health (DPH), MOH
Dr. Chawangwa Mondongo Dr. Joe Jarvis	Botswana U Penn Fungal (Cryptococcus) Meningitis
Ms. Lenna Fosagi	DPH, MOH
Ms. Tjantilili Mosweunyane Dr. Simon Chihanga Mr. Davis Ntebela Ms. Mpho Motlaleng	Malaria Program, DPH, MOH
Dr. Godfrey Simoonga	Greater Gaborone DHMT
Ms. Sinah Phiri	Sexual and Reproductive Health Program, MOH
Ms. Elsie Hulela Mr. Max Kapanda	ART Program, Department of HIV/AIDS Prevention and Care (DHAPC), MOH
Ms. Penny Makuruetsa	CHBC, DHAPC, MOH
Ms. Betty Orapaleng	HTC, DHAPC, MOH
Ms. Cynthia Kefas Ms. T. Motsemme Dr. Agegnhe Diriba Dr. Tantamiaa Mudiayi Dr. Botshela Kgwaadira Dr. Diriba Mosisso	BNTP, DPH, MOH
Dr. Malebogo Pusoentsi Ms. B.P. Shatera	NCD, DPH, MOH
Mr. Ookame Charles	Mental Health Program, DPH, MOH
Dr. Ava Avalos	
Dr. Thomas Gilbert	Accident & Emergency, PMH

Ms. Mokoka	Audiology, PMH
Dr. Sebathu Chiyapo	Oncology, PMH
Mr. Edson Nyoni Dr. Jose Luis Fernandez Rojas Ms. Masego Tabengwa Mr. Tekolo Onkemetse	National Health Laboratory
Ms. Thato Senwakegtse Ms. Gomolemo Maseelane Ms. P.A. Mosweu Dr. Mwanikie Mr. Mompati Kgosimotho Mr. Ephraim Rapalai Motlogelwa C. Diswai Mooketsi Mosweu	Environmental & Occupational Health, MOH
Mr. Bushe Laba Dr. Karabo Thokwane	Emergency Medical Services, MOH
Mr. Mokgweetsinyane Mr. Sidney Kololo Dr. Nesredin Jami Qumer	Disease Control Unit, MOH (NTDs and Integrated Disease Surveillance)
Ms. Alise Lehasa Ms. Deborah Motsilenyane	Eye Care/Prevention of Blindness, MOH
Ms. Eunice Ramonna Ms. Nametsegang Mogotsi Mr. Meshack Metswi Mr. Samuel Kolane Basego Mothowaeng Kebonye Mopako Nurse Dikhudu G. Dinyao Ms. Olorato Elias	Health Promotion and Education Division, MOH
Dr. Francesca Cainelli	Head of Medicine/Meningitis, PMH
Dr. Ernest Fetogang	M&E, MOH
Mr. Ephraim O. Tawanana Ms. Boineelo Ngwako Oarabile Baiphethi Ms. Lydia Mudzikati	Medical Laboratory, PMH

Ms. Shirley Johane Mr. Joseph Thuso Senosi Mr. Edson Nyoni Tebelelo Motshelanoka	
Ms. Patience Madabe	National Food Control Division, MOH
Ms. Angela Kashani Ms. Esther Rugara	National Food Laboratory
Dr. Milton Montebatsi Dr. Tshabayembi Tshinengijatt Ms. Keemenao Mogopodi	Nephrology, PMH
Ms. Gladness Tlhomelang Ms. Tshepo Makete	Nutrition and Dietetics, PMH
Ms. Onalenna Ntshebe	Nutrition Rehabilitation Program, PMH
Ms. Masiga	Oral Health School Program, MOH
Dr. Galebole Dr. Ndlovu Dr. Jorosi-Motomise Dr. Mothei-Matshaba Dr. Keokilwe Tshepang Moshakga	Oral Health, PMH
Dr. Ramabu	Orthopedics, PMH
Ms. Kgomotso Moruisi	Allied Health, MOH
Dr. Limonta	Dermatology/Skin Diseases, PMH
Dr. Kobamelo Sekakela Ms. Beauty Kwadiba Ms. Wame Mobeana	Spinalis, PMH
Ms. Phiri Marumo Dr. A. Sivaraj	Surgery, PMH
Ms. Mamello Bantsi Dr. Taolo	Organ Transplant, PMH
Dr. K. Motumise Dr. Makone Mr. Setso O. Setso Ms. Tebogo Lefatshe Chief Records Officer	PMH

Mr. M. Bafana Mr. Hennie van Tonder	Biomedical Engineering, MOH Reaf Consulting
Mr. Tema Mr. Thabo Phiri	Laboratory, MOH
Mr. Muhammed Farooq Chohan Mr. Mohammed Younus	Central Medical Stores, MOH
Mr. Tolybert Zhou	Orthosurge Botswana

MOH personnel trained in OneHealth

Pilate Khulumani, Health Research Unit
Kgomotso Motlhanka, Health Research Unit
Mooketsi Moalosi, Policy Planning Unit
Mosiniki Seeketso, Policy Planning Unit
Irene Leteane, Rehabilitation and Mental Health Division
Moses Modise, Rehabilitation and Mental Health Division
Poelo A. Mosweu, Environmental and Occupational Health (WASH)
Elizabeth Mantswe, Alcohol and Substance Abuse Disorders
Olorato Elias, Health Promotion
Patience Madabe, National Food Control Division (Nutrition Feeding Programme)
Sinah Phiri, Sexual and Reproductive Health
Esther Rugara, National Food Control Laboratory
G. Kgakana Tapela, Corporate Services
Samson Modise, Corporate Services
Mohammed Younus, CMS
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MOH Data Collectors

Mooketsi Moalosi, Policy Planning Unit
Mosiniki Seeketso, Policy Planning Unit
Kgomotso Motlhanka, Health Research Unit

ANNEX F: NORMATIVE UNIT COSTS PER PATIENT PER YEAR FOR SPECIFIC DISEASE PROGRAMS

Maternal/newborn and reproductive health	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	Community/ Outreach	Clinic	Primary and District Hospital	Tertiary Hospital	Clinic	Primary, District and Tertiary Hospital
Family planning						
Pill	131.89	129.71	180.19	180.19	312.59	378.40
Condom	119.08	116.90	127.94	0.00	299.78	326.15
Injectable	0.00	100.44	110.09	110.09	283.32	308.31
IUD	0.00	254.49	264.15	282.40	437.37	462.36
Implant	0.00	1,503.29	1,512.95	1,531.20	1,686.17	1,711.16
Female sterilization	0.00	0.00	338.59	338.59	0.00	536.80
Male sterilization	0.00	0.00	330.47	330.47	0.00	528.68
LAM	0.00	0.00	0.00	0.00	0.00	0.00
Vaginal barrier method	131.72	247.65	323.81	0.00	430.53	522.02
Vaginal tablets	68.25	69.79	89.02	89.02	252.68	287.23
Other contraceptives	0.00	0.00	0.00	0.00	0.00	0.00
Safe abortion						
Safe abortion	0.00	0.00	313.43	313.43	0.00	511.64
Management of abortion complications						
Post-abortion case management*	0.00	855.00	864.66	864.66	1,037.88	1,062.87
Management of ectopic pregnancy care						
Ectopic case management	0.00	0.00	1,794.18	2,595.53	0.00	1,992.39

Pregnancy care – Antenatal care (ANC)						
Tetanus toxoid (pregnant women)	0.00	64.35	75.32	79.08	247.24	273.53
Syphilis detection and treatment (pregnant women)	0.00	67.59	79.07	79.07	250.47	277.28
Basic ANC	57.60	54.03	63.68	0.00	236.91	261.90
Pregnancy care – Treatment of pregnancy complications						
Hypertensive disease case management	0.00	57.80	67.45	67.45	240.68	265.67
Management of pre-eclampsia (Magnesium sulfate)	0.00	0.00	248.95	248.95	0.00	447.16
Management of other pregnancy complications	0.00	56.12	75.64	0.00	239.00	273.85
Childbirth care – Facility births						
Labor and delivery management	0.00	308.08	317.73	317.73	490.96	515.95
Active management of the 3rd stage of labor	0.00	62.77	72.43	72.43	245.65	270.64
Pre-referral management of labor complications	0.00	0.00	3,106.40	3,106.40	0.00	3,304.62
Management of eclampsia (Magnesium sulfate)	0.00	1,323.93	1,333.59	1,333.59	1,506.82	1,531.80
Neonatal resuscitation (institutional)	0.00	461.73	471.39	471.39	644.61	669.60
Management of obstructed labor	0.00	0.00	21,339.61	21,339.61	0.00	21,537.82
Treatment of local infections (newborn)	0.00	0.00	57.13	57.13	0.00	255.34
Kangaroo mother care	182.93	179.36	189.02	0.00	362.25	387.23
Feeding counseling and support for low-birthweight infants	720.31	755.97	734.71	0.00	938.85	932.92
Childbirth care – Home births						
Clean practices and immediate essential newborn care (home)	391.78	0.00	0.00	0.00	0.00	0.00
Childbirth care – Other						
Antenatal corticosteroids for pre-term labor	0.00	0.00	213.56	213.56	0.00	411.77
Antibiotics for pPRoM	0.00	56.03	65.68	65.68	238.91	263.90
Induction of labor (beyond 41 weeks)	0.00	0.00	116.20	116.20	0.00	314.41
Postpartum care – Treatment of sepsis						
Maternal sepsis case management	0.00	3,164.36	3,174.02	3,174.02	3,347.24	3,372.23
Postpartum care – Treatment of newborn sepsis						
Newborn sepsis – Full supportive care	0.00	2,599.95	2,609.60	2,609.60	2,782.83	2,807.82
Newborn sepsis – Injectable antibiotics	0.00	501.84	511.49	511.49	684.72	709.70
Postpartum care – Other						

Mastitis	0.00	42.71	52.36	52.36	225.59	250.57
Treatment of postpartum hemorrhage	0.00	0.00	1,019.85	1,019.85	0.00	1,218.06
Other sexual and reproductive health						
Treatment of syphilis	0.00	383.39	393.04	393.04	566.27	591.25
Treatment of PID	0.00	155.21	164.86	164.86	338.09	363.08
Treatment of UTI	0.00	55.04	64.69	64.69	237.92	262.90
Cervical cancer screening	0.00	330.84	327.83	327.83	513.72	526.04
Treatment of vaginal discharge	0.00	0.00	0.00	0.00	0.00	0.00

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; human resources costs obtained from OneHealth medical personnel treatment inputs.

Child health	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	Community/ Outreach	Clinic	Primary and District Hospital	Tertiary Hospital	Clinic	Primary, District and Tertiary Hospital
Vitamin A supplementation for treatment of xerophthalmia in children	0.00	32.78	0.00	0.00	215.66	0.00
Deworming (children)	0.00	49.71	0.00	0.00	232.59	0.00
Diarrhea management						
ORS	68.49	0.00	0.00	0.00	0.00	0.00
Zinc (diarrhea treatment)	173.02	0.00	0.00	0.00	0.00	0.00
Antibiotics for treatment of dysentery	0.00	0.00	54.87	54.87	0.00	253.08
Treatment of severe diarrhea	0.00	0.00	226.52	226.52	0.00	424.73
Pneumonia						
Pneumonia treatment (children)	0.00	62.54	0.00	0.00	245.43	0.00
Treatment of severe pneumonia	0.00	0.00	1,724.86	1,724.86	0.00	1,923.08
Measles						
Vitamin A for measles treatment (children)	0.00	33.42	0.00	0.00	216.30	0.00

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; human resources costs obtained from OneHealth medical personnel treatment inputs.

Immunization	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	Community/ Outreach	Clinic	Primary and District Hospital	Tertiary Hospital	Clinic	Primary and District Hospital
Rotavirus vaccine	0.00	107.22	114.82	0.00	290.10	313.03
Measles vaccine	0.00	93.60	99.14	0.00	276.49	297.35
Pentavalent vaccine	0.00	183.68	193.34	0.00	366.57	391.55
DPT vaccination	0.00	55.39	58.87	0.00	238.27	257.08
Hep B vaccine to prevent liver cancer	0.00	0.00	50.72	0.00	0.00	248.93
Polio vaccine*	0.00	62.67	53.12	0.00	245.55	251.34
BCG vaccine	0.00	42.05	49.65	0.00	224.94	247.86
Pneumococcal vaccine	0.00	589.60	599.25	0.00	772.48	797.47
HPV vaccine	0.00	68.41	0.00	0.00	251.29	0.00
Yellow fever	0.00	43.26	0.00	0.00	226.15	0.00
Tetanus	0.00	0.00	0.00	0.00	0.00	0.00

Note: Interventions not applicable at community or hospital levels; drugs and consumables costs obtained from OneHealth treatment Inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Malaria	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	Community/ Outreach	Clinic	Primary and District Hospital	Tertiary Hospital	Clinic	Primary, District and Tertiary Hospital
Insecticide-treated materials	364.29	147.09	0.00	0.00	329.97	0.00
Pregnant women sleeping under an ITN	390.07	362.77	0.00	0.00	545.65	0.00
IRS	611.56	0.00	0.00	0.00	0.00	0.00
Malaria treatment (adults)	36.04	153.58	163.24	163.24	336.46	361.45
Surveillance	82.16	78.59	88.24	88.24	261.47	286.46
Diagnosis	600.40	596.83	606.49	0.00	779.71	804.70
Larval control	595.67	0.00	0.00	0.00	0.00	0.00
Diagnosis fever cases	600.40	0.00	0.00	0.00	0.00	0.00

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

TB	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	Community/ Outreach	Clinic	Primary and District Hospital	Tertiary Hospital	Clinic	Primary, District and Tertiary Hospital
TB - notification and treatment						
First-line TB drugs for Category I & III patients (adults)	105,494.16	106,290.69	107,316.83	107,377.08	106,473.57	107,515.04
First-line TB treatment for children	240.73	5,649.00	5,658.65	5,658.65	5,831.88	5,856.87
First-line TB drugs for Category II patients	80,743.83	104,413.55	104,987.12	110,373.44	104,596.43	105,185.33
Extra-pulmonary TB	114,173.93	137,765.93	129,977.65	129,984.77	137,948.81	130,175.86
TB contact tracing	212.62	209.05	0.00	0.00	391.93	0.00
MDR - notification and treatment						
MDR-TB notification among new patients and previously treated patients	150,254.45	151,938.03	151,947.69	151,947.69	152,120.92	152,145.90
MDR-TB notification in children among previously treated patients	108,726.27	153,888.60	153,898.25	153,898.25	154,071.48	154,096.47
Case management of MDR-TB cases	0.00	6,094.46	6,104.11	6,104.11	6,277.34	6,302.32
Collaborative TB and HIV/AIDS interventions						
Co-trimoxazole preventive therapy for TB HIV+ patients	6,151.99	6,148.42	6,158.08	6,158.08	6,331.30	6,356.29
Care & support for TB HIV+ patients	42.14	38.57	48.22	48.22	221.45	246.44

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

HIV/AIDS	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	Community/ Outreach	Clinic	Primary and District Hospital	Tertiary Hospital	Clinic	Primary, District and Tertiary Hospital
Prevention - Other						
Youth focused interventions - Out-of-school	735.57	732.00	0.00	0.00	914.88	0.00
Voluntary counseling and testing	172.44	138.75	178.53	178.53	351.76	376.74
Condoms	67.04	33.34	73.13	73.13	246.35	271.34
Male circumcision	424.93	391.24	431.02	431.02	604.25	629.23
PMTCT	472.64	438.94	478.72	478.72	651.95	676.94
Post-exposure prophylaxis	0.00	0.00	3,867.54	3,867.54	0.00	4,065.75
Care and treatment						
ART (First-Line Treatment) for men	2,132.24	2,005.05	2,044.84	2,044.84	2,218.06	2,243.05
ART (First-Line Treatment) for women	2,122.86	1,995.67	2,035.46	2,017.21	2,208.68	2,233.67
ART (Second-Line Treatment) for adults	2,989.43	2,955.74	2,995.52	2,995.52	3,168.75	3,193.73
Cotrimoxazole for children	3,164.96	3,131.26	3,171.04	3,171.04	3,344.27	3,369.26
Pediatric ART	2,376.68	2,342.98	2,382.76	2,382.76	2,555.99	2,580.98
Diagnostics/lab costs for HIV+ in care	1,524.98	1,491.28	1,531.06	1,531.06	1,704.29	1,729.28
Management of opportunistic infections associated with HIV/AIDS	133.32	119.06	15,573.06	15,057.30	332.06	15,771.27
Nutrition supplements in first 6 months for HIV/AIDS cases	164.69	131.00	170.78	0.00	344.01	368.99
Collaborative HIV/AIDS and TB interventions						
Screen HIV+ cases for TB	137.86	182.20	223.40	223.40	395.21	421.61
ART (+CPT) for TB HIV+ patients	475.13	441.44	481.22	481.22	654.45	679.43

HIV prevention for TB patients	1,077.43	1,043.74	1,083.52	1,083.52	1,256.75	1,281.73

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Noncommunicable diseases	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	Community/ Outreach	Clinic	Primary and District Hospital	Tertiary Hospital	Clinic	Primary, District and Tertiary Hospital
CVD & diabetes						
Screening for risk of CVD/diabetes	173.98	182.12	243.68	243.68	365.00	441.89
Follow-up care for those at low risk of CVD/diabetes (absolute risk: 10–20%)	173.98	170.42	140.29	180.07	353.30	378.28
Treatment for those with very high cholesterol but low absolute risk of CVD/diabetes (<20%)	0.00	853.39	922.75	962.54	1,036.28	1,160.75
Treatment for those with high blood pressure but low absolute risk of CVD/diabetes (<20%)	0.00	785.64	755.51	795.29	968.52	993.50
Treatment for those with absolute risk of CVD/diabetes 20–30%	0.00	1,281.22	1,280.02	1,319.73	1,464.10	1,518.02
Treatment for those with high absolute risk of CVD/diabetes (>30%)	0.00	1,399.19	1,353.18	1,392.96	1,582.08	1,591.17
Treatment of cases with type I diabetes (with insulin)	14,796.93	14,793.36	14,763.23	14,803.02	14,976.24	15,001.23
Treatment for Type II diabetes	10,011.47	10,007.90	10,030.71	10,070.49	10,190.78	10,268.70
Respiratory disease						
Identification and control of asthma	540.39	536.83	506.70	546.48	719.71	744.69
Chronic Obstructive Pulmonary Disease	0.00	592.09	609.62	649.40	774.97	847.62

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Mental, neurological, and substance use disorders	TOTAL NORMATIVE UNIT COST				
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)				
	Outpatient Visits			Inpatient Visits	
	Community/ Outreach	Primary and District Hospital	Tertiary Hospital	Primary and District Hospital	Tertiary Hospital
Depression					
Basic psychosocial treatment and anti-depressant medication	0.00	211.70	234.77	409.91	432.99
Intensive psychosocial treatment and anti-depressant medication	0.00	233.87	233.87	432.08	432.08
Psychosocial care for peri-natal depression	0.00	286.23	286.23	484.44	484.44
Psychosis					
Basic psychosocial support and anti-psychotic medication	0.00	324.50	324.50	522.72	522.72
Intensive psychosocial support and anti-psychotic medication	0.00	552.54	746.94	750.75	945.15
Bipolar disorder					
Basic psychosocial treatment, advice, and follow-up for bipolar disorder, plus mood-stabilizing medication	0.00	780.51	838.20	978.72	1,036.41
Intensive psychosocial intervention for bipolar disorder, plus mood-stabilizing medication	0.00	724.40	724.40	922.62	922.62
Developmental disorders					
Basic psychosocial treatment, advice, and follow-up for developmental disorders	0.00	73.03	79.33	271.24	277.55
Intensive psychosocial intervention for developmental disorders	0.00	658.08	658.08	856.29	856.29
Behavioral disorders					
Basic psychosocial treatment, advice, and follow-up for behavioral disorders	0.00	125.44	148.52	323.66	346.73

Intensive psychosocial intervention for behavioral disorders	0.00	555.03	555.03	753.24	753.24
Methylphenidate medication	0.00	1,842.55	1,842.55	2,040.76	2,040.76
Dementia					
Assessment, diagnosis, advice, and follow-up for dementia	0.00	148.29	171.37	346.51	369.58
Pharmacological treatment of dementia	0.00	304.18	304.18	502.39	502.39
Alcohol use/dependence					
Identification and assessment of new cases of alcohol use/dependence	0.00	44.93	44.93	243.15	243.15
Brief interventions and follow-up for alcohol use/dependence	0.00	94.53	117.61	292.74	315.82
Management of alcohol withdrawal	0.00	228.71	228.71	426.92	426.92
Relapse prevention medication for alcohol use/dependence	0.00	245.16	245.16	443.37	443.37
Drug use/dependence					
Identification and assessment of new cases of drug use/dependence	0.00	54.06	57.90	252.27	256.12
Brief interventions and follow-up for drug use/dependence	0.00	125.44	148.52	323.66	346.73
Management of opioid withdrawal	0.00	8,743.28	8,743.28	8,941.49	8,941.49
Management of non-opioid/other drug withdrawal	0.00	8,743.28	8,743.28	8,941.49	8,941.49
Self-harm/suicide					
Assess and care for person with self-harm	0.00	149.27	195.43	347.49	393.64
Basic psychosocial treatment, advice, and follow-up for self-harm/suicide	0.00	211.10	257.26	409.32	455.47
Pesticide intoxication management	0.00	313.86	313.86	512.08	512.08

Note: Interventions not applicable at community or hospital levels; drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Nutrition: Rehabilitation Program	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Nutrition assessment	0.00	0.00	0.00	288.60	0.00	486.81
Screening for nutrition (outreach)	49.74	0.00	0.00	0.00	0.00	0.00
Nutrition care intervention	0.00	0.00	1,284.98	1,998.18	1,467.86	2,196.40

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Nutrition: Feeding & Malnutrition	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Vitamin A supplementation in infants and children 6–59 months	0.00	55.63	52.06	61.72	234.94	259.93
Management of severe malnutrition (children)	0.00	7,458.88	7,455.31	7,464.96	7,638.19	7,663.18
Food ration for children through VGF programs	0.00	1,666.20	1,662.63	1,672.28	1,845.51	1,870.50
Treatment of severe acute malnutrition with complications	0.00	7,757.07	7,753.51	7,763.16	7,936.39	7,961.37
Food supplements for vulnerable groups	0.00	2,086.99	2,083.42	2,591.55	2,266.30	2,789.76
Treatment of moderate acute malnutrition	0.00	1,387.88	1,384.31	1,393.97	1,567.19	1,592.18

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LIST; HR costs obtained from OneHealth medical personnel treatment inputs.

Nutrition: Food lab	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Food testing – government feeding program						
Tsabana	0.00	0.00	0.00	9,898.06	0.00	10,096.28
Malutu	0.00	0.00	0.00	9,898.09	0.00	9,858.31
UHT Milk	0.00	0.00	0.00	6,967.72	0.00	6,927.94
Jam	0.00	0.00	0.00	6,230.66	0.00	6,190.88
Tinned beef	0.00	0.00	0.00	6,958.14	0.00	6,918.36
Oil	0.00	0.00	0.00	756.09	0.00	716.31
Beans	0.00	0.00	0.00	6,284.54	0.00	6,244.76
Mabele	0.00	0.00	0.00	7,039.66	0.00	6,999.88
Samp	0.00	0.00	0.00	5,983.90	0.00	5,944.12
Peanut nut	0.00	0.00	0.00	8,242.63	0.00	8,202.84
Powdered drink	0.00	0.00	0.00	5,613.73	0.00	5,573.95
Food testing						
Carbonated beverages	0.00	0.00	0.00	7,751.56	0.00	7,711.78
Biltong	0.00	0.00	0.00	7,903.31	0.00	7,863.52
Bakery and confectionary	0.00	0.00	0.00	6,396.08	0.00	6,356.30
Cereal grains	0.00	0.00	0.00	7,932.63	0.00	7,892.84
Cheese	0.00	0.00	0.00	6,367.35	0.00	6,327.57
Sauces and pickles	0.00	0.00	0.00	6,230.66	0.00	6,190.88
Dairy mixed juice	0.00	0.00	0.00	7,179.70	0.00	7,139.92
Dried/powdered milk	0.00	0.00	0.00	7,774.11	0.00	7,734.33

Edible ices/ice pops	0.00	0.00	0.00	7,403.31	0.00	7,363.52
Infant and children biscuit-type products	0.00	0.00	0.00	7,974.11	0.00	7,934.33
Dried foods requiring heating before consumption	0.00	0.00	0.00	8,364.97	0.00	8,325.19
Fruit juice	0.00	0.00	0.00	7,468.43	0.00	7,428.65
Madila, buttermilk, and yogurt	0.00	0.00	0.00	7,398.43	0.00	7,358.65
Pasteurized milk	0.00	0.00	0.00	7,499.52	0.00	7,459.74
Processed meats	0.00	0.00	0.00	7,753.31	0.00	7,713.52
Raw meat	0.00	0.00	0.00	6,161.93	0.00	6,122.15
Soups and dried products	0.00	0.00	0.00	6,767.35	0.00	6,727.57
Dried, ready to eat (nuts, seeds, and dried fish)	0.00	0.00	0.00	8,634.11	0.00	8,594.33
Spices	0.00	0.00	0.00	7,000.88	0.00	6,961.10
Tea leaves	0.00	0.00	0.00	7,413.31	0.00	7,373.52
Fresh fruit and vegetables	0.00	0.00	0.00	6,066.73	0.00	6,026.95
Honey	0.00	0.00	0.00	5,576.74	0.00	5,536.96
Energy drinks	0.00	0.00	0.00	6,364.35	0.00	6,324.56
Alcoholic beverages	0.00	0.00	0.00	5,783.75	0.00	5,743.97
Canned goods (vegetables and fish)	0.00	0.00	0.00	5,895.76	0.00	5,855.98
Table salt	0.00	0.00	0.00	5,813.75	0.00	5,773.97
Soya	0.00	0.00	0.00	6,162.28	0.00	6,122.49
Other						
Food Testing for infants and young children	0.00	0.00	0.00	10,153.69	0.00	10,113.91
Assessment of hygienic conditions of food preparation and environment	0.00	0.00	0.00	5,887.48	0.00	5,847.69
Assessment of ready-to-eat food from food establishments, learning institutions, and hospitals	0.00	0.00	0.00	5,763.21	0.00	5,723.43
National Food Technology Centre (NAFTC) – Outsourced service for food testing	0.00	0.00	0.00	939.78	0.00	900.00
UB – Outsourced service for testing food samples	0.00	0.00	0.00	8,539.78	0.00	8,500.00
BOBS – outsourced service for testing food samples	0.00	0.00	0.00	1,539.78	0.00	1,500.00

Potable water testing						
Borehole and municipality water (WUC)	0.00	0.00	0.00	7,003.30	0.00	6,963.52
Bottled water	0.00	0.00	0.00	6,938.16	0.00	6,898.38

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Nutrition and Dietetics	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Inpatient – Nutrition intervention for children	0.00	0.00	0.00	853.35	0.00	1,051.56
Inpatient – Nutrition intervention for Neonates (pre-term)	0.00	0.00	0.00	3,152.24	0.00	3,350.45
Inpatient – Nutrition intervention for children with allergies	0.00	0.00	0.00	11,166.50	0.00	11,364.71
Inpatient – Nutrition intervention for children with lactose intolerance	0.00	0.00	0.00	587.68	0.00	785.89
Inpatient – Nutrition intervention for children malabsorption	0.00	0.00	0.00	1,780.02	0.00	1,978.23
Inpatient – Nutrition intervention for children with gag reflux	0.00	0.00	0.00	496.48	0.00	694.69
Inpatient – Nutrition intervention for children in need of weight gain supplements	0.00	0.00	0.00	1,376.42	0.00	1,574.63
Inpatient – Nutrition intervention for children who are tube fed	0.00	0.00	0.00	19,273.55	0.00	19,471.76
Inpatient – Nutrition intervention for children with chylothorax	0.00	0.00	0.00	8,056.13	0.00	8,254.34
Inpatient – Nutrition intervention for children with severe acute malnutrition	0.00	0.00	0.00	13,743.66	0.00	13,941.88
Outpatient – Moderate malnutrition in children	0.00	0.00	0.00	333,068.51	0.00	333,266.72
Outpatient – Severe malnutrition for children	0.00	0.00	0.00	333,068.51	0.00	333,266.72

with cerebral palsy						
Inpatient – Nutrition intervention for adults needing supplemental medical nutritional products	0.00	0.00	0.00	9,034.71	0.00	9,232.93
Inpatient – Nutrition intervention for adults who are tube fed	0.00	0.00	0.00	473,383.38	0.00	473,581.60
Inpatient – Total parenteral nutrition	0.00	0.00	0.00	18,426.68	0.00	18,624.89

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Nutrition and Dietetics Lab	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Sodium, Potassium, and Chloride Test	0.00	0.00	0.00	267.36	0.00	465.57
Calcium Test	0.00	0.00	0.00	244.90	0.00	443.12
Magnesium Test	0.00	0.00	0.00	245.62	0.00	443.83
Phosphate Test	0.00	0.00	0.00	244.96	0.00	443.17
ALT	0.00	0.00	0.00	237.57	0.00	435.78
AST	0.00	0.00	0.00	237.48	0.00	435.69
ALP	0.00	0.00	0.00	237.42	0.00	435.63
GGT	0.00	0.00	0.00	237.67	0.00	435.88
Total Bilirubin	0.00	0.00	0.00	237.43	0.00	435.64
Direct Bilirubin	0.00	0.00	0.00	237.43	0.00	435.64
Total Protein	0.00	0.00	0.00	237.45	0.00	435.66
Albumin	0.00	0.00	0.00	237.42	0.00	435.63
Glucose Test	0.00	0.00	0.00	236.29	0.00	434.50

Urea Test	0.00	0.00	0.00	244.24	0.00	442.45
Creatinine Test	0.00	0.00	0.00	237.19	0.00	435.40
Full Blood Count – Stromatolyser Test (inclusive of RBC, WBC, Hb)	0.00	0.00	0.00	127.21	0.00	325.42
Full Blood Count – Coulter ACT 5 Diff (inclusive of RBC, WBC, Hb)	0.00	0.00	0.00	1,978.08	0.00	2176.29
HBA1C	0.00	0.00	0.00	132.64	0.00	330.85
Cholesterol	0.00	0.00	0.00	305.53	0.00	503.74
Triglycerides	0.00	0.00	0.00	245.10	0.00	443.31
HDL	0.00	0.00	0.00	142.90	0.00	341.11
LDL	0.00	0.00	0.00	142.90	0.00	341.11
Blood Collection	0.00	0.00	0.00	46.64	0.00	244.85

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; Direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Accident and Emergency	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Resuscitation	0.00	0.00	0.00	423.60	0.00	621.81
General stabilization	0.00	0.00	0.00	478.28	0.00	676.49

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Emergency Medical Services	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Emergency Cardiovascular Care	0.00	0.00	2,330.33	0.00	2,513.22	0.00
Pain Management	47.23	47.23	0.00	0.00	0.00	0.00
Nebulization	296.07	296.07	0.00	0.00	0.00	0.00
Rapid Sequence Induction	721.04	721.04	0.00	0.00	0.00	0.00
Intravenous Fluid Therapy	201.33	201.33	0.00	0.00	0.00	0.00
Hemorrhage Control	43.54	43.54	0.00	0.00	0.00	0.00
Splinting	43.26	43.26	0.00	0.00	0.00	0.00
Spinal Immobilization	36.87	36.87	0.00	0.00	0.00	0.00
Obstetric Management	37.56	37.56	0.00	0.00	0.00	0.00
Patient Assessment	36.87	36.87	0.00	0.00	0.00	0.00
Airway Management	104.12	104.12	0.00	0.00	0.00	0.00
Oxygenation and Ventilation	330.60	330.60	0.00	0.00	0.00	0.00
ECG Rhythm Analysis	39.56	39.56	0.00	0.00	0.00	0.00
Intensive Care Transfer	638.95	638.95	0.00	0.00	0.00	0.00
General Patient Inter-facility transfer	862.85	862.85	0.00	0.00	0.00	0.00
Neonatal Transfer	34.49	34.49	0.00	0.00	0.00	0.00
Aeromedical Evacuation (Outsourced services)	88,575.36	88,575.36	0.00	0.00	0.00	0.00
Emergency Ground Ambulance Transport (Outsourced services)	3,033.69	3,033.69	0.00	0.00	0.00	0.00
Wound Care And Dressing	44.78	44.78	0.00	0.00	0.00	0.00
Urinary Catheterization	38.36	38.36	0.00	0.00	0.00	0.00
Insertion Of Intraosseous Needle	48.21	48.21	0.00	0.00	0.00	0.00
Respiratory Emergency Care	353.74	353.74	0.00	0.00	0.00	0.00

Neuro-endocrine Emergency Care	625.30	625.30	0.00	0.00	0.00	0.00
Poison Antidote Care	1,120.69	1,120.69	0.00	0.00	0.00	0.00

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Cancer: Rx & Surgery	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Treatment; (Kaposi's sarcoma) (skin)						
Treatment; (Kaposi's sarcoma) (skin)	0.00	0.00	0.00	1,9537.59	0.00	19,735.80
Treatment; Reproductive						
Breast Cancer (intent to cure)	0.00	0.00	0.00	6,3042.36	0.00	63,240.57
Breast Cancer (intent to cure) – General Surgery– Moderate Case	0.00	0.00	0.00	2,151.08	0.00	2,349.29
Breast Cancer (Palliative)	0.00	0.00	0.00	4,323.47	0.00	4,521.68
Treatment; Reproductive II						
Cervix (intent to cure)	0.00	0.00	0.00	0.00	0.00	0.00
Cervix (Palliative)	0.00	0.00	0.00	17,919.94	0.00	18,118.15
Treatment; Hematological						
Non-Hodgkin's Lymphoma	0.00	0.00	0.00	20,193.54	0.00	20,391.75
Hodgkin's Lymphoma	0.00	0.00	0.00	242,795.69	0.00	242,993.90
CML	0.00	0.00	0.00	1,132,659.25	0.00	1,132,857.46
Treatment; Gastrointestinal						
Stromal Tumors (GIST)	0.00	0.00	0.00	1,134,397.73	0.00	1,134,595.94
Stromal Tumors (GIST) – General Surgery– Moderate	0.00	0.00	0.00	2,142.27	0.00	2,340.49

Esophagus – Cardio Thoracic Surgery– Moderate Case	0.00	0.00	0.00	2,144.45	0.00	2,342.66
Esophagus	0.00	0.00	0.00	10,123.20	0.00	10,321.41
Rectum	0.00	0.00	0.00	264,527.76	0.00	264,725.98
Colon	0.00	0.00	0.00	319,808.07	0.00	320,006.29
Colon – General surgery – Moderate Case	0.00	0.00	0.00	2,159.42	0.00	2,357.63
Pancreas	0.00	0.00	0.00	2,509,204.89	0.00	2,509,403.11
Pancreas – General Surgery– Moderate Case	0.00	0.00	0.00	2,160.23	0.00	2,358.44
Treatment: Respiratory						
Lung	0.00	0.00	0.00	18,746.61	0.00	18,944.83
Lung – Cardio Thoracic surgery– Moderate Case	0.00	0.00	0.00	2,159.41	0.00	2,357.63

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Cancer: Lab	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Screening & Diagnosis of Kaposi's Sarcoma: Surgical Biopsy	0.00	0.00	0.00	506.18	0.00	704.40
Screening & Diagnosis of Kaposi's Sarcoma: Bluing (Scott's Tap Water)	0.00	0.00	0.00	327.21	0.00	525.42
Screening & Diagnosis of Kaposi's Sarcoma: Full Blood Count – Stromatolyser Test	0.00	0.00	0.00	127.33	0.00	325.55
Screening & Diagnosis of Kaposi's Sarcoma: Full Blood Count – Coulter ACT 5 Diff	0.00	0.00	0.00	1,978.08	0.00	2,176.29
Screening & Diagnosis of Kaposi's Sarcoma: Renal Function Test – Urea Test	0.00	0.00	0.00	243.79	0.00	442.01
Screening & Diagnosis of Kaposi's Sarcoma: Renal Function Test – Creatinine Test	0.00	0.00	0.00	243.73	0.00	441.94

Screening & Diagnosis of Kaposi's Sarcoma: Renal Function Test – Sodium, Potassium, and Chloride Test	0.00	0.00	0.00	266.19	0.00	464.40
Screening & Diagnosis of Kaposi's Sarcoma: Liver Function Test – ALT	0.00	0.00	0.00	243.90	0.00	442.12
Screening & Diagnosis of Kaposi's Sarcoma: Liver Function Test – AST	0.00	0.00	0.00	243.82	0.00	442.03
Screening & Diagnosis of Kaposi's Sarcoma: Liver Function Test – ALP	0.00	0.00	0.00	243.76	0.00	441.97
Screening & Diagnosis of Kaposi's Sarcoma: Liver Function Test – GGT	0.00	0.00	0.00	244.02	0.00	442.23
Screening & Diagnosis of Kaposi's Sarcoma: Liver Function Test – Direct Bilirubin	0.00	0.00	0.00	243.77	0.00	441.98
Screening & Diagnosis of Kaposi's Sarcoma: Liver Function Test – Total Protein	0.00	0.00	0.00	243.79	0.00	442.01
Screening & Diagnosis of Kaposi's Sarcoma: Liver Function Test – Albumin	0.00	0.00	0.00	243.76	0.00	441.97
Screening & Diagnosis of Breast Cancer: Fine Needle Aspirate (FNA) biopsy	0.00	0.00	0.00	262.89	0.00	461.10
Screening & Diagnosis of Breast Cancer: Hematoxylin and Eosin Stain	0.00	0.00	0.00	574.49	0.00	772.70
Screening & Diagnosis of Breast Cancer: May-Grunwald and Giemsa	0.00	0.00	0.00	152.42	0.00	350.63
Screening & Diagnosis of Breast Cancer: Surgical Biopsy	0.00	0.00	0.00	576.16	0.00	774.37
Screening & Diagnosis of Breast Cancer: Bluing (Scott's Tap Water)	0.00	0.00	0.00	329.02	0.00	527.23
Screening & Diagnosis of Cervix: Surgical Biopsy	0.00	0.00	0.00	576.16	0.00	774.37
Screening & Diagnosis of Cervix: Bluing (Scott's Tap Water)	0.00	0.00	0.00	352.82	0.00	551.03
Screening & Diagnosis of Cervix: Ultrasound of abdomen and pelvis	0.00	0.00	0.00	167.25	0.00	365.46
Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): Fine Needle Aspirate (FNA) biopsy	0.00	0.00	0.00	291.23	0.00	489.44
Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): Hematoxylin and Eosin Stain	0.00	0.00	0.00	570.51	0.00	768.72
Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): May-Grunwald and Giemsa	0.00	0.00	0.00	152.42	0.00	350.63
Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): Surgical Biopsy	0.00	0.00	0.00	576.16	0.00	774.37
Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): Bluing (Scott's Tap Water)	0.00	0.00	0.00	326.68	0.00	524.89
Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): CT Scan	0.00	0.00	0.00	256.95	0.00	455.16
Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): Full Blood Count – Stromatolyser Test	0.00	0.00	0.00	127.33	0.00	325.55
Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's	0.00	0.00	0.00	1,978.08	0.00	2176.29

Lymphoma): Full Blood Count – Coulter ACT 5 Diff						
Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): Echo	0.00	0.00	0.00	312.12	0.00	510.33
Screening & Diagnosis of Hematological (Non-Hodgkin's & Hodgkin's Lymphoma): Lactase Dehydrogenase (LDH)	0.00	0.00	0.00	153.72	0.00	351.93
Screening & Diagnosis of Hematological (Hodgkin's CML): Bone Marrow Biopsy	0.00	0.00	0.00	949.91	0.00	1,148.13
Screening & Diagnosis of Hematological (Hodgkin's CML): Full Blood Count – Stromatolyser Test	0.00	0.00	0.00	127.33	0.00	325.55
Screening & Diagnosis of Hematological (Hodgkin's CML): Full Blood Count – Coulter ACT 5 Diff	0.00	0.00	0.00	1,978.08	0.00	2176.29
Screening & Diagnosis of Hematological (Hodgkin's CML): Peripheral Smear	0.00	0.00	0.00	221.75	0.00	419.96
Screening & Diagnosis of Hematological (Hodgkin's CML): Ultrasound Abdomen	0.00	0.00	0.00	162.41	0.00	360.62
Screening & Diagnosis of Gastrointestinal Stromal Tumor: Surgical Biopsy	0.00	0.00	0.00	576.16	0.00	774.37
Screening & Diagnosis of Gastrointestinal Stromal Tumor: Bluing (Scott's Tap Water)	0.00	0.00	0.00	326.68	0.00	524.89
Screening & Diagnosis of Gastrointestinal Stromal Tumor: CT scan	0.00	0.00	0.00	257.01	0.00	455.22
Screening & Diagnosis of Gastrointestinal Stromal Tumor: Full Blood Count – Stromatolyser Test	0.00	0.00	0.00	127.33	0.00	325.55
Screening & Diagnosis of Gastrointestinal Stromal Tumor: Full Blood Count – Coulter ACT 5 Diff	0.00	0.00	0.00	1,978.08	0.00	2176.29
Screening & Diagnosis of Gastrointestinal Stromal Tumor: Liver Function Test – ALT	0.00	0.00	0.00	245.07	0.00	443.29
Screening & Diagnosis of Gastrointestinal Stromal Tumor: Liver Function Test – AST	0.00	0.00	0.00	244.99	0.00	443.20
Screening & Diagnosis of Gastrointestinal Stromal Tumor: Liver Function Test – ALP	0.00	0.00	0.00	244.93	0.00	443.14
Screening & Diagnosis of Gastrointestinal Stromal Tumor: Liver Function Test – GGT	0.00	0.00	0.00	245.19	0.00	443.40
Screening & Diagnosis of Gastrointestinal Stromal Tumor: Liver Function Test – Direct Bilirubin	0.00	0.00	0.00	244.94	0.00	443.15
Screening & Diagnosis of Gastrointestinal Stromal Tumor: Liver Function Test – Total Protein	0.00	0.00	0.00	244.96	0.00	443.18
Screening & Diagnosis of Gastrointestinal Stromal Tumor: Liver Function Test – Albumin	0.00	0.00	0.00	244.93	0.00	443.14
Screening & Diagnosis of Gastrointestinal Stromal Tumor: Renal Function Test – Urea Test	0.00	0.00	0.00	243.79	0.00	442.01

Screening & Diagnosis of Gastrointestinal Stromal Tumor: Renal Function Test – Creatinine Test	0.00	0.00	0.00	244.90	0.00	443.11
Screening & Diagnosis of Gastrointestinal Stromal Tumor: Renal Function Test – Sodium, Potassium, and Chloride Test	0.00	0.00	0.00	267.36	0.00	465.57
Screening & Diagnosis of Gastrointestinal Esophagus: Surgical Biopsy	0.00	0.00	0.00	576.16	0.00	774.37
Screening & Diagnosis of Gastrointestinal Esophagus: Bluing (Scott's Tap Water)	0.00	0.00	0.00	326.68	0.00	524.89
Screening & Diagnosis of Gastrointestinal Esophagus: Barium Swallow	0.00	0.00	0.00	159.78	0.00	357.99
Screening & Diagnosis of Gastrointestinal Esophagus: Endoscopy	0.00	0.00	0.00	315.82	0.00	514.03
Screening & Diagnosis of Gastrointestinal Esophagus: CT Scan	0.00	0.00	0.00	261.85	0.00	460.06
Screening & Diagnosis of Gastrointestinal Esophagus: Full Blood Count – Stromatolyser Test	0.00	0.00	0.00	127.33	0.00	325.55
Screening & Diagnosis of Gastrointestinal Esophagus: Full Blood Count – Coulter ACT 5 Diff	0.00	0.00	0.00	1,978.08	0.00	2176.29
Screening & Diagnosis of Gastrointestinal Esophagus: Liver Function Test – ALT	0.00	0.00	0.00	245.07	0.00	443.29
Screening & Diagnosis of Gastrointestinal Esophagus: Liver Function Test – AST	0.00	0.00	0.00	244.99	0.00	443.20
Screening & Diagnosis of Gastrointestinal Esophagus: Liver Function Test – ALP	0.00	0.00	0.00	244.93	0.00	443.14
Screening & Diagnosis of Gastrointestinal Esophagus: Liver Function Test – GGT	0.00	0.00	0.00	245.19	0.00	443.40
Screening & Diagnosis of Gastrointestinal Esophagus: Liver Function Test – Direct Bilirubin	0.00	0.00	0.00	244.94	0.00	443.15
Screening & Diagnosis of Gastrointestinal Esophagus: Liver Function Test – Total Protein	0.00	0.00	0.00	244.96	0.00	443.18
Screening & Diagnosis of Gastrointestinal Esophagus: Liver Function Test – Albumin	0.00	0.00	0.00	244.93	0.00	443.14
Screening & Diagnosis of Gastrointestinal Esophagus: Renal Function Test – Urea Test	0.00	0.00	0.00	244.96	0.00	443.18
Screening & Diagnosis of Gastrointestinal Esophagus: Renal Function Test – Creatinine Test	0.00	0.00	0.00	244.90	0.00	443.11
Screening & Diagnosis of Gastrointestinal Esophagus: Renal Function Test – Sodium, Potassium, and Chloride Test	0.00	0.00	0.00	267.36	0.00	465.57
Screening & Diagnosis of Gastrointestinal Anal Canal: Surgical Biopsy	0.00	0.00	0.00	576.16	0.00	774.37
Screening & Diagnosis of Gastrointestinal Anal Canal: Bluing (Scott's Tap Water)	0.00	0.00	0.00	326.68	0.00	524.89
Screening & Diagnosis of Gastrointestinal Anal Canal: Proctoscopy	0.00	0.00	0.00	277.44	0.00	475.66

Screening & Diagnosis of Gastrointestinal Anal Canal: Lower Endoscopy	0.00	0.00	0.00	315.82	0.00	514.03
Screening & Diagnosis of Gastrointestinal Anal Canal: CT Scan	0.00	0.00	0.00	261.85	0.00	460.06
Screening & Diagnosis of Gastrointestinal Anal Canal: Barium Enema	0.00	0.00	0.00	257.18	0.00	455.39
Screening & Diagnosis of Gastrointestinal Anal Canal: Full Blood Count – Stromatolyser Test	0.00	0.00	0.00	127.33	0.00	325.55
Screening & Diagnosis of Gastrointestinal Anal Canal: Full Blood Count – Coulter ACT 5 Diff	0.00	0.00	0.00	1,978.08	0.00	2176.29
Screening & Diagnosis of Gastrointestinal Anal Canal: Liver Function Test – ALT	0.00	0.00	0.00	245.07	0.00	443.29
Screening & Diagnosis of Gastrointestinal Anal Canal: Liver Function Test – AST	0.00	0.00	0.00	244.99	0.00	443.20
Screening & Diagnosis of Gastrointestinal Anal Canal: Liver Function Test – ALP	0.00	0.00	0.00	244.93	0.00	443.14
Screening & Diagnosis of Gastrointestinal Anal Canal: Liver Function Test – GGT	0.00	0.00	0.00	245.19	0.00	443.40
Screening & Diagnosis of Gastrointestinal Anal Canal: Liver Function Test – Direct Bilirubin	0.00	0.00	0.00	244.94	0.00	443.15
Screening & Diagnosis of Gastrointestinal Anal Canal: Liver Function Test – Total Protein	0.00	0.00	0.00	244.96	0.00	443.18
Screening & Diagnosis of Gastrointestinal Anal Canal: Liver Function Test – Albumin	0.00	0.00	0.00	244.93	0.00	443.14
Screening & Diagnosis of Gastrointestinal Anal Canal: Renal Function Test – Urea Test	0.00	0.00	0.00	243.79	0.00	442.01
Screening & Diagnosis of Gastrointestinal Anal Canal: Renal Function Test – Creatinine Test	0.00	0.00	0.00	244.90	0.00	443.11
Screening & Diagnosis of Gastrointestinal Anal Canal: Renal Function Test – Sodium, Potassium, and Chloride Test	0.00	0.00	0.00	267.36	0.00	465.57
Screening & Diagnosis of Gastrointestinal Rectum: Surgical Biopsy	0.00	0.00	0.00	330.41	0.00	528.63
Screening & Diagnosis of Gastrointestinal Rectum: Bluing (Scott's Tap Water)	0.00	0.00	0.00	326.68	0.00	524.89
Screening & Diagnosis of Gastrointestinal Rectum: Proctoscopy	0.00	0.00	0.00	250.62	0.00	448.84
Screening & Diagnosis of Gastrointestinal Rectum: Lower Endoscopy	0.00	0.00	0.00	205.36	0.00	403.57
Screening & Diagnosis of Gastrointestinal Rectum: CT Scan	0.00	0.00	0.00	254.76	0.00	452.98
Screening & Diagnosis of Gastrointestinal Rectum: Colonoscopy	0.00	0.00	0.00	205.36	0.00	403.57
Screening & Diagnosis of Gastrointestinal Rectum: Ultrasound Abdomen	0.00	0.00	0.00	162.41	0.00	360.62
Screening & Diagnosis of Gastrointestinal Rectum: Full Blood Count –	0.00	0.00	0.00	127.33	0.00	325.55

Stromatolyser Test						
Screening & Diagnosis of Gastrointestinal Rectum: Full Blood Count – Coulter ACT 5 Diff	0.00	0.00	0.00	1,978.08	0.00	2176.29
Screening & Diagnosis of Gastrointestinal Rectum: Liver Function Test – ALT	0.00	0.00	0.00	245.07	0.00	443.29
Screening & Diagnosis of Gastrointestinal Rectum: Liver Function Test – AST	0.00	0.00	0.00	244.99	0.00	443.20
Screening & Diagnosis of Gastrointestinal Rectum: Liver Function Test – ALP	0.00	0.00	0.00	244.93	0.00	443.14
Screening & Diagnosis of Gastrointestinal Rectum: Liver Function Test – GGT	0.00	0.00	0.00	245.19	0.00	443.40
Screening & Diagnosis of Gastrointestinal Rectum: Liver Function Test – Direct Bilirubin	0.00	0.00	0.00	244.94	0.00	443.15
Screening & Diagnosis of Gastrointestinal Rectum: Liver Function Test – Total Protein	0.00	0.00	0.00	244.96	0.00	443.18
Screening & Diagnosis of Gastrointestinal Rectum: Renal Function Test – Urea Test	0.00	0.00	0.00	243.79	0.00	442.01
Screening & Diagnosis of Gastrointestinal Rectum: Renal Function Test – Creatinine Test	0.00	0.00	0.00	244.90	0.00	443.11
Screening & Diagnosis of Gastrointestinal Rectum: Renal Function Test – Sodium, Potassium, and Chloride Test	0.00	0.00	0.00	266.19	0.00	464.40
Screening & Diagnosis of Gastrointestinal Colon: Colonoscopy	0.00	0.00	0.00	204.62	0.00	402.83
Screening & Diagnosis of Gastrointestinal Colon: Surgical Biopsy	0.00	0.00	0.00	576.16	0.00	774.37
Screening & Diagnosis of Gastrointestinal Colon: Bluing (Scott's Tap Water)	0.00	0.00	0.00	325.97	0.00	524.18
Screening & Diagnosis of Gastrointestinal Pancreas: Surgical Biopsy	0.00	0.00	0.00	576.16	0.00	774.37
Screening & Diagnosis of Gastrointestinal Pancreas: Bluing (Scott's Tap Water)	0.00	0.00	0.00	326.68	0.00	524.89
Screening & Diagnosis of Respiratory Lung: Fine Needle Aspirate (FNA)	0.00	0.00	0.00	288.94	0.00	487.15
Screening & Diagnosis of Respiratory Lung: Hematoxylin and Eosin Stain	0.00	0.00	0.00	574.49	0.00	772.70
Screening & Diagnosis of Respiratory Lung: May-Grunwald and Giemsa	0.00	0.00	0.00	152.42	0.00	350.63
Screening & Diagnosis of Respiratory Lung: Surgical Biopsy	0.00	0.00	0.00	576.16	0.00	774.37
Screening & Diagnosis of Respiratory Lung: Bluing (Scott's Tap Water)	0.00	0.00	0.00	329.02	0.00	527.23
Screening & Diagnosis of Respiratory Lung: Chest X-Ray	0.00	0.00	0.00	152.03	0.00	350.24
Screening & Diagnosis of Respiratory Lung: Bronchoscopy	0.00	0.00	0.00	961.01	0.00	1159.23

Screening & Diagnosis of Respiratory Lung: CT Scan for Chest and Abdomen	0.00	0.00	0.00	256.99	0.00	455.21
Screening & Diagnosis of Respiratory Lung: Full Blood Count – Stromatolyser Test	0.00	0.00	0.00	127.33	0.00	325.55
Screening & Diagnosis of Respiratory Lung: Liver Function Test – ALT	0.00	0.00	0.00	245.07	0.00	443.29
Screening & Diagnosis of Respiratory Lung: Liver Function Test – AST	0.00	0.00	0.00	244.99	0.00	443.20
Screening & Diagnosis of Respiratory Lung: Liver Function Test – ALP	0.00	0.00	0.00	244.93	0.00	443.14
Screening & Diagnosis of Respiratory Lung: Liver Function Test – GGT	0.00	0.00	0.00	245.19	0.00	443.40
Screening & Diagnosis of Respiratory Lung: Liver Function Test – Direct Bilirubin	0.00	0.00	0.00	244.94	0.00	443.15
Screening & Diagnosis of Respiratory Lung: Liver Function Test – Total Protein	0.00	0.00	0.00	244.96	0.00	443.18
Screening & Diagnosis of Respiratory Lung: Liver Function Test – Albumin	0.00	0.00	0.00	244.93	0.00	443.14
Screening & Diagnosis of Respiratory Lung: Renal Function Test – Urea Test	0.00	0.00	0.00	243.79	0.00	442.01
Screening & Diagnosis of Respiratory Lung: Renal Function Test – Sodium, Potassium, and Chloride Test	0.00	0.00	0.00	266.19	0.00	464.40

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Disease Control Unit: NTDs–Rx	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Leprosy screening	0.00	51.54	0.00	0.00	0.00	0.00
Leprosy treatment	0.00	0.00	7,686.30	0.00	7,865.61	0.00

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Disease Control Unit: NTDs–Lab	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospital	Clinics and Health Posts	Primary, District, and Referral Hospital
Leprosy biopsy test – Zeil Nielseen stain	0.00	0.00	0.00	90.28	0.00	288.49

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Meningitis	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Bacterial Meningitis	0.00	0.00	0.00	8,771.13	0.00	8,969.35
TB Meningitis	0.00	0.00	0.00	30,381.85	0.00	30,580.06
Fungal (Cryptococcal) Meningitis	0.00	0.00	0.00	23,115.35	0.00	23,313.57
Lumbar Puncture (& Laboratory)	0.00	0.00	0.00	855.51	0.00	1,053.72
Hydrocephalus (Surgery)	0.00	0.00	0.00	6,347.14	0.00	6,545.36

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Nephrology	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Screening – Renal Function Test; Full Blood Count Test; Calcium, Magnesium, and Phosphate Tests; Liver Function Test; Uric Acid; Urinalysis; Glucose	0.00	0.00	0.00	0.00	0.00	0.00
Screening – Ultrasound of the abdomen	0.00	0.00	0.00	108.22	0.00	306.44
Chronic Kidney Disease (Stages 1 to 4) (Stage 4 preparation for renal replacement therapy)	0.00	0.00	0.00	65,144.75	0.00	65,342.96
End-stage Renal Disease (Stage 5)	0.00	0.00	0.00	171,716.18	0.00	171,914.39
Catheter-related infections	0.00	0.00	0.00	5,881.81	0.00	6,080.02
Reinsertion of Catheter (PD or Hemo) for blocked & non-functioning catheters	0.00	0.00	0.00	173,182.03	0.00	173,380.24

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Nephrology Lab	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Screening – Renal Function Test; Full Blood Count Test; Calcium, Magnesium, and Phosphate Tests; Liver Function Test; Uric Acid; Urinalysis Glucose	0.00	0.00	0.00	661.06	0.00	859.27
Screening – Ultrasound of the abdomen	0.00	0.00	0.00	127.21	0.00	325.42

Chronic Kidney Disease (Stages 1 to 4) (Stage 4 preparation for renal replacement therapy)	0.00	0.00	0.00	1,978.08	0.00	2,176.29
End-stage Renal Disease (Stage 5)	0.00	0.00	0.00	244.90	0.00	443.12
Catheter-related infections	0.00	0.00	0.00	245.62	0.00	443.83
Reinsertion of Catheter (PD or Hemo) for blocked & non-functioning catheters	0.00	0.00	0.00	244.96	0.00	443.17

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Oral Health Rx & Surgery	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Caries	0.00	0.00	4,445.78	0.00	4,628.66	0.00
Perio	0.00	0.00	506.32	0.00	689.21	0.00
Trauma	0.00	0.00	287.16	0.00	470.04	0.00
Oral Cancer	0.00	0.00	14,123.73	0.00	14,306.61	0.00

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Oral Health LAB & X-ray	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
LFT						
Liver Failure Test	0.00	0.00	1,595.69	0.00	1,778.57	0.00
RFT						
Renal Failure Test	0.00	0.00	645.38	0.00	828.26	0.00
Other Tests						
Full Blood Count – Stromatolyser Test	0.00	0.00	333.41	0.00	516.29	0.00
Full Blood Count – Coulter ACT 5 Diff	0.00	0.00	1,968.42	0.00	2,151.31	0.00
Crossmatch	0.00	0.00	761.11	0.00	9,43.99	0.00
Blood Grouping	0.00	0.00	425.45	0.00	608.33	0.00
Antibody Screen	0.00	0.00	761.11	0.00	943.99	0.00
Antibody Identification	0.00	0.00	761.11	0.00	943.99	0.00
RHT	0.00	0.00	117.30	0.00	300.18	0.00
Biopsy Lab	0.00	0.00	565.94	0.00	748.82	0.00
CD4	0.00	0.00	455.71	0.00	638.60	0.00
Glucose Test	0.00	0.00	224.63	0.00	407.51	0.00

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Organ Transplant	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Kidney Transplant	0.00	0.00	0.00	250,039.78	0.00	250,237.99
Bone Marrow Transplant	0.00	0.00	0.00	200,039.78	0.00	200,237.99
Partial Liver Transplant	0.00	0.00	0.00	400,039.78	0.00	400,237.99
Bilateral Lung Transplant	0.00	0.00	0.00	3,500,039.78	0.00	3,500,237.99

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Orthopedics – Rx & Surgery	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District and Referral Hospitals
Orthopedic Surgery – Mild Case	0.00	0.00	0.00	1,439.73	0.00	1,637.94
Orthopedic Surgery – Moderate Case	0.00	0.00	0.00	1,436.34	0.00	1,634.55
Orthopedic Surgery – Severe Case	0.00	0.00	0.00	1,419.79	0.00	1,618.00
Plaster Room Services	0.00	0.00	0.00	1,850.40	0.00	2,048.61
Inpatient Services – Female and Male Orthopedic Ward	0.00	0.00	0.00	5,716.85	0.00	5,915.06

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Prevention of Blindness	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Cataract Surgery	0.00	1,083.74	0.00	1,089.82	0.00	1,288.04
Cataract Screening	673.48	0.00	669.91	679.57	852.80	877.78
Treatment of Glaucoma	0.00	0.00	0.00	634.27	0.00	832.48
Glaucoma Screening	2,289.08	0.00	0.00	2,295.17	0.00	2,493.38
Glaucoma Surgery	0.00	0.00	0.00	360.37	0.00	558.59
Diabetic Retinopathy Treatment	0.00	0.00	600,092.31	600,101.97	600,275.20	600,300.18
Treatment of Diabetic Retinopathy Screening	0.00	0.00	61.82	71.47	244.70	269.68
Refractive Error Screening	113.12	0.00	109.55	119.21	292.43	317.42
Childhood Blindness Screening	248.89	0.00	245.32	254.98	428.21	453.19
Childhood Blindness Treatment	0.00	0.00	0.00	1,106.52	0.00	1,304.73
Corneal Repairs – Surgery	0.00	0.00	0.00	176.11	0.00	374.32
Conjunctival Growth and Pterygium surgery	0.00	0.00	0.00	104.81	0.00	303.02
Eye Removal	0.00	0.00	0.00	9,463.97	0.00	9,662.18
Strabismus Surgery	0.00	0.00	0.00	382.49	0.00	580.70
Foreign Body	0.00	0.00	0.00	76.72	0.00	274.93
Production of Lenses	0.00	0.00	0.00	66.99	0.00	265.20
Glasses Dispensing	0.00	0.00	0.00	867.02	0.00	1,065.23

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Referred Cases	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
International Referral						
Cardiology	0.00	0.00	0.00	62,284.78	0.00	62,482.99
Dental	0.00	0.00	0.00	62,284.78	0.00	62,482.99
ENT	0.00	0.00	0.00	62,284.78	0.00	62,482.99
Gastroenterology	0.00	0.00	0.00	62,284.78	0.00	62,482.99
Hematology	0.00	0.00	0.00	62,284.78	0.00	62,482.99
Medical	0.00	0.00	0.00	62,284.78	0.00	62,482.99
Nephrology	0.00	0.00	0.00	62,284.78	0.00	62,482.99
Neurosurgery	0.00	0.00	0.00	62,284.78	0.00	62,482.99
Ob Gyn	0.00	0.00	0.00	62,284.78	0.00	62,482.99
Oncology	0.00	0.00	0.00	62,284.78	0.00	62,482.99
Ophthalmology	0.00	0.00	0.00	62,284.78	0.00	62,482.99
Orthopedics	0.00	0.00	0.00	62,284.78	0.00	62,482.99
Other	0.00	0.00	0.00	62,284.78	0.00	62,482.99
Pediatrics	0.00	0.00	0.00	62,284.78	0.00	62,482.99
Rheumatology	0.00	0.00	0.00	62,284.78	0.00	62,482.99
Surgery	0.00	0.00	0.00	62,284.78	0.00	62,482.99
Urology	0.00	0.00	0.00	62,284.78	0.00	62,482.99
Local Referral						
Cardiology	0.00	0.00	0.00	23,233.78	0.00	23,431.99
Dental	0.00	0.00	0.00	23,233.78	0.00	23,431.99
ENT	0.00	0.00	0.00	23,233.78	0.00	23,431.99

Gastroenterology	0.00	0.00	0.00	23,233.78	0.00	23,431.99
Hematology	0.00	0.00	0.00	23,233.78	0.00	23,431.99
Medical	0.00	0.00	0.00	23,233.78	0.00	23,431.99
Nephrology	0.00	0.00	0.00	23,233.78	0.00	23,431.99
Neurosurgery	0.00	0.00	0.00	23,233.78	0.00	23,431.99
Neurology	0.00	0.00	0.00	23,233.78	0.00	23,431.99
Ob Gyn	0.00	0.00	0.00	23,233.78	0.00	23,431.99
Oncology	0.00	0.00	0.00	23,233.78	0.00	23,431.99
Ophthalmology	0.00	0.00	0.00	23,233.78	0.00	23,431.99
Orthopedics	0.00	0.00	0.00	23,233.78	0.00	23,431.99
Other	0.00	0.00	0.00	23,233.78	0.00	23,431.99
Pediatrics	0.00	0.00	0.00	23,233.78	0.00	23,431.99
Rheumatology	0.00	0.00	0.00	23,233.78	0.00	23,431.99
Surgery	0.00	0.00	0.00	23,233.78	0.00	23,431.99
Urology	0.00	0.00	0.00	23,233.78	0.00	23,431.99

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Dermatology Rx Surgery	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Photodermatitis	0.00	0.00	0.00	522.99	0.00	721.21
Alopecia	0.00	0.00	0.00	87.69	0.00	285.91
Atopic Dermatitis/Eczema/LSC/Prurigo Nodularis	0.00	0.00	0.00	92.09	0.00	290.31
Acne (Vulgaris, Rosacea)	0.00	0.00	0.00	534.52	0.00	732.73
Fungal infections	0.00	0.00	0.00	151.05	0.00	349.26

Tinea Capiti	0.00	0.00	0.00	118.14	0.00	316.35
Tinea Corpori, Pedis Topical	0.00	0.00	0.00	106.58	0.00	304.80
Psoriasis Topical	0.00	0.00	0.00	85.89	0.00	284.10
Herpes (Simplex & Zoster)	0.00	0.00	0.00	301.80	0.00	500.01
Bullous Pemphigoid/Autoimmune Blistering Disorders	0.00	0.00	0.00	241.66	0.00	439.87
Pyodermas, Impetigo,Folliculitis, Furanculusis	0.00	0.00	0.00	98.15	0.00	296.37
Verruca Vularis/Verruca Plana/Condyloma Accuminata	0.00	0.00	0.00	23,19.07	0.00	2,517.28
Keloids	0.00	0.00	0.00	2,794.83	0.00	2,993.04
Callous/Palmoplantar Keratoderma	0.00	0.00	0.00	72.49	0.00	270.70
Tinea Versicolor	0.00	0.00	0.00	79.23	0.00	277.44
Pruritus	0.00	0.00	0.00	1,839.78	0.00	2,037.99
Urticaria	0.00	0.00	0.00	247.16	0.00	445.37
Candidiasis	0.00	0.00	0.00	85.81	0.00	284.02
Scabies	0.00	0.00	0.00	143.06	0.00	341.27
Seborrcic Dermatitis	0.00	0.00	0.00	79.23	0.00	277.44
Vitiligo	0.00	0.00	0.00	389.66	0.00	587.87
Warts	0.00	0.00	0.00	2,066.17	0.00	2,264.38
Lichen Planus	0.00	0.00	0.00	88.30	0.00	286.51
Biopsy	0.00	0.00	0.00	575.49	0.00	773.71

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Dermatology Lab	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Full Blood Count – Stromatolyser Test	0.00	0.00	0.00	127.33	0.00	325.55
Full Blood Count – Coulter ACT 5 Diff	0.00	0.00	0.00	1,978.08	0.00	2,176.29
RFT – Urea Test	0.00	0.00	0.00	243.79	0.00	442.01
RFT – Creatinine Test	0.00	0.00	0.00	243.73	0.00	441.94
RFT – Sodium, Potassium, and Chloride Test	0.00	0.00	0.00	266.19	0.00	464.40
LFT	0.00	0.00	0.00	1,050.87	0.00	1,249.08
Cholesterol	0.00	0.00	0.00	244.92	0.00	443.13
Triglycerides	0.00	0.00	0.00	245.10	0.00	443.31
HDL – CHOL	0.00	0.00	0.00	142.90	0.00	341.11
LDL – CHOL	0.00	0.00	0.00	142.90	0.00	341.11
T3	0.00	0.00	0.00	222.94	0.00	421.15
T4	0.00	0.00	0.00	215.96	0.00	414.17
Tsh	0.00	0.00	0.00	159.74	0.00	357.95
Rapid HIV Test	0.00	0.00	0.00	128.03	0.00	326.24

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST); HR costs obtained LiST from OneHealth medical personnel treatment inputs.

Spinalis	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Incomplete Paraplegic	0.00	0.00	0.00	190,862.99	0.00	191,061.20
Complete Paraplegic	0.00	0.00	0.00	190,862.18	0.00	191,060.40
Incomplete Tetraplegic	0.00	0.00	0.00	4,436,648.30	0.00	4,436,846.51
Complete Tetraplegic	0.00	0.00	0.00	4,337,215.91	0.00	4,337,414.13

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

Surgery	TOTAL NORMATIVE UNIT COST					
	Drugs/Consumables + HR + Other Direct and Indirect Costs (BWP)					
	Outpatient Visits				Inpatient Visits	
	DHMT	Mobile Stops	Clinics and Health Posts	Primary, District, and Referral Hospitals	Clinics and Health Posts	Primary, District, and Referral Hospitals
Spine Surgery – Severe Case	0.00	0.00	1,863.20	0.00	2,046.08	0.00
Cardio Thoracic Surgery – Mild Case	0.00	0.00	2,047.96	0.00	2,230.84	0.00
Cardio Thoracic Surgery – Moderate Case	0.00	0.00	2,044.36	0.00	2,227.24	0.00
Cardio Thoracic Surgery – Severe Case	0.00	0.00	2,027.81	0.00	2,210.69	0.00
Plastic Surgery – Mild Case	0.00	0.00	1,879.96	0.00	2,062.84	0.00
Plastic Surgery – Moderate Case	0.00	0.00	1,876.37	0.00	2,059.25	0.00
Plastic Surgery – Severe Case	0.00	0.00	1,859.81	0.00	2,042.70	0.00

ENT Surgery – Mild Case	0.00	0.00	2,020.92	0.00	2,203.80	0.00
ENT Surgery – Moderate Case	0.00	0.00	2,017.33	0.00	2,200.21	0.00
ENT Surgery – Severe Case	0.00	0.00	2,029.02	0.00	2,211.90	0.00
Urology Surgery – Mild Case	0.00	0.00	1,876.96	0.00	2,059.84	0.00
Urology Surgery – Moderate Case	0.00	0.00	1,873.36	0.00	2,056.25	0.00
Urology Surgery –Severe Case	0.00	0.00	1,884.65	0.00	2,067.53	0.00
Neurology Surgery – Mild Case	0.00	0.00	2,438.66	0.00	2,621.54	0.00
Neurology Surgery – Moderate Case	0.00	0.00	2,716.51	0.00	2,899.40	0.00
Neurology Surgery – Severe Case	0.00	0.00	2,699.96	0.00	2,882.84	0.00
Dental Surgery – Mild Case	0.00	0.00	1,905.20	0.00	2,088.09	0.00
Dental Surgery – Moderate Case	0.00	0.00	1,873.37	0.00	2,056.25	0.00
Dental Surgery – Severe Case	0.00	0.00	1,856.81	0.00	2,039.70	0.00
Gyn Laparoscopy Surgery – Mild Case	0.00	0.00	1,876.96	0.00	2,059.84	0.00
Gyn Laparoscopy Surgery – Moderate Case	0.00	0.00	1,873.37	0.00	2,056.25	0.00
Gyn Laparoscopy Surgery – Severe Case	0.00	0.00	1,856.81	0.00	2,039.70	0.00
Pediatric Surgery – Mild Case	0.00	0.00	1,876.96	0.00	2,059.84	0.00
Pediatric Surgery – Moderate Case	0.00	0.00	1,873.37	0.00	2,056.25	0.00
Pediatric Surgery – Severe Case	0.00	0.00	1,856.81	0.00	2,039.70	0.00
General Surgery – Mild Case	0.00	0.00	2,505.89	0.00	2,688.77	0.00
General Surgery – Moderate Case	0.00	0.00	2,502.29	0.00	2,685.18	0.00
General Surgery – Severe Case	0.00	0.00	2,482.89	0.00	2,665.77	0.00
Spine Surgery – Mild Case	0.00	0.00	1,883.35	0.00	2,066.23	0.00
Spine Surgery – Moderate Case	0.00	0.00	1,879.75	0.00	2,062.64	0.00

Note: Drugs and consumables costs obtained from OneHealth treatment inputs; direct and indirect costs obtained from LiST; HR costs obtained from OneHealth medical personnel treatment inputs.

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