

ZIMBABWE

# Costing Zimbabwe's Essential Health Benefit: Costing Findings

**EQUITY AND QUALITY IN HEALTH:  
LEAVING NO ONE BEHIND**





**KIT Royal Tropical Institute**

***Costing Zimbabwe's Essential Health Benefit:  
Costing Findings***

**FINAL REPORT  
October 2014**

**Kelsey Vaughan, MSc, MPP**

Royal Tropical Institute (KIT)  
Mauritskade 63  
1092 AD Amsterdam  
Telephone +31 20 568 8223  
businessdevelopment@kit.nl  
www.kit.nl



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## Acronyms

ANC	Antenatal care
ASRHS	Adolescent sexual and reproductive health services
DALY	Disability-adjusted life year
EHB	Essential Health Benefit (Package)
EHS	Environmental health services
FP	Family planning
GDP	Gross domestic product
HIS	Health information system
HIV	Human immunodeficiency virus
HR	Human resources
IEC	Information, education, communication
KIT	Royal Tropical Institute
MNCH	Maternal, newborn and child health
MOHCC	Ministry of Health and Child Care (formerly Ministry of Health and Child Welfare, MOHCW)
N/A	Not available
NHA	National Health Accounts
OPD	Outpatient department
PMTCT	Prevention of mother-to-child transmission
PNC	Postnatal care
RDC	Rural district council
RPR	Rapid plasma regain
STG	Standard treatment guideline
STI	Sexually-transmitted infection
UHC	Universal health coverage
UNICEF	United Nations Children's Fund
WHO	World Health Organization
WHO-CHOICE	World Health Organization-CHOosing Interventions that are Cost-Effective

## Executive Summary

### INTRODUCTION

A strengthening economy and a renewed focus in recent years on the national health strategy, combined with an international movement towards Universal Health Coverage (UHC), has led Zimbabwe's Ministry of Health and Child Care to pursue an Essential Health Benefit (EHB) that will be universally available to all citizens. Over the last year and a half, two core packages of health services (one for primary/clinic and rural health center level, one for secondary/hospital level, sometimes referred to as the first referral level in Zimbabwe) have been developed, validated and costed. The extensive packages are an update to the original core package, first published in March 1995, and are divided into four areas: maternal health, child health, communicable disease and non-communicable disease. The core packages cover a wide range of services, particularly in the growing area of non-communicable disease control which includes eye care; ear, nose and throat conditions; mental health illness; injuries, accidents and emergencies; surgeries and anesthetic services; diabetes; hypertension and cardiovascular diseases; common cancers; chronic obstruction respiratory disease including asthma; acute and chronic renal disease; services for the elderly; oral health services; environmental health services (EHS); information, education and communication (IEC) and outreach. This report presents the methodology and findings from this costing study.

### METHODOLOGY

On the basis of international best practices for costing EHBs, and modeled on the methodology used for costing Kenya's essential package, a bottom-up, facility-based costing methodology was developed. Data was collected in late 2013 from 15 primary level facilities and 3 district hospitals in 10 districts and 8 provinces, and supplemented by extensive data collection at central level, completed in June 2014.

The cost of providing the core packages includes human resources and contracted services, pharmaceuticals, laboratory tests, supplies, equipment (annualized), buildings (annualized), maintenance and utilities; IEC materials and EHS. In most cases utilization data was used to allocate costs from these categories to the core package categories (maternal health, child health, communicable disease and non-communicable disease). We have estimated the cost of providing the core package at primary and secondary level non-private facilities, namely mission, municipality, RDC, government and Zrp/Army facilities.

Three analysis scenarios were developed:

1. Scenario one, based on 2012 data; this scenario more or less reflects the delivery of services in Zimbabwe as of 2012, as captured during the facility data collection.
2. Scenario two, which builds on 2012 data and includes some assumptions about improved availability of pharmaceuticals and equipment, an increase in salary levels assuming the same staffing complement found in 2012, and increased spending on contracted services, labs, building maintenance, utilities and IEC. It also assumes user fees currently paid for EHS would be eliminated and the materials costs absorbed by government.

3. Scenario three, which further scales up availability of pharmaceuticals, assumes the core package equipment is available at each facility, further increases salary levels and assumes the approved staffing complement is in place at each facility, and further increases spending on contracted services, labs, building maintenance, utilities and IEC. EHS user fees continue to be absorbed by government and spending on EHS materials also increases.

## FINDINGS

For each sample facility and each scenario, a cost per facility per year is estimated, as well as a cost per capita based on the facility's catchment population. A summary of average total cost by facility type is provided below.

Level	Average total cost per year (US\$)								
	Scenario one			Scenario two			Scenario three		
	HR	Rest	Total	HR	Rest	Total	HR	Rest	Total
Primary average	93,384	38,273	131,657	130,737	73,688	204,425	41,049	91,775	132,824
Secondary	452,218	417,172	869,390	633,105	843,630	1,476,735	1,647,015	1,154,798	2,801,813
<b>Total of average primary plus secondary</b>	545,602	455,446	1,001,048	763,843	917,318	1,681,161	1,688,064	1,246,572	2,934,637

Although initially surprising that scenario three is less costly than scenario one at primary level, this likely reflects the outdated approved staffing complement list upon which the human resources costs of scenario three is based. Unfortunately an updated staffing complement list was not available.

At both service delivery levels and in all scenarios, child health and communicable disease account for the largest share of costs (both 30-40% of the total), followed by maternal health (around 20%) and communicable disease (around 10%). At both service delivery levels and in all scenarios, human resources account for the largest share of costs, as high as 83% at primary facilities in scenario one.

Average (mean) cost per capita at primary and secondary levels is outlined below:

Level	Average cost per capita per year (US\$)								
	Scenario one			Scenario two			Scenario three		
	HR	Rest	Total	HR	Rest	Total	HR	Rest	Total
Primary average	11.70	4.42	16.12	16.39	7.61	23.99	6.19	10.24	16.43
Secondary	25.12	15.60	40.72	35.16	21.37	56.53	56.55	30.40	86.95
Total	36.82	20.02	56.84	51.54	28.98	80.52	62.74	40.64	103.38

Cost findings from the sample facilities were extrapolated to all facilities nationwide and projected over a period of five years under three different scenarios: a conservative one, assuming three years delivery at scenario one conditions and two years under scenario two; a middle scenario, with one year delivery at scenario one, three



years in scenario two and one year in scenario three; and an optimistic projection which starts with three years at scenario two and the last two years at scenario three. Using a simple per capita extrapolation, the total cost of providing the package over five years ranges from US\$3.8 billion in the conservative scenario to US\$5.2 billion in the optimistic scenario. Using a different extrapolation technique that extrapolates the total cost per facility to all non-private facilities in the country, we estimate a five-year cost of providing the core package nationwide of US\$1.7 billion in the conservative scenario and US\$2.3 billion in the optimistic scenario.

We believe these are credible cost estimates given the extensiveness of the proposed core packages. Additionally, these cost findings are closely in line with those found in Kenya, where a similar package is provided, and at secondary level, from a hospital costing study in South Africa.

The report starts with an introduction to EHBs and a further explanation of the conditions in Zimbabwe that led to the present work on defining, validating and costing the EHB (section 1). The study components and deliverables are briefly presented, although the focus of this report is on the costing of the core packages. Section 2 outlines the costing methodology in detail, including methods for both data collection and analysis. The costing results are presented in section 3, and findings are compared with EHB costs from other countries. Finally, section 4 highlights the stakeholder feedback and dissemination meeting held in September 2014 and makes suggestions for next steps.

# 1 Background

## ***1.1 What is an Essential Health Benefit (EHB)***

There are several terms used more or less interchangeably: essential health benefit, essential health benefit package, basic benefit package, core package, core package of health services, minimum package and other similar terms. These refer to a minimum list of both public health and clinical interventions guaranteed by the government to be available at different levels of care. Essential benefits or basic packages became popular following the release of the 1993 World Development Report which suggested that governments should focus health spending on a minimum package of essential public health and clinical services. Subsequent reports and international movement towards UHC have further popularized the idea.

A WHO draft technical brief on EHBs notes that “essential health packages aim to concentrate scarce resources on interventions which provide the best 'value for money'.”<sup>1</sup> This is especially true in lower-income countries where the EHB often defines what is available, while higher-income countries tend to list only what is excluded. In resource-limited settings, EHBs often start out small, including a set of core evidence-based, cost-effective interventions, and are expanded over time as more financial resources become available, as the burden of disease changes or as political priorities, both local and international, shift. EHBs can help improve efficiency and equity, while clearly defining a package to which the government can be held accountable. EHBs can be offered at public as well as contracted private facilities through formal private-public partnerships and these could be at central level or even at facility-level.

## ***1.2 Why an EHB for Zimbabwe?***

Economic and social decline in Zimbabwe in the early 2000's led to a fall in many indicators of health, health care and the social determinants of health across as outlined in the 2011 Equity Watch report<sup>2</sup>. However, since the 2009 launch of the “Getting Zimbabwe Moving Again” strategy by the national government, the economy has grown stronger. Simultaneously, the 2009 National Health Strategy indicated a need to review the provision of the basic entitlements to health, which has now been captured in the revised national constitution. Nonetheless, a small tax base and low overall and government per capita expenditure on health continue to hamper progress in health. Additionally, provision of what is essentially an unlimited package of services at public facilities is financially unsustainable. Although user fees are officially forbidden, they are charged in practice to compensate for massive financing shortfalls in the systems.

## ***1.3 Defining, validating and costing the EHB***

Against this background and in accordance with a global movement towards universal health coverage (UHC), the MOHCC requested UNICEF to support its efforts to define, validate and cost of an Essential Health Benefits (EHB) that can be made available to all citizens of Zimbabwe, in line with the National Health Policy and Strategy and the country's constitution. UNICEF hired the Royal Tropical Institute (KIT) in Amsterdam, The Netherlands to determine, validate and cost an Essential Health Benefit (EHB) made universally available and accessible in line

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<sup>1</sup> WHO Service Delivery Seminar Series. Draft Technical Brief No. 2, 3 July 2008. Essential Health Packages: What are they for? What do they change?

<sup>2</sup> TARSC, MOHCW 2011

with the National Health Policy and taking into account the population health profile and views of stakeholders. This work was undertaken over the period 1 March 2013 to 31 October 2014.

### **1.3.1.1 Study components**

The commissioned study was broken down into the following components:

#### **1. Workplan and implementation schedule**

At the start of the project, a workplan and implementation schedule was developed assuming the consultancy's original timeline of 1 March to 31 December 2013.

#### **2. Defining and validating the EHB**

Working closely with the Ministry, the draft core packages (one for primary/clinic level, one for secondary/hospital level) was prepared taking into consideration the country's public health profile. This was done through an epidemiological review endorsed by MoHCW, UNICEF and CCORE and submitted to UNICEF in May-June 2013. The draft core package is divided into four package areas (maternal health, child health, communicable diseases, non-communicable diseases) and was developed separately for primary and secondary levels. This draft was circulated and a workshop organized on 30 May 2013 to validate the draft. The workshop was attended by approximately 20 persons from a wide range of offices within the Ministry at both central and provincial levels. Revisions were taken and made during the workshop. The revised draft was then circulated to participants for any final comments. The final product was circulated on 16 September 2013 by Dr Dhlakama.

#### **3. Costing the core packages**

This report will detail the process of costing the core packages, which included:

- Preparing sound and country-specific costing methodology
- Assembling and training a data collection team
- Data collection in 10 districts in 8 provinces
- Supplementary data collection at national level
- Preparation of this draft report
- Presentation of draft findings to UNICEF and MOHCC
- Revisions and preparation of final report

As part of this work, a desk study was undertaken to review what is known internationally about essential health benefit packages. This report first explains what essential health benefit packages are and how they are costed, and then reviews both the content and cost of packages from countries in Southern Africa and beyond. This report was submitted to UNICEF as part of the second deliverable.

#### **4. Dissemination**

Dissemination is planned for September and October 2014.

##### **1.3.1.2 Deliverables**

The deliverables included:

- Deliverable 1: Workplan and implementation schedule (delivered March 2013)
- Deliverable 2: EHB is determined, validated, and endorsed by MoHCW, UNICEF and CCORE (delivered 28 June 2013)
- Deliverable 3: Endorsed EHB is costed (final results presented in this report)
- Deliverable 4: Result dissemination including main report, mini-report and seminar to present findings (dissemination event held 23 September 2014)

This report focuses on the costing exercise (deliverable 3), although the other deliverables are briefly discussed below.

## 2 Costing methodology

### 2.1 Choice of methodology

In general, costing is an exercise conducted to estimate the opportunity cost of resources put to use for various reasons. In healthcare, costing seeks to determine the cost of operating a programme, providing a service or intervention, etc. In all cases, the objective is to assess the value of a particular resource input required to achieve an intervention. There are two main kinds of inputs to be considered in most costing exercises: recurrent inputs, which are commodities consumed within one year that must be regularly replaced, and capital inputs, which require an initial outlay when bought but that can then be used during several years (or simply > 1 year). Costs are often further divided into broad categories such as human resources (salaries and other allowances), pharmaceuticals, labs and other supplies, equipment, buildings, trainings, travel expenses, support services and others. Cost categories can be defined according to the purpose of the costing exercise.

Costing exercises have two elements: measurement of the quantities of resource use ( $q$ ) and the assignment of unit costs or prices ( $p$ ). Total cost is therefore a product of quantities of resources used and corresponding unit costs. There are various approaches used to estimate the unit input cost in health services and these depend on the precision of the costing exercise required. However, three general approaches are worth mentioning in estimating the unit costs of any given service – the bottom-up or ingredients approach, the top-down approach, and the combined approach. There is no single agreed upon methodology for costing essential health benefits, and all three approaches have been used in various countries around the world.

#### 2.1.1 Bottom-up approach

The bottom-up approach identifies all the individual ingredients that make up the service, programme or intervention, the quantities required, and a unit price for each. The total cost is determined by summing the product of quantities and unit prices for each of the ingredients. The bottom-up approach has the advantage of being very precise; however, it is time-intensive and often requires primary data collection. Additionally, errors made in this approach can have a large impact on the total cost.

#### 2.1.2 Top-down approach

The top-down approach starts with a known total- for example a hospital's expenditure for a given time period, and subdivides that expenditure into categories called cost centres; within cost centres costs are further divided into smaller cost centres until finally the cost of your output (for example, a given service) can be identified. The top-down approach is better for large programmes or departments and is useful for estimating costs and determining average costs. It is good for complicated costing scenarios including those with many inputs. However, the top-down approach is less accurate overall than the bottom-up approach and it is more difficult to adjust for differences within groups.

#### 2.1.3 Combined approach

It is also possible to combine the bottom-up and top-down approaches. This approach is considered the strongest and can produce the most accurate costing estimates, but a large amount of data is required.

## 2.1.4 Selection of costing approach for Zimbabwe

The proposed methodology for costing Zimbabwe's EHB was modeled after a similar study which costed the EHB in Kenya using a comprehensive combined approach methodology (see the proposed methodology submitted to UNICEF on 28 June 2013)<sup>3</sup>. However, it was later determined that recent top-down data was not available (the most recent National Health Accounts were done for 2009); therefore, we decided to use a bottom-up approach, which is summarized in Table 1:

**Table 1: Overview of the methodology used to cost Zimbabwe's EHB**

<u>Element</u>	<u>Description</u>
Approach	Bottom-up
Study design	Retrospective data collection for the year 2012 Programmatic perspective Facility-based costing Time horizon: five years
Sample size	18 facilities (stratified sampling)
Data collection	Facility level data collection supplemented by data collection at the central level
Analysis	Weighted allocation of costs (HR, equipment, supplies, etc.) to core services package categories by facility type and extrapolation to similar facility types Three scenarios
Outputs	Cost per capita per year, by package and total Broken down into HR, drugs, equipment, etc. Stratified by facility type and gender Projected over a period of five years

The proposed methodology was presented by KIT and validated by key stakeholders from the Ministry of Health and Child Care at a validation workshop on 30 May 2013. A detailed draft methodology report was submitted to UNICEF on 28 June 2013 as part of the second deliverable. In particular that report noted the costing perspective chosen (programmatic perspective, so costs of delivering core package services at primary and secondary level, regardless of whether costs are incurred by MOHCC, donors or others). This means that costs incurred at other levels (for example, central or provincial) such as supervision, data management, non-facility based technology and innovation such as the infant text messaging system and others are not included. Additionally, non-routine training costs which may be needed to implement the new packages are not included.

## 2.1.5 Patient costs

Although the focus of the EHB costing was always on facility-level costs, It was originally envisioned to include a small patient sample. This is because presently patients also incur some costs in accessing core package services, for example for pharmaceuticals which may be covered by a future package; therefore limited patient costs (out-of pocket expenses incurred in the preceding two to four weeks such as user charges, diagnostic charges,

<sup>3</sup> Flessa et al. Basing care reforms on evidence: The Kenya health sector costing model. BMC Health Services Research 2011, 11:128.

treatment and care charges and transport to and from care centers) were to be included. However, given the existing information on patient out-of-pocket spending in Zimbabwe (PICES, NHIFA, other surveys) and the fact that the small proposed sample size would limit generalizability and could only be used for anecdotal purposes (flagged by UNICEF at the REG meeting in August 2013), it was decided that the scenarios could account for the shifting of patient costs back to the public sector. Therefore, no patient cost information is included in this report.

## **2.2 Data collection**

### **2.2.1 Timetable**

Data collection was organized in the following phases:

#### **Development of methodology and tools (March-August 2013)**

This included developing the draft methodology and tools (March-May 2013); presenting the draft methodology at a wider stakeholder meeting (May 2013); presenting the refined methodology to UNICEF (6 August) and modifying the methodology and tools according to comments received (June-August 2013).

#### **Recruitment and training of data collectors (August-September 2013)**

A local health economist, Travor Mabugu from HEPRI, was hired to manage the facility data collection. In August and September 2013 he recruited and trained data collectors.

#### **Fieldwork at sample sites (October-December 2013)**

During the period October to December 2013, the local data collection team piloted the tools and then collected data from the 18 sample sites.

#### **Data cleaning (December 2013)**

Data collected at the 18 sample sites was entered into Excel and cleaned in December 2013.

#### **Obtain missing and supplementary data at national level (January-June 2014)**

This phase included obtaining all costing data available at the central Ministry of Health and Child Care level. During a visit to the Ministry in June 2014 the following data was obtained:

- Utilization data from T-5 forms, for 2012 and 2013, separately for primary and secondary level facilities, by province, by age and gender where available
- Supplementary utilization data: new cases of child sexual abuse (2012), outreach events (current average per district), environmental health services statistics (2013)
- Human resource staffing components by facility type
- Building valuations, maintenance budgets and useful lifetimes

- List of currently available drugs, consumption by facility level and ideal consumption
- National Medicines Survey 2013
- Environmental health services user fees collected (2013)
- IEC materials budget and expenditure
- Existing national reports on household out-of-pocket expenditure (PICES, National Health Accounts Report 2010)

Based on feedback received from UNICEF and stakeholder meeting attendees, some further data collection was required, completed in September 2014 prior to finalizing this report.

## **2.2.2 Tools**

A facility data extraction tool was developed on the basis of a similar tool used for HIV costing in Zimbabwe; a draft was shared with UNICEF on 17 July 2013 by email and presented at a project update meeting at UNICEF in Harare on 6 August 2013. The same tool was used at primary and hospital facilities and included information on HR (full- and part-time staff as well as contracted services), equipment, medicines, buildings (including new infrastructure) and utilities. Each area is further described below.

## **2.2.3 Cost categories**

### **2.2.3.1 Human resources**

All staff (full-time, part-time, locum and others) working at the facility were identified, recorded and their salaries determined (note: some salary information had to be obtained at the central level; salaries include allowances but exclude housing). Volunteer time was valued at the Ministry remuneration rate for whatever position the volunteer performs, or using domestic wage rates adjusted for level of education if a corresponding Ministry salary scale was not available. Total hours worked per week were obtained from log sheets and staff complement registers or directly from volunteers. Reported human resources include contracted services, defined as those services provided outside of the facility by specialized independent entities or by another facility that possesses the full complement of equipment and services.

Recognizing that not all facilities are fully staffed according to Ministry guidelines, the costing scenarios have explored different staffing levels. Approved staff complement details were obtained from the Human Resources Department at the central Ministry of Health and Child Care. Scenario three excludes village health workers as they are not specified in the approved staffing complement used for this scenario.

### **2.2.3.2 Pharmaceuticals**

Pharmaceutical data was not available at facility level. From central level we obtained the 2014 purchase list (including essential, vital and necessary medicines) as well as average monthly consumption of available drugs at primary and secondary levels. The list of currently available drugs is estimated to be 35-45% of all drugs; the rest are not being purchased at the moment due to the financial situation. The costing scenarios take into account



both currently available and future estimated consumption. This list is based on purchase prices which may not include logistics and distribution costs.

### 2.2.3.3 Laboratory and other supplies

Data for laboratory test counts, reagents and other consumables were not available at facility level. From central level we obtained the estimated number of blood count tests per month as well as cell pack, stromatolyser and cell clean consumption, by level (central hospitals, provincial and district/mission). However, unit prices could not be provided. Likewise for chemistry, we obtained the estimated number of blood sugar, LFT, U&E and creatinine tests per month, for central hospitals, provincial hospitals, and district/mission hospitals, but without a list of reagents and other supplies and their unit costs. We could not find this information in available literature related to Zimbabwe or from the region. Some published laboratory costing studies include the human resources costs, which we did not want to do as this would lead to duplication. Therefore, we referred to a study from Murru et al<sup>4</sup> which costed health services in Lacor Hospital, Uganda. In a 2001-2002 analysis of total direct hospital costs, they determined the share of laboratory reagent/supplies costs as share of total hospital direct costs to be 0,008209. We have therefore applied the same proportion to the three secondary-level facilities in our sample.

Like pharmaceuticals, supply data was not available at facility level. From central level we obtained the 2014 purchase list which includes both pharmaceuticals and supplies, as well as average monthly consumption of supplies at primary and secondary levels. The list of currently available supplies is estimated to be 35-45% of all required supplies; the rest are not being purchased at the moment due to the financial situation. The costing scenarios take into account both currently available and future estimated consumption.

### 2.2.3.4 Equipment

Equipment in this study was defined to include any small, medium and large machines used in health service provision at the facility, including vehicles. All equipment listed on the equipment inventory (obtained from facility equipment inventory/asset register, including donated equipment) was determined to be for non-specific uses (potentially used for all four core package categories) or for specific uses (eg, obstetrics equipment is used 100% for maternal health). Specific equipment was allocated to the package categories at the point of data collection. For example, an EPI fridge found in EHB001 and used to store vaccinations was allocated 100% to child health. Both non-specific and specific equipment was valued using estimated purchase prices and then annualized according to the following formula:

$$\text{Annualized cost} = ((1 + \text{discount rate})^{(\text{useful lifespan} - 1)} / (\text{discount rate} * (1 + \text{discount rate})^{\text{useful lifespan}}))$$

A discount rate of 3% was used. Useful lifespan in scenarios one and two was determined in consultation with facility staff and according to Ministry guidelines; five years has been used for scenario three.

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<sup>4</sup> Murru, Maurizio; Corrado, Bruno; Odaga, John; Ahairwe, Denis; Akulu, Ernesta; Bavcar, Alessandro; Bonane, Emmanuel; Kirunda, David; Mwesezi, Henry; Nagujja, Angela & Ndindayino, Kalire. Costing health services in Lacor Hospital. Health Policy and Development, Vol. 1, No. 1, 2003, pp. 61-68.

### 2.2.3.5 Buildings, maintenance and utilities

The term building refers to existing buildings and/or space (including temporary space) within each facility that is used to organize the various components of the service delivery efforts. Because floor space estimates were not available at the facility level, we used the FHP clinic and hospital plans to estimate floor space and cost per square meter, separately for primary and secondary level facilities. Facility cost was annualized over a period of 25 years using the same formula described above.

From central level we obtained the maintenance budgets for 2011, 2012 and 2013.

Utility usage (electricity, airtime, water and borehole water, telephone and internet, fuel and firewood) was obtained at the facility level. Some facilities reported not having running water or internet, for example, so not all facilities reported on all utilities.

### 2.2.3.6 IEC

The costs of printing IEC materials, per district, were obtained from the central offices of the Ministry of Health and Child Care in Harare.

### 2.2.3.7 EHS

In addition to costs for EHS personnel (captured during facility-level data collection and reflected in the HR category), there are significant material costs associated with EHS. As of 2012 the EHS department did not have an operating budget, therefore these costs were being covered by user fees charged at point of service. User fees reported in the 2013 annual report have been included in some scenarios.

## 2.2.4 Utilization data

Utilization data was obtained at central level from the T-5 records for 2012 and 2013, separately for primary and secondary levels, reported by province (note: the original obtained data often presented Chitungwiza City data separately from Harare province; these were later combined).

The T-5 records are organized by service area: antenatal care (ANC), family planning (FP), vaccinations, outpatient department (OPD), sexually-transmitted infections (STI) and postnatal care (PNC). All areas are separated by gender, but the reports do not use standard age groupings, as seen in the below table:

**Table 2: Availability of T-5 data by age**

T-5 category	Available age breakdown
ANC clinic	0-16 years 16-24 years 25+ years
FP clinic	0-16 years 16-24 years 25+ years
Vaccinations clinic	Under 1 year 1+ year
OPD clinic	Under 5 years

	5+ years
STI clinic	0-9 years 10-24 years 25-49 years 50+ years
PNC clinic	1 day after birth 3 days after birth 6 weeks after birth 7days after birth

The T-5 data was not immediately suitable for use in the costing exercise. Notably, all T-5 data had to be allocated to core package areas and services. Not all core package services are recorded in the T-5, including adolescent sexual and reproductive health services (ASRHS), services for elderly, environmental health services, IEC, outreach and child welfare. Where possible utilization for these areas was obtained:

- ASRHS – a suggestion was made by the Ministry to take out the youngest age group(s) from the STI utilization data and count these consults as AYRHS. However, the available age groups for STIs (0-9; 10-24; 25-49; 50+) do not align well with those required for AYRHS, therefore AYSRHS utilization is incorporated in the STI utilization.
- Services for elderly – consultations for elderly are not separately recorded on the T-5. Likewise, separating out elderly consults from OPD utilization was not possible because OPD utilization is recorded for under 5s and 5+ years of age.
- EHS – statistics on EHS services rendered were taken from the 2013 annual report but are not reflected in the utilization data used for the costing because of the multitude of available services (water points, water sampling, solid waste management settlements and quantity of waste produced, liquid waste management settlements, number of households using septic tanks and number using reticulated system; food inspections, meat inspections, food samples taken and analyzed, premise inspections, building plans examined, sanitation facilities completed, user fees collected, health and hygiene education sessions conducted, domiciliary visits conducted, human products screened, disease control activities). Staff time was captured during the facility data collection and EHS service revenue (user fees) has been incorporated in supplies.
- IEC – IEC materials are used by health facility staff already captured in the facility data collection. However, we have incorporated the IEC budget for printing materials as part of the supplies available.
- Outreach – we have included an estimated one outreach event per district per month in utilization figures, based on reporting by Guruve in Mashonaland Central (obtained by telephone, 18 June 2014).
- Child welfare data has been included in the form of number of new cases of child sexual abuse reported at facility level for 2012.

Additionally, duplicates in the T-5 data needed to be deleted so utilization was not over-reported. The following lines were deleted:

- HIV tests (as part of prevention of mother-to-child transmission (PMTCT)) with positive result (duplicate of HIV tests (as part of PMTCT) done)
- Rapid plasma reagin (RPR) tests positive (duplicate of RPR tests done)
- Babies born protected (duplicate with immunization doses given)
- Primary course completed (duplicate with other immunization statistics)

Some T-5 data could not be clearly allocated to a single core package category. Utilization figures for the following services were divided evenly amongst all core package categories on the basis of the category's share of the total:

- All other diseases
- Locally monitored diseases - disease 1
- Locally monitored diseases - disease 2
- Other Notifiable Diseases
- Referrals Out
- Repeat visits

Utilization figures for the following services were divided between non-communicable diseases and child health. Utilization by persons aged 5+ was allocated to non-communicable diseases and utilization by those under 5 was allocated to child health:

- Bilharzia (Schistosomiasis)
- Diarrhoea - No dehydration
- Diarrhoea - with dehydration
- Dysentery
- Nutritional Deficiencies - Kwashiorkor (Bilateral oedema)
- Nutritional Deficiencies - Marasmus
- Nutritional Deficiencies - Pellagra

### 2.2.4.1 STGs

A small group (approximately 6 experts) from the Ministry of Health and Child Care looked at Zimbabwe's Essential Drug list (2011) and allocated the usage of each drug to the core package categories (eg, 25% of the time drug X is used for maternal health conditions and 75% of the time for non-communicable disease). The STGs were validated in January 2014.

STGs for provision of services were not used as they did not match closely enough with the core package services.

### 2.2.5 Selection of sample facilities

Because this is a facility-based costing study to estimate the costs associated with delivering the core health services package at the facility-level (primary and district), we chose to collect data directly from a sample of facilities across the country. The sampling framework took into account that services are provided to varying extents across different facility types and geographical regions, despite all facilities working under the same treatment guidelines. This is mainly due to different capacities (human resources, equipment, etc.) and implementation constraints which lead to different efficiency levels, overheads and also varying economies of scale. Additionally, type of ownership (trustee) has a role in directing how facilities are run and the resources available. We used a sampling framework that stratified the country's 1,500+ health facilities according to the following criteria:

- By facility type (primary, secondary)
- By ownership/trustee (government, mission, municipality and rural district council) (note: because this is a costing exercise of public provision of the core packages, private facilities have been excluded)
- By province
- By urban/rural

The sample size for this study was 18; sample facilities were selected according to the percentage of total facilities by type, ownership/trustee, province and urban/rural location. This framework did not guarantee that all facility types or ownerships/trustee types would be included or that a comparator facility would be included. However, the chosen facilities represented 12 districts in 8 provinces, included 15 primary clinics and 3 hospitals, and included a mix of urban (4) and rural (14) sites. The sample included 9 rural district council clinics (RDC), and three facilities each owned by government, municipality and mission. The chosen sites are detailed in Table 3.

**Table 3: Data collection sites (sample facilities)**

Site #	Site name	Province	District	Level	Urban or Rural	Ownership / trustee	Catchment population
EHB001	Ruyamuro	Mashonaland Central	Guruve	Primary	Rural	RDC	12,116
EHB002	Gota	Mashonaland	Guruve	Primary	Rural	RDC	5,075

		Central					
EHB003	Kotwa Clinic	Mashonaland East	Mudzi	Primary	Rural	RDC	16,729
EHB004	Nyamukoho	Mashonaland East	Mudzi	Primary	Rural	RDC	3,280
EHB005	Murehwa District Hospital	Mashonaland East	Murewa	Secondary	Rural	Government	199,607
EHB006	St Paul's Musami	Mashonaland East	Murewa	Primary	Rural	Mission	37,464
EHB007	Chitowa 1 Clinic	Mashonaland East	Murewa	Primary	Rural	RDC	1,075
EHB008	St Andrew's Mission Hospital	Manicaland	Mutare	Primary	Urban	Mission	11,525
EHB009	Mutare City Health Clinic	Manicaland	Mutare	Primary	Urban	Municipality	7,548
EHB010	Sadza District Hospital	Mashonaland East	Chikomba	Secondary	Rural	Government	10,026
EHB011	Gokomere Mission Clinic	Masvingo	Masvingo	Primary	Rural	Mission	5,701
EHB012	Mtambi Clinic	Midlands	Zvishavane	Primary	Rural	RDC	6,453
EHB013	Sesemba Clinic	Matabeleland North	Nkayi	Primary	Rural	RDC	5,203
EHB014	Sikhobokhobo	Matabeleland North	Nkayi	Primary	Rural	RDC	7,703
EHB015	Chemahororo Clinic	Midlands	Gokwe South	Primary	Rural	RDC	19,390
EHB016	Gokwe South District Hospital	Midlands	Gokwe South	Secondary	Rural	Government	305,982
EHB017	Chinengundu Clinic	Mashonaland West	Chegutu	Primary	Urban	Municipality	24,916
EHB018	Pfupajena Municipality Clinic	Mashonaland West	Chegutu	Primary	Urban	Municipality	24,916

## 2.3 Analysis

Data was analyzed during the period June to August 2014 using an Excel tool. The draft Excel analysis tool was shared with UNICEF on 25 July 2013. The below sub-sections detail the analysis methodology used.

### 2.3.1 Scenarios

Three analysis scenarios were developed:

- Scenario one: is based on the actual 2012 data collected at both facility and central level.

- Scenario two: takes into account some 2013 data which was available. In the cases where 2013 data was not available, 2012 figures have been increased by 40% to match the change seen in utilization between 2012 and 2013.
- Scenario three: uses all available information about how service delivery should ideally take place, including full staffing compliments, EHB equipment lists and expected drug orders. In the cases where this data was not available, 2013 figures have been increased by 10% to match the assumed increase in utilization.

These scenarios incorporate the planned sensitivity analyses to explore the impact of changes in variables on our outcomes (total cost, cost per capita). We know some cost categories are particularly underestimated in current provision (captured in the 2012 facility-based data collection); for example, some facilities operate without a full staff complement. The scenarios have taken into account alternative resource inputs for each cost category. Each scenario is described in detail in the below table.

**Table 4: Analysis scenarios**

<b>Cost category</b>	<b>Scenario one (based on 2012 data)</b>	<b>Scenario two (based on 2013 data)</b>	<b>Scenario three</b>
<b>Human resources (including contracted services)</b>	2012 actual for both HR and contracted services	40% salary increase with current staffing levels  Contracted services from scenario one plus 40%	Scenario two salaries with approved staffing complement *  Scenario two contracted services plus 10%
<b>Pharmaceuticals and other supplies</b>	2012 actual consumption at 2014 prices (based on available data)	Consumption increased by 50% to approximate actual 2014 medicines order	Consumption further increased by 50% to approximate ideal 2014 medicines order
<b>Labs</b>	% of total hospital expenditure	Scenario one plus 40%	Scenario two plus 10%
<b>Equipment</b>	2012 actual	Scenario one plus 40%. Includes 2 vehicles at secondary level (one ambulance and one admin/service vehicle)	EHB equipment lists with international supply prices (UNICEF, others). Includes 11 vehicles at secondary level (5 ambulances, 4 service vehicles and 2 admin vehicles)
<b>Buildings and utilities</b>	FHP standards; actual 2012 maintenance and utilities	FHP standards; scenario one maintenance and utilities increased by 40%; vehicle fuel and maintenance based on 2 vehicles at secondary level facilities unless we found more during data collection	FHP standards; scenario two maintenance and utilities increased by 10%. Vehicle fuel and maintenance based on 11 vehicles at secondary level facilities

\* The approved staffing complement appears to be the 1985 complement, which is agreed to be outdated but a newer approved complement could not be found.

Because the proposed core packages are so extensive, a cost markup to account for non-package services has not been included in any scenario.

Three scenarios for utilization data were also constructed, as shown in Table 5:

**Table 5: Overview of analysis scenarios**

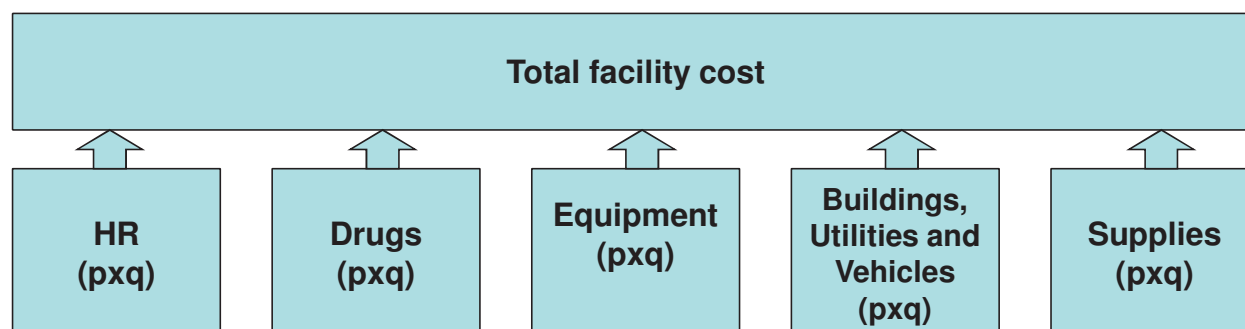
Type of utilization data	Scenario one (based on 2012 data)	Scenario two (based on 2013 data)	Scenario three
T-5	2012 actual	2013 actual	2013 actual plus 10%
EHS	2013 actual, without user fees	2013 actual with user fees included	2013 actual plus 10%, with user fees plus 10%
IEC	Actual 2012 expenditure	2012 budget request	2012 budget request

The below sections further describe the analysis in general terms, applicable to all three scenarios.

### 2.3.2 Cost per facility

Cost per facility was determined by multiplying unit costs by quantities for each of the cost categories, as seen below in Figure 1.

**Figure 1: Calculation of total cost per facility**



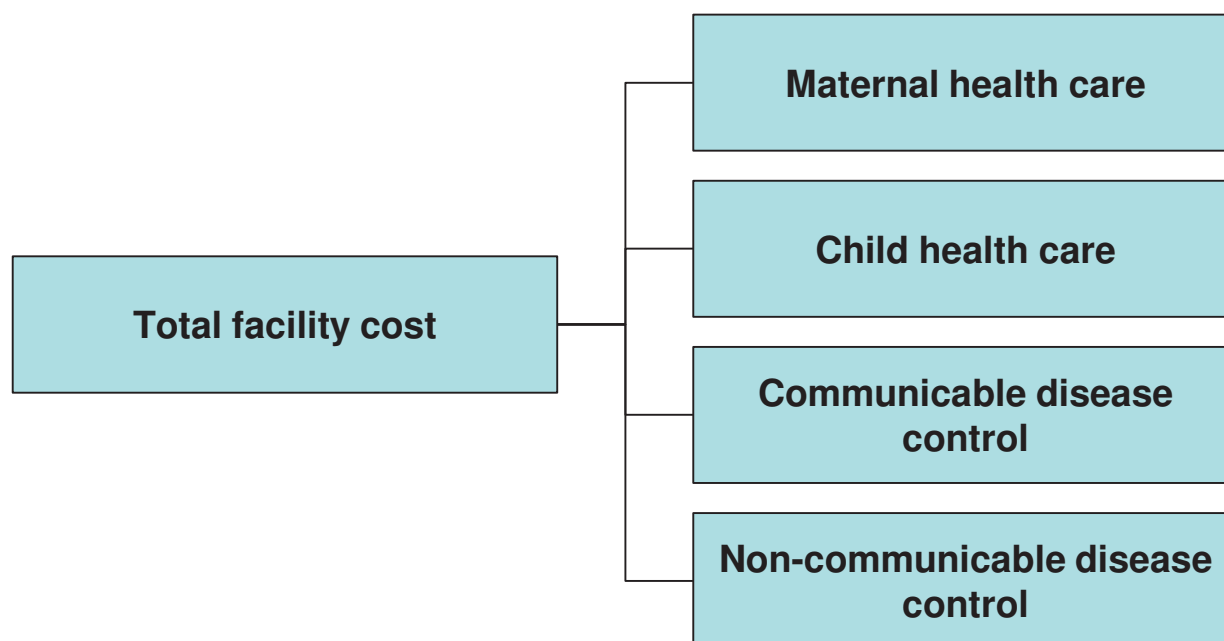
This was done separately for each of the 18 sampled facilities.

### 2.3.3 Cost per package category, per facility

Cost per package category was derived from total facility cost. Total facility cost was divided between the categories of the core services package as seen in Figure 2:



**Figure 2: Makeup of total facility cost**



This was done using various step-down allocation methods described below, by cost category. After costs within each cost category were allocated to the package categories, they were summed to give the total cost per package category. The sum of the costs of each package category for a given facility results in the total facility cost.

### 2.3.3.1 HR and contracted services

Scenario one uses actual salaries and staffing patterns found during the data collection at the sample sites. Scenario two assumes the same staffing complement but with a 40% increase in salaries across the board (matching the change in utilization between 2012 and 2013), while scenario three uses the 1985 approved staffing complement per sample site but with no further salary increases. This is partially based on findings from a study on human resources for health remuneration in Sub-Saharan African countries (Ghana, Burkina Faso, Zambia, Nigeria and others) which suggested that some public sector salaries in Zimbabwe are low (public sector doctors in Zimbabwe earn roughly half of what doctors earn in Zambia when inflating the reported study salaries to 2014 levels at 3% per year; registered general nurses working in the public sector in Zimbabwe earn approximately 10% less than the average of the same cadre in Ghana, Burkina Faso, Zambia and Nigeria, inflated to 2014 levels) while others are high (public sector certified nurses in Zimbabwe earn nearly twice what certified nurses in Burkina Faso earn, where the Burkina Faso salary was inflated from 2006 to 2014 at 3% per year)<sup>5</sup>.

HR costs were allocated to the package categories on the basis of provincial utilization figures for the province where the facility is located. For example: facility EHB001 is the Ruyamuro RDC in Guruve District, located in

<sup>5</sup> McCoy D, Bennett S, Witter S et al. (2008). Salaries and incomes of health workers in sub-Saharan Africa. *Lancet*, vol. 371, (9613) 675-681.

Mashonaland Central province. In scenario one, utilization at primary level facilities in Mashonaland Central is divided between the package categories as follows:

- Maternal health – 22.4% of all consultations
- Child health – 37.6% of all consultations
- Communicable disease – 15.8% of all consultations
- Non-communicable disease – 24.2% of all consultations

The total HR costs for EHB001 (\$49,049 in scenario one) were therefore divided between the core package categories according to the above mentioned proportions.

For contracted services, all three scenarios use actual reported contracted services (at two of the 18 sample sites only), which are scaled up 40% in scenario two and another 10% in scenario three (percentages chosen to match changes in utilization).

### **2.3.3.2 Pharmaceuticals and supplies**

Scenario one uses data collected from the sample sites on consumption in 2012, valued at 2014 prices. Where available we have used the Ministry-provided unit costs; where missing, we referred to UNICEF pricing guides and supply lists<sup>6,7</sup>. Scenario two increases the spending on medicine by 50% to account for increased availability of drugs reported in 2014 and approximate the actual medicines order; scenario three further increases spending on medicines by another 50% from scenario two to approximate the ideal 2014 medicines order.

The validated STGs indicated the use of each drug or supply; for example, Adrenaline 1mg/ml inj. 1ml amp is used 25% of the time for maternal health package conditions; 25% for child health; and 50% for non-communicable diseases. Therefore, the total cost of this drug at EHB001 in scenario one was \$19.74; \$4.94 (25%) allocated to maternal health; \$4.94 (25%) allocated to child health; and \$9.87 (50%) allocated to non-communicable disease.

### **2.3.3.3 Laboratory tests**

Spending on labs in scenario one was estimated on the basis of a percentage of total hospital expenditure, as described in the methodology section. Scenario two increases spending by 40%, while scenario three increases spending a further 10%. The scale-up percentages match the changes in utilization used in the three scenarios.

Laboratory test costs were allocated to the package categories using the same methodology as for human resources and contracted services.

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<sup>6</sup> UNICEF Supply Catalogue. [https://supply.unicef.org/unicef\\_b2c/app/displayApp/\(layout=7.0-12\\_1\\_66\\_67\\_115&care=%24ROOT\)/.do?rf=y](https://supply.unicef.org/unicef_b2c/app/displayApp/(layout=7.0-12_1_66_67_115&care=%24ROOT)/.do?rf=y)

<sup>7</sup> Procurement of medicines by UNICEF 2009-2012: standard materials (September 2012).  
[http://www.unicef.org/supply/files/Procurement\\_Overview\\_20092012.pdf](http://www.unicef.org/supply/files/Procurement_Overview_20092012.pdf)

### 2.3.3.4 Equipment

In scenarios one and two, non-specific equipment was allocated to the package categories according to the principles used for human resources and contracted services. Specific equipment was allocated to the package categories according to the same idea used for pharmaceuticals and supplies, not on the basis of STGs but rather based on usage information gathered during the data collection period. Equipment was annualized over the useful lifetimes gathered during data collection and discounted at 3%. In scenario two equipment expenditure is increased by 40% over scenario one to match changes seen in utilization.

In scenario three, costing was based on the EHB equipment lists. At primary level, all equipment was assumed to be non-specific and was allocated to the package categories according to the principles used for human resources and contracted services. At secondary level, equipment clearly used 100% for specific purposes was allocated to the appropriate package category as such. All other equipment was determined to be non-specific and was allocated to the package categories according to the principles used for human resources and contracted services. In this scenario all equipment was assumed to have a useful lifespan of 5 years and was discounted at 3% per year. Because of missing unit prices, equipment expenditure for both primary and secondary facilities has been increased by 1/3 (based on the number of missing prices as a percentage of total equipment items) as to account for the missing equipment.

Vehicles are included in scenario one as found during data collection. Scenario two assumes one ambulance and one service/admin vehicle (both Land Cruisers) per district hospital (based on actual vehicle availability reported in 2014), while scenario three assumes five ambulances, four service vehicles and two admin vehicles per district hospital. Vehicles are annualized over a ten year period at a rate of 3% per year.

All scenarios include a 15% cost of service ratio to account for equipment maintenance.<sup>8</sup>

### 2.3.3.5 Buildings, building maintenance and utilities

Building costs have been annualized over 25 years, assumed to be the useful lifetime, and at a discount rate of 3%. The provincial maintenance budget for buildings was assumed to be spent 1/3 at provincial level and 2/3 at district level and below; this share was then allocated to the sample facilities based on population (catchment population divided by provincial population).

Utilities include telephone (airtime), water, electricity, vehicle fuel and maintenance or other transport-related costs and firewood. The scenario two figures represent a 40% increase on scenario one, while scenario three includes a further increase of 10%, again to match changes in utilization.

Building, maintenance and utility costs were allocated to package categories using the methodology described for human resources.

### 2.3.3.6 IEC materials

The provincial IEC budget was assumed to be spent 1/3 at provincial level and 2/3 at district level and below; this share was then allocated to the sample facilities based on population (catchment population divided by

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<sup>8</sup> [http://whqlibdoc.who.int/publications/2011/9789241501538\\_eng.pdf](http://whqlibdoc.who.int/publications/2011/9789241501538_eng.pdf)

provincial population). Spending on IEC increases in scenarios two and three is on the basis of information provided by the Director of Health Promotion.

Because IEC falls under non-communicable disease in the core packages, IEC material costs were allocated 100% to non-communicable disease.

### 2.3.3.7 Environmental health services

Because EHS fall under non-communicable disease in the EHB, EHS user fees were allocated 100% to non-communicable disease. EHS user fees are included in scenarios two and three to reflect that the user fees will be phased out and these expenditures paid by the Ministry of Health and Child Care. Scenario two includes actual user fees collected in 2013 (estimated for those provinces that did not report) and are scaled up by 10% in scenario three.

### 2.3.4 Cost per capita, per sampled facility

Cost per capita was determined for each sample facility by dividing the total facility cost by the catchment population for that facility. Likewise, cost per capita for each area of the core package was obtained by dividing total cost of each area of the package by the facility's catchment population.

### 2.3.5 Extrapolation beyond sampled facilities

Two forms of extrapolation were done. The first uses the average cost per capita at primary and secondary levels to determine a total cost per capita, which is then applied nationwide on the basis of population figures from the 18 August 2012 census<sup>9</sup>, excluding ten percent (10%) of the population who are known to not utilize public health services and 2.64% of the population who uses non-traditional services (NHA, 2010). It was decided to include religious objectors and those who do not seek care at the moment since the exercise is for public planning purposes.

The second extrapolation is on the basis of facility type. Where two or more of the same facility types were sampled (based on ownership/trustee and level), the cost estimates from these facilities were averaged. The average was then applied nationwide on the basis of the number of like-facilities. The costs of providing the EHB at non-included facility types was estimated on the basis of their similarity to included facility types. Table 6 explains this extrapolation method in more detail.

**Table 6: Overview of second extrapolation method**

Level	Ownership / Trustee	Number sampled	Total number nationwide <sup>10</sup>	Extrapolation
Primary	Mission	3	125	Average total cost for mission facility (based on 3 sampled facilities) X total number of mission facilities nationwide
	Municipality	3	126	Average total cost for municipality facility

<sup>9</sup> <http://www.geohive.com/cntry/zimbabwe.aspx>

<sup>10</sup> Based on 2011 National Health Profile, draft. Totals were not correct in the Word document but have been corrected here.

				(based on 3 sampled facilities) X total number of municipality facilities nationwide
	RDC	9	542	Average total cost for RDC facility (based on 9 sampled facilities) X total number of RDC facilities nationwide
	Government	0	562	Average total cost for primary facility (based on 15 sampled facilities) X total number of government facilities nationwide
	Zrp/Army	0	27	Average total cost for primary facility (based on 15 sampled facilities) X total number of Zrp/Army facilities nationwide
Secondary	Government - District	3	63	Average total cost for secondary facility (based on 3 sampled facilities) X total number of government-district secondary facilities nationwide
	Other secondary level hospitals	0	51	Average total cost for secondary facility (based on 3 sampled facilities) X total number of other secondary level hospital facilities nationwide
TOTAL		18	Primary: 1382 Secondary: 114	

### 2.3.6 Five year projections

We estimated the costs of providing the core health services packages over a period of five years, in line with what other countries have done. We believe this is a reasonable period about which to make cost assumptions. Beyond five years, however, the micro and macro environments are likely to have changed and the estimates may need to be revised.

Several sample scenarios for the five year projections are presented; these are arbitrarily developed to give an idea of what is possible with the data.

Projection scenario	Description
Conservative	First three years in scenario one; following two years in scenario two
Middle	First year in scenario one; following three years in scenario two; last year in scenario three
Optimistic	First three years in scenario two; last two years in scenario three

The five year projections are done separately for each of the extrapolation methods.

The five year projections do not reflect any further adjustments to population or utilization figures other than what is already captured in the analysis scenarios.

Costs in years 2-5 include a 0.31% inflation adjustment per year.<sup>11</sup> Interest on capital and other costs associated with borrowing money are not included.

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<sup>11</sup> Y-O-Y inflation rate (July 2014), [http://www.zimstat.co.zw/index.php?option=com\\_content&view=article&id=63](http://www.zimstat.co.zw/index.php?option=com_content&view=article&id=63).

### 3 Results

For each scenario, results are presented first for the sample sites, then for nationwide based on extrapolation. Results are presented in terms of:

- Average (mean) total cost of providing the core package
  - By core services package category
  - By cost category
- Average (mean) cost per capita per year for each package category and total
  - By core services package category
  - By cost category

Costs are presented separately for primary and secondary levels and by facility ownership/trustee status (mission, municipality, RDC, government). Because of how human resources are financed, these costs are presented separately. This is noted by the designations “HR” and “rest”.

In the final version of this report, results will be stratified by gender and disability status as follows:

- Utilization by gender is available for most T-5 services; where not available, general population gender statistics can be used
- Utilization by disability status is not recorded; we have figures on the presence of disability in the population that will be used to estimate of the total cost, which percentage roughly corresponds to disabled persons, assuming equal utilization with the rest of the population. Additionally, the cost of the rehabilitation services provided under the non-communicable disease package will be highlighted

These stratifications will not change the results presented below.

As outlined earlier in this report, the T-5 age groupings are not consistent so this data cannot be used to stratify results by age.

#### ***3.1 Average (mean) total cost of providing the core package per year***

The mean total cost of providing the core package is presented below in Table 7, by facility type. This is based on the 18 sampled facilities.

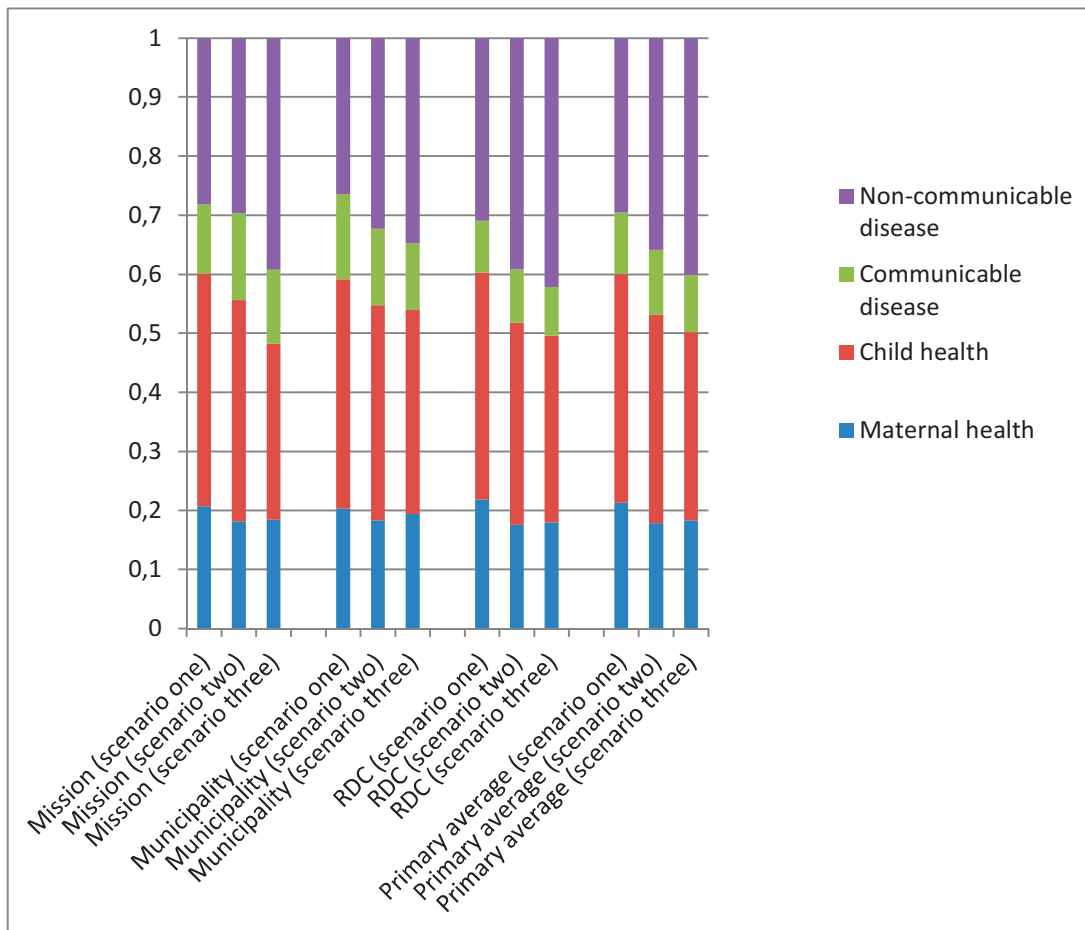
Table 7: Average (mean) total cost of providing the core package, by facility trustee and by scenario

Level	Facility ownership (trustee)	Average total cost per year (US\$)											
		Scenario one			Scenario two			Scenario three					
		HR	Rest	Total	HR	Rest	Total	HR	Rest	Total			
Primary	Mission	291,698	53,574	345,272	408,378	109,627	518,005	81,100	134,242	215,343			
	Municipality	57,922	56,306	114,229	81,091	100,258	181,349	33,059	121,100	154,159			
	RDC	39,100	27,162	66,262	54,739	52,852	107,591	30,361	67,844	98,205			
	<i>Average</i>	93,384	38,273	131,657	130,737	73,688	204,425	41,049	91,775	132,824			
Secondary	Government	452,218	417,172	869,390	633,105	843,630	1,476,735	1,647,015	1,154,798	2,801,813			
<b>TOTAL</b>	<b>Total of average primary secondary government</b>	<b>545,602</b>	<b>455,446</b>	<b>1,001,048</b>	<b>763,843</b>	<b>917,318</b>	<b>1,681,161</b>	<b>1,688,064</b>	<b>1,246,572</b>	<b>2,934,637</b>			

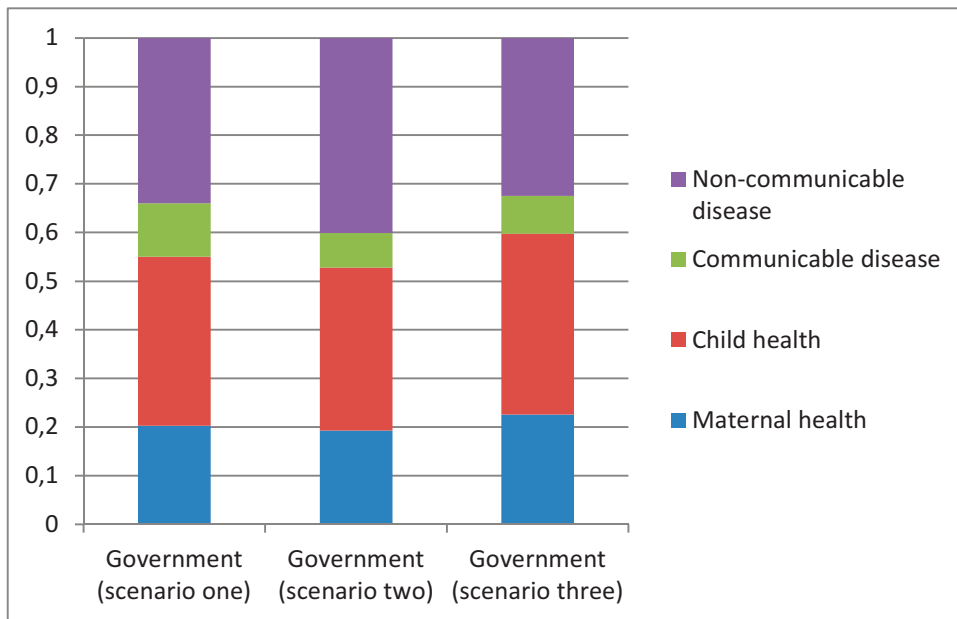


The average total cost of providing the core package is divided between the core package categories as seen in Figures 4 (primary level facilities) and 5 (secondary level facilities).

**Figure 3: Share of average total cost of providing the core package at primary level, by core package category**



**Figure 4: Share of average total cost of providing the core package at secondary level, by core package category**



The breakdown of average total cost of providing the core package by cost category is shown in Tables 8 (primary level facilities) and 9 (secondary level facilities).

Table 8: Allocation of average total cost of providing the core package at primary level to cost categories, by facility type and scenario (%)

Cost category *	Primary											
	Mission			Municipality			RDC			Average primary		
	Scenario one	Scenario two	Scenario three	Scenario one	Scenario two	Scenario three	Scenario one	Scenario two	Scenario three	Scenario one	Scenario two	Scenario three
HR	83%	78%	39%	51%	46%	24%	59%	52%	32%	64%	59%	32%
Medicines	9%	9%	24%	8%	8%	17%	18%	17%	27%	12%	11%	23%
Equipment	2%	1%	7%	1%	1%	7%	5%	4%	11%	3%	2%	8%
Utilities	2%	2%	6%	30%	26%	29%	2%	2%	2%	12%	10%	13%
Buildings	3%	2%	7%	8%	5%	7%	13%	9%	10%	8%	5%	8%
Contracted services	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
IEC materials	1%	6%	15%	2%	13%	15%	2%	16%	17%	2%	12%	16%
EHS	0%	0%	1%	0%	1%	1%	0%	1%	1%	0%	1%	1%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

\* Laboratory reagents/supplies are excluded since they are at secondary level only

Table 9: Allocation of average total cost of providing the core package at secondary level to cost categories, by scenario (%)

Cost category	Secondary		
	Government		
	Scenario one	Scenario two	Scenario three
HR	50%	42%	58%
Medicines	4%	3%	3%
Equipment	3%	4%	6%
Utilities	3%	5%	10%
Buildings	36%	20%	11%
Contracted services	0%	0%	0%
IEC materials	4%	23%	11%
EHS	0%	1%	0%
Lab reagents/supplies	1%	1%	1%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

### ***3.2 Average (mean) cost per capita per year***

The average (mean) cost per capita of providing the core package, by facility type and scenario, is presented in Table 10. This is based on the 18 sampled facilities.

Table 10: Average cost per capita of providing the core package at primary and secondary levels, by facility type and scenario

Level	Facility ownership (trustee)	Average cost per capita per year (US\$)											
		Scenario one			Scenario two			Scenario three					
		HR	Rest	Total	HR	Rest	Total	HR	Rest	Total			
Primary	Mission	27.27	3.12	30.39	38.17	5.75	43.92	7.31	7.56	14.87			
	Municipality	5.11	3.07	8.18	7.15	5.36	12.51	2.26	6.72	8.97			
	RDC	8.71	5.31	14.02	12.20	8.97	21.18	7.13	12.31	19.44			
Secondary	Average	11.70	4.42	16.12	16.39	7.61	23.99	6.19	10.24	16.43			
	Government	25.12	15.60	40.72	35.16	21.37	56.53	56.55	30.40	86.95			
	TOTAL*	36.82	20.02	56.84	51.54	28.98	80.52	62.74	40.64	103.38			

\* Total is average primary plus secondary

Of the non-HR portion of costs, costs are divided between fixed costs (things that cannot be easily changed year-on-year, in this case buildings and equipment) and variable or recurrent costs (costs that can be more easily changed from year to year, such as medicines and other supplies, utilities, EHS, IEC, etc.), as seen in Table 11.

Table 11: Fixed vs variable costs (excluding HR), three scenarios

Level	Facility ownership (trustee)	Fixed vs variable vs HR costs (%)											
		Scenario one				Scenario two				Scenario three			
		Fixed	Var.	HR	Total	Fixed	Var.	HR	Total	Fixed	Var.	HR	Total
Primary	Mission	5 %	13 %	83 %	100 %	4 %	18 %	78 %	100 %	14 %	47 %	39 %	100 %
	Municipality	9 %	40 %	51 %	100 %	6 %	48 %	46 %	100 %	14 %	62 %	24 %	100 %
	RDC	18 %	22 %	59 %	100 %	13 %	35 %	52 %	100 %	20 %	47 %	32 %	100 %
	Average	11 %	25 %	64 %	100 %	8 %	34 %	59 %	100 %	16 %	52 %	32 %	100 %
Secondary	Government	38 %	12 %	50 %	100 %	24 %	34 %	42 %	100 %	17 %	25 %	58 %	100 %
TOTAL*		25 %	18 %	57 %	100 %	16 %	34 %	50 %	100 %	100 %	38 %	45 %	100 %

\* Total is average primary and secondary, averaged

### ***3.3 Five year projections***

The five year projections estimate the cost of providing the core packages at public, municipal, RDC and mission primary and secondary level facilities. Five year costs range from a low of US\$1.7 billion in the conservative projection scenario based on facility types to a high of US\$5.2 billion in the optimistic projection scenario, when costs are estimated on the basis of cost per capita. Tables 12-14 present all the projection scenarios.



**Table 12: Five year projections, conservative scenario, in US\$**

Extrapolation method	Year		2		3		4		5		5-YEAR TOTAL *
	Scenario one	Scenario two	Scenario one	Scenario two	Scenario one	Scenario two	Scenario one	Scenario two	Scenario one	Scenario two	
Simple per capita	649,897,682	651,912,365	653,933,293	929,238,887	932,119,528	3,817,101,755					
Based on facility types	270,122,287	270,959,666	271,799,641	438,724,002	440,084,047	1,691,689,643					

\* 58% of total costs over the five-year period are for human resources; the rest accounts for 42% of the total. In the simple per capita extrapolation method this corresponds with US\$2.2 billion and US\$1.6 billion, respectively. When extrapolation is based on facility types, this corresponds to US\$983 million and US\$709 million, respectively.

**Table 13: Five year projections, middle scenario, in US\$**

Extrapolation method	Year		2		3		4		5		5-YEAR TOTAL *
	Scenario one	Scenario two	Scenario one	Scenario two	Scenario one	Scenario two	Scenario one	Scenario two	Scenario one	Scenario two	
Simple per capita	649,897,682	923,504,286	926,367,149	929,238,887	1,196,752,568	4,625,760,573					
Based on facility types	270,122,287	436,016,510	437,368,161	438,724,002	503,403,157	2,085,634,118					

\* Using the simple per capita extrapolation, 52% of total costs over the five-year period are for human resources; the rest accounts for 48% of the total. This corresponds with US\$2.4 billion and US\$2.2 billion, respectively. When extrapolation is based on facility types, this corresponds with US\$1.1 billion and US\$997 million, respectively.

**Table 14: Five year projections, optimistic scenario, in US\$**

Extrapolation method	Year		2		3		4		5		5-YEAR TOTAL *
	Scenario one	Scenario two	Scenario one	Scenario two	Scenario one	Scenario two	Scenario one	Scenario two	Scenario one	Scenario two	
Simple per capita	920,650,270	923,504,286	926,367,149	1,193,054,101	1,196,752,568	5,160,328,374					
Based on facility types	434,669,036	436,016,510	437,368,161	501,847,430	503,403,157	2,313,304,295					

\* Using the simple per capita extrapolation, 48% of total costs over the five-year period are for human resources; the rest accounts for 52% of the total. This corresponds with US\$2.5 billion and US\$2.7 billion, respectively. When extrapolation is based on facility types, this corresponds with US\$1.1 billion and US\$1.2 billion, respectively.

Including the 2.64% of the population who currently uses traditional medicine would increase costs by up to 1.4% in the simple per capita extrapolation calculations.

### 3.4 Comparison of findings with EHB package costs from other countries

The desk study done as part of the second deliverable for this project found the following costs per capita for EHB packages in a number of regional and international countries (see Table 15). It is important to remember that many of these estimates were not based on proper costing exercises but rather on the cost of contracting out service provision based on an available budget divided by the catchment population. Therefore, they do not reflect the real costs of providing the package, but rather the available funds. The cost of providing an EHB package is also associated with a country's level of development, gross domestic product (GDP) per capita and other economic indicators. As a country becomes more developed and salary levels rise, for example, the cost of providing the basic package also increases. Many of the countries listed below are less developed than Zimbabwe, which partially accounts for the low cost estimates, together with the methodological difference in how costs were estimated. Many of the packages are also much less extensive than Zimbabwe's; see the previous desk review submitted as part of deliverable two for an overview of the contents of all packages.

**Table 15: EHB package per capita costs, per country**

Country	Cost per capita (US\$)
<i>Neighboring countries</i>	
Kenya	US\$25.8 in fiscal year 2005/06 and expected to grow to US\$35.2 in fiscal year 2009/10; when non-package services are included, the costs increase to US\$36.9 in 2005/06 and grow to US\$50.22 in 2009/10
Lesotho	N/A
Malawi	US\$22 per year, subsequently reduced to US\$17
Mozambique	N/A
Tanzania	N/A
Uganda	US\$22.1-28 in 2008/09
Zambia	US\$12-18 at first and second levels; tertiary care is an additional US\$2
<i>International</i>	
Afghanistan	US\$4.30-5.12
Botswana	N/A
Cambodia	US\$3.03-4.43
Egypt	US\$6.97
Ghana	N/A
Liberia	US\$3.41-4.28
Nigeria	US\$16
Rwanda	N/A
Sierra Leone	N/A
South Africa	US\$74.57 (hospital package)
South Sudan	N/A
Swaziland	N/A
Timor Leste	N/A
Zanzibar	US\$3.63 (PHCC level and below)

In terms of content, Zimbabwe's extensive core package is most similar to Kenya's; however, unlike Zimbabwe, Kenya's package does not cover EHS or other public health services. The cost of the package per capita was estimated to be US\$25.80 in fiscal year 2005/06 and expected to grow to US\$35.20 in fiscal year 2009/10. When non-package services are included (it is unknown which services are defined as non-package, but they may be ones included in Zimbabwe's core package), the costs increase to US\$36.90 in 2005/06 and grow to US\$50.22 in 2009/10. Inflated to 2014 prices at an annual rate of 3%, Kenya's package could be expected to cost US\$58.22 in 2014, similar to the estimation of US\$56.84 in Zimbabwe's scenario one. The percentage of staffing costs as a percentage of total facility costs is also not dissimilar in Kenya and Zimbabwe; in Kenya, for example, more than 70% of costs in public outpatient facilities went to salary, whereas in Zimbabwe under several scenarios we found similar figures.

There are also some similarities with Tanzania's package although the cost of Tanzania's package is unfortunately not known.

Table 16 summarizes the contents of the packages in the three countries.

**Table 16: Comparison of EHB package contents in Kenya, Tanzania and Zimbabwe**

Country	MNCH	Communicable diseases	NCDs	EPI	Nutrition	Other clinical services*	Emergency and injuries	Social welfare	Environmental health	Other public health**	Traditional medicine	Pharm. & med. supplies	Institutional elements
Kenya <sup>12</sup>	X	X	X	X	X	X	X					X	
Tanzania <sup>13</sup>	X	X	X			X	X	X	X	X	X		X
Zimbabwe	X	X	X	X	X	X	X		X	X		X	

\* Other clinical services include eye care, skin care, dental care, mental health, etc.

\*\* Other public health may include health promotion, community-level activities and more.

The cost of Zimbabwe's secondary (hospital) level package (US\$40.72 in scenario one, US\$56.53 in scenario two and US\$86.95 in scenario three) is also similar to South Africa's<sup>14</sup>, estimated at US\$74.57 at 2013 exchange rates or US\$76.81 inflated to 2014 at 3% per year.

<sup>12</sup> Reversing the Trends: The Second NATIONAL HEALTH SECTOR Strategic Plan of Kenya, NHSSP II – 2005–2010. Republic of Kenya Ministry of Health.

<sup>13</sup> Comprehensive Council Health Planning Guidelines, July 2011. Ministry of Health and Social Welfare, The United Republic of Tanzania.

<sup>14</sup> Söderlund, Neil. An Essential Hospital Package for South Africa – Selection Criteria, Costs and Affordability. SAMJ, Vol. 89, No. 7, July 1999.

## 4 Dissemination and next steps

The draft report was circulated and presented at a stakeholder meeting organized by and held at MOHCC on Tuesday 23 September 2014 in Harare. Approximately 30 participants were in attendance. A summary of questions and comments provided during the presentation and short discussion session thereafter are listed below:

- A suggestion was made to supplement the costing exercise with activity-based costing; it was explained that this was the original intention but later deemed to be not possible due to problems with the STGs not aligning with package services and categories
- A short discussion around changes in both population growth and utilization was had; it was explained that the costing done does not reflect changes in utilization although this could be explored with the data files provided
- There was a suggestion to change the wording of the scenarios from “base”, “improved” and “ideal” since the “ideal” scenario was not actually an ideal situation but actually represents standard delivery under better circumstances. This suggestion has been incorporated in the final version of this report and the scenarios renamed “scenario one”, “scenario two” and “scenario three”
- There were suggestions to further justify the use of percentage estimates; it was explained that estimates were used due to the lack of reliable data. Nonetheless, estimates have been updated to match changes in utilization in the three scenarios
- There were discussions about removing the percentage of the population who does not use services from the extrapolation and five-year projection estimations; this is now reflected in the final version of the report
- Several excellent points were raised about the need to now compare the costing findings with the revenue generation work that is ongoing to assess affordability of the package

A full list of changes made from the draft to the final version of the report is included as a supplement to this report.

Experiences from around the world indicate that EHBs often start out small, including a set of core evidence-based, cost-effective interventions, and are expanded over time as more financial resources become available, as the burden of disease changes or as political priorities, both local and international, shift. We suggest these findings therefore be compared against resource projections for the coming years; choices may need to be made to match the service package with available funding. We highly recommend following guidance in the WHO draft technical brief on EHBs which notes that “essential health packages aim to concentrate scarce resources on interventions which provide the best 'value for money'.” Resources like WHO-CHOICE and an examination of the disability-adjusted life years (DALYs) that can be averted with each core package service may be useful.

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