THE COST OF YOUR HEALTHCARE

A costing of healthcare services in Bhutan

2009 - 2010

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Contents

1. EXECUTIVE SUMMARY

The Royal Government of Bhutan is examining alternatives for a sustainability strategy and is seriously committed to improve the effectiveness and efficiency of its health spending. Also, there are rising citizen expectations from public services and the increasing public pressure to improve efficiency and effectiveness of services.

This report is the outcome of a study undertaken, on behalf of the Ministry of Health, to obtain information about the costs of delivering health services at different levels in Bhutan in order to:

- Inform MOH of the cost of delivering various types of services at different levels;
- Increase cost-awareness and knowledge;
- Inform the policy process and input to decision making

The study reviewed the costs and activity in 9 districts covering a total of 13 facilities including the National Referral Hospital, the two Regional Referral Hospitals, four district hospitals and six basic health units (three grade I and three grade II BHUs).

The study uses an easily replicable methodology to assess the cost of resources used to provide services. It is based on data compiled for the period July 2009 to June 2010 thus covering the financial year 2009/10. For the purpose of the study a standard costing model was developed. The model classified health facility services into three types: overhead, intermediate and final. Overhead services included all administrative services. Intermediate services covered various support function like investigative services, kitchen, etc. The final type includes outpatient and inpatient services.

In the first step of the study all costs were collected – both recurrent and capital costs. The capital items had its cost annualized to an annual depreciation cost. Then all costs were assigned to the three types of cost centers. According to various rules the costs of overhead and intermediate services were allocated to final or direct service providing departments. Based on the final costs and activity of these departments unit costs for services could be calculated.

Presented below is a summary of the key findings and recommendations. In general the results and facility comparisons of the study should be interpreted with caution. There are many factors influencing the final unit costs of facilities from quality of data, demand for services, case-mix of patients, geographical features just being some of them. However, even taking this into consideration the results of the study can be used to fulfill the objectives.

Main results and observations

- ***Costs and cost-structures at facilities***. The study gives a detailed insight into total costs, cost-structures and composition of costs of facilities at various levels. Recurrent costs generally across all levels have the highest share of total costs with salaries being the main cost element. In general the share of fixed costs is relatively high. This means that to a certain point the marginal cost of treating more patients will be relatively low. Hence an effective and efficient use of resources is secured by maximizing use of fixed costs. This requires on one hand a tool to assist in controlling patient flows – like an effective referral system – and on the other hand the necessary information to adapt inputs/resources to actual demand for services.

- ***Unit costs***. The costs of OPD-visits, admissions in general as well as disease-specific groupings of admissions have been calculated and shows – as would be expected – that services are generally more costly at higher levels. An OPD-visit is generally four times as costly at a referral hospital compared to a BHU and twice as costly compared to a district hospital. Inpatients unit costs show the same pattern. The average inpatient cost of a referral hospital is about three times that of a BHU and more than one-half time that of a district hospital.

- ***Cost-effectiveness***. Providing services at the lowest effective level of service delivery (facilities) is the most cost-effective way of providing services in the long run. It is a challenge to control demand for services and channel the patients to the right facilities. If this is managed, it will in the longer run result in cost savings.

- ***Cost-efficiency***. More optimal and cost efficient options for assigning manpower to facilities are available and if pursued could result in both cost cutting and reductions in waiting times for patients.

- ***Data issues***. In general a huge amount of health related data is available in Bhutan. The costing study reviewed a lot of these sources extensively and the review and analysis conducted as a part of the study especially uncovered two areas that would benefit greatly from renewed focus and improvements. These were the Bhutanese Health Management and Information System (BHMIS) and the data management of equipments and drugs at the Drugs, Vaccines and Equipment Division (DVED) of the MOH.

Way forward – and recommendations

This study is the first comprehensive attempt to do costing analysis in Bhutan. As such it should be seen as a starting point for further analysis in specific areas like for example costing of diagnostic services.

The results can be used as input in the design of new policies. If the current political discussions regarding charging non-Bhutanese for health services are pursued the results of the unit costing can be used to set tariffs.

In addition to the above mentioned areas/options for using the results, there are especially two other areas where the analysis points towards possibilities of efficiency gains and cost cutting. These are **firstly** a revision – or development - of the referral system and **secondly** further analyze productivity at the facilities.

It is therefore **recommended** to:

- Analyze options for developing and implementing a referral system for elective services in Bhutan that embraces cost-effective provision of services by channeling the patients to facilities with the lowest level of effective service delivery. – If the service needed by a patient is provided at a district hospital the patient should in principle not receive it at a referral hospital.

- Further analyze productivity – especially in terms of allocated manpower – in order to more effectively align staff allocations with actual output of the facilities. This will both ensure a more cost efficient use of resources as well as reducing waiting times in "over-populated" facilities.

2. INTRODUCTION

The Royal Government of Bhutan (RGoB) is examining alternatives for a sustainability strategy and is seriously committed to improve the effectiveness and efficiency of its health spending. Also, there are rising citizen expectations from public services and the increasing public pressure to improve efficiency and effectiveness of services. As a follow up to the preparatory activities undertaken in 2009-10, including a national workshop on sustainable Health Financing in January 2010 followed by the country's participation in a regional health financing workshop in Maldives in June 2010, the RGoB, with support from the World Bank and other development partners has embarked on a Public Expenditure Review (PER) exercise for the Human Development sectors of health, education and social protection in Bhutan, with an aim to provide evidence to inform policy development in line with the sectoral priorities.

This report is the outcome of a study undertaken, on behalf of the Ministry of Health, to obtain information about the costs of delivering health services in Bhutan. It comes at a time where other initiatives in the area of health care financing are taking place. This includes a National Health Accounts study and a Public Expenditure Review (PER).

The results of the study can be used as an input in the investigation of various health financing options and in the pursuit of cost-containment and cost-effective options for health service delivery in Bhutan. The results can help increase cost-awareness and general knowledge to inform the policy process.

The study reviewed the costs and activity in 9 districts covering a total of 13 facilities including the National Referral Hospital, the two Regional Referral Hospitals, four district hospitals and six basic health units (three grade I and three grade II BHUs).

The study was designed and implemented by an external consultant with the active participation of MOH officials[1], especially in the process of collecting data. The process of determining unit costs has required the collection of a huge mass of data necessary for relating costs to activities. In the process of collecting these data a substantial amount of work has been carried out by central MOH staff, staff at the health facilities and district administrations including District Health Officers and huge thanks goes out to them for active participation in the process of facilitating this study. Time and space prevents a thorough and detailed analysis of all data collected but the information will be provided to enable MOH officials to undertake further analysis.

It is important to note that the study has not been designed to assess the quality of the health care services or the outcome of the care provided. It has its focus on quantification in terms of cost of various health services at various levels of service delivery.

[1]The main consultant was Kim Gustavsen (Health Economist and Health Systems Specialist) and central MOH staff included Sangay Wangmo, Tandin Dendup, Sonam Yangchen, Sonam Phuntsho and Ugyen Wangchuk.

3. OBJECTIVES AND EXPECTED RESULTS OF THE STUDY

The objectives of the study were to cost the delivery of health services at different levels in Bhutan in order to:

- Inform MOH of the cost of delivering various types of services at different levels;
- Increase cost-awareness and knowledge;
- Inform the policy process and input to decision making

The study also analyzes, where feasible, the cost efficiency and cost effectiveness of the services provided by the Government of Bhutan.

The following areas were costed:

Total cost of each facility

- By category
  - Recurrent costs (salaries, drugs, medical equipment, utilities, maintenance, etc.)
  - Capital costs (buildings, equipment, vehicles) as yearly depreciation
- By type (fixed vs. variable)
- By cost center (direct and indirect costs)

Unit costs by facility

- Unit cost per OPD attendance
- Unit cost per IPD bed day
- Unit cost per IPD admission
- Unit cost per IPD by disease groupings (medical/surgical and major disease groupings)

4. THE BHUTANESE HEALTH SECTOR

In the past 20 years Bhutan has moved from a country with some of the poorest health indicators in the world to a country that is well on its way to attaining most of the Millennium Development Goals (MDGs). Bhutan was an early adopter of the Primary Health Care (PHC) approach. The result today is a strong and equitably distributed PHC system, with about 90% of the total population within three hours walking distance from a service delivery unit (Health Sector Review 2007).

The joint review of the health sector conducted in 2009 confirmed that the Royal Government of Bhutan had sustained its focus on PHC and on an equitable expansion in both access to and use of basic health services. It also noted that there were rising public expectations, increasing costs of health services, and that human resources continued to be a critical issue.

4.1 Delivery of health care

Health care in Bhutan is delivered through a network of fairly standardized health facilities. In 2008 the District Health Service Programme was established as a part of the decentralization reform of the 10th Five Year Plan to oversee district planning, including staffing, training, supplies and construction. However, human resource planning and employment, as well as purchase of drugs and equipment are still handled centrally. Likewise is construction of larger hospitals.

Vertical health and disease control programmes, including those for tuberculosis, leprosy, malaria, immunizations, and maternal and child health is being managed centrally.

Table 4.1 below outlines the major developments in health facilities and staff in Bhutan in the past 10 years.

Table 4.1: Health facilities and staff 2001 - 2010

	2001	2005	2010
Hospitals	29	29	30
Basic Health Units	168	176	181
Out-Reach Clinics	461	485	518
Doctors	114	145	187
Doctors/10,000	1.3	2.3	2.7
Health Assistants	163	171	366
Nurses	569	538	556

Source: Joint Evaluation of Danish-Bhutanese Country Programme 2000-2009 and Annual Health Bulletin 2011

The period has seen an increase in 65 percent of doctors and more than a doubling in the number of health assistants. The number of nurses has remained relatively stable as has the number of health facilities with only minor increases in the numbers.

4.2 Financing of health care

The health system in Bhutan is predominantly financed by the government. A recently completed National Health Accounts study – the first of its kind in Bhutan – gives an overview of the flow of funds in the health sector in Bhutan.

According to the results of the study the total expenditure on health in Bhutan in the financial year 2009/10 was BTN 1,981 million or BTN 2,847 per capita (about USD 58). This amounts to 3.7 percent of GDP being on the lower side compared to other countries in the region.

The public expenditure on health as a share of total government expenditure is 6.3 percent. Only about 11 percent of total health expenditure is household out-of-pocket expenditure.

4.3 Major health care indicators

Some of the major health indicators and development in these can be seen in table 4.2 below. The positive trends can be attributed to the expansion of health services in the period providing better access for the entire population as well as improvements in quality of services.

Table 4.2: Major Health Indicators 1984 - 2010

Indicator	1984	1994	2000	2005	2010
Infant Mortality Rate (per 1,000 live births)	103	70.7	60.5	40.1	40.1
Under 5 Mortality Rate (per 1,000 live births)	162	96.9	84.0	61.5	61.5
Maternal Mortality Ratio (per 100,000 live births)	770	380	255	215	
Births attended by trained health staff (percent)	NA	10.9	23.6	49.1	69.5
Access to safe drinking waters (percent)				52.3	88.0

Source: Health Sector Review, Bhutan 2007; Joint Evaluation of Danish-Bhutanese Country Programme 2000-2009 and Annual Health Bulletin 2011.

Note: IMR and U5MR for 2010 based on Population & Housing Census 2005 and hence same number as 2005.

Improvements in water and sanitation, expansion of primary education and general socio-economic development has likewise been major factors contributing to the fact that Bhutan is well on its way to – and already has reached some – of the MDG targets. It should be noted that due to the low population and low number of deaths maternal mortality rates should be interpreted with caution. The MMR actually covers very few actual maternal deaths because and are in reality meaningless to report in a Bhutanese context as also pointed out in the 2007 review of the sector and again in the Joint Sector Review of 2009.

During the period a decline in the infectious diseases (diarrhea, dysentery, etc.) has been observed as well as an increase in non-communicable diseases (especially diabetes and hypertension). Likewise the areas of alcohol-induced liver diseases and traffic accidents contribute to a substantial part of the disease burden in Bhutan.

5. METHODOLOGY

This section outlines the costing methodology used for the study. A more detailed description of the costing methodology can be found in annex B.

5.1 Scope

The unit cost study was designed to relate activities carried out in a number of health facilities to the costs of undertaking those activities. Data limitations and the time available for the study limited the number of unit costs to be derived from the data. It is important to note that the study was not designed to assess the quality of the care or the outcome of care provided and so no judgment can be made on the relative cost-benefit of care provided by different facilities.

Likewise the unit costs represent the average cost for each facility. No marginal costing was done.

Sample size

A total of 13 facilities plus their attached out-reach clinics was covered in nine different districts. They are represented in the table below.

Table 5.1: Health facilities studied

Facility Name	Facility Type	Dzongkhag/District
JDWNRH	National Referral Hospital	Thimphu
Mongar RRH	Regional Referral Hospital	Mongar
Gelephu RRH	Regional Referral Hospital	Sarpang
Paro DH	District Hospital	Paro
Wangdi Choling DH	District Hospital	Bumthang
Damphu DH	District Hospital	Tsirang
Punakha DH	District Hospital	Punakha
Gyelposhing BHU I	Basic Health Unit, Grade I	Mongar
Bajo BHU I	Basic Health Unit, Grade I	Wangdi Phodrang
Bali BHU I	Basic Health Unit, Grade I	Haa
Genekha BHU II	Basic Health Unit, Grade II	Thimphu
Mendelgang BHU II	Basic Health Unit, Grade II	Tsirang
Thinleygang BHU II	Basic Health Unit, Grade II	Punakha

Although only 13 facilities (plus attached out-reach clinics) of a total of 213 facilities were studied, if viewed from a service delivery point about 60 and 57 percent of respectively total OPD and IPD cases in Bhutan was covered through the facilities included in the study. Hence coverage in terms of services delivered was very high. This is due to the fact that all the referral hospitals as well as some of the larger district hospitals are covered by the study.

Table 5.2 below summarizes characteristics of the 13 facilities in terms of staffing, type and number of services delivered.

Table 5.2: Summary of health facilities

Facility Name	Number of staff (FTE)	OPD-visits	Admissions	OPD-visits per FTE staff	Admissions per FTE staff
JDWNRH	730	383,658	11,662	525	16.0
Mongar RRH	261	13,025	3,608	50	13.8
Gelephu RRH	180	61,350	3,422	340	19.0
Paro DH	85	46,099	3,223	542	37.9
Wangdi Choling DH	43	69,447	977	1,615	22.7
Damphu DH	47	16,102	1,106	343	23.5
Punakha DH	76	36,838	2,058	485	27.1
Gyelposhing BHU I	9	9,046	49	1,005	5.4
Bajo BHU I	45	21,655	1,123	481	25.0
Bali BHU I	35	18,844	476	538	13.6
Genekha BHU II	4	3,235	NA	809	NA
Mendelgang BHU II	4.5	6,565	NA	1,459	NA
Thinleygang BHU II	4	7,119	NA	1,780	NA
Total	1,523.5	623,536	27,704	409	18.3

It should be noted that the productivity results of the table above does not distinguish between division of staff between inpatient and outpatient services. The numbers have been derived by simple division of OPD-visits/Admissions with the total number of full-time-equivalent (FTE) staff of each facility. Hence interpretations should be made with caution. For example in hospitals it might only be half or less of the total staff that works in the OPD with the major part being in IPD. In BHUs almost all staff works in OPD because of the (relatively) low number of inpatients. Hence the productivity numbers of hospitals in reality would be higher than reflected in the table.

Capital Costs

Both capital and recurrent costs was considered in the study. A unit cost analysis that ignores capital costs is assuming that physical assets will be available forever. The daily use of these assets (buildings, equipment, etc.) and the depreciation of capital items is an expense – even though it is not an expenditure (e.g. salaries and drugs are an expenditure).The cost of capital items was annualized in to a yearly depreciation cost.

Perspective

The perspective adopted for the study is the viewpoint of the facility – not from a society or patient perspective. The costs are thus the costs related to providing services at a given facility. This ensures comparability and uniformity of the results as well as providing institutional information as input to the policy process.

Hence costs incurred by patients (travel, cost of an escort, etc.) have not been considered. Likewise supervisory costs of central MOH and various vertical programmes have not been estimated and used as overheads for the individual health facilities. Finally costing of out-of-country referrals is not covered by the study as it is limited to the costs of health facilities in Bhutan.

Timing

The timing of the study is outlined below. The study was originally foreseen to be finalized by July 2011 but data collection took longer than expected and the nature and quality of the data also caused delays in the data processing and thus the final report.

April: Startup – situation analysis, facility visits and setup of data collection. Consultants first visit.

May - July: Data collection by Ministry of Health

June: Further data collection, facility visits and interviews. Consultants second visit.

July - September: Data processing and report writing

5.2 Preparation

The consultant worked closely with officers from the Policy & Planning Division of the Ministry of Health. The initial visit in April 2011 was used to survey facilities, identify and evaluate data sources and set up data collection. The main facility level data collection was carried out by MOH officials in May – June 2011 following guidelines developed during the first visit of the consultant.

Sample of facilities

All the three major referral hospitals in the country were included in the study. Likewise four district hospitals and six basic health units (three grade I and three grade II) were included. Outreach clinics under the respective facilities were also costed. However, the HMIS data collected did not distinguish between services provided at the facility and services provided as a part of the out-reach services. Hence the cost of out-reach services was included in the total cost of the facilities and thus included in the unit costs of the entire facility.

The facilities to be included in the study were decided by the MOH. The selection of district hospitals and basic health units was not done randomly. Geographic factors and logistics played a role in the selection with travel distance being one of the key determinants. The limited time

available for the study made it necessary to minimize time spent travelling. Hence there is an overrepresentation of facilities from the western part of the country.

Data collection guidelines

Data sources were reviewed during the inception visit in April 2011 and guidelines for data collection were developed.

Definition of final product

The final product was defined initially during the inception visit and further revised and developed during the consultant's second visit in June. The developed standard costing model was designed in accordance with the desired output. Initially it was the ambition to include costing of deliveries, unit costs of ANC visits as well as cost of immunization and family planning services. However, further analysis of performed interviews and collected data made it clear that costing of these would require further in-depth studies.

5.3 Data collection

The study required the collection of huge amounts of data from all levels as well as interviews with key staff at facilities and central agencies. The data section in the methodology annex describes this process and the data sources in further depth.

In general a lot of data is available in Bhutan. All facilities are fully financed by the government. Drugs, consumables and equipment are supplied from the MOH and detailed records were in principle available. The Infrastructure Department of the MOH has data and information related to construction of facilities. The Bhutanese Health Management Information System is generally well developed and a lot of data is being reported using a system of standard forms at facilities that are collected at district level, summarized and then send electronically to the MOH. The referral hospitals keep their own records and these were also made available and used for the study. Finally the facility-wise yearly financial statements was the main source for the facility-wise recurrent costs.

Bhutan is a small country and the government is the main provider of health services. This gives the government a unique opportunity for full insight into all inputs to the system – from drugs, equipment and buildings to personnel; as well as outputs of the system in terms of services delivered. This opportunity is currently not being fully utilized.

The collection and processing of data revealed shortcomings that Bhutan could benefit from improving. Some of the major ones were:

- The DVED supplied huge amounts of data and worked with high effort to satisfy the needs for the study. However, the data received was incomplete with some areas clearly missing – even after revisions. The major ones being purchase prices of all equipment could not be produced; records of facility drug consumption were not available; the supplied drug list seems to have drugs missing in the list and equipment lists of facilities unclear. A new

system to record and manage the information was currently being implemented and it looked promising. Hopefully this can improve the situation.

- The BHMIS is not consistent and duplication is present with same data being reported by different forms - and the results do not match. An example is number of admissions being reported in one form. In another form inpatients by disease – a disaggregation of admissions by disease – is reported. The two numbers do not match. And for the three referral hospitals, that have their own records department, a third and different number from the other two can be found.

- Disease coding is not uniform. A grouping of about 80 codes is being used in most facilities with JDWNRH using a more elaborate version. Likewise coding is inconsistent from facility to facility. For example in the BHMIS form where inpatients are recorded by disease, facilities record a normal delivery differently and some not at all as it is not perceived as a disease. The ICD10 codes and structure of the BHMIS morbidity reports is in need of a review.

- JDWNRH has the most elaborate inpatient medical records system with detailed coding of diagnosis, patient data, bed-days etc. However, outpatient reports by disease are not available as is the case for all other facilities in the country.

The collection of data was more complex than initially assumed. This resulted in most of the time of the consultant's second visit in June was spent collecting and validating data.

5.4 Standard costing model

A standard costing model was developed and used for all 13 facilities. The model is described in detail in the methodology annex and is supplied in soft-copy together with this report. It can thus be used to cost other health facilities in Bhutan as well as being used as a basis for further development of costing in Bhutan. It has been designed in excel with all computations being done automatically based on input of data to the model.

The model has a number of cost centers identified at three levels: overhead, intermediate and final cost centers. Overhead costs being administration, security, etc; intermediate covers various supportive functions like diagnostic services, operating theatre and kitchen. The final cost centers include areas of final service provision like outpatient and inpatient departments.

Inputs to each cost center were identified, quantified and given a financial value. To allocate the cost of the overhead and intermediate cost centers to final cost centers a step-wise approach was used. Finally unit costs for final cost centers were calculated.

All data in the model is based on collected data from the various sources. In general all estimations are based on facts from data, and it was rare to find completely missing data that required full estimations of the cost items. However, as mentioned above there were issues with the quality of data – especially in areas where different options for the same number was available. Likewise there were areas where data was clearly missing or obviously too low – and some too

high. So some assumptions were made along the way – for example no data on equipments in grade II basic health units were available. The methodology annex highlights all these areas.

Defining cost centers

The standard model builds on classic top-down costing methodology where cost centers are identified and given a financial value.

The number of cost centers was defined according to the desired output of the study. In general these are grouped in three categories – overhead, intermediate and final cost centers.

The different cost centers are depicted in the table below.

Table 5.3: Cost Centers of the Standard Costing Model

Overhead	Intermediate	Final
Administration	Imaging	Outpatient department
Transport	Kitchen	Inpatient department
Staff quarters	Laboratory	• Medical
Security & Maintenance	Pharmacy/Dispensary	• Surgical & medical
	Operating Theatre	Maternal & Child Health Indigenous Unit

The inpatient department was divided into medical and medical & surgical wards. Based on the disease groupings patients could be classified as either of these. Since it is not possible with certainty by disease grouping to know whether surgical or medical (or both) procedures was used in the treatment, the group surgical & medical covers diseases where both procedures can be used and medical only covers diseases where treatment is purely medical and not surgical.

Obviously not all facilities have all cost centers. Likewise the more advanced facilities could benefit from a more detailed division of cost centers. A uniform model was selected taking time allocated for the study, simplicity and methodological rigorousness in to consideration.

The cost of the overhead and intermediate cost centers were then allocated to the final – service delivery – cost centers using a step-down allocation. The various keys used for these allocation varies and can be found in details in the methodology annex. When all costs had been allocated to final costs centers unit costs were calculated simply by dividing total cost of the cost center with the number of units produced.

Period covered

The period chosen for the study is at the time of the study the most recent financial year 2009/10. A period of one year was chosen in order to equalize seasonal variations as well as some key data is only available on an annual basis like the final financial statements of the facilities.

Annual depreciation of capital items

The annual depreciation cost of capital items may be quite hard to measure if certain information is not available like purchase price and life expectancy of items. It may therefore be very sensitive to the assumptions made. For the purpose of the study all capital items was given a financial value and a life expectancy. The yearly depreciation cost of capital items was then calculated using a depreciation rate of six percent based on developments in the Bhutanese consumer price-index.

The level of detail behind the calculations of the annual depreciation of capital items is very high. More than 1,300 types of different equipment have had life expectancy estimated in order to calculate the annual depreciation cost. See the methodology annex for further details on how annual depreciation of capital items was calculated.

6. RESULTS

The main results of the study across all levels of service delivery are summarized in table 6.1 below.

Table 6.1: Average Unit Costs at different levels in 2009/10 in BTN

	Referral Hs Unit Cost	District Hs Unit Cost	BHU I Unit Cost	BHU II Unit Cost
OUTPATIENT DEPARTMENT				
- OPD-visit	635	307	163	161
INPATIENT DEPARTMENT				
- Admissions	17,354	10,116	5,657	NA
- Bed-days	2,795	NA	NA	NA
Inpatients - medical				
- Admissions	18,007	9,157	5,756	NA
- Bed-days	2,345	NA	NA	NA
Inpatients - surgical & medical				
- Admissions	17,170	10,667	5,581	NA
- Bed-days	2,963	NA	NA	NA

Note: Various sources used as outlined in the methodology section.

The average cost of an OPD-visit varies from BTN 161 at a basic health unit to BTN 635 at the referral hospitals with the cost being BTN 307 at district hospitals. That is roughly a doubling of the cost going from basic health units to district hospitals – and a doubling again going from district hospitals to referral hospitals. Interestingly the average OPD-cost at basic health units grade I and II is almost identical.

The same pattern is seen with regards to inpatients. The average cost per admission being BTN 5,657 at BHU I's, rising to 10,116 at district hospitals and 17,354 at referral hospitals. It was only referral hospitals that had trustworthy data on bed-days. The average cost per bed-day being BTN 2,795 with average surgical bed-days being more expensive than medical bed-days.

Interestingly the cost of admissions of medical patients is higher than non-medical at referral hospitals and basic health units and the other way around at district hospitals. Even though bed-day cost is higher for surgical patients this reflects the fact that medical patients on the average stay longer in the hospital.

Data on facility-wise number of total bed-days was available from the BHMIS. However, the quality of the data was questionable for many of the facilities and hence not used to calculate bed-day cost. The number of bed-days used to calculate unit costs for referral hospitals is not from the BHMIS but from inpatient records of the three facilities.

The next sections cover in more detail the three different levels in terms of cost composition, unit costs and disease specific unit costs.

6.1. National and Regional Referral Hospitals

Some of the characteristics of the three referral hospitals are summarized below. In terms of inpatient cases the numbers of the two regional referral hospitals are at the same level. When looking at number of OPD-visits Mongar is very low at a level below all four district hospitals and even lower than two of the basic health units. As this appeared much lower than expected the OPD volume was double-checked with the Medical Records Officer at Mongar RRH and the low number was confirmed.

Summary of Referral Hospitals

Facility Name	Number of beds	Number of staff (FTE)	OPD-visits	Admissions	OPD-visits per FTE staff	Admissions per FTE staff
JDWNRH	350	730	383,658	11,662	525	16.0
Mongar RRH	100	261	13,025	3,608	50	13.8
Gelephu RRH	60	180	61,350	3,422	340	19.0
Total	510	1,171	458,033	18,692	391	16.0

6.1.1 Total Costs

The total costs of referral hospitals are depicted below in table 6.2. All capital costs are annual depreciation values. In table 6.3 the total costs according to the costing models final cost centers can be seen.

Table 6.2: Total Costs of referral hospitals in 2009/10 in BTN

	-- JDWNRH --		-- GELEPHU RRH --		-- MONGAR RRH --	
	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT
Recurrent cost	**367,228,683**	**76.4**	**48,033,763**	**57.6**	**78,544,890**	**63.0**
- Staff	163,739,489	34.1	35,859,441	43.0	45,602,000	36.6
- Drugs and medical supplies	157,095,702	32.7	4,351,393	5.2	8,777,319	7.0
- Other	46,393,492	9.6	7,822,929	9.4	24,165,571	19.4
Capital cost	**113,574,306**	**23.6**	**35,311,555**	**42.4**	**46,180,815**	**37.0**
- Buildings	50,044,316	10.4	27,668,401	33.2	28,227,798	22.6
- Equipment	57,986,587	12.1	5,333,403	6.4	13,795,464	11.1
- Vehicles	5,543,403	1.2	2,309,751	2.8	4,157,552	3.3
TOTAL COST	**480,802,988**	**100.0**	**83,345,317**	**100.0**	**124,725,704**	**100.0**

Note: Various sources used as outlined in the methodology section.

As expected from the size and level of activity the total costs of JDWNRH is about 4-5 times higher than that of the other two referral hospitals.

The share of recurrent costs varies from approximately 58 percent to 76 percent. The cost of drugs and medical supplies is very high at JDWNRH at almost 33 percent of total costs and only 5 and 7 percent respectively at Gelephu and Mongar. Especially the cost of medical supplies at JDWNRH is very high. This could be attributed to the fact that the medical supplies at JDWNRH is based on actual consumption in the financial year and not what was put in the annual indent. As also highlighted in the methodology annex there is a general feeling that drugs and medical supplies in general are underestimated since it is not based on actual consumption – except for medical supplies of JDWNRH.

Table 6.3: Total Costs for Final Cost Centers for referral hospitals in 2009/10 in BTN

	-- JDWNRH --		-- GELEPHU RRH --		-- MONGAR RRH --	
	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT
Outpatient department	**228,886,403**	**47.6**	**26,916,967**	**32.3**	**34,949,150**	**28.0**
Inpatient department	**208,145,466**	**43.3**	**44,167,701**	**53.0**	**72,064,400**	**57.8**
- All Medical	40,573,558	8.4	14,905,157	17.9	18,330,638	14.7
- Surgical & Medical	167,571,908	34.9	29,262,544	35.1	53,733,762	43.1
Maternal & Child Health (MCH)	**43,771,120**	**9.1**	**10,454,217**	**12.5**	**15,944,199**	**12.8**
Indigenous Unit	**-**	**-**	**1,806,561**	**2.2**	**1,767,165**	**1.4**
Total	**480,802,988**	**100.0**	**83,345,446**	**100.0**	**124,724,914**	**100.0**

Note: Various sources used as outlined in the methodology section.

The cost share of outpatient departments varies from 28 percent at Mongar RRH to almost 48 percent at JDWNRH with Gelephu RRH slightly higher than Mongar RRH at 32.3 percent. Taking the huge amount of outpatient visits of JDWNRH in to account that is not surprising. The cost share of inpatient departments varies from 43 percent at JDWNRH to almost 58 percent at Mongar RRH with Gelephu RRH at 53 percent.

The Maternal & Child Health (or Reproductive Health Units) share of total costs are around 10 percent in general (from 9.1 at JDWNRH to 12.8 at Mongar RRH).

6.1.2. Fixed and Variable Costs

Table 6.4 presents fixed vs. variable costs. The share of fixed costs varies from about 64 to 89 percent and the variable costs respectively vary from 11 to 36 percent.

Table 6.4: Fixed vs. Variable Costs for referral hospitals in 2009/10 in BTN

	-- JDWNRH --		-- GELEPHU RRH --		-- MONGAR RRH --	
	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT
Fixed costs	307,006,609	63.9	74,197,116	89.0	107,614,895	86.3
Variable costs	173,796,379	36.1	9,148,202	11.0	17,110,810	13.7
Total	**480,802,988**	**100.0**	**83,345,317**	**100.0**	**124,725,704**	**100.0**

Note: Various sources used as outlined in the methodology section.

In general fixed costs do not vary with activity (to a certain point). The buildings, number of beds and staff in a facility are there regardless of (short-term) variations in activity. In the longer run number of staff can be adapted to activity but in the shorter run it is fixed.

Not surprisingly share of fixed costs are relatively high. Since only variable cost varies with activity the marginal cost of treating one more patient is relatively low up to a certain point where it will be necessary to expand the staff and capital items as well. Hence it can be very cost-effective to fully utilize the fixed assets and in the longer run adapt it to the expected demand for services.

Bed occupancy rates for the facilities are about 60 percent for JDWNRH and 80 and 66 percent respectively for Gelephu and Mongar RRHs (calculated by using total bed-days in respective facilities compared to number of available beds). Hence there are indications of surplus inpatient capacity not utilized. However, further analysis into geographical access issues, availability of staff etc. is needed in this area to make final conclusions.

6.1.3. Direct and Indirect Costs

Table 6.5 presents direct vs. indirect costs at the referral hospitals. The share of direct costs varies from 30 percent at JDWNRH to almost 53 percent at Gelephu RRH.

Table 6.5: Direct vs. Indirect Costs for referral hospitals in 2009/10 in BTN

	-- JDWNRH --		-- GELEPHU RRH --		-- MONGAR RRH --	
	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT
Direct costs	144,610,339	30.1	43,756,875	52.5	47,337,792	38.0
Indirect costs	336,192,649	69.9	39,588,571	47.5	77,387,122	62.0
Total	**480,802,988**	**100.0**	**83,345,446**	**100.0**	**124,724,914**	**100.0**

Note: Various sources used as outlined in the methodology section.

Direct cost represents costs that can be attributed directly to the final service provision at for example inpatient and outpatient departments. Indirect costs are from overhead and supportive services that are allocated to final service producing departments according to various allocation keys.

The relative share of direct vs. indirect costs can give indications of the precision of the costing. As a rule of thumb, the higher the share of direct costs, the higher the precision in the costing since fewer assumptions on how to allocate costs has to be made. Indirect cost is from the overhead and intermediate cost centers and the direct cost is from final cost centers in the costing model.

The direct costs of JDWNRH are relatively low standing at only 30 percent. This is mainly due to the high cost share of drugs and medical supplies (almost one-third of total costs) that cannot be linked directly to the final cost centers.

6.1.4. Unit Costs

Unit costs are presented in table 6.6 below. Across the three hospitals the average unit costs of an OPD-visit have huge variations. The average cost of an OPD-visit at Mongar RRH is more than six times that of Gelephu RRH (BTN 2,683 and 439 respectively). The cost at JDWNRH is about one-third higher than at Gelephu standing at BTN 597. When looking at the activity Mongar RRH has a very low number of OPD-visits of about 13,000 compared to the 61,350 and 383,658 at Gelephu RRH and JDWNRH respectively. This is the main explanation as to why the unit cost for an OPD-visit is so high. As noted above this could be a mistake in the HMIS reporting. However, the number was double-checked with Mongar RRH and confirmed.

The average cost of an inpatient admission has less variation with the lowest being BTN 12,907 at Gelephu RRH and BTN 17,848 and 19,974 at JDWNRH and Mongar RRH respectively. The average cost per bed-day is BTN 2,465, 2,810 and 2,996 for Gelephu RRH, JDWNRH and Mongar RRH respectively. In line with average cost per admission Mongar RRH is the most expensive hospital due to its low utilization relative to costs. Likewise Mongar RRH has the highest average length of stay of 6.7 days per admission (24,051/3,608) compared to 6.4 and 5.2 for JDWNRH and Gelephu RRH respectively.

Table 6.6: Unit Costs and Activity for referral hospitals in 2009/10 in BTN and actual activity

	JDWNRH Unit Cost	GELEPHU Unit Cost	MONGAR Unit Cost	JDWNRH Activity	GELEPHU Activity	MONGAR Activity
OUTPATIENT DEPARTMENT						
- OPD-visit	597	439	2,683	383,658	61,350	13,025
INPATIENT DEPARTMENT						
- Admissions	17,848	12,907	19,974	11,662	3,422	3,608
- Beddays	2,810	2,465	2,996	74,070	17,918	24,051
Inpatients - medical						
- Admissions	22,616	11,709	17,762	1,794	1,273	1,032
- Beddays	2,458	1,972	2,473	16,506	7,557	7,413
Inpatients - surgical & medical						
- Admissions	16,981	13,617	20,859	9,868	2,149	2,576
- Beddays	2,911	2,824	3,229	57,565	10,360	16,639

Note: Various sources used as outlined in the methodology section.

Interestingly the most expensive admission is medical patients at JDWNRH being more expensive than the surgical ones. For both Gelephu and Mongar RRHs the surgical admissions are more expensive than the medical ones. An explanation could be in the case-mix of patients with complicated medical patients being referred to JDWNRH. Likewise bed occupancy rates in surgical and medical wards could contribute to the difference.

In table 6.7 below the admissions and cost of these are grouped in to the major diagnostic groups following the format used in the HMIS reporting. The calculations are based on the unique treatment structure of each hospital with variations in patient case-mix and length of stay. In general the most expensive kind of disease to treat is TB ranging from BTN 44,000 to almost 51,000. Likewise within other diagnostic groups large variations can be found, for example muscular-skeletal diseases vary from BTN 13,988 to 43,072 being the most extreme.

The results should be interpreted with caution. Especially how many cases the calculations are based on as well as the potential difference in case-mix of patients should be taken into consideration. It would be fair to assume some of the most complicated cases will be found at JDWNRH. Likewise socio-economic factors could attribute to more advanced cases or physically “weaker” patients in the poorer eastern parts of the country where Mongar RRH lies. This could be a part of the explanation to the higher costs found there.

Table 6.7: Disease Specific Inpatient Cost per Admission and activity for referral hospitals 2009/10 in BTN

Disease grouping	JDWNRH Cost	GELEPHU Cost	MONGAR Cost	JDWNRH Activity	GELEPHU Activity	MONGAR Activity
INFECTIONS	-	-	-	-	-	-
- Diarrhoea	8,112	8,481	6,182	155	130	31
- Tuberculosis	46,705	44,377	50,942	125	86	90
- Other infections	11,928	8,387	9,598	40	65	32
VIRAL, PROTOZOAL & HELMINTHIC DIS.	15,541	7,549	20,877	263	315	38
NEOPLASM	24,405	11,968	-	1,031	43	-
BLOOD DISEASE	20,423	9,385	21,177	72	58	55
ENDOCRINE, METABOLIC & NUTR.	-	-	-	-	-	-
- Diabetes	28,760	18,145	27,697	120	53	37
- Other endocrine etc.	32,589	12,623	26,213	47	25	10
MENTAL DISORDERS	28,439	10,381	10,967	243	19	40
DISEASE OF NERVOUS SYSTEM	30,647	11,306	16,169	148	28	143
EYE & EAR DISEASES	-	-	-	-	-	-
- Cataract	30,566	16,099	25,513	85	15	44
- Other Eye & Ear	23,122	19,330	19,707	217	16	135
DISEASE OF CIRCULATORY SYSTEM	-	-	-	-	-	-
- Hypertension	24,336	8,481	10,634	53	55	54
- Other circulatory etc.	23,685	20,422	20,887	402	69	105
RESPIRATORY DISEASE	-	-	-	-	-	-
- Common Cold	7,866	6,903	9,644	17	158	123
- Pneumonia	18,436	11,045	13,354	301	143	246
- Other respiratory	20,179	13,705	20,314	437	268	203
DISEASES OF THE DIGESTIVE SYSTEM	-	-	-	-	-	-
- Peptic Ulcer Syndrome	16,715	7,100	13,107	75	38	23
- Alcohol Liver Diseases	20,648	13,214	17,311	135	100	110
- Other digestive	12,154	14,420	24,867	955	146	278
SKIN DISEASES	31,914	15,376	22,367	184	256	159
DISEASES OF MUSC-SKEL. ETC.	43,072	13,988	29,527	133	42	244
GENITO-URINARY DISEASES	17,694	12,008	21,185	722	212	359
PREGNANCY, CHILDBIRTH AND PUERP.	-	-	-	-	-	-
- Abortions	8,733	7,061	6,459	275	81	31
- Other pregnancy etc.	8,594	12,434	15,751	3,592	658	572
PERINATAL CONDITIONS	18,446	29,869	19,710	753	24	187
MALFORMATIONS	29,401	8,473	22,961	127	2	14
INJURIES AND TRAUMA	30,972	14,047	20,970	955	317	245
ALL	**17,848**	**12,907**	**19,974**	**11,662**	**3,422**	**3,608**

Note: Various sources used as outlined in the methodology section.

6.2. District Hospitals

The analysis included four district hospitals of various sizes. Paro District Hospital is the largest hospital having inpatient caseload almost at the same level as the two regional referral hospitals.

Summary of District Hospitals

Facility Name	Number of beds	Number of staff (FTE)	OPD-visits	Admissions	OPD-visits per FTE staff	Admissions per FTE staff
Paro DH	60	85	46,099	3,223	542	37.9
Wangdi Choling	20	43	69,447	977	1,615	22.7
Damphu DH	20	47	16,102	1,106	343	23.5
Punakha DH	40	76	36,838	2,058	485	27.1
Total	140	251	168,486	7,364	671	29.3

6.2.1. Total Costs

Table 6.8 below depicts the total costs of district hospitals. All capital costs are annual depreciation values. In table 6.9 the total costs according to the costing models final cost centers can be seen.

Table 6.8: Total Costs of district hospitals in 2009/10 in BTN

	-- PARO --		-- WANGDI CHOLING --		-- DAMPHU --		-- PUNAKHA --	
	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT
Recurrent cost	**31,792,854**	**61.9**	**13,432,542**	**55.8**	**24,741,826**	**68.3**	**14,368,855**	**40.2**
- Staff	18,781,853	36.6	6,629,755	27.6	6,845,515	18.9	8,811,370	24.6
- Drugs and med. suppl.	8,471,533	16.5	2,343,787	9.7	15,888,222	43.9	1,735,724	4.9
- Other	4,539,468	8.8	4,459,000	18.5	2,008,089	5.5	3,821,761	10.7
Capital cost	**19,555,130**	**38.1**	**10,624,472**	**44.2**	**11,472,658**	**31.7**	**21,407,887**	**59.8**
- Buildings	17,323,172	33.7	8,674,300	36.1	9,012,118	24.9	17,072,533	47.7
- Equipment	1,308,058	2.5	1,026,271	4.3	1,536,640	4.2	2,949,504	8.2
- Vehicles	923,900	1.8	923,900	3.8	923,900	2.6	1,385,851	3.9
TOTAL COST	**51,347,984**	**100.0**	**24,057,014**	**100.0**	**36,214,484**	**100.0**	**35,776,743**	**100.0**

Note: Various sources used as outlined in the methodology section.

Table 6.9: Total Costs for Final Cost Centers for district hospitals in 2009/10 in BTN

	-- PARO --		-- WANGDI CHOLING --		-- DAMPHU --		-- PUNAKHA --	
	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT
Outpatient department	**13,762,383**	**26.8**	**10,195,062**	**42.4**	**19,792,163**	**54.7**	**8,026,951**	**22.4**
Inpatient department	**32,671,295**	**63.6**	**9,307,581**	**38.7**	**11,397,144**	**31.5**	**21,120,422**	**59.0**
- All Medical	10,691,474	20.8	2,775,535	11.5	4,278,843	11.8	6,850,165	19.1
- Surgical & Medical	21,979,821	42.8	6,532,045	27.2	7,118,301	19.7	14,270,257	39.9
MCH	**4,311,618**	**8.4**	**3,150,723**	**13.1**	**3,812,650**	**10.5**	**5,147,534**	**14.4**
Indigenous Unit	**602,688**	**1.2**	**1,403,678**	**5.8**	**1,212,543**	**3.3**	**1,481,760**	**4.1**
Total	**51,347,984**	**100.0**	**24,057,044**	**100.0**	**36,214,499**	**100.0**	**35,776,666**	**100.0**

Note: Various sources used as outlined in the methodology section.

The total cost of the hospitals varies from about BTN 24 million to 51 million with Paro as the largest naturally having the highest total cost.

The share of recurrent costs varies from approximately 40 percent to 62 percent. What is especially noteworthy is the high cost of drugs and medical supplies of almost BTN 16 million at Damphu Hospital. This is due to a very high (BTN 14 million) supply of one drug type (arthemeter & lumefanthrine treatment for malaria) with a unit cost that is questionably high.

The cost share of outpatient departments varies from about 22 percent at Punakha Hospital to almost 55 percent at Damphu Hospital. The cost share of inpatient departments varies from about 32 percent at Damphu to almost 64 percent at Paro Hospital. It should be noted that the above mentioned issue related to the cost of drugs at Damphu suggests that the OPD-share of costs are overestimated and vice-versa with the inpatient costs.

The Maternal & Child Health share of total costs varies from 8.4 to 14.4 percent with Paro being lowest and Punakha highest.

6.2.2. Fixed and Variable Costs

Table 6.10 presents fixed vs. variable costs. The share of fixed costs varies from about 53 to 90 percent and the variable costs respectively vary from 10 to 47 percent.

Table 6.10: Fixed vs. Variable Costs for district hospitals in 2009/10 in BTN

	-- PARO --		-- WANGDI CHOLING --		-- DAMPHU --		-- PUNAKHA --	
	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT
Fixed costs	39,992,773	77.9	21,699,227	90.2	19,124,067	52.8	31,486,344	88.0
Variable costs	11,355,211	22.1	2,357,787	9.8	17,090,417	47.2	4,290,398	12.0
Total	**51,347,984**	**100.0**	**24,057,014**	**100.0**	**36,214,484**	**100.0**	**35,776,743**	**100.0**

Note: Various sources used as outlined in the methodology section.

The high-level of variable costs at Damphu Hospital is related to the issue mentioned above with the likely too high cost of drugs for the facility – and drugs are a variable cost.

As is generally noted the high-levels of fixed costs will – to a certain point – mean low marginal costs. The difficult exercise is how to adapt the demand to the optimal level of activity where fixed assets are fully utilized.

6.2.3 Direct and Indirect Costs

In table 6.11 below *direct vs. indirect costs* of the four district hospitals are presented. The share of direct costs varies from 34 percent at Damphu Hospital to more than 60 percent at Paro Hospital.

Direct cost represents costs that can be attributed directly to the final service provision at for example inpatient and outpatient departments. Indirect costs are from overhead and supportive services that are allocated to final service producing departments according to various allocation keys.

Table 6.11: Direct vs. Indirect Costs for district hospitals in 2009/10 in BTN

	-- PARO --		-- WANGDI CHOLING --		-- DAMPHU --		-- PUNAKHA --	
	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT
Direct costs	31,016,095	60.4	11,528,586	47.9	12,371,247	34.2	21,176,333	59.2
Indirect costs	20,331,889	39.6	12,528,459	52.1	23,843,253	65.8	14,600,334	40.8
Total	**51,347,984**	**100.0**	**24,057,044**	**100.0**	**36,214,499**	**100.0**	**35,776,666**	**100.0**

Note: Various sources used as outlined in the methodology section.

As such the share direct costs can give indications of the precision of the costing. As a rule of thumb, the higher the share of direct costs, the higher the precision in the costing since fewer assumptions on how to allocate costs has to be made. Indirect cost is from the overhead and intermediate cost centers and the direct cost is from final cost centers in the costing model.

The direct costs of Damphu Hospital are relatively low standing at only 34 percent. Again this is a result of the high cost share of drugs that cannot be linked directly to the final cost centers.

6.2.4 Unit Costs

Unit costs are presented in table 6.12 below. Across the four hospitals the average unit costs of an OPD-visit have huge variations. The average cost of an OPD-visit at Damphu Hospital is more than eight times that of Wangdi Choling Hospital (BTN 1,229 and 147 respectively). The cost at Paro and Punakha hospitals are BTN 299 and 218 respectively. Table 6.13 shows Damphu Hospital has a relatively low number of OPD-visits of only about 16,000 compared to the other hospitals (ranging from 36,838 to 69,447). This is a part of the explanation as to why the unit cost

for an OPD-visit is so high at Damphu. The above mentioned high cost of drugs also adds to the high cost. A sensitivity analysis shows that if the cost of drugs at Damphu was at the same level as the other three hospitals, the average cost of an OPD-visit would be reduced by half from BTN 1,229 to 628.

Table 6.12: Unit Costs for district hospitals in 2009/10 in BTN

	PARO Unit Cost	WANGDI CHO Unit Cost	DAMPHU Unit Cost	PUNAKHA Unit Cost
OUTPATIENT DEPARTMENT				
- OPD-visit	299	147	1,229	218
INPATIENT DEPARTMENT				
- Admissions	10,137	9,527	10,305	10,263
- Beddays	NA	NA	NA	NA
Inpatients - medical				
- Admissions	9,076	9,314	8,445	9,738
- Beddays	NA	NA	NA	NA
Inpatients - surgical & medical				
- Admissions	10,748	9,620	11,878	10,535
- Beddays	NA	NA	NA	NA

Note: Various sources used as outlined in the methodology section.

The average cost of an inpatient admission is very similar across hospitals ranging from BTN 9,527 to 10,305. As valid data on number of bed-days is not available for the hospitals no cost has been calculated. However, if valid data becomes available, the design of the costing model allows for it to be entered and have the cost calculated automatically in an easy way.

Across all hospitals the average cost of surgical admissions are higher than medical admissions.

Table 6.13: Activity for district hospitals in 2009/10 in actual numbers

ACTIVITY	PARO Activity	WANGDI CHO Activity	DAMPHU Activity	PUNAKHA Activity
OUTPATIENT DEPARTMENT				
- OPD-visit	46,099	69,447	16,102	36,838
INPATIENT DEPARTMENT				
- Admissions	3,223	977	1,106	2,058
- Beddays	NA	NA	NA	NA
Inpatients - medical				
- Admissions	1,178	298	507	703
- Beddays	NA	NA	NA	NA
Inpatients - surgical & medical				
- Admissions	2,045	679	599	1,355
- Beddays	NA	NA	NA	NA

Note: Various sources used as outlined in the methodology section.

In tables 6.14 and 6.15 below the number of admissions and cost of these are grouped in to the major diagnostic groups following the format used in the HMIS reporting. As there is no valid data on total bed-days as well as average length of stay for the different disease groupings, each group has received a weight to calculate unit costs. The weights are based on a weighted average of the average length of stay in each disease group at the three referral hospitals.

In general – as we saw with the referral hospitals – the most expensive kind of disease to treat is TB ranging from BTN 28,463 to 33,369. Since the average cost of admissions is very similar in all four hospitals and the weights used for the various diseases are the same for all hospitals, the costs disease-wise have little variation. This was not the case for the referral hospitals where unique inpatient data from each facility was available giving each of the referral hospitals their own unique disease-wise weights.

The results should be interpreted with caution. Especially should be noted how many cases the calculations are based on. Likewise the potential difference in case-mix of patients should be taken into consideration.

Table 6.14: Disease Specific Inpatient Activity for district hospitals in 2009/10 in actual numbers

Disease grouping	PARO Activity	WANGDI CHO Activity	DAMPHU Activity	PUNAKHA Activity
INFECTIONS	-	-	-	-
- Diarrhoea	102	17	92	117
- Tuberculosis	28	8	2	35
- Other infections	37	9	76	35
VIRAL, PROTOZOAL & HELMINTHIC DIS.	14	21	24	120
NEOPLASM	-	-	-	-
BLOOD DISEASE	52	35	22	30
ENDOCRINE, METABOLIC & NUTR.	-	-	-	-
- Diabetes	23	4	19	7
- Other endocrine etc.	9	5	6	20
MENTAL DISORDERS	48	11	6	27
DISEASE OF NERVOUS SYSTEM	32	14	6	25
EYE & EAR DISEASES	-	-	-	-
- Cataract	-	32	3	-
- Other Eye & Ear	10	6	78	10
DISEASE OF CIRCULATORY SYSTEM	-	-	-	-
- Hypertension	162	24	16	44
- Other circulatory etc.	94	27	28	91
RESPIRATORY DISEASE	-	-	-	-
- Common Cold	240	28	122	6
- Pneumonia	68	36	29	156
- Other respiratory	188	70	91	212
DISEASES OF THE DIGESTIVE SYSTEM	-	-	-	-
- Peptic Ulcer Syndrome	300	50	74	25
- Alcohol Liver Diseases	64	36	14	55
- Other digestive	359	83	80	375
SKIN DISEASES	179	19	105	95
DISEASES OF MUSC-SKEL. ETC.	106	36	66	59
GENITO-URINARY DISEASES	253	80	60	168
PREGNANCY, CHILDBIRTH AND PUERP.	-	-	-	-
- Abortions	95	26	8	51
- Other pregnancy etc.	216	53	27	100
PERINATAL CONDITIONS	49	58	5	34
MALFORMATIONS	66	3	1	1
INJURIES AND TRAUMA	430	186	47	157
ALL	**3,223**	**977**	**1,106**	**2,058**

Note: Various sources used as outlined in the methodology section.

Table 6.15: Disease Specific Inpatient Cost per Admission for district hospitals in 2009/10 in BTN

Disease grouping	PARO Cost	WANGDI CHO Cost	DAMPHU Cost	PUNAKHA Cost
INFECTIONS	-	-	-	-
- Diarrhoea	5,430	5,049	5,920	5,204
- Tuberculosis	30,606	28,463	33,369	29,336
- Other infections	6,488	6,033	7,073	6,218
VIRAL, PROTOZOAL & HELMINTHIC DIS.	7,738	7,196	8,436	7,417
NEOPLASM	-	-	-	-
BLOOD DISEASE	10,867	10,106	11,849	10,416
ENDOCRINE, METABOLIC & NUTR.	-	-	-	-
- Diabetes	16,412	15,262	17,893	15,730
- Other endocrine etc.	16,205	15,070	17,668	15,532
MENTAL DISORDERS	15,286	14,215	16,665	14,651
DISEASE OF NERVOUS SYSTEM	13,778	12,813	15,021	13,206
EYE & EAR DISEASES	-	-	-	-
- Cataract	-	12,786	15,669	-
- Other Eye & Ear	11,752	10,028	12,289	12,257
DISEASE OF CIRCULATORY SYSTEM	-	-	-	-
- Hypertension	9,165	8,523	9,992	8,784
- Other circulatory etc.	12,571	10,728	13,147	13,112
RESPIRATORY DISEASE	-	-	-	-
- Common Cold	5,452	5,070	5,944	5,226
- Pneumonia	9,502	8,836	10,359	9,107
- Other respiratory	10,050	8,576	10,510	10,482
DISEASES OF THE DIGESTIVE SYSTEM	-	-	-	-
- Peptic Ulcer Syndrome	8,448	7,856	9,210	8,097
- Alcohol Liver Diseases	11,151	10,370	12,157	10,688
- Other digestive	8,113	6,923	8,484	8,461
SKIN DISEASES	12,260	10,462	12,821	12,787
DISEASES OF MUSC-SKEL. ETC.	17,119	14,608	17,902	17,855
GENITO-URINARY DISEASES	9,623	8,212	10,064	10,037
PREGNANCY, CHILDBIRTH AND PUERP.	-	-	-	-
- Abortions	4,582	3,910	4,792	4,779
- Other pregnancy etc.	5,499	4,692	5,750	5,735
PERINATAL CONDITIONS	10,412	8,885	10,888	10,859
MALFORMATIONS	15,801	13,484	16,524	16,480
INJURIES AND TRAUMA	14,556	12,421	15,222	15,181
ALL	**10,137**	**9,527**	**10,305**	**10,263**

Note: Various sources used as outlined in the methodology section.

6.3. Basic Health Units

The analysis included six basic health units. Three grade I and three grade II BHUs. Bajo BHU I has recently been upgraded to a district hospital, but at the period studied (financial year 09/10) it was still a basic health unit.

In the table below summaries of the basic health units can be seen.

Summary of Basic Health Units

Facility Name	Number of beds	Number of staff (FTE)	OPD-visits	Admissions	OPD-visits per FTE staff	Admissions per FTE staff
Gyelposhing I	10	9	9,046	49	1,005	5.4
Bajo I	11	45	21,655	1,123	481	25.0
Bali I	20	35	18,844	476	538	13.6
Genekha II	4	4	3,235	NA	809	NA
Mendelgang II	3	4.5	6,565	NA	1,459	NA
Thinleygang II	3	4	7,119	NA	1,780	NA
Total	51	101.5	66,464	1,648	655	18.5

6.3.1 Total Costs

Table 6.16 and 6.17 below depicts the total costs of the six basic health units. All capital costs are annual depreciation values. In tables 6.18 and 6.19 the total costs according to the costing models final cost centers can be seen.

Table 6.16: Total Costs of basic health units - grade I in 2009/10 in BTN

	-- GYELPOSHING --		-- BAJO --		-- BALI --	
	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT
Recurrent cost	**2,488,950**	**77.2**	**9,575,588**	**84.0**	**7,524,683**	**78.7**
- Staff	1,581,000	49.1	6,474,695	56.8	4,818,339	50.4
- Drugs and medical supplies	335,950	10.4	1,464,214	12.8	696,980	7.3
- Other	572,000	17.8	1,636,679	14.3	2,009,364	21.0
Capital cost	**733,454**	**22.8**	**1,829,930**	**16.0**	**2,033,987**	**21.3**
- Buildings	588,458	18.3	613,885	5.4	726,491	7.6
- Equipment	144,996	4.5	292,145	2.6	383,596	4.0
- Vehicles	-	-	923,900	8.1	923,900	9.7
TOTAL COST	**3,222,403**	**100.0**	**11,405,518**	**100.0**	**9,558,670**	**100.0**

Note: Various sources used as outlined in the methodology section.

The total cost of the basic health units, grade I varies from BTN 3.2 million to 11.5 million and from BTN 1.5 million to 2.7 million for basic health units, grade II. Gyelposhing BHU seems to be quite small for a grade I basic health unit and the total costs are only slightly higher than that of Mendelgang BHU that is grade II.

The shares of recurrent costs are generally much higher at BHUs than at both district hospitals and referral hospitals. That is due to the fact that the costs of capital items generally are relatively low in these less specialized facilities. So in all six BHUs the share of recurrent costs lies between 75.8 and 84.5 percent.

No data on equipment for grade II BHUs was available. Hence based on the levels of equipment at grade I BHUs it is assumed each BHU II has an annual depreciation cost of equipment of BTN 100,000.

Table 6.17: Total Costs of basic health units - grade II in 2009/10 in BTN

	-- GENEKHA --		-- MENDELGANG --		-- THINLEYGANG --	
	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT
Recurrent cost	**1,157,573**	**75.8**	**2,287,229**	**84.5**	**1,732,746**	**80.5**
- Staff	663,576	43.5	999,832	36.9	1,000,000	46.5
- Drugs and medical supplies	114,224	7.5	549,045	20.3	310,059	14.4
- Other	379,773	24.9	738,352	27.3	422,687	19.6
Capital cost	**368,802**	**24.2**	**419,656**	**15.5**	**419,656**	**19.5**
- Buildings	268,802	17.6	319,656	11.8	319,656	14.9
- Equipment	100,000	6.6	100,000	3.7	100,000	4.6
- Vehicles	-	-	-	-	-	-
TOTAL COST	**1,526,374**	**100.0**	**2,706,885**	**100.0**	**2,152,402**	**100.0**

Note: Various sources used as outlined in the methodology section.

Tables 6.18 and 6.19 below shows total costs for final cost centers. A major part of the work taking place at BHUs are related to health promotion and prevention reflected by relatively high shares of the MCH cost centers with the grade II BHUs having the relatively highest share (42 to 59 percent).

Table 6.18: Total Costs for Final Cost Centers for basic health units - grade I in 2009/10 in BTN

	-- GYELPOSHING --		-- BAJO --		-- BALI --	
	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT
Outpatient department	**1,270,280**	**39.4**	**3,896,267**	**34.2**	**2,912,409**	**30.5**
Inpatient department	**885,612**	**27.5**	**4,935,677**	**43.3**	**3,500,636**	**36.6**
- All Medical	284,741	8.8	1,788,658	15.7	2,014,915	21.1
- Surgical & Medical	600,871	18.6	3,147,019	27.6	1,485,721	15.5
Maternal & Child Health (MCH)	**1,066,512**	**33.1**	**1,955,132**	**17.1**	**2,177,446**	**22.8**
Indigenous Unit	**-**	**-**	**618,442**	**5.4**	**968,180**	**10.1**
Total	**3,222,403**	**100.0**	**11,405,518**	**100.0**	**9,558,670**	**100.0**

Note: Various sources used as outlined in the methodology section.

Table 6.19: Total Costs for Final Cost Centers for basic health units - grade II in 2009/10 in BTN

	-- GENEKHA --		-- MENDELGANG --		-- THINLEYGANG --	
	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT
Outpatient department	**512,891**	**33.6**	**1,305,463**	**48.2**	**910,780**	**42.3**
Inpatient department	**114,311**	**7.5**	**269,092**	**9.9**	**244,519**	**11.4**
- All Medical	114,311	7.5	269,092	9.9	244,519	11.4
- Surgical & Medical	-	-	-	-	-	-
Maternal & Child Health (MCH)	**899,173**	**58.9**	**1,131,860**	**41.8**	**996,633**	**46.3**
Indigenous Unit	**-**	**-**	**-**	**-**	**-**	**-**
Total	**1,526,374**	**100.0**	**2,706,415**	**100.0**	**2,151,932**	**100.0**

Note: Various sources used as outlined in the methodology section.

The cost share of outpatient departments varies from about 31 percent at Bali to 48 percent at Mendelgang. The cost share of inpatient departments varies from about 28 percent at Gyelposhing to 43 percent at Bajo for the grade II BHUs. The grades II BHUs have a very low share (7 – 10 percent) of the costs in inpatient departments naturally reflecting the fact that they have very few inpatients at this type of facility. In general inpatients at BHU IIs only stay one day for observation and is then either discharged or referred to another higher level facility.

6.3.2 Fixed and Variable Costs

Table 6.20 and 6.21 presents fixed vs. variable costs of BHUs. The share of fixed costs varies from about 64 to 83 percent and the variable costs respectively vary from 17 to 36 percent.

Table 6.20: Fixed vs. Variable Costs for basic health units - grade I in 2009/10 in BTN

	-- GYELPOSHING --		-- BAJO --		-- BALI --	
	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT
Fixed costs	2,659,454	82.5	8,944,423	78.4	7,850,054	82.1
Variable costs	562,950	17.5	2,461,095	21.6	1,708,616	17.9
Total	**3,222,403**	**100.0**	**11,405,518**	**100.0**	**9,558,670**	**100.0**

Note: Various sources used as outlined in the methodology section.

Table 6.21: Fixed vs. Variable Costs for basic health units - grade II in 2009/10 in BTN

	-- GENEKHA --		-- MENDELGANG --		-- THINLEYGANG --	
	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT
Fixed costs	1,047,151	68.6	1,732,126	64.0	1,442,343	67.0
Variable costs	479,224	31.4	974,759	36.0	710,059	33.0
Total	**1,526,374**	**100.0**	**2,706,885**	**100.0**	**2,152,402**	**100.0**

Note: Various sources used as outlined in the methodology section.

In general the share of fixed costs is lower in BHU IIs compared to BHU Is.

It is generally noted that the high-levels of fixed costs will – to a certain point – mean low marginal costs. The difficult exercise is how to adapt the demand to the optimal level of activity where fixed assets are fully utilized.

6.3.3. Direct and Indirect Costs

In tables 6.22 and 6.23 below *direct vs. indirect costs* of the basic health units are presented. The share of direct costs varies from about 30 percent at Gyelposhing to almost 65 percent at Genekha and Thinleygang.

Table 6.22: Direct vs. Indirect Costs for basic health units - grade I in 2009/10 in BTN

	-- GYELPOSHING --		-- BAJO --		-- BALI --	
	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT
Direct costs	961,797	29.8	6,382,957	56.0	4,921,768	51.5
Indirect costs	2,260,606	70.2	5,022,561	44.0	4,636,902	48.5
Total	**3,222,403**	**100.0**	**11,405,518**	**100.0**	**9,558,670**	**100.0**

Note: Various sources used as outlined in the methodology section.

Table 6.23: Direct vs. Indirect Costs for basic health units - grade II in 2009/10 in BTN

	-- GENEKHA --		-- MENDELGANG --		-- THINLEYGANG --	
	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT
Direct costs	985,255	64.5	1,372,009	50.7	1,371,219	63.7
Indirect costs	541,119	35.5	1,334,406	49.3	780,713	36.3
Total	**1,526,374**	**100.0**	**2,706,415**	**100.0**	**2,151,932**	**100.0**

Note: Various sources used as outlined in the methodology section.

Direct cost represents costs that can be attributed directly to the final service provision at for example inpatient and outpatient departments. Indirect costs are from overhead and supportive services that are allocated to final service producing departments according to various allocation keys.

As such the share direct costs can give indications of the precision of the costing. As a rule of thumb, the higher the share of direct costs, the higher the precision in the costing since fewer assumptions on how to allocate costs has to be made. Indirect cost is from the overhead and intermediate cost centers and the direct cost is from final cost centers in the costing model.

Five of six BHUs have direct cost shares above 50 percent. It is only in Gyelposhing it is very low (29.8 percent). The explanation to this can be found by analyzing the cost center data of Gyelposhing further. Here it becomes evident that cost of laboratory services is very high, suggesting some kind of research taking place.

6.3.4. Unit Costs

Unit costs are presented in tables 6.24 and 6.25 below. Across the six basic health units the average unit cost of an OPD-visit varies from BTN 128 to 199. Compared to some of the variations of the district and referral hospitals these results are much more in line with each other with no extreme outliers. On the average the unit cost of an OPD-visit at a BHU I is almost identical to that of a BHU II (BTN 163 and 161 respectively).

Table 6.24: Unit Costs and Activity for basic health units - grade I in 2009/10 in BTN

	GYELPOSHING Unit Cost	BAJO Unit Cost	BALI Unit Cost	GYELP. Activity	BAJO Activity	BALI Activity
OUTPATIENT DEPARTMENT						
- OPD-visit	140	180	155	9,046	21,655	18,844
INPATIENT DEPARTMENT						
- Admissions	18,074	4,395	7,354	49	1,123	476
- Beddays	NA	NA	NA	NA	NA	NA
Inpatients - medical						
- Admissions	16,749	4,284	7,306	17	417	276
- Beddays	NA	NA	NA	NA	NA	NA
Inpatients - surgical & medical						
- Admissions	18,777	4,461	7,420	32	706	200
- Beddays	NA	NA	NA	NA	NA	NA

Note: Various sources used as outlined in the methodology section.

Table 6.25: Unit Costs and Activity for basic health units - grade II in 2009/10 in BTN

	GENEKHA Unit Cost	MENDELG. Unit Cost	THINLEYG. Unit Cost	GENEKHA Activity	MENDELG. Activity	THINLEYG. Activity
OUTPATIENT DEPARTMENT						
- OPD-visit	159	199	128	3,235	6,565	7,119

Note: Various sources used as outlined in the methodology section.

Inpatient data is only reported for BHU Is. There are also inpatients at BHU IIs but interviews with staff at the facilities uncovered that it was very limited (30-40 yearly) and they were all either discharged or referred to another facility after spending one night.

The average cost of an inpatient admission at a BHU II varies from BTN 4,395 at Bajo to 18,074 at Gyelposhing with Bali in between at BTN 7,354. The very high cost at Gyelposhing relates to the fact that only 49 patients were there in the period studied. The same numbers for Bajo and Bali were 1,123 and 476 respectively.

As valid data on number of bed-days is not available for the basic health units no cost has been calculated. However, if valid data becomes available, the design of the costing model allows for it to be entered and have the cost calculated automatically.

Across all basic health units the average cost of surgical admissions are higher than medical admissions.

In table 6.26 below the number of admissions and cost of these are grouped in to the major diagnostic groups following the format used in the HMIS reporting for the BHU IIs. As with the district hospitals no valid data on total bed-days and average length of stay for the different disease groupings were available. So each group has received a weight based on a weighted average of the average length of stay in each disease group at the three referral hospitals. Using this weight the unit costs has been calculated.

As mentioned in the above sections on both referral and district hospitals the results should be interpreted with caution. Especially for the BHUs it should be noted how many cases the calculations are based on.

Table 6.26: Disease Specific Inpatient Cost per Admission for basic health units - grade I in 2009/10 in BTN

Disease grouping	GYELPOSHING Cost	BAJO Cost	BALI Cost	GYELP. Activity	BAJO Activity	BALI Activity
INFECTIONS	-	-	-	-	-	-
- Diarrhoea	8,999	2,494	4,587	2	19	19
- Tuberculosis	-	14,056	-	-	3	-
- Other infections	-	2,979	5,481	-	25	83
VIRAL, PROTOZOAL & HELMINTHIC DIS.	-	3,554	-	-	38	-
NEOPLASM	-	-	-	-	-	-
BLOOD DISEASE	18,011	4,991	9,181	1	23	4
ENDOCRINE, METABOLIC & NUTR.	-	-	-	-	-	-
- Diabetes	-	7,537	13,864	-	4	2
- Other endocrine etc.	-	7,442	13,690	-	1	4
MENTAL DISORDERS	-	7,020	12,913	-	32	23
DISEASE OF NERVOUS SYSTEM	22,835	6,327	11,639	6	9	6
EYE & EAR DISEASES	-	-	-	-	-	-
- Cataract	-	-	-	-	-	-
- Other Eye & Ear	-	4,940	9,110	-	12	2
DISEASE OF CIRCULATORY SYSTEM	-	-	-	-	-	-
- Hypertension	15,189	4,209	7,742	1	39	9
- Other circulatory etc.	25,260	5,284	9,746	1	45	13
RESPIRATORY DISEASE	-	-	-	-	-	-
- Common Cold	9,036	2,504	4,606	1	44	28
- Pneumonia	15,748	4,364	8,027	2	113	60
- Other respiratory	20,194	4,225	7,791	1	77	28
DISEASES OF THE DIGESTIVE SYSTEM	-	-	-	-	-	-
- Peptic Ulcer Syndrome	14,001	3,880	7,136	4	48	19
- Alcohol Liver Diseases	-	5,121	9,420	-	19	19
- Other digestive	16,301	3,410	6,289	13	141	32
SKIN DISEASES	24,635	5,154	9,505	1	44	13
DISEASES OF MUSC-SKEL. ETC.	-	7,196	13,271	-	29	8
GENITO-URINARY DISEASES	19,336	4,045	7,460	3	108	47
PREGNANCY, CHILDBIRTH AND PUERP.	-	-	-	-	-	-
- Abortions	9,207	1,926	3,552	1	26	6
- Other pregnancy etc.	11,049	2,311	4,263	5	57	34
PERINATAL CONDITIONS	20,921	4,377	8,072	1	17	6
MALFORMATIONS	-	-	-	-	-	-
INJURIES AND TRAUMA	29,247	6,118	11,284	6	150	11
ALL	**18,074**	**4,395**	**7,354**	**49**	**1,123**	**476**

Note: Various sources used as outlined in the methodology section.

7. ANALYSIS OF RESULTS

This section analyses and sums up the main results from the previous section.

7.1. Assumptions and limitations

The design of a costing study based on a uniform model is based on a number of assumptions and naturally has its limitations. It is important to understand and consider these when analyzing the results. It also has strengths.

The strength of this study design is that by basing the costing on a uniform model it allows for comparisons between facilities as all are subject to the same assumptions and limitations. Likewise it can easily be expanded to include other facilities of the country as well as being updated regularly with newer data in order to analyze developments over time. The study is to a very high degree based on data regularly registered and maintained at facilities and MOH. Only in a few selected areas assumptions on data has been made, for example when the information was missing. This high degree of data dependency is a strength resulting in "real" results. However, it also makes the results very sensitive to issues with data quality as will be discussed below.

The main assumptions and limitations of the study are listed and commented below. The detailed model design can be found in the annex.

- ***Quality not assessed***. The focus of the study has been on quantification in terms of cost of health services at various levels of service delivery. The quality of the health care services or the outcome of care has not been assessed. This implies when making comparisons there is an underlying assumption – ceteris paribus – that the results or quality of the services we compare are the same.

- ***Uniform model design assumes uniform facilities***. The uniformity of the model design treats the facilities as uniform entities producing the same output. Even though there is a high degree of uniformity of health facilities in Bhutan there are still differences among facilities. These issues need to be taken into consideration when interpreting the results. For example we know that various specialized diagnostic services are available only in some facilities as well as case-mix of patients vary within the same diagnostic groups.

- ***Top-down model design***. The top-down design of the model allows for giving a macro-picture of cost structures and unit costs of various facilities. However, more detailed costing of specific services (micro-costing) would also require a bottom-up approach like Activity-Based-Costing. There was an interest in doing this in a few selected areas like costing of specific laboratory and diagnostic services. This can be done using an ABC-analysis approach but this kind of analysis is a whole study in itself and could not be fitted within the time-frame of the current study. Likewise it is only a fragment of the various diagnostic services that are reported in the BHMIS, so it would require a detailed output analysis at selected facilities in this area as well. However, since the costing model have defined cost centers for supportive services like laboratory and imaging the facility-wise total cost of

these areas is available and can be found in the more detailed data annex for all 13 facilities.

- ***Average vs. Marginal Costing***. The study analyses average cost of services. Cost structures of fixed and variable costs imply that the marginal cost of treating for example more patients – to a certain point – is lower than the average cost – and often much lower when looking at the relatively high share of fixed costs at the facilities. It can therefore not be concluded that "moving" production around between facilities from expensive to cheaper facilities would result in reducing the costs by the differences in average costs of the facilities. This could to some degree be the case in the longer run if the fixed costs are adapted to meet new levels of service delivery.

- ***Data issues***. In general the study is very data intensive and thus the results are very sensitive to the quality of data. This is dealt with separately in the section below.

7.2. Data issues

The costing study is very data intensive. All results are based on data from facilities, MOH and district authorities and thus sensitive to the quality of data. During the course of collecting, processing and analyzing the data various issues became apparent. These are summarized below.

General issues

- ***Data availability***. In theory all the needed data for the study was available from various institutions and facilities. This is very unique especially for a country at the developing stage of Bhutan. This is possible due to the purely public health system of Bhutan as well as centralization of key function like health infrastructure management, procurement and supply of drugs and medical equipment and a national health information system. The only information that was collected was information like deployment of staff at different departments of the facilities in order to design the various allocation mechanisms of the costing model. This was collected by interviewing key staff-members and fill in predefined forms. This gives a unique opportunity to do a lot of quantitative based analysis beyond doing a cost analysis. However, even though the data was available the form it was available in as well as the quality of the data was very fluctuating. The review and analysis conducted during this study especially uncovered two areas that would benefit greatly from renewed focus and improvements. These were the Bhutanese Health Management and Information System (BHMIS) and the data management of equipments and drugs at the Drugs, Vaccines and Equipment Division (DVED) of the MOH.

Input data

- ***Financial information***. Financial statements from the financial year 2009/10 were easily available. Information is collected by line items and in general does not support managers in making informed decisions on resource use. There is generally no system in place to compute costs, productivity or efficiency indicators to support rational use of resources.

- ***Drugs and consumables***. Lists of actual use of drugs and consumables were not available making tracking of it difficult. Instead was used facility-wise drugs and consumables distributed in the financial year 2009/10. It is thus assumed that what is delivered will be consumed. For some types this might be the case whereas for others definitely not. There is one exception – JDWNRH. Here the medical consumables were actual consumption in the financial year. Likewise it was difficult to actually obtain valid purchase prices. It is the general feeling of the consultant that the lists supplied of drugs and consumables were incomplete and in areas incorrect with regards to unit prices of various commodities. This is supported by the relatively high amount medical supplies of JDWNRH that is based on actual consumption.

- ***Medical equipment***. Lists of medical equipment of the various facilities were not available from the DVED. Instead the annual indents were used in conjunction with a recent equipment inventory collected from selected facilities by another department of the MOH. Purchase prices were supplied from DVED and where not available it was estimated. It is the general feeling of the consultant that the equipment lists are incomplete and thus to a certain degree underestimates the annual depreciation cost of equipment.

Output data

The main output data source is the Bhutan Health Management Information System (BHMIS). In addition to this inpatient records from the three referral hospitals were used as well as outpatient records from JDWNRH. Likewise selected interviews with staff at the facilities were used to qualify the reported activity of the facilities.

- ***BHMIS reporting forms***. There are many forms used by the facilities to report to the BHMIS and some forms duplicate the reported activity. For example one form is used to report total admissions and another to report admissions by morbidity. Having too many forms results in unnecessary bureaucracy, increased administrative burdens and increased risk of reporting mistakes. The reporting likewise did not allow for disaggregation of activities taking place as out-reach services.

- ***Irregularities in reported activity***. The above duplication leads to different results for the same activity depending on where in the BHMIS you search for the information. Likewise reporting irregularities was observed and staff was not sure on what to actually report in some of the forms. For example at some facilities a normal delivery was reported in the morbidity inpatient report and in others it wasn't. Likewise where deliveries were reported the disease coding varied as no code for a normal delivery is being used in the morbidity reporting.

- ***No uniform disease coding***. The ICD10 system is used for disease coding. In the BHMIS is reported on a total of about 80 codes (or group of codes). However, the morbidity reports only include "diseases" leaving no obvious place to record activities like deliveries unless they experience complications. Likewise JDWNRH uses more detailed level of ICD10 coding that expands on the 80 codes.

- ***No uniform electronic patient administrative system***. The larger hospitals have their own electronic patient administrative system to record activities in. However, the systems vary from typing into Word to using spreadsheets and databases (Excel and Access). The sector could benefit greatly from a uniform system to be implemented at all hospitals that could also track drug use by patients. By having this, the HMIS reporting could be based on simple data queries to the system and abandoning the manual reporting by filling in forms or typing into a web-based user-interface.

- ***Only selected diagnostic services covered by BHMIS.*** Only a small selection of the most common diagnostic services is reported in the BHMIS system for laboratory and imaging.

It was initially the ambition of the study to include costing of services like deliveries, immunizations and various laboratory services. However, further investigations – as mentioned above – revealed that the available data did not support unit costing of these areas. Further analysis outside the scope of this study would be necessary. However, as both imaging and laboratory services are quantified as cost centers, the total cost of these services are available for each facility – just no unit costing of services (see annex D).

7.3. Cost composition of the facilities

In order to effectively and efficiently manage and control a health system you need to know your costs and the composition of these. This ensures decision makers can make informed decisions on policy directions and supports managers in managing.

Table 7.1: Cost composition of facilities by level in 2009/10 in BTN

	Referral Hospitals		District Hospitals		Bassic Health Units	
	BTN	PERCENT	BTN	PERCENT	BTN	PERCENT
Recurrent cost	**493,807,335**	**71.7**	**84,336,077**	**57.2**	**24,766,768**	**81.0**
- Staff	245,200,930	35.6	41,068,493	27.9	15,537,442	50.8
- Drugs and medical supplies	170,224,413	24.7	28,439,266	19.3	3,470,471	11.4
- Other	78,381,992	11.4	14,828,318	10.1	5,758,855	18.8
Capital cost	**195,066,675**	**28.3**	**63,060,147**	**42.8**	**5,805,484.4**	**19.0**
- Buildings	105,940,515	15.4	52,082,123	35.3	2,836,946	9.3
- Equipment	77,115,454	11.2	6,820,473	4.6	1,120,737	3.7
- Vehicles	12,010,706	1.7	4,157,552	2.8	1,847,801	6.0
TOTAL COST	**688,874,010**	**100.0**	**147,396,224**	**100.0**	**30,572,252**	**100.0**

Note: Various sources used as outlined in the methodology section.

Table 7.1 above presents the composition of costs at three levels: Referral hospitals, district hospitals and basic health units.

Recurrent costs account for the main part of the costs at all types of facilities with salaries being the major cost item. The share of recurrent costs is highest at BHUs (81 percent) and lowest at district hospitals (57 percent). Likewise district hospitals have the highest share of cost on buildings with the annual depreciation cost of these amounting to one-third of the total yearly cost.

The highest cost share of drugs, medical supplies and equipment can be found at referral hospitals and then district hospitals with BHUs having the lowest share. This reflects the more advanced services provided at referral hospitals and district hospitals that requires more intensive drugs, supplies and equipment.

7.4. Cost efficiency and cost effectiveness

Cost efficiency

Providing services in a cost efficient way means optimizing the output given the input or minimizing the input to a given output – or put in another way *getting most value for money*.

It can be difficult to measure as there is – as also mentioned above - generally no system in place to compute costs, productivity or efficiency indicators to support rational use of resources. The difficulties of tracking drugs and consumables to patients inhibit cost efficiency improvements.

Likewise the cost variations seen at facilities are related both to the way services are delivered as well as the demand for services that affect costs. Further analysis is needed to distinguish one from the other.

The centralized system of supplying drugs and equipment has the disadvantage that the cost-awareness of staff at the facilities is very low. There is no clear system supporting rational and cost-efficient drug and medical supply use. The DVED are working towards improving this and its efforts in this regard would benefit from being supported.

With availability of this information and further adaption of production inputs to actual demand for services cost efficiency can be improved.

Cost efficiency is further discussed on the section on productivity below where variations in one input factor (staff) are compared to actual output in terms of in- and outpatients.

Cost effectiveness

Where cost-efficiency is about optimizing the production/delivery of services at a health facility, cost-effectiveness is about choosing the correct and cost-effective options. For example where is it most cost-effective to supply the services?

The results of the study are very clear and summarized in the table below.

Table 7.2: Unit costs by level of facility in 2009/10 in BTN

	Referral Hs Unit Cost	District Hs Unit Cost	BHU I Unit Cost	BHU II Unit Cost
OUTPATIENT DEPARTMENT				
- OPD-visit	635	307	163	161
INPATIENT DEPARTMENT				
- Admissions	*17,354*	10,116	5,657	NA
- Beddays	*2,795*	NA	NA	NA

Note: Various sources used as outlined in the methodology section.

The higher level of the health facility the higher is the unit cost. This is the case for OPD-visits as well as inpatient admissions. An OPD-visit at a BHU is about half the cost of a district hospital and about one-fourth of a referral hospital. Inpatient unit cost is about BTN 5,700 at BHUs, BTN 10,000 at district hospitals and more than BTN 17,000 at referral hospitals.

So the most cost-effective way of providing services would be to supply them at the lowest level possible. Visits at the facilities and interviews with the staff in general identified the BHUs as the least busy whereas the higher the level of the facility the more busy it will be. This is obvious when visiting JDWNRH and looking at the long lines of OPD-patients waiting for consultations. So not only would it be less expensive to have more people receive services at a lower level it would also relieve the higher level facilities of some of the pressure from people coming to receive services and patients will spend less time waiting at facilities.

It is generally observed in Bhutan that the referral system is not working very well. Patients go to a facility of their own choosing. A filter system for elective services could be an option with the initial point of contact to the health system being the BHU where people live. The BHU could then either treat or if necessary refer to the lowest level facility supplying the type of services the patient needs.

If we assume that just ten percent of the patients at referral hospitals could receive services at district hospitals and again that ten percent of patients at district hospitals could receive services at BHUs this means that for just the 13 facilities included in the study about BTN 32,000,000 could be saved on a yearly basis in the long run. That is roughly the cost of running 15 BHUs in one year.

This is of course a simplified calculation and is in general under the assumption that the capital items in the long run will adapt to the demand in order make changes in the fixed costs and not only variable costs. However, even taking the simplicity in mind the study supports the fact that cost savings can be made by increasing cost efficiency and cost effectiveness of delivered services and channel the patients to the right facilities.

7.5 Productivity

A key factor that affects unit costs at all facilities is the productivity of staff. In table 7.3 below some overall productivity indicators of the 13 facilities can be seen. The numbers are a bit rough but give an indication of the variations among facilities.

Table 7.3 Productivity of health facilities

Facility Name	Number of staff (FTE)	OPD-visits	Admissions	OPD-visits per FTE staff	Admissions per FTE staff
JDWNRH	730	383,658	11,662	525	16.0
Mongar RRH	261	13,025	3,608	50	13.8
Gelephu RRH	180	61,350	3,422	340	19.0
Paro DH	85	46,099	3,223	542	37.9
Wangdi Choling DH	43	69,447	977	1,615	22.7
Damphu DH	47	16,102	1,106	343	23.5
Punakha DH	76	36,838	2,058	485	27.1
Gyelposhing BHU I	9	9,046	49	1,005	5.4
Bajo BHU I	45	21,655	1,123	481	25.0
Bali BHU I	35	18,844	476	538	13.6
Genekha BHU II	4	3,235	NA	809	NA
Mendelgang BHU II	4.5	6,565	NA	1,459	NA
Thinleygang BHU II	4	7,119	NA	1,780	NA
Total	1,523.5	623,536	27,704	409	18.3

Note: Various sources used as outlined in the methodology section.

It should be noted that the productivity numbers are based on total staff. That means for example that OPD-visits per full-time-equivalent staff include all staff of the facility and not only the staff working in the OPD-department. So for example BHU IIs will score higher on OPD-visits since they have no or very limited IPD-services.

In general the higher the number the more productive is the facility. For example Wangdo Choling Hospital has a very high OPD-productivity and is also the district hospital with the lowest unit cost per OPD-visit.

The variations in the numbers indicate that there are areas where the staffing could be more aligned with the actual activity taking place at the facility. Low numbers is an indication of cost inefficiency.

The results reflected in table 7.3 emphasizes that assignment of personnel to the facilities is not optimally linked to outputs or productivity. More optimal and cost efficient options for assigning personnel are available and should be further investigated.

8. Concluding remarks and recommendations

The objectives of the study were to cost the delivery of health services at different levels in Bhutan in order to:

- Inform MOH of the cost of delivering various types of services at different levels;
- Increase cost-awareness and knowledge;
- Inform the policy process and input to decision making

Analysis, where feasible, of the cost efficiency and cost effectiveness of the services provided by the Government of Bhutan.

Main results and observations

The results as reflected in the report meet the above objectives and some of the main observations are summarized below:

- ***Costs and cost-structures at facilities***. The study gives a detailed insight into total costs, cost-structures and composition of costs of facilities at various levels.

- ***Unit costs***. The costs of OPD-visits, admissions in general as well as disease-specific groupings of admissions have been calculated and shows – as would be expected – that services are generally more costly at higher levels. An OPD-visit is generally four times as costly at a referral hospital compared to a BHU and twice as costly compared to a district hospital. Inpatients unit costs show the same pattern. The average inpatient cost of a referral hospital is about three times that of a BHU and more than one-half time that of a district hospital.

- ***Cost-effectiveness***. Providing services at the lowest effective level of service delivery (facilities) is the most cost-effective way of providing services in the long run. It is a challenge to control demand for services and channel the patients to the right facilities. If this is managed, it will in the longer run result in cost savings.

- ***Cost-efficiency***. More optimal and cost efficient options for assigning personnel to facilities are available and if pursued could result in both cost cutting and reductions in waiting times for patients.

- ***Data issues***. In general a huge amount of health related data is available in Bhutan. The costing study reviewed a lot of these sources extensively and the review and analysis conducted as a part of the study especially uncovered two areas that would benefit greatly from renewed focus and improvements. These were the Bhutanese Health Management and Information System (BHMIS) and the data management of equipments and drugs at the Drugs, Vaccines and Equipment Division (DVED) of the MOH.

Way forward – and recommendations

This study is the first comprehensive attempt to do costing analysis in Bhutan. As such it should be seen as a starting point for further analysis in specific areas like for example costing of diagnostic services.

The methodology has been described in detail and the standard costing model can be used to include other facilities, update costing data in order to follow yearly developments in cost of services. The methodology can be further developed and fine-tuned. Data and data sources used in the costing exercise – as well as other areas – can undergo improvements in order to increase both precision of the costing as well as general quality of the information. Information that can be used together with the results of the costing exercise to assist decision makers in making informed decisions.

The results can be used as input in the design of new policies. Should the current political discussions regarding charging non-Bhutanese for health services materialize the results of the unit costing can be used to set tariffs.

In addition to the above mentioned areas/options for using the results, there are especially two other areas where the analysis done in the study points towards efficiency gains and cost cutting. These are **firstly** a revision – or development - of the referral system and **secondly** further analysis of productivity at the facilities.

It is therefore **recommended** to:

- Analyze options for developing and implementing a referral system for elective services in Bhutan that embraces cost-effective provision of services by channeling the patients to facilities with the lowest level of effective service delivery. – If the service needed by a patient is provided at a district hospital the patient should in principle not receive it at a referral hospital.
- Further analyze productivity – especially in terms of allocated personnel – in order to more effectively align staff allocations with actual output of the facilities. This will both ensure a more cost efficient use of resources as well as reducing waiting times in “over-populated” facilities.

ANNEX A: METHODOLOGY

This study used an easily replicable methodology to assess the cost of resources used to provide services at health facilities in Bhutan.

Scope

The unit cost study was designed to relate activities carried out in a number of health facilities to the costs of undertaking those activities. Data limitations and the time available for the study limited the number of unit costs to be derived from the data. It is important to note that the study was not designed to assess the quality of the care or the outcome of care provided and so no judgment can be made on the relative cost-benefit of care provided by different facilities.

Likewise the unit costs represent the average cost for each facility. No marginal costing was done.

Sample size

A total of 13 facilities plus their attached out-reach clinics was covered in nine different districts. They are represented in the table below.

Although only 13 facilities (plus attached out-reach clinics) of a total of 213 facilities was studied, if viewed from a service delivery point about 60 and 57 percent of respectively total OPD and IPD cases in Bhutan was covered. Hence coverage in terms of services delivered was very high. This is due to the fact that all the referral hospitals as well as some of the larger district hospitals are covered by the study.

Table B.1: Health facilities studied

Facility Name	Facility Type	Dzongkhag/District
JDWNRH	National Referral Hospital	Thimphu
Mongar RRH	Regional Referral Hospital	Mongar
Gelephu RRH	Regional Referral Hospital	Sarpang
Paro DH	District Hospital	Paro
Wangdi Choling DH	District Hospital	Bumthang
Damphu DH	District Hospital	Tsirang
Punakha DH	District Hospital	Punakha
Gyelposhing BHU I	Basic Health Unit, Grade I	Mongar
Bajo BHU I	Basic Health Unit, Grade I	Wangdi Phodrang
Bali BHU I	Basic Health Unit, Grade I	Haa
Genekha BHU II	Basic Health Unit, Grade II	Thimphu
Mendelgang BHU II	Basic Health Unit, Grade II	Tsirang
Thinleygang BHU II	Basic Health Unit, Grade II	Punakha

Perspective

The perspective adopted for the study is the viewpoint of the facility – not from a society or patient perspective. The costs are thus the costs related to providing services at a given facility. This ensures comparability and uniformity of the results as well as providing institutional information as input to the policy process.

Hence costs incurred by patients (travel, cost of an escort, etc.) have not been considered. Likewise costs of central MOH and various vertical programmes have not been estimated and used as overheads for the individual health facilities. Finally costing of out-of-country referrals is not covered by the study.

Timing

The timing of the study is outlined below. The study was originally foreseen to be finalized by July 2011 but data collection took longer than expected and the nature and quality of the data also caused delays in the data processing and thus the final report.

April: Startup – situation analysis, facility visits and setup of data collection. Consultants first visit and inception report.

May - July: Data collection by Ministry of Health

June: Further data collection, facility visits and interviews. Consultants second visit.

July - September: Data processing and report writing

Preparation

The consultant worked closely with officers from the Policy & Planning Department of the Ministry of Health. The initial visit in April 2011 was used to survey facilities, identify and evaluate data sources and set up data collection. The main decentral (facility) data collection was carried out by MOH officials in May and June 2011 following guidelines developed during the first visit of the consultant.

Sample of facilities

The three major referral hospitals were all included in the study. Likewise were four district hospitals and six basic health units (three grade I and three grade II). Out-reach clinics under the respective facilities was also costed. However, the HMIS data collected did not distinguish between services provided at the facility and services provided as a part of the out-reach services. Hence the cost of out-reach services was included in the total cost of the facilities and thus included in the unit costs of the entire facility.

The facilities to be included in the study were decided by the MOH. The selection of district hospitals and basic health units was not done randomly. Geography and logistics played a role in the selection with travel distance being one of the key determinants. The limited time available for the study made it necessary to minimize time spent travelling. Hence there is an overrepresentation of facilities from the western part of the country.

Data collection guidelines

Data sources were reviewed during the inception visit in April 2011 and guidelines for data collection were developed. The can be seen in the Inception Report in annex C.

Definition of final product

The final product was defined initially during the inception visit and further revised and developed during the consultant's second visit in June. The developed standard costing model was designed in accordance with the desired output. Initially it was the ambition to include costing of deliveries, unit costs of ANC visits as well as cost of immunization and family planning services. However, further analysis of performed interviews and collected data made it clear that costing of these would require further in-depth studies.

Period covered

The period chosen for the study is at the time of the study the most recent financial year 2009/10. A period of one year was chosen in order to equalize seasonal variations as well as some key data is only available on an annual basis like the final financial statements of the facilities.

Data collection

The study required the collection of huge amounts of data from all levels as well as interviews with key staff at facilities and central agencies.

In general a lot of data is available in Bhutan. All facilities are fully financed by the government. Drugs, consumables and equipment are supplied from the MOH and detailed records were in principle available. The Infrastructure Department of the MOH has data and information related to construction of facilities. The Bhutanese Health Management Information System is well developed and a lot of data is being reported using a system of standard forms at facilities that are collected at district level, summarized and then send electronically to the MOH. The referral hospitals keep their own records and these were also made available and used for the study. Finally the facility-wise yearly financial statements was the main source for the facility-wise recurrent costs. In the table below is an overview of the data collected and the sources:

Information / Data	Source
Facility financial statements	Dzongkhag administrations or facility
Staff lists and salaries	Dzongkhag administrations or facility
Staff allocations to departments	Individual facilities
Drugs	MOH/DVED
Non-drug consumables	MOH/DVED
Equipment	MOH/DVED and MOH
Buildings and cost of buildings	MOH – Buildings and infrastructure department
Activity data by facility	MOH/HMIS and referral hospitals

Bhutan is a small country and the government is the only provider of health services. This gives the government a unique opportunity for full insight into all inputs to the system – from drugs, equipment and buildings to personnel; as well as outputs of the system in terms of services delivered. This opportunity is currently not being fully utilized.

The collection and processing of data revealed shortcomings that Bhutan could benefit from improving. Some of the major ones were:

- The DVED supplied huge amounts of data and worked with high effort to satisfy the needs for the study. However, the data received was incomplete with some areas clearly missing – even after revisions. The major ones being purchase prices of all equipment could not be produced; records of facility drug consumption were not available; the supplied drug list seems to have drugs missing in the list and equipment lists of facilities unclear. A new system to record and manage the information was currently being implemented and it looked promising. Hopefully this can improve the situation.

- The BHMIS is not consistent and duplication is present with same data being reported by different forms - and the results do not match. An example is number of admissions being reported in one form. In another form inpatients by disease – a disaggregation of admissions by disease – is reported. The two numbers do not match. And for the three referral hospitals, that has their own records department, a third and different number from the other two can be found.

- Disease coding is not uniform. A grouping of about 80 codes is being used in most facilities with JDWNRH using a more elaborate version. Likewise coding is inconsistent from facility to facility. For example in the BHMIS form where inpatients are recorded by disease, facilities record a normal delivery differently and some not at all as it is not perceived as a disease. The ICD10 codes and structure of the BHMIS morbidity reports is in need of a review.

- JDWNRH has the most elaborate inpatient medical records system with detailed coding of diagnosis, patient data, bed-days etc. However, outpatient reports by disease are not available as is the case for all other facilities in the country.

STANDARD COSTING MODEL

A standard costing model was developed and used for all 13 facilities. The model is supplied in soft-copy together with this report. It can thus used to cost other health facilities in Bhutan as well as being used as a basis for further development of costing in Bhutan. It has been designed in excel with all computations being done automatically based on input of data in the model.

All data in the model is based on collected data from the various sources as outlined above. In general all estimations are based on facts from data, and it was rare to find completely missing data that required full estimations of the cost items. However, as mentioned above there were issues with the quality of data – especially in areas where different options for the same number

was available. Likewise there were areas where data was clearly missing or obviously too low – and some too high. So some assumptions and modifications were made along the way. The major ones are listed below:

- No equipment data available for BHU grade II's. Based on information from grade I BHUs an annual depreciation cost of equipment was estimated at BTN 100,000
- Disease specific admissions at BHU grade I's and district hospitals was in general lower than total reported admissions. The residual of the total admissions was allocated to diseases using the same distribution as reported in the disease specific admissions report
- In general drugs and consumables is what were supplied to the facility in the period 2009/10. Data on actual consumption was not available except for JDWNRH (and this was used for JDWNRH)
- Inpatient data from the referral hospitals was sorted and organized. Obvious wrong entries were deleted. This included length of stay above 1000 days, entries with wrong disease codings, etc. In total about 200 admissions was deleted from JDWNRH and about 20 – 50 from the other two referral hospitals.
- Prices for equipments were difficult to obtain. In general latest price was used. This varied from 2007 – 2011 prices. It is common to see fluctuations from year to year (both up and down) in prices on equipment. Hence it was not deemed necessary to adjust reported prices to 2009/10 level.
- Many of the reported equipment items and consumables were irregular. Larger hospitals having less equipment than smaller ones are just one example. This was not regulated and the reported numbers were used. This should be taken into consideration when interpreting the results.
- The druglist even though including about 500 items seemed incomplete as some of the essential vaccines for example were not on the list. This was not regulated and the reported numbers were used. This should be taken into consideration when interpreting the results.
- Some prices on drugs seemed questionable. For example the unit cost of arthemeter & lumefanthrine treatment for malaria is extremely high and hopefully wrong. This was not regulated and the reported numbers were used. This should be taken into consideration when interpreting the results.
- There seems to be a "jump" in the costing of buildings from BHU I to district hospitals with a cost per square meter being more than double at district hospitals and above. The sources for the costing of these are the same but reported separately.
- Some data for Thinleygang was unusable and hence some of the numbers used are estimated based on the very similar facility Mendelgang.

Defining cost centers

Standard costing methodology with a top-down approach was used. A bottom-up approach was used to assess direct cost at the various departments or "cost centers" where staff time was allocated directly according to interviews and filling in a staff allocation form.

In accordance with the functional structure of health facilities in Bhutan and the available data a standard model was developed. The model that is being used for all 13 facilities have a number of cost centers identified at three levels:

- Overhead Cost Centers: Includes administration (accounting, etc.) and general services (security, maintenance, reception, telephone operators, etc.).
- Intermediate Cost Center: Includes various supportive functions like investigative services (radiology, laboratory, etc.), operating theatre and kitchen.
- Final Cost Centers. Includes final service provision like outpatient and inpatient departments as well as indigenous and Maternal and Child Health. No unit costing was done for the last two areas as the quality of the activity data was not adequate and likewise further in-depth interviews at all facilities would be needed.

Inputs to each cost center were identified, quantified and given a financial value. To allocate the cost of the overhead and intermediate cost centers to final cost centers a step-wise approach was used. Finally unit costs for final cost centers could be calculated. This is dealt with in further detail in the following.

The number of cost centers was defined according to the desired output of the study. The different cost centers are depicted in the table below.

Table B.2: Cost Centers of the Standard Costing Model

Overhead	Intermediate	Final
Administration	Imaging	Outpatient department
Transport	Kitchen	Inpatient department
Staff quarters	Laboratory	• Medical
Security & Maintenance	Pharmacy/Dispensary	• Surgical & medical
	Operating Theatre	Maternal & Child Health Indigenous Unit

The inpatient department was divided into medical and medical & surgical wards. Based on the disease groupings patients could be classified as either of these. Since it is not possible with certainty by disease grouping to know whether surgical or medical (or both) procedures was used in the treatment, the group surgical & medical covers diseases where both procedures can be used and medical only covers diseases where treatment is purely medical and not surgical.

Obviously not all facilities have all cost centers. Likewise the more advanced facilities could benefit from a more detailed division of cost centers. A uniform model was selected taking time allocated for the study, simplicity and methodological rigorousness in to consideration.

Capital Costs

Both capital and recurrent costs was considered in the study. A unit cost analysis that ignores capital costs is assuming that physical assets will be available forever. The daily use of these assets (buildings, equipment, etc.) and the depreciation of capital items is an expense – even though it is not an expenditure (i.e. like salaries and drugs are an expenditure).

The annual depreciation cost of capital items may be quite hard to measure if certain information is not available like purchase price and life expectancy of items. It may therefore be very sensitive to the assumptions made. For the purpose of the study all capital items was given a financial value and a life expectancy. The yearly depreciation cost of capital items was then calculated using a depreciation rate of six percent based on developments the latest years in the Bhutanese consumer price-index.

To calculate the yearly depreciation cost of capital items a standard method was used. If the capital outlay is K, we need to find the annual sum E which over a period of n years (the life of the capital item), at an interest rate r, will be equivalent to K. This is expressed by the following formula:

$$\mathrm{K} = E\,\frac{1-(1+r)^{-n}}{r}$$

This formula was used to calculate the annual depreciation cost of capital items (for more on annualization of capital items see *Methods for the Economic Evaluation of Health Care Programmes by Drummond et. al, 2005.*

The level of detail behind the calculations of the annual depreciation of capital items is very high. More than 1,300 types of different equipment have had life expectancy estimated in order to calculate the annual depreciation cost. To do this, items was grouped in four groups of assumed life expectancy: 1, 5, 10 and 15 years. Those with one year life expectancy were naturally considered a consumable. In the literature it is generally assumed that clinical items only have a life expectancy of 5 years (see for example: *Methods for the Economic Evaluation of Health Care Programmes by Drummond et. al, 2005.*). However, for this exercise clinical items was generally grouped to either 5 or 10 years based on factors like price, type and general judgment of the consultant. Only various stout furniture etc. was given a life expectancy of 15 years. Vehicles were given a life expectancy of 10 years and buildings 30 years.

Calculate direct costs for each cost center

The various input data was allocated to the cost centers. Staff was allocated according to facility filled forms of staff allocations. Many staff typically works in multiple departments. For example, sometimes doctors or nurses work for both inpatient and outpatient departments. Staff time and related salaries are thus allocated to relevant cost centers according to the proportion of the time spent at that cost center.

Drugs were allocated to the pharmacy as was medical supplies that could not directly be allocated to other cost centers. Cost of utilities was allocated to overhead cost centers.

Step-wise allocation of overhead and intermediate cost centers to final cost centers

Above all cost was allocated to overhead, intermediate or final cost centers. The cost allocated to overhead and intermediate can be seen as indirect cost that in the next step has to be allocated to the final cost centers.

The first step of this allocation is to take all overhead costs and allocate it to intermediate and final cost centers. Then take the new intermediate cost centers and allocate these to the final cost centers. To do this certain allocation rules were used. These are summarized and commented in the table below.

Cost Center	Allocation rule
Overhead	
Administration	Allocated to intermediate and final cost centers based on share of direct cost
Transport	Allocated to intermediate and final cost centers based on share of direct cost
Staff quarters	Allocated to intermediate and final cost centers based on share of direct cost
Security & Maintenance	Allocated to intermediate and final cost centers based on share of direct cost
Intermediate	
Imaging	Allocated to final cost centers: OPD, IPD and MCH based on share of direct cost
Kitchen	Allocated fully to IPD and IPD medical and surgical weighted based on number of admissions of each type
Laboratory	Allocated to final cost centers: OPD, IPD and MCH based on share of direct cost
Pharmacy/Dispensary	10 percent allocated to MCH, 90 percent to IPD and OPD based on activity giving 4 OPD-visit the same weight as 1 IPD-admission.
Operating Theatre	Fully allocated to surgical IPD

Calculate unit costs

After the step-wise allocation of costs to final cost centers unit costs are easily calculated by dividing total cost of each final cost center with the activity of the cost center.

The calculations of unit costs for disease-specific inpatients were done using weights to each disease-group. Bed days per disease group were used as the weight. Unique data of disease-wise bed-days were available from the inpatient records of the three referral hospitals. This data was not available from district hospitals and basic health units. Hence the weights used for these were based on a weighted average of the three referral hospitals.

ANNEX B: DETAILED FACILITY DATA

This annex contains more detailed data for each of the 13 facilities. In the excel-file accompanying this report more data is available – including all data on the capital items and annualization of these; detailed data on drugs and weights used to calculate disease specific inpatient costs; step-by-step tables showing the allocation from overhead and intermediate cost centers to final

JDW National Referral Hospital

TOTAL COSTS		
	BTN	PERCENT
Recurrent cost	**367,228,683**	**76.4**
- Staff	163,739,489	34.1
- Drugs and medical supplies	157,095,702	32.7
- Other	46,393,492	9.6
Capital cost	**113,574,306**	**23.6**
- Buildings	50,044,316	10.4
- Equipment	57,986,587	12.1
- Vehicles	5,543,403	1.2
TOTAL COST	**480,802,988**	**100.0**

FIXED vs. VARIABLE COSTS		
	BTN	PERCENT
Fixed costs	307,006,609	63.9
Variable costs	173,796,379	36.1
Total	**480,802,988**	**100.0**

TOTAL COST FOR FINAL COST CENTRES AND UNIT COSTS				
	Cost	Activity	Number	Unit Cost
Outpatient department	228,886,403	OPD-visits	383,658	597
Inpatient department	208,145,466	Admissions	11,662	17,848
		Beddays	74,070	2,810
- *All Medical*	40,573,558	Admissions	1,794	22,616
		Beddays	16,506	2,458
- *Surgical & Medical*	167,571,908	Admissions	9,868	16,981
		Beddays	57,565	2,911
Maternal & Child Health (MCH)	43,771,120			
Indigenous Unit	-			
Total	**480,802,988**			

RECURRENT COSTS			
	BTN	PERCENT	Cost Type
STAFF	**163,739,489**	**44.6**	**F**
Pay and allowances	152,509,000	41.5	F
Other personal emoluments	975,000	0.3	F
Contributions Provident Fund	8,501,829	2.3	F
Retirement benefits	1,753,660	0.5	F
DRUGS AND MEDICAL SUPPLIES	**157,095,702**	**42.8**	**V**
Drugs	31,273,637	8.5	V
Medical supplies	125,822,065	34.3	V
- Anastethics	65,424,243	17.8	V
- General consumables	-	-	V
- Gynaecology	203,541	0.1	V
- Operating Theater	917,289	0.2	V
- Pediatric	419,040	0.1	V
- Physiotherapy	399,015	0.1	V
- Imaging (x-ray/ultra-sound)	55,806,238	15.2	V
- Sutures	2,652,699	0.7	V
OTHER RECURRENT COSTS	**46,393,492**	**12.6**	
Utilities	**12,771,570**	**3.5**	F
- Water, electricity, sewerage	10,898,589	3.0	F
- Fuel wood	359,603	0.1	F
- Telephone, postage, fax, etc.	1,513,378	0.4	F
Stationary, office supplies	**3,772,000**	**1.0**	F
Uniforms and linen	**2,668,961**	**0.7**	F
Patient Diet	**4,235,071**	**1.2**	V
Transport	**199,626**	**0.1**	V
Maintenance	**7,378,749**	**2.0**	F
- Buildings	3,689,732	1.0	F
- Vehicles	1,965,794	0.5	F
- Equipment	1,723,223	0.5	F
Travel allowances	**12,265,980**	**3.3**	V
Other	**3,101,536**	**0.8**	F
Total	**367,228,683**	**100.0**	

CAPITAL COSTS - annual depreciation cost			
	BTN	PERCENT	COST TYPE
Buildings	**50,044,316**	**44.1**	**F**
- Health facility	45,187,725		F
- Out-Reach Sheds	25,427		F
- Staff quarters	4,831,164		F
Equipment	**57,986,587**	**51.1**	**F**
- General	7,179,152		F
- In-Patient Dep	4,767,685		F
- Out-Patient Dep	-		F
- Operating Theater	14,333,183		F
- Laboratory	5,977,497		F
- Kitchen	571,878		F
- Imaging (x-ray/ultra-sound)	17,351,322		F
- Maternal & Child Health	-		F
- Dental	3,926,723		F
- Other	3,879,148		F
Transport	**5,543,403**	**4.9**	**F**
Total	**113,574,306**	**100.0**	

DIRECT COST PER COST CENTRE		
	BTN	**PERCENT**
Overhead Cost Centres	**72,043,853**	**15.0**
Administration	41,875,017	8.7
Transport	7,662,384	1.6
Staff quarters	4,831,164	1.0
Security & Maintenance	17,675,288	3.7
Intermediate Cost Centres	**264,148,796**	**54.9**
Imaging	84,593,716	17.6
Kitchen	5,646,666	1.2
Laboratory	33,658,194	7.0
Operating Theater	29,160,796	6.1
Pharmacy/Dispensary	111,089,424	23.1
Final Cost Centres	**144,610,339**	**30.1**
Outpatient department	58,010,864	12.1
Inpatient department	72,238,975	15.0
- All Medical	*17,366,935*	*3.6*
- Surgical & Medical	*54,872,041*	*11.4*
Maternal & Child Health (MCH)	14,360,501	3.0
Indigenous Unit	-	-
Total	**480,802,988**	**100.0**

TOTAL COST FOR FINAL COST CENTRES		
	BTN	**PERCENT**
Outpatient department	**228,886,403**	**47.6**
Inpatient department	**208,145,466**	**43.3**
- All Medical	40,573,558	8.4
- Surgical & Medical	167,571,908	34.9
Maternal & Child Health (MCH)	**43,771,120**	**9.1**
Indigenous Unit	**-**	**-**
Total	**480,802,988**	**100.0**

DISEASE SPECIFIC INPATIENT COSTS		
Disease grouping	**Activity**	**Admission Cost**
INFECTIONS		-
- Diarrhoea	155	8,112
- Tuberculosis	125	46,705
- Other infections	40	11,928
VIRAL, PROTOZOAL & HELMINTHIC DIS.	263	15,541
NEOPLASM	1,031	24,405
BLOOD DISEASE	72	20,423
ENDOCRINE, METABOLIC & NUTR.		-
- Diabetes	120	28,760
- Other endocrine etc.	47	32,589
MENTAL DISORDERS	243	28,439
DISEASE OF NERVOUS SYSTEM	148	30,647
EYE & EAR DISEASES		-
- Cataract	85	30,566
- Other Eye & Ear	217	23,122
DISEASE OF CIRCULATORY SYSTEM		-
- Hypertension	53	24,336
- Other circulatory etc.	402	23,685
RESPIRATORY DISEASE		-
- Common Cold	17	7,866
- Pneumonia	301	18,436
- Other respiratory	437	20,179
DISEASES OF THE DIGESTIVE SYSTEM		-
- Peptic Ulcer Syndrome	75	16,715
- Alcohol Liver Diseases	135	20,648
- Other digestive	955	12,154
SKIN DISEASES	184	31,914
DISEASES OF MUSC-SKEL. ETC.	133	43,072
GENITO-URINARY DISEASES	722	17,694
PREGNANCY, CHILDBIRTH AND PUERP.		-
- Abortions	275	8,733
- Other pregnancy etc.	3,592	8,594
PERINATAL CONDITIONS	753	18,446
MALFORMATIONS	127	29,401
INJURIES AND TRAUMA	955	30,972
ALL	**11,662**	**17,848**

Mongar Regional Referral Hospital

TOTAL COSTS		
	BTN	PERCENT
Recurrent cost	**78,544,890**	**63.0**
- Staff	45,602,000	36.6
- Drugs and medical supplies	8,777,319	7.0
- Other	24,165,571	19.4
Capital cost	**46,180,815**	**37.0**
- Buildings	28,227,798	22.6
- Equipment	13,795,464	11.1
- Vehicles	4,157,552	3.3
TOTAL COST	**124,725,704**	**100.0**

FIXED vs. VARIABLE COSTS		
	BTN	PERCENT
Fixed costs	107,614,895	86.3
Variable costs	17,110,810	13.7
Total	**124,725,704**	**100.0**

TOTAL COST FOR FINAL COST CENTRES AND UNIT COSTS				
	Cost	Activity	Number	Unit Cost
Outpatient department	34,949,150	OPD-visits	13,025	2,683
Inpatient department	72,064,400	Admissions	3,608	19,974
		Beddays	24,051	2,996
- *All Medical*	18,330,638	Admissions	1,032	17,762
		Beddays	7,413	2,473
- *Surgical & Medical*	53,733,762	Admissions	2,576	20,859
		Beddays	16,639	3,229
Maternal & Child Health (MCH)	15,944,199			
Indigenous Unit	1,767,165			
Total	**124,724,914**			

RECURRENT COSTS			
	BTN	PERCENT	COST TYPE
STAFF	**45,602,000**	**58.1**	**F**
Pay and allowances	42,536,000	54.2	F
Other personal emoluments	715,000	0.9	F
Contributions Provident Fund	2,038,000	2.6	F
Retirement benefits	313,000	0.4	F
DRUGS AND MEDICAL SUPPLIES	**8,777,319**	**11.2**	**V**
Drugs	4,419,553	5.6	V
Medical supplies	4,357,766	5.5	V
- Anastethics	453,480	0.6	V
- General consumables	1,740,300	2.2	V
- Gynaecology	80,317	0.1	V
- Operating Theater	311,020	0.4	V
- Pediatric	613,265	0.8	V
- Physiotherapy	191,716	0.2	V
- Imaging (x-ray/ultra-sound)	422,903	0.5	V
- Sutures	544,764	0.7	V
OTHER RECURRENT COSTS	**24,165,571**	**30.8**	
Utilities	**2,612,741**	**3.3**	F
- Water, electricity, sewerage	1,189,464	1.5	F
- Fuel wood	872,606	1.1	F
- Telephone, postage, fax, etc.	550,671	0.7	F
Stationary, office supplies	**1,432,842**	**1.8**	F
Uniforms and linen	**364,650**	**0.5**	F
Patient Diet	**1,740,491**	**2.2**	V
Transport	**63,000**	**0.1**	V
Maintenance	**11,190,847**	**14.2**	F
- Buildings	5,553,882	7.1	F
- Vehicles	2,229,965	2.8	F
- Equipment	3,407,000	4.3	F
Travel allowances	**6,530,000**	**8.3**	V
Other	**231,000**	**0.3**	F
Total	**78,544,890**	**100.0**	

CAPITAL COSTS - annual depreciation cost			
	BTN	PERCENT	COST TYPE
Buildings	**28,227,798**	**61.1**	**F**
- Health facility	27,316,053		F
- Out-Reach Sheds	76,282		F
- Staff quarters	835,464		F
Equipment	**13,795,464**	**29.9**	**F**
- General	6,053,195		F
- In-Patient Dep	763,095		F
- Out-Patient Dep	40,062		F
- Operating Theater	1,797,409		F
- Laboratory	1,414,839		F
- Kitchen	1,078,640		F
- Imaging (x-ray/ultra-sound)	568,861		F
- Maternal & Child Health	95,132		F
- Dental	721,746		F
- Other	1,262,484		F
Transport	**4,157,552**	**9.0**	**F**
Total	**46,180,815**	**100.0**	

DIRECT COST PER COST CENTRE		
	BTN	**PERCENT**
Overhead Cost Centres	**46,414,137**	**37.2**
Administration	13,591,998	10.9
Transport	6,765,796	5.4
Staff quarters	835,464	0.7
Security & Maintenance	25,220,879	20.2
Intermediate Cost Centres	**30,972,985**	**24.8**
Imaging	991,764	0.8
Kitchen	3,458,009	2.8
Laboratory	8,419,588	6.8
Operating Theater	7,544,021	6.0
Pharmacy/Dispensary	10,559,603	8.5
Final Cost Centres	**47,337,792**	**38.0**
Outpatient department	14,486,006	11.6
Inpatient department	24,302,055	19.5
- All Medical	*7,489,838*	*6.0*
- Surgical & Medical	*16,812,217*	*13.5*
Maternal & Child Health (MCH)	7,440,185	6.0
Indigenous Unit	1,109,546	0.9
Total	**124,724,914**	**100.0**

TOTAL COST FOR FINAL COST CENTRES		
	BTN	**PERCENT**
Outpatient department	**34,949,150**	**28.0**
Inpatient department	**72,064,400**	**57.8**
- All Medical	18,330,638	14.7
- Surgical & Medical	53,733,762	43.1
Maternal & Child Health (MCH)	**15,944,199**	**12.8**
Indigenous Unit	**1,767,165**	**1.4**
Total	**124,724,914**	**100.0**

DISEASE SPECIFIC INPATIENT COSTS		
Disease grouping	**Activity**	**Admission Cost**
INFECTIONS		-
- Diarrhoea	31	6,182
- Tuberculosis	90	50,942
- Other infections	32	9,598
VIRAL, PROTOZOAL & HELMINTHIC DIS.	38	20,877
NEOPLASM	-	-
BLOOD DISEASE	55	21,177
ENDOCRINE, METABOLIC & NUTR.		-
- Diabetes	37	27,697
- Other endocrine etc.	10	26,213
MENTAL DISORDERS	40	10,967
DISEASE OF NERVOUS SYSTEM	143	16,169
EYE & EAR DISEASES		-
- Cataract	44	25,513
- Other Eye & Ear	135	19,707
DISEASE OF CIRCULATORY SYSTEM		-
- Hypertension	54	10,634
- Other circulatory etc.	105	20,887
RESPIRATORY DISEASE		-
- Common Cold	123	9,644
- Pneumonia	246	13,354
- Other respiratory	203	20,314
DISEASES OF THE DIGESTIVE SYSTEM		-
- Peptic Ulcer Syndrome	23	13,107
- Alcohol Liver Diseases	110	17,311
- Other digestive	278	24,867
SKIN DISEASES	159	22,367
DISEASES OF MUSC-SKEL. ETC.	244	29,527
GENITO-URINARY DISEASES	359	21,185
PREGNANCY, CHILDBIRTH AND PUERP.		-
- Abortions	31	6,459
- Other pregnancy etc.	572	15,751
PERINATAL CONDITIONS	187	19,710
MALFORMATIONS	14	22,961
INJURIES AND TRAUMA	245	20,970
ALL	**3,608**	**19,974**

Gelephu Regional Referral Hospital

TOTAL COSTS		
	BTN	PERCENT
Recurrent cost	**48,033,763**	**57.6**
- Staff	35,859,441	43.0
- Drugs and medical supplies	4,351,393	5.2
- Other	7,822,929	9.4
Capital cost	**35,311,555**	**42.4**
- Buildings	27,668,401	33.2
- Equipment	5,333,403	6.4
- Vehicles	2,309,751	2.8
TOTAL COST	**83,345,317**	**100.0**

FIXED vs. VARIABLE COSTS		
	BTN	PERCENT
Fixed costs	74,197,116	89.0
Variable costs	9,148,202	11.0
Total	**83,345,317**	**100.0**

TOTAL COST FOR FINAL COST CENTRES AND UNIT COSTS				
	Cost	Activity	Number	Unit Cost
Outpatient department	26,916,967	OPD-visits	61,350	439
Inpatient department	44,167,701	Admissions	3,422	12,907
		Beddays	17,918	2,465
- *All Medical*	14,905,157	Admissions	1,273	11,709
		Beddays	7,557	1,972
- *Surgical & Medical*	29,262,544	Admissions	2,149	13,617
		Beddays	10,360	2,824
Maternal & Child Health (MCH)	10,454,217			
Indigenous Unit	1,806,561			
Total	**83,345,446**			

RECURRENT COSTS			
	BTN	PERCENT	Cost Type
STAFF	**35,859,441**	**74.7**	**F**
Pay and allowances	33,613,669	70.0	F
Other personal emoluments	353,600	0.7	F
Contributions Provident Fund	1,749,972	3.6	F
Retirement benefits	142,200	0.3	F
DRUGS AND MEDICAL SUPPLIES	**4,351,393**	**9.1**	**V**
Drugs	3,017,255	6.3	V
Medical supplies	1,334,138	2.8	V
- Anastethics	26,252	0.1	V
- General consumables	1,223,637	2.5	V
- Gynaecology	1,418	0.0	V
- Operating Theater	-	-	V
- Pediatric	8,507	0.0	V
- Physiotherapy	-	-	V
- Imaging (x-ray/ultra-sound)	49,725	0.1	V
- Sutures	24,599	0.1	V
OTHER RECURRENT COSTS	**7,822,929**	**16.3**	
Utilities	**630,003**	**1.3**	F
- Water, electricity, sewerage	296,951	0.6	F
- Fuel wood	146,149	0.3	F
- Telephone, postage, fax, etc.	186,903	0.4	F
Stationary, office supplies	**498,738**	**1.0**	F
Uniforms and linen	**53,480**	**0.1**	F
Patient Diet	**725,442**	**1.5**	V
Transport	**8,750**	**0.0**	V
Maintenance	**1,676,443**	**3.5**	F
- Buildings	499,737	1.0	F
- Vehicles	45,225	0.1	F
- Equipment	1,131,481	2.4	F
Travel allowances	**4,062,617**	**8.5**	V
Other	**167,456**	**0.3**	F
Total	**48,033,763**	**100.0**	

CAPITAL COSTS - annual depreciation cost			
	BTN	PERCENT	COST TYPE
Buildings	**27,668,401**	**78.4**	**F**
- Health facility	27,316,053		F
- Out-Reach Sheds	25,427		F
- Staff quarters	326,921		F
Equipment	**5,333,403**	**15.1**	**F**
- General	1,173,405		F
- In-Patient Dep	530,886		F
- Out-Patient Dep	-		F
- Operating Theater	1,209,130		F
- Laboratory	971,458		F
- Kitchen	-		F
- Imaging (x-ray/ultra-sound)	463,263		F
- Maternal & Child Health	-		F
- Dental	667,490		F
- Other	317,771		F
Transport	**2,309,751**	**6.5**	**F**
Total	**35,311,555**	**100.0**	

DIRECT COST PER COST CENTRE		
	BTN	**PERCENT**
Overhead Cost Centres	**15,569,403**	**18.7**
Administration	7,751,784	9.3
Transport	3,335,085	4.0
Staff quarters	326,921	0.4
Security & Maintenance	4,155,613	5.0
Intermediate Cost Centres	**24,019,167**	**28.8**
Imaging	1,600,226	1.9
Kitchen	1,089,464	1.3
Laboratory	6,732,486	8.1
Operating Theater	8,678,686	10.4
Pharmacy/Dispensary	5,918,305	7.1
Final Cost Centres	**43,756,875**	**52.5**
Outpatient department	14,647,599	17.6
Inpatient department	21,032,702	25.2
- All Medical	*9,439,750*	*11.3*
- Surgical & Medical	*11,592,952*	*13.9*
Maternal & Child Health (MCH)	6,607,488	7.9
Indigenous Unit	1,469,085	1.8
Total	**83,345,446**	**100.0**

TOTAL COST FOR FINAL COST CENTRES		
	BTN	**PERCENT**
Outpatient department	**26,916,967**	**32.3**
Inpatient department	**44,167,701**	**53.0**
- All Medical	14,905,157	17.9
- Surgical & Medical	29,262,544	35.1
Maternal & Child Health (MCH)	**10,454,217**	**12.5**
Indigenous Unit	**1,806,561**	**2.2**
Total	**83,345,446**	**100.0**

DISEASE SPECIFIC INPATIENT COSTS		
Disease grouping	**Activity**	**Admission Cost**
INFECTIONS		-
- Diarrhoea	130	8,481
- Tuberculosis	86	44,377
- Other infections	65	8,387
VIRAL, PROTOZOAL & HELMINTHIC DIS.	315	7,549
NEOPLASM	43	11,968
BLOOD DISEASE	58	9,385
ENDOCRINE, METABOLIC & NUTR.		-
- Diabetes	53	18,145
- Other endocrine etc.	25	12,623
MENTAL DISORDERS	19	10,381
DISEASE OF NERVOUS SYSTEM	28	11,306
EYE & EAR DISEASES		-
- Cataract	15	16,099
- Other Eye & Ear	16	19,330
DISEASE OF CIRCULATORY SYSTEM		-
- Hypertension	55	8,481
- Other circulatory etc.	69	20,422
RESPIRATORY DISEASE		-
- Common Cold	158	6,903
- Pneumonia	143	11,045
- Other respiratory	268	13,705
DISEASES OF THE DIGESTIVE SYSTEM		-
- Peptic Ulcer Syndrome	38	7,100
- Alcohol Liver Diseases	100	13,214
- Other digestive	146	14,420
SKIN DISEASES	256	15,376
DISEASES OF MUSC-SKEL. ETC.	42	13,988
GENITO-URINARY DISEASES	212	12,008
PREGNANCY, CHILDBIRTH AND PUERP.		-
- Abortions	81	7,061
- Other pregnancy etc.	658	12,434
PERINATAL CONDITIONS	24	29,869
MALFORMATIONS	2	8,473
INJURIES AND TRAUMA	317	14,047
ALL	**3,422**	**12,907**

Paro District Hospital

TOTAL COSTS		
	BTN	PERCENT
Recurrent cost	**31,792,854**	**61.9**
- Staff	18,781,853	36.6
- Drugs and medical supplies	8,471,533	16.5
- Other	4,539,468	8.8
Capital cost	**19,555,130**	**38.1**
- Buildings	17,323,172	33.7
- Equipment	1,308,058	2.5
- Vehicles	923,900	1.8
TOTAL COST	**51,347,984**	**100.0**

FIXED vs. VARIABLE COSTS		
	BTN	PERCENT
Fixed costs	39,992,773	77.9
Variable costs	11,355,211	22.1
Total	**51,347,984**	**100.0**

TOTAL COST FOR FINAL COST CENTRES AND UNIT COSTS				
	Cost	Activity	Number	Unit Cost
Outpatient department	13,762,383	OPD-visits	46,099	299
Inpatient department	32,671,295	Admissions	3,223	10,137
		Beddays	NA	NA
- *All Medical*	10,691,474	Admissions	1,178	9,076
		Beddays	NA	NA
- *Surgical & Medical*	21,979,821	Admissions	2,045	10,748
		Beddays	NA	NA
Maternal & Child Health (MCH)	4,311,618			
Indigenous Unit	602,688			
Total	**51,347,984**			

RECURRENT COSTS			
	BTN	PERCENT	Cost Type
STAFF	**18,781,853**	**59.1**	**F**
Pay and allowances	16,400,242	51.6	F
Other personal emoluments	996,289	3.1	F
Contributions Provident Fund	983,322	3.1	F
Retirement benefits	402,000	1.3	F
DRUGS AND MEDICAL SUPPLIES	**8,471,533**	**26.6**	**V**
Drugs	6,929,533	21.8	V
Medical supplies	1,542,000	4.9	V
- Anastethics	269,034	0.8	V
- General consumables	742,194	2.3	V
- Gynaecology	-	-	V
- Operating Theater	-	-	V
- Pediatric	96,619	0.3	V
- Physiotherapy	-	-	V
- Imaging (x-ray/ultra-sound)	133,082	0.4	V
- Sutures	301,071	0.9	V
OTHER RECURRENT COSTS	**4,539,468**	**14.3**	
Utilities	**500,112**	**1.6**	F
- Water, electricity, sewerage	317,798	1.0	F
- Fuel wood	91,324	0.3	F
- Telephone, postage, fax, etc.	90,989	0.3	F
Stationary, office supplies	**107,367**	**0.3**	F
Uniforms and linen	**58,997**	**0.2**	F
Patient Diet	**403,678**	**1.3**	V
Transport	**8,000**	**0.0**	V
Maintenance	**738,951**	**2.3**	F
- Buildings	90,383	0.3	F
- Vehicles	607,828	1.9	F
- Equipment	40,740	0.1	F
Travel allowances	**2,472,000**	**7.8**	V
Other	**250,363**	**0.8**	F
Total	**31,792,854**	**100.0**	

CAPITAL COSTS - annual depreciation cost			
	BTN	PERCENT	COST TYPE
Buildings	**17,323,172**	**88.6**	**F**
- Health facility	16,563,989		F
- Out-Reach Sheds	177,990		F
- Staff quarters	581,193		F
Equipment	**1,308,058**	**6.7**	**F**
- General	191,583		F
- In-Patient Dep	-		F
- Out-Patient Dep	-		F
- Operating Theater	494,054		F
- Laboratory	-		F
- Kitchen	-		F
- Imaging (x-ray/ultra-sound)	137,359		F
- Maternal & Child Health	-		F
- Dental	289,135		F
- Other	195,928		F
Transport	**923,900**	**4.7**	**F**
Total	**19,555,130**	**100.0**	

DIRECT COST PER COST CENTRE		
	BTN	PERCENT
Overhead Cost Centres	**7,209,322**	**14.0**
Administration	4,434,470	8.6
Transport	1,454,709	2.8
Staff quarters	581,193	1.1
Security & Maintenance	738,951	1.4
Intermediate Cost Centres	**13,122,567**	**25.6**
Imaging	656,041	1.3
Kitchen	589,187	1.1
Laboratory	1,038,257	2.0
Operating Theater	1,645,271	3.2
Pharmacy/Dispensary	9,193,811	17.9
Final Cost Centres	**31,016,095**	**60.4**
Outpatient department	5,081,696	9.9
Inpatient department	22,776,124	44.4
- All Medical	*7,887,255*	*15.4*
- Surgical & Medical	*14,888,869*	*29.0*
Maternal & Child Health (MCH)	2,640,205	5.1
Indigenous Unit	518,070	1.0
Total	**51,347,984**	**100.0**

TOTAL COST FOR FINAL COST CENTRES		
	BTN	PERCENT
Outpatient department	**13,762,383**	**26.8**
Inpatient department	**32,671,295**	**63.6**
- All Medical	10,691,474	20.8
- Surgical & Medical	21,979,821	42.8
Maternal & Child Health (MCH)	**4,311,618**	**8.4**
Indigenous Unit	**602,688**	**1.2**
Total	**51,347,984**	**100.0**

DISEASE SPECIFIC INPATIENT COSTS		
Disease grouping	**Activity**	**Admission Cost**
INFECTIONS		-
- Diarrhoea	102	5,430
- Tuberculosis	28	30,606
- Other infections	37	6,488
VIRAL, PROTOZOAL & HELMINTHIC DIS.	14	7,738
NEOPLASM	-	-
BLOOD DISEASE	52	10,867
ENDOCRINE, METABOLIC & NUTR.		-
- Diabetes	23	16,412
- Other endocrine etc.	9	16,205
MENTAL DISORDERS	48	15,286
DISEASE OF NERVOUS SYSTEM	32	13,778
EYE & EAR DISEASES		-
- Cataract	-	-
- Other Eye & Ear	10	11,752
DISEASE OF CIRCULATORY SYSTEM		-
- Hypertension	162	9,165
- Other circulatory etc.	94	12,571
RESPIRATORY DISEASE		-
- Common Cold	240	5,452
- Pneumonia	68	9,502
- Other respiratory	188	10,050
DISEASES OF THE DIGESTIVE SYSTEM		-
- Peptic Ulcer Syndrome	300	8,448
- Alcohol Liver Diseases	64	11,151
- Other digestive	359	8,113
SKIN DISEASES	179	12,260
DISEASES OF MUSC-SKEL. ETC.	106	17,119
GENITO-URINARY DISEASES	253	9,623
PREGNANCY, CHILDBIRTH AND PUERP.		-
- Abortions	95	4,582
- Other pregnancy etc.	216	5,499
PERINATAL CONDITIONS	49	10,412
MALFORMATIONS	66	15,801
INJURIES AND TRAUMA	430	14,556
ALL	**3,223**	**10,137**

Wangdicholing District Hospital

TOTAL COSTS		
	BTN	PERCENT
Recurrent cost	**13,432,542**	**55.8**
- Staff	6,629,755	27.6
- Drugs and medical supplies	2,343,787	9.7
- Other	4,459,000	18.5
Capital cost	**10,624,472**	**44.2**
- Buildings	8,674,300	36.1
- Equipment	1,026,271	4.3
- Vehicles	923,900	3.8
TOTAL COST	**24,057,014**	**100.0**

FIXED vs. VARIABLE COSTS		
	BTN	PERCENT
Fixed costs	21,699,227	90.2
Variable costs	2,357,787	9.8
Total	**24,057,014**	**100.0**

TOTAL COST FOR FINAL COST CENTRES AND UNIT COSTS				
	Cost	Activity	Number	Unit Cost
Outpatient department	10,195,062	OPD-visits	69,447	147
Inpatient department	9,307,581	Admissions	977	9,527
		Beddays	NA	NA
- *All Medical*	2,775,535	Admissions	298	9,314
		Beddays	NA	NA
- *Surgical & Medical*	6,532,045	Admissions	679	9,620
		Beddays	NA	NA
Maternal & Child Health (MCH)	3,150,723			
Indigenous Unit	1,403,678			
Total	**24,057,044**			

RECURRENT COSTS			
	BTN	PERCENT	Cost Type
STAFF	**6,629,755**	**49.4**	**F**
Pay and allowances	6,629,755	49.4	F
Other personal emoluments		-	F
Contributions Provident Fund		-	F
Retirement benefits		-	F
DRUGS AND MEDICAL SUPPLIES	**2,343,787**	**17.4**	**V**
Drugs	1,538,060	11.5	V
Medical supplies	805,727	6.0	V
- Anastethics	34,138	0.3	V
- General consumables	640,434	4.8	V
- Gynaecology	17,558	0.1	V
- Operating Theater	-	-	V
- Pediatric	65,413	0.5	V
- Physiotherapy	-	-	V
- Imaging (x-ray/ultra-sound)	3,383	0.0	V
- Sutures	44,801	0.3	V
OTHER RECURRENT COSTS	**4,459,000**	**33.2**	
Utilities	**2,235,000**	**16.6**	F
- Water, electricity, sewerage	1,700,000	12.7	F
- Fuel wood		-	F
- Telephone, postage, fax, etc.	535,000	4.0	F
Stationary, office supplies	**90,000**	**0.7**	F
Uniforms and linen	**37,000**	**0.3**	F
Patient Diet	**14,000**	**0.1**	V
Transport		**-**	V
Maintenance	**2,083,000**	**15.5**	F
- Buildings	2,083,000	15.5	F
- Vehicles		-	F
- Equipment		-	F
Travel allowances		**-**	V
Other		**-**	F
Total	**13,432,542**	**100.0**	

CAPITAL COSTS - annual depreciation cost			
	BTN	PERCENT	COST TYPE
Buildings	**8,674,300**	**81.6**	**F**
- Health facility	8,572,591		F
- Out-Reach Sheds	101,709		F
- Staff quarters	-		F
Equipment	**1,026,271**	**9.7**	**F**
- General	41,365		F
- In-Patient Dep	169,009		F
- Out-Patient Dep	-		F
- Operating Theater	-		F
- Laboratory	212,883		F
- Kitchen	-		F
- Imaging (x-ray/ultra-sound)	137,359		F
- Maternal & Child Health	-		F
- Dental	248,844		F
- Other	216,813		F
Transport	**923,900**	**8.7**	**F**
Total	**10,624,472**	**100.0**	

DIRECT COST PER COST CENTRE		
	BTN	**PERCENT**
Overhead Cost Centres	**7,986,962**	**33.2**
Administration	4,700,705	19.5
Transport	923,900	3.8
Staff quarters	-	-
Security & Maintenance	2,362,356	9.8
Intermediate Cost Centres	**4,541,497**	**18.9**
Imaging	622,794	2.6
Kitchen	14,000	0.1
Laboratory	1,312,625	5.5
Operating Theater	-	-
Pharmacy/Dispensary	2,592,078	10.8
Final Cost Centres	**11,528,586**	**47.9**
Outpatient department	3,890,706	16.2
Inpatient department	5,139,891	21.4
- All Medical	*1,532,009*	*6.4*
- Surgical & Medical	*3,607,882*	*15.0*
Maternal & Child Health (MCH)	1,560,332	6.5
Indigenous Unit	937,656	3.9
Total	**24,057,044**	**100.0**

TOTAL COST FOR FINAL COST CENTRES		
	BTN	**PERCENT**
Outpatient department	**10,195,062**	**42.4**
Inpatient department	**9,307,581**	**38.7**
- All Medical	2,775,535	11.5
- Surgical & Medical	6,532,045	27.2
Maternal & Child Health (MCH)	**3,150,723**	**13.1**
Indigenous Unit	**1,403,678**	**5.8**
Total	**24,057,044**	**100.0**

DISEASE SPECIFIC INPATIENT COSTS		
Disease grouping	**Activity**	**Admission Cost**
INFECTIONS		-
- Diarrhoea	17	5,049
- Tuberculosis	8	28,463
- Other infections	9	6,033
VIRAL, PROTOZOAL & HELMINTHIC DIS.	21	7,196
NEOPLASM	-	-
BLOOD DISEASE	35	10,106
ENDOCRINE, METABOLIC & NUTR.		-
- Diabetes	4	15,262
- Other endocrine etc.	5	15,070
MENTAL DISORDERS	11	14,215
DISEASE OF NERVOUS SYSTEM	14	12,813
EYE & EAR DISEASES		-
- Cataract	32	12,786
- Other Eye & Ear	6	10,028
DISEASE OF CIRCULATORY SYSTEM		-
- Hypertension	24	8,523
- Other circulatory etc.	27	10,728
RESPIRATORY DISEASE		-
- Common Cold	28	5,070
- Pneumonia	36	8,836
- Other respiratory	70	8,576
DISEASES OF THE DIGESTIVE SYSTEM		-
- Peptic Ulcer Syndrome	50	7,856
- Alcohol Liver Diseases	36	10,370
- Other digestive	83	6,923
SKIN DISEASES	19	10,462
DISEASES OF MUSC-SKEL. ETC.	36	14,608
GENITO-URINARY DISEASES	80	8,212
PREGNANCY, CHILDBIRTH AND PUERP.		-
- Abortions	26	3,910
- Other pregnancy etc.	53	4,692
PERINATAL CONDITIONS	58	8,885
MALFORMATIONS	3	13,484
INJURIES AND TRAUMA	186	12,421
ALL	**977**	**9,527**

Damphu District Hospital

TOTAL COSTS		
	BTN	PERCENT
Recurrent cost	**24,741,826**	**68.3**
- Staff	6,845,515	18.9
- Drugs and medical supplies	15,888,222	43.9
- Other	2,008,089	5.5
Capital cost	**11,472,658**	**31.7**
- Buildings	9,012,118	24.9
- Equipment	1,536,640	4.2
- Vehicles	923,900	2.6
TOTAL COST	**36,214,484**	**100.0**

FIXED vs. VARIABLE COSTS		
	BTN	PERCENT
Fixed costs	19,124,067	52.8
Variable costs	17,090,417	47.2
Total	**36,214,484**	**100.0**

TOTAL COST FOR FINAL COST CENTRES AND UNIT COSTS				
	Cost	Activity	Number	Unit Cost
Outpatient department	19,792,163	OPD-visits	16,102	1,229
Inpatient department	11,397,144	Admissions	1,106	10,305
		Beddays	NA	NA
- *All Medical*	4,278,843	Admissions	507	8,445
		Beddays	NA	NA
- *Surgical & Medical*	7,118,301	Admissions	599	11,878
		Beddays	NA	NA
Maternal & Child Health (MCH)	3,812,650			
Indigenous Unit	1,212,543			
Total	**36,214,499**			

RECURRENT COSTS			
	BTN	PERCENT	Cost Type
STAFF	**6,845,515**	**27.7**	**F**
Pay and allowances	6,166,755	24.9	F
Other personal emoluments	280,000	1.1	F
Contributions Provident Fund	377,760	1.5	F
Retirement benefits	21,000	0.1	F
DRUGS AND MEDICAL SUPPLIES	**15,888,222**	**64.2**	**V**
Drugs	15,444,736	62.4	V
Medical supplies	443,485	1.8	V
- Anastethics	33,950	0.1	V
- General consumables	299,486	1.2	V
- Gynaecology	-	-	V
- Operating Theater	-	-	V
- Pediatric	68,089	0.3	V
- Physiotherapy	-	-	V
- Imaging (x-ray/ultra-sound)	41,960	0.2	V
- Sutures	-	-	V
OTHER RECURRENT COSTS	**2,008,089**	**8.1**	
Utilities	**129,370**	**0.5**	F
- Water, electricity, sewerage	56,354	0.2	F
- Fuel wood	16,881	0.1	F
- Telephone, postage, fax, etc.	56,135	0.2	F
Stationary, office supplies	**139,843**	**0.6**	F
Uniforms and linen	**45,965**	**0.2**	F
Patient Diet	**306,395**	**1.2**	V
Transport	**10,800**	**0.0**	V
Maintenance	**485,716**	**2.0**	F
- Buildings	60,981	0.2	F
- Vehicles	419,000	1.7	F
- Equipment	5,735	0.0	F
Travel allowances	**885,000**	**3.6**	V
Other	**5,000**	**0.0**	F
Total	**24,741,826**	**100.0**	

CAPITAL COSTS - annual depreciation cost			
	BTN	PERCENT	COST TYPE
Buildings	**9,012,118**	**78.6**	**F**
- Health facility	8,572,591		F
- Out-Reach Sheds	76,282		F
- Staff quarters	363,245		F
Equipment	**1,536,640**	**13.4**	**F**
- General	10,054		F
- In-Patient Dep	118,953		F
- Out-Patient Dep	-		F
- Operating Theater	430,398		F
- Laboratory	232,022		F
- Kitchen	-		F
- Imaging (x-ray/ultra-sound)	137,359		F
- Maternal & Child Health	48,654		F
- Dental	256,996		F
- Other	302,204		F
Transport	**923,900**	**8.1**	**F**
Total	**11,472,658**	**100.0**	

DIRECT COST PER COST CENTRE		
	BTN	**PERCENT**
Overhead Cost Centres	**4,570,921**	**12.6**
Administration	1,614,009	4.5
Transport	1,396,342	3.9
Staff quarters	363,245	1.0
Security & Maintenance	1,197,324	3.3
Intermediate Cost Centres	**19,272,332**	**53.2**
Imaging	358,548	1.0
Kitchen	306,395	0.8
Laboratory	1,178,123	3.3
Operating Theater	868,650	2.4
Pharmacy/Dispensary	16,560,616	45.7
Final Cost Centres	**12,371,247**	**34.2**
Outpatient department	4,931,898	13.6
Inpatient department	4,904,861	13.5
- All Medical	*1,891,869*	*5.2*
- Surgical & Medical	*3,012,992*	*8.3*
Maternal & Child Health (MCH)	1,474,990	4.1
Indigenous Unit	1,059,498	2.9
Total	**36,214,499**	**100.0**

TOTAL COST FOR FINAL COST CENTRES		
	BTN	**PERCENT**
Outpatient department	**19,792,163**	**54.7**
Inpatient department	**11,397,144**	**31.5**
- All Medical	4,278,843	11.8
- Surgical & Medical	7,118,301	19.7
Maternal & Child Health (MCH)	**3,812,650**	**10.5**
Indigenous Unit	**1,212,543**	**3.3**
Total	**36,214,499**	**100.0**

DISEASE SPECIFIC INPATIENT COSTS		
Disease grouping	**Activity**	**Admission Cost**
INFECTIONS		-
- Diarrhoea	92	5,920
- Tuberculosis	2	33,369
- Other infections	76	7,073
VIRAL, PROTOZOAL & HELMINTHIC DIS.	24	8,436
NEOPLASM	-	-
BLOOD DISEASE	22	11,849
ENDOCRINE, METABOLIC & NUTR.		-
- Diabetes	19	17,893
- Other endocrine etc.	6	17,668
MENTAL DISORDERS	6	16,665
DISEASE OF NERVOUS SYSTEM	6	15,021
EYE & EAR DISEASES		-
- Cataract	3	15,669
- Other Eye & Ear	78	12,289
DISEASE OF CIRCULATORY SYSTEM		-
- Hypertension	16	9,992
- Other circulatory etc.	28	13,147
RESPIRATORY DISEASE		-
- Common Cold	122	5,944
- Pneumonia	29	10,359
- Other respiratory	91	10,510
DISEASES OF THE DIGESTIVE SYSTEM		-
- Peptic Ulcer Syndrome	74	9,210
- Alcohol Liver Diseases	14	12,157
- Other digestive	80	8,484
SKIN DISEASES	105	12,821
DISEASES OF MUSC-SKEL. ETC.	66	17,902
GENITO-URINARY DISEASES	60	10,064
PREGNANCY, CHILDBIRTH AND PUERP.		-
- Abortions	8	4,792
- Other pregnancy etc.	27	5,750
PERINATAL CONDITIONS	5	10,888
MALFORMATIONS	1	16,524
INJURIES AND TRAUMA	47	15,222
ALL	**1,106**	**10,305**

Punakha District Hospital

TOTAL COSTS		
	BTN	PERCENT
Recurrent cost	**14,368,855**	**40.2**
- Staff	8,811,370	24.6
- Drugs and medical supplies	1,735,724	4.9
- Other	3,821,761	10.7
Capital cost	**21,407,887**	**59.8**
- Buildings	17,072,533	47.7
- Equipment	2,949,504	8.2
- Vehicles	1,385,851	3.9
TOTAL COST	**35,776,743**	**100.0**

FIXED vs. VARIABLE COSTS		
	BTN	PERCENT
Fixed costs	31,486,344	88.0
Variable costs	4,290,398	12.0
Total	**35,776,743**	**100.0**

TOTAL COST FOR FINAL COST CENTRES AND UNIT COSTS				
	Cost	Activity	Number	Unit Cost
Outpatient department	8,026,951	OPD-visits	36,838	218
Inpatient department	21,120,422	Admissions	2,058	10,263
		Beddays	NA	NA
- *All Medical*	6,850,165	Admissions	703	9,738
		Beddays	NA	NA
- *Surgical & Medical*	14,270,257	Admissions	1,355	10,535
		Beddays	NA	NA
Maternal & Child Health (MCH)	5,147,534			
Indigenous Unit	1,481,760			
Total	**35,776,666**			

RECURRENT COSTS			
	BTN	PERCENT	Cost Type
STAFF	**8,811,370**	**61.3**	**F**
Pay and allowances	7,381,000	51.4	F
Other personal emoluments	366,000	2.5	F
Contributions Provident Fund	434,370	3.0	F
Retirement benefits	630,000	4.4	F
DRUGS AND MEDICAL SUPPLIES	**1,735,724**	**12.1**	**V**
Drugs	1,209,867	8.4	V
Medical supplies	525,857	3.7	V
- Anastethics	95,727	0.7	V
- General consumables	356,575	2.5	V
- Gynaecology	24,926	0.2	V
- Operating Theater	-	-	V
- Pediatric	16,201	0.1	V
- Physiotherapy	-	-	V
- Imaging (x-ray/ultra-sound)	25,356	0.2	V
- Sutures	7,071	0.0	V
OTHER RECURRENT COSTS	**3,821,761**	**26.6**	
Utilities	**128,319**	**0.9**	F
- Water, electricity, sewerage	40,000	0.3	F
- Fuel wood	24,348	0.2	F
- Telephone, postage, fax, etc.	63,971	0.4	F
Stationary, office supplies	**147,488**	**1.0**	F
Uniforms and linen		**-**	F
Patient Diet		**-**	V
Transport	**10,674**	**0.1**	V
Maintenance	**907,280**	**6.3**	F
- Buildings	900,000	6.3	F
- Vehicles		-	F
- Equipment	7,280	0.1	F
Travel allowances	**2,544,000**	**17.7**	V
Other	**84,000**	**0.6**	F
Total	**14,368,855**	**100.0**	

CAPITAL COSTS - annual depreciation cost			
	BTN	PERCENT	COST TYPE
Buildings	**17,072,533**	**79.7**	**F**
- Health facility	16,563,989		F
- Out-Reach Sheds	-		F
- Staff quarters	508,544		F
Equipment	**2,949,504**	**13.8**	**F**
- General	-		F
- In-Patient Dep	275,672		F
- Out-Patient Dep	-		F
- Operating Theater	931,920		F
- Laboratory	643,042		F
- Kitchen	-		F
- Imaging (x-ray/ultra-sound)	223,631		F
- Maternal & Child Health	-		F
- Dental	495,313		F
- Other	379,925		F
Transport	**1,385,851**	**6.5**	**F**
Total	**21,407,887**	**100.0**	

DIRECT COST PER COST CENTRE		
	BTN	**PERCENT**
Overhead Cost Centres	**7,263,112**	**20.3**
Administration	2,769,113	7.7
Transport	2,021,647	5.7
Staff quarters	508,544	1.4
Security & Maintenance	1,963,808	5.5
Intermediate Cost Centres	**7,337,222**	**20.5**
Imaging	874,465	2.4
Kitchen	329,398	0.9
Laboratory	1,599,871	4.5
Operating Theater	1,749,793	4.9
Pharmacy/Dispensary	2,783,695	7.8
Final Cost Centres	**21,176,333**	**59.2**
Outpatient department	3,870,672	10.8
Inpatient department	12,721,677	35.6
- All Medical	*4,612,828*	*12.9*
- Surgical & Medical	*8,108,849*	*22.7*
Maternal & Child Health (MCH)	3,403,040	9.5
Indigenous Unit	1,180,944	3.3
Total	**35,776,666**	**100.0**

TOTAL COST FOR FINAL COST CENTRES		
	BTN	**PERCENT**
Outpatient department	**8,026,951**	**22.4**
Inpatient department	**21,120,422**	**59.0**
- All Medical	6,850,165	19.1
- Surgical & Medical	14,270,257	39.9
Maternal & Child Health (MCH)	**5,147,534**	**14.4**
Indigenous Unit	**1,481,760**	**4.1**
Total	**35,776,666**	**100.0**

DISEASE SPECIFIC INPATIENT COSTS		
Disease grouping	**Activity**	**Admission Cost**
INFECTIONS		-
- Diarrhoea	117	5,204
- Tuberculosis	35	29,336
- Other infections	35	6,218
VIRAL, PROTOZOAL & HELMINTHIC DIS.	120	7,417
NEOPLASM	-	-
BLOOD DISEASE	30	10,416
ENDOCRINE, METABOLIC & NUTR.		-
- Diabetes	7	15,730
- Other endocrine etc.	20	15,532
MENTAL DISORDERS	27	14,651
DISEASE OF NERVOUS SYSTEM	25	13,206
EYE & EAR DISEASES		-
- Cataract	-	-
- Other Eye & Ear	10	12,257
DISEASE OF CIRCULATORY SYSTEM		-
- Hypertension	44	8,784
- Other circulatory etc.	91	13,112
RESPIRATORY DISEASE		-
- Common Cold	6	5,226
- Pneumonia	156	9,107
- Other respiratory	212	10,482
DISEASES OF THE DIGESTIVE SYSTEM		-
- Peptic Ulcer Syndrome	25	8,097
- Alcohol Liver Diseases	55	10,688
- Other digestive	375	8,461
SKIN DISEASES	95	12,787
DISEASES OF MUSC-SKEL. ETC.	59	17,855
GENITO-URINARY DISEASES	168	10,037
PREGNANCY, CHILDBIRTH AND PUERP.		-
- Abortions	51	4,779
- Other pregnancy etc.	100	5,735
PERINATAL CONDITIONS	34	10,859
MALFORMATIONS	1	16,480
INJURIES AND TRAUMA	157	15,181
ALL	**2,058**	**10,263**

Gyelposhing Basic Health Unit, Grade I

TOTAL COSTS		
	BTN	PERCENT
Recurrent cost	**2,488,950**	**77.2**
- Staff	1,581,000	49.1
- Drugs and medical supplies	335,950	10.4
- Other	572,000	17.8
Capital cost	**733,454**	**22.8**
- Buildings	588,458	18.3
- Equipment	144,996	4.5
- Vehicles	-	-
TOTAL COST	**3,222,403**	**100.0**

FIXED vs. VARIABLE COSTS		
	BTN	PERCENT
Fixed costs	2,659,454	82.5
Variable costs	562,950	17.5
Total	**3,222,403**	**100.0**

TOTAL COST FOR FINAL COST CENTRES AND UNIT COSTS				
	Cost	Activity	Number	Unit Cost
Outpatient department	1,270,280	OPD-visits	9,046	140
Inpatient department	885,612	Admissions	49	18,074
		Beddays	NA	NA
- *All Medical*	284,741	Admissions	17	16,749
		Beddays	NA	NA
- *Surgical & Medical*	600,871	Admissions	32	18,777
		Beddays	NA	NA
Maternal & Child Health (MCH)	1,066,512			
Indigenous Unit	-			
Total	**3,222,403**			

RECURRENT COSTS			
	BTN	PERCENT	Cost Type
STAFF	**1,581,000**	**63.5**	**F**
Pay and allowances	1,370,000	55.0	F
Other personal emoluments	60,000	2.4	F
Contributions Provident Fund	151,000	6.1	F
Retirement benefits		-	F
DRUGS AND MEDICAL SUPPLIES	**335,950**	**13.5**	**V**
Drugs	284,582	11.4	V
Medical supplies	51,367	2.1	V
- Anastethics	2,460	0.1	V
- General consumables	38,666	1.6	V
- Gynaecology	4,463	0.2	V
- Operating Theater	2,861	0.1	V
- Pediatric	-	-	V
- Physiotherapy	2,918	0.1	V
- Imaging (x-ray/ultra-sound)	-	-	V
- Sutures	-	-	V
OTHER RECURRENT COSTS	**572,000**	**23.0**	
Utilities	**132,000**	**5.3**	F
- Water, electricity, sewerage	79,000	3.2	F
- Fuel wood	-	-	F
- Telephone, postage, fax, etc.	53,000	2.1	F
Stationary, office supplies	**24,000**	**1.0**	F
Uniforms and linen	**9,000**	**0.4**	F
Patient Diet	**89,000**	**3.6**	V
Transport		**-**	V
Maintenance	**180,000**	**7.2**	F
- Buildings	135,000	5.4	F
- Vehicles		-	F
- Equipment	45,000	1.8	F
Travel allowances	**138,000**	**5.5**	V
Other		**-**	F
Total	**2,488,950**	**100.0**	

CAPITAL COSTS - annual depreciation cost			
	BTN	PERCENT	COST TYPE
Buildings	**588,458**	**80.2**	**F**
- Health facility	381,408		F
- Out-Reach Sheds	25,427		F
- Staff quarters	181,623		F
Equipment	**144,996**	**19.8**	**F**
- General	144,996		F
- In-Patient Dep	-		F
- Out-Patient Dep	-		F
- Operating Theater	-		F
- Laboratory	-		F
- Kitchen	-		F
- Imaging (x-ray/ultra-sound)	-		F
- Maternal & Child Health	-		F
- Dental	-		F
- Other	-		F
Transport	**-**	**-**	**F**
Total	**733,454**	**100.0**	

DIRECT COST PER COST CENTRE		
	BTN	**PERCENT**
Overhead Cost Centres	**821,617**	**25.5**
Administration	252,040	7.8
Transport	-	-
Staff quarters	181,623	5.6
Security & Maintenance	387,954	12.0
Intermediate Cost Centres	**1,438,989**	**44.7**
Imaging	-	-
Kitchen	89,000	2.8
Laboratory	698,994	21.7
Operating Theater	107,586	3.3
Pharmacy/Dispensary	543,409	16.9
Final Cost Centres	**961,797**	**29.8**
Outpatient department	270,855	8.4
Inpatient department	262,254	8.1
- All Medical	*100,934*	*3.1*
- Surgical & Medical	*161,320*	*5.0*
Maternal & Child Health (MCH)	428,689	13.3
Indigenous Unit	-	-
Total	**3,222,403**	**100.0**

TOTAL COST FOR FINAL COST CENTRES		
	BTN	**PERCENT**
Outpatient department	**1,270,280**	**39.4**
Inpatient department	**885,612**	**27.5**
- All Medical	284,741	8.8
- Surgical & Medical	600,871	18.6
Maternal & Child Health (MCH)	**1,066,512**	**33.1**
Indigenous Unit	**-**	**-**
Total	**3,222,403**	**100.0**

DISEASE SPECIFIC INPATIENT COSTS		
Disease grouping	**Activity**	**Admission Cost**
INFECTIONS		-
- Diarrhoea	2	8,999
- Tuberculosis	-	-
- Other infections	-	-
VIRAL, PROTOZOAL & HELMINTHIC DIS.	-	-
NEOPLASM	-	-
BLOOD DISEASE	1	18,011
ENDOCRINE, METABOLIC & NUTR.		-
- Diabetes	-	-
- Other endocrine etc.	-	-
MENTAL DISORDERS	-	-
DISEASE OF NERVOUS SYSTEM	6	22,835
EYE & EAR DISEASES		-
- Cataract	-	-
- Other Eye & Ear	-	-
DISEASE OF CIRCULATORY SYSTEM		-
- Hypertension	1	15,189
- Other circulatory etc.	1	25,260
RESPIRATORY DISEASE		-
- Common Cold	1	9,036
- Pneumonia	2	15,748
- Other respiratory	1	20,194
DISEASES OF THE DIGESTIVE SYSTEM		-
- Peptic Ulcer Syndrome	4	14,001
- Alcohol Liver Diseases	-	-
- Other digestive	13	16,301
SKIN DISEASES	1	24,635
DISEASES OF MUSC-SKEL. ETC.	-	-
GENITO-URINARY DISEASES	3	19,336
PREGNANCY, CHILDBIRTH AND PUERP.		-
- Abortions	1	9,207
- Other pregnancy etc.	5	11,049
PERINATAL CONDITIONS	1	20,921
MALFORMATIONS	-	-
INJURIES AND TRAUMA	6	29,247
ALL	**49**	**18,074**

Bajo Basic Health Unit, grade I

TOTAL COSTS		
	BTN	PERCENT
Recurrent cost	**9,575,588**	**84.0**
- Staff	6,474,695	56.8
- Drugs and medical supplies	1,464,214	12.8
- Other	1,636,679	14.3
Capital cost	**1,829,930**	**16.0**
- Buildings	613,885	5.4
- Equipment	292,145	2.6
- Vehicles	923,900	8.1
TOTAL COST	**11,405,518**	**100.0**

FIXED vs. VARIABLE COSTS		
	BTN	PERCENT
Fixed costs	8,944,423	78.4
Variable costs	2,461,095	21.6
Total	**11,405,518**	**100.0**

TOTAL COST FOR FINAL COST CENTRES AND UNIT COSTS				
	Cost	Activity	Number	Unit Cost
Outpatient department	3,896,267	OPD-visits	21,655	180
Inpatient department	4,935,677	Admissions	1,123	4,395
		Beddays	NA	NA
- *All Medical*	1,788,658	Admissions	417	4,284
		Beddays	NA	NA
- *Surgical & Medical*	3,147,019	Admissions	706	4,461
		Beddays	NA	NA
Maternal & Child Health (MCH)	1,955,132			
Indigenous Unit	618,442			
Total	**11,405,518**			

RECURRENT COSTS			
	BTN	PERCENT	Cost Type
STAFF	**6,474,695**	**67.6**	**F**
Pay and allowances	6,060,015	63.3	F
Other personal emoluments		-	F
Contributions Provident Fund	400,680	4.2	F
Retirement benefits	14,000	0.1	F
DRUGS AND MEDICAL SUPPLIES	**1,464,214**	**15.3**	**V**
Drugs	1,042,933	10.9	V
Medical supplies	421,280	4.4	V
- Anastethics	54,247	0.6	V
- General consumables	256,111	2.7	V
- Gynaecology	64,329	0.7	V
- Operating Theater	-	-	V
- Pediatric	21,772	0.2	V
- Physiotherapy	-	-	V
- Imaging (x-ray/ultra-sound)	-	-	V
- Sutures	24,821	0.3	V
OTHER RECURRENT COSTS	**1,636,679**	**17.1**	
Utilities	**113,875**	**1.2**	F
- Water, electricity, sewerage	54,079	0.6	F
- Fuel wood	9,133	0.1	F
- Telephone, postage, fax, etc.	50,663	0.5	F
Stationary, office supplies	**84,841**	**0.9**	F
Uniforms and linen	**6,000**	**0.1**	F
Patient Diet	**38,397**	**0.4**	V
Transport		**-**	V
Maintenance	**425,368**	**4.4**	F
- Buildings	42,057	0.4	F
- Vehicles	383,311	4.0	F
- Equipment		-	F
Travel allowances	**958,484**	**10.0**	V
Other	**9,714**	**0.1**	F
Total	**9,575,588**	**100.0**	

CAPITAL COSTS - annual depreciation cost			
	BTN	PERCENT	COST TYPE
Buildings	**613,885**	**33.5**	**F**
- Health facility	381,408		F
- Out-Reach Sheds	50,854		F
- Staff quarters	181,623		F
Equipment	**292,145**	**16.0**	**F**
- General	30,204		F
- In-Patient Dep	184,406		F
- Out-Patient Dep	-		F
- Operating Theater	-		F
- Laboratory	77,535		F
- Kitchen	-		F
- Imaging (x-ray/ultra-sound)	-		F
- Maternal & Child Health	-		F
- Dental	-		F
- Other	-		F
Transport	**923,900**	**50.5**	**F**
Total	**1,829,930**	**100.0**	

DIRECT COST PER COST CENTRE		
	BTN	**PERCENT**
Overhead Cost Centres	**2,765,732**	**24.2**
Administration	870,473	7.6
Transport	923,900	8.1
Staff quarters	181,623	1.6
Security & Maintenance	789,736	6.9
Intermediate Cost Centres	**2,256,828**	**19.8**
Imaging	-	-
Kitchen	38,397	0.3
Laboratory	441,903	3.9
Operating Theater	-	-
Pharmacy/Dispensary	1,776,528	15.6
Final Cost Centres	**6,382,957**	**56.0**
Outpatient department	1,514,137	13.3
Inpatient department	3,187,579	27.9
- All Medical	*1,152,790*	*10.1*
- Surgical & Medical	*2,034,789*	*17.8*
Maternal & Child Health (MCH)	1,212,766	10.6
Indigenous Unit	468,475	4.1
Total	**11,405,518**	**100.0**

TOTAL COST FOR FINAL COST CENTRES		
	BTN	**PERCENT**
Outpatient department	**3,896,267**	**34.2**
Inpatient department	**4,935,677**	**43.3**
- All Medical	1,788,658	15.7
- Surgical & Medical	3,147,019	27.6
Maternal & Child Health (MCH)	**1,955,132**	**17.1**
Indigenous Unit	**618,442**	**5.4**
Total	**11,405,518**	**100.0**

DISEASE SPECIFIC INPATIENT COSTS		
Disease grouping	**Activity**	**Admission Cost**
INFECTIONS		-
- Diarrhoea	19	2,494
- Tuberculosis	3	14,056
- Other infections	25	2,979
VIRAL, PROTOZOAL & HELMINTHIC DIS.	38	3,554
NEOPLASM	-	-
BLOOD DISEASE	23	4,991
ENDOCRINE, METABOLIC & NUTR.		-
- Diabetes	4	7,537
- Other endocrine etc.	1	7,442
MENTAL DISORDERS	32	7,020
DISEASE OF NERVOUS SYSTEM	9	6,327
EYE & EAR DISEASES		-
- Cataract	-	-
- Other Eye & Ear	12	4,940
DISEASE OF CIRCULATORY SYSTEM		-
- Hypertension	39	4,209
- Other circulatory etc.	45	5,284
RESPIRATORY DISEASE		-
- Common Cold	44	2,504
- Pneumonia	113	4,364
- Other respiratory	77	4,225
DISEASES OF THE DIGESTIVE SYSTEM		-
- Peptic Ulcer Syndrome	48	3,880
- Alcohol Liver Diseases	19	5,121
- Other digestive	141	3,410
SKIN DISEASES	44	5,154
DISEASES OF MUSC-SKEL. ETC.	29	7,196
GENITO-URINARY DISEASES	108	4,045
PREGNANCY, CHILDBIRTH AND PUERP.		-
- Abortions	26	1,926
- Other pregnancy etc.	57	2,311
PERINATAL CONDITIONS	17	4,377
MALFORMATIONS	-	-
INJURIES AND TRAUMA	150	6,118
ALL	**1,123**	**4,395**

Bali Basic Health Unit, Grade I

TOTAL COSTS		
	BTN	PERCENT
Recurrent cost	**7,524,683**	**78.7**
- Staff	4,818,339	50.4
- Drugs and medical supplies	696,980	7.3
- Other	2,009,364	21.0
Capital cost	**2,033,987**	**21.3**
- Buildings	726,491	7.6
- Equipment	383,596	4.0
- Vehicles	923,900	9.7
TOTAL COST	**9,558,670**	**100.0**

FIXED vs. VARIABLE COSTS		
	BTN	PERCENT
Fixed costs	7,850,054	82.1
Variable costs	1,708,616	17.9
Total	**9,558,670**	**100.0**

TOTAL COST FOR FINAL COST CENTRES AND UNIT COSTS				
	Cost	Activity	Number	Unit Cost
Outpatient department	2,912,409	OPD-visits	18,844	155
Inpatient department	3,500,636	Admissions	476	7,354
		Beddays	NA	NA
- *All Medical*	2,014,915	Admissions	276	7,306
		Beddays	NA	NA
- *Surgical & Medical*	1,485,721	Admissions	200	7,420
		Beddays	NA	NA
Maternal & Child Health (MCH)	2,177,446			
Indigenous Unit	968,180			
Total	**9,558,670**			

RECURRENT COSTS			
	BTN	PERCENT	Cost Type
STAFF	**4,818,339**	**64.0**	**F**
Pay and allowances	4,656,039	61.9	F
Other personal emoluments	162,300	2.2	F
Contributions Provident Fund		-	F
Retirement benefits		-	F
DRUGS AND MEDICAL SUPPLIES	**696,980**	**9.3**	**V**
Drugs	478,440	6.4	V
Medical supplies	218,540	2.9	V
- Anastethics	14,456	0.2	V
- General consumables	105,009	1.4	V
- Gynaecology	39,562	0.5	V
- Operating Theater	-	-	V
- Pediatric	18,690	0.2	V
- Physiotherapy	-	-	V
- Imaging (x-ray/ultra-sound)	22,269	0.3	V
- Sutures	18,554	0.2	V
OTHER RECURRENT COSTS	**2,009,364**	**26.7**	
Utilities	**201,811**	**2.7**	F
- Water, electricity, sewerage	80,000	1.1	F
- Fuel wood	27,493	0.4	F
- Telephone, postage, fax, etc.	94,318	1.3	F
Stationary, office supplies	**100,000**	**1.3**	F
Uniforms and linen	**-**	**-**	F
Patient Diet	**150,000**	**2.0**	V
Transport	**10,000**	**0.1**	V
Maintenance	**587,838**	**7.8**	F
- Buildings	335,082	4.5	F
- Vehicles	208,000	2.8	F
- Equipment	44,756	0.6	F
Travel allowances	**851,636**	**11.3**	V
Other	**108,079**	**1.4**	F
Total	**7,524,683**	**100.0**	

CAPITAL COSTS - annual depreciation cost			
	BTN	PERCENT	COST TYPE
Buildings	**726,491**	**35.7**	**F**
- Health facility	381,408		F
- Out-Reach Sheds	127,136		F
- Staff quarters	217,947		F
Equipment	**383,596**	**18.9**	**F**
- General	383,596		F
- In-Patient Dep	-		F
- Out-Patient Dep	-		F
- Operating Theater	-		F
- Laboratory	-		F
- Kitchen	-		F
- Imaging (x-ray/ultra-sound)	-		F
- Maternal & Child Health	-		F
- Dental	-		F
- Other	-		F
Transport	**923,900**	**45.4**	**F**
Total	**2,033,987**	**100.0**	

DIRECT COST PER COST CENTRE		
	BTN	**PERCENT**
Overhead Cost Centres	**2,772,927**	**29.0**
Administration	748,212	7.8
Transport	1,047,092	11.0
Staff quarters	217,947	2.3
Security & Maintenance	759,677	7.9
Intermediate Cost Centres	**1,863,975**	**19.5**
Imaging	244,950	2.6
Kitchen	150,000	1.6
Laboratory	352,510	3.7
Operating Theater	-	-
Pharmacy/Dispensary	1,116,515	11.7
Final Cost Centres	**4,921,768**	**51.5**
Outpatient department	1,012,083	10.6
Inpatient department	1,965,571	20.6
- All Medical	*1,131,068*	*11.8*
- Surgical & Medical	*834,504*	*8.7*
Maternal & Child Health (MCH)	1,256,799	13.1
Indigenous Unit	687,315	7.2
Total	**9,558,670**	**100.0**

TOTAL COST FOR FINAL COST CENTRES		
	BTN	**PERCENT**
Outpatient department	**2,912,409**	**30.5**
Inpatient department	**3,500,636**	**36.6**
- All Medical	2,014,915	21.1
- Surgical & Medical	1,485,721	15.5
Maternal & Child Health (MCH)	**2,177,446**	**22.8**
Indigenous Unit	**968,180**	**10.1**
Total	**9,558,670**	**100.0**

DISEASE SPECIFIC INPATIENT COSTS		
Disease grouping	**Activity**	**Admission Cost**
INFECTIONS		-
- Diarrhoea	19	4,587
- Tuberculosis	-	-
- Other infections	83	5,481
VIRAL, PROTOZOAL & HELMINTHIC DIS.	-	-
NEOPLASM	-	-
BLOOD DISEASE	4	9,181
ENDOCRINE, METABOLIC & NUTR.		-
- Diabetes	2	13,864
- Other endocrine etc.	4	13,690
MENTAL DISORDERS	23	12,913
DISEASE OF NERVOUS SYSTEM	6	11,639
EYE & EAR DISEASES		-
- Cataract	-	-
- Other Eye & Ear	2	9,110
DISEASE OF CIRCULATORY SYSTEM		-
- Hypertension	9	7,742
- Other circulatory etc.	13	9,746
RESPIRATORY DISEASE		-
- Common Cold	28	4,606
- Pneumonia	60	8,027
- Other respiratory	28	7,791
DISEASES OF THE DIGESTIVE SYSTEM		-
- Peptic Ulcer Syndrome	19	7,136
- Alcohol Liver Diseases	19	9,420
- Other digestive	32	6,289
SKIN DISEASES	13	9,505
DISEASES OF MUSC-SKEL. ETC.	8	13,271
GENITO-URINARY DISEASES	47	7,460
PREGNANCY, CHILDBIRTH AND PUERP.		-
- Abortions	6	3,552
- Other pregnancy etc.	34	4,263
PERINATAL CONDITIONS	6	8,072
MALFORMATIONS	-	-
INJURIES AND TRAUMA	11	11,284
ALL	**476**	**7,354**

Genekha Basic Health Unit, Grade II

TOTAL COSTS		
	BTN	PERCENT
Recurrent cost	**1,157,573**	**75.8**
- Staff	663,576	43.5
- Drugs and medical supplies	114,224	7.5
- Other	379,773	24.9
Capital cost	**368,802**	**24.2**
- Buildings	268,802	17.6
- Equipment	100,000	6.6
- Vehicles	-	-
TOTAL COST	**1,526,374**	**100.0**

FIXED vs. VARIABLE COSTS		
	BTN	PERCENT
Fixed costs	1,047,151	68.6
Variable costs	479,224	31.4
Total	**1,526,374**	**100.0**

TOTAL COST FOR FINAL COST CENTRES AND UNIT COSTS				
	Cost	Activity	Number	Unit Cost
Outpatient department	512,891	OPD-visits	3,235	159
Inpatient department	114,311	Admissions	NA	NA
		Beddays	NA	NA
- *All Medical*	114,311	Admissions	NA	NA
		Beddays	NA	NA
- *Surgical & Medical*	-	Admissions	NA	NA
		Beddays	NA	NA
Maternal & Child Health (MCH)	899,173			
Indigenous Unit	-			
Total	**1,526,374**			

RECURRENT COSTS			
	BTN	PERCENT	Cost Type
STAFF	**663,576**	**57.3**	**F**
Pay and allowances	663,576	57.3	F
Other personal emoluments		-	F
Contributions Provident Fund		-	F
Retirement benefits		-	F
DRUGS AND MEDICAL SUPPLIES	**114,224**	**9.9**	**V**
Drugs	82,514	7.1	V
Medical supplies	31,710	2.7	V
- Anastethics	64	0.0	V
- General consumables	10,588	0.9	V
- Gynaecology	-	-	V
- Operating Theater	-	-	V
- Pediatric	20,772	1.8	V
- Physiotherapy	-	-	V
- Imaging (x-ray/ultra-sound)	-	-	V
- Sutures	286	0.0	V
OTHER RECURRENT COSTS	**379,773**	**32.8**	
Utilities	**14,773**	**1.3**	F
- Water, electricity, sewerage	5,865	0.5	F
- Fuel wood		-	F
- Telephone, postage, fax, etc.	8,908	0.8	F
Stationary, office supplies		**-**	F
Uniforms and linen		**-**	F
Patient Diet		**-**	V
Transport		**-**	V
Maintenance	**-**	**-**	F
- Buildings		-	F
- Vehicles		-	F
- Equipment		-	F
Travel allowances	**365,000**	**31.5**	V
Other		**-**	F
Total	**1,157,573**	**100.0**	

CAPITAL COSTS - annual depreciation cost			
	BTN	PERCENT	COST TYPE
Buildings	**268,802**	**72.9**	**F**
- Health facility	159,828		F
- Out-Reach Sheds	-		F
- Staff quarters	108,974		F
Equipment	**100,000**	**27.1**	**F**
- General	-		F
- In-Patient Dep	-		F
- Out-Patient Dep	-		F
- Operating Theater	-		F
- Laboratory	-		F
- Kitchen	-		F
- Imaging (x-ray/ultra-sound)	-		F
- Maternal & Child Health	-		F
- Dental	-		F
- Other	-		F
Transport	**-**	**-**	**F**
Total	**368,802**	**100.0**	

DIRECT COST PER COST CENTRE		
	BTN	**PERCENT**
Overhead Cost Centres	**426,896**	**28.0**
Administration	143,471	9.4
Transport	-	-
Staff quarters	108,974	7.1
Security & Maintenance	174,451	11.4
Intermediate Cost Centres	**114,224**	**7.5**
Imaging	-	-
Kitchen	-	-
Laboratory	-	-
Operating Theater	-	-
Pharmacy/Dispensary	114,224	7.5
Final Cost Centres	**985,255**	**64.5**
Outpatient department	266,645	17.5
Inpatient department	82,340	5.4
- All Medical	*82,340*	*5.4*
- Surgical & Medical	-	-
Maternal & Child Health (MCH)	636,270	41.7
Indigenous Unit	-	-
Total	**1,526,374**	**100.0**

TOTAL COST FOR FINAL COST CENTRES		
	BTN	**PERCENT**
Outpatient department	**512,891**	**33.6**
Inpatient department	**114,311**	**7.5**
- All Medical	114,311	7.5
- Surgical & Medical	-	-
Maternal & Child Health (MCH)	**899,173**	**58.9**
Indigenous Unit	**-**	**-**
Total	**1,526,374**	**100.0**

Mendelgang Basic Health Unit, Grade II

TOTAL COSTS		
	BTN	PERCENT
Recurrent cost	**2,287,229**	**84.5**
- Staff	999,832	36.9
- Drugs and medical supplies	549,045	20.3
- Other	738,352	27.3
Capital cost	**419,656**	**15.5**
- Buildings	319,656	11.8
- Equipment	100,000	3.7
- Vehicles	-	-
TOTAL COST	**2,706,885**	**100.0**

FIXED vs. VARIABLE COSTS		
	BTN	PERCENT
Fixed costs	1,732,126	64.0
Variable costs	974,759	36.0
Total	**2,706,885**	**100.0**

TOTAL COST FOR FINAL COST CENTRES AND UNIT COSTS				
	Cost	Activity	Number	Unit Cost
Outpatient department	1,305,463	OPD-visits	6,565	199
Inpatient department	269,092	Admissions	NA	NA
		Beddays	NA	NA
- *All Medical*	269,092	Admissions	NA	NA
		Beddays	NA	NA
- *Surgical & Medical*	-	Admissions	NA	NA
		Beddays	NA	NA
Maternal & Child Health (MCH)	1,131,860			
Indigenous Unit	-			
Total	**2,706,415**			

RECURRENT COSTS			
	BTN	PERCENT	Cost Type
STAFF	**999,832**	**43.7**	**F**
Pay and allowances	858,792	37.5	F
Other personal emoluments	74,450	3.3	F
Contributions Provident Fund	66,590	2.9	F
Retirement benefits		-	F
DRUGS AND MEDICAL SUPPLIES	**549,045**	**24.0**	**V**
Drugs	490,005	21.4	V
Medical supplies	59,040	2.6	V
- Anastethics	320	0.0	V
- General consumables	25,230	1.1	V
- Gynaecology	9,388	0.4	V
- Operating Theater	-	-	V
- Pediatric	20,772	0.9	V
- Physiotherapy	-	-	V
- Imaging (x-ray/ultra-sound)	-	-	V
- Sutures	2,860	0.1	V
OTHER RECURRENT COSTS	**738,352**	**32.3**	
Utilities	**17,750**	**0.8**	F
- Water, electricity, sewerage	7,000	0.3	F
- Fuel wood	4,500	0.2	F
- Telephone, postage, fax, etc.	6,250	0.3	F
Stationary, office supplies	**11,000**	**0.5**	F
Uniforms and linen	**3,000**	**0.1**	F
Patient Diet		**-**	V
Transport	**24,464**	**1.1**	V
Maintenance	**232,138**	**10.1**	F
- Buildings	232,138	10.1	F
- Vehicles		-	F
- Equipment		-	F
Travel allowances	**401,250**	**17.5**	V
Other	**48,750**	**2.1**	F
Total	**2,287,229**	**100.0**	

CAPITAL COSTS - annual depreciation cost			
	BTN	PERCENT	COST TYPE
Buildings	**319,656**	**76.2**	**F**
- Health facility	159,828		F
- Out-Reach Sheds	50,854		F
- Staff quarters	108,974		F
Equipment	**100,000**	**23.8**	**F**
- General	-		F
- In-Patient Dep	-		F
- Out-Patient Dep	-		F
- Operating Theater	-		F
- Laboratory	-		F
- Kitchen	-		F
- Imaging (x-ray/ultra-sound)	-		F
- Maternal & Child Health	-		F
- Dental	-		F
- Other	-		F
Transport	**-**	**-**	**F**
Total	**419,656**	**100.0**	

DIRECT COST PER COST CENTRE		
	BTN	**PERCENT**
Overhead Cost Centres	**785,831**	**29.0**
Administration	239,235	8.8
Transport	24,464	0.9
Staff quarters	108,974	4.0
Security & Maintenance	413,159	15.3
Intermediate Cost Centres	**548,575**	**20.3**
Imaging	-	-
Kitchen	-	-
Laboratory	-	-
Operating Theater	-	-
Pharmacy/Dispensary	548,575	20.3
Final Cost Centres	**1,372,009**	**50.7**
Outpatient department	432,693	16.0
Inpatient department	190,959	7.1
- All Medical	*190,959*	*7.1*
- Surgical & Medical	-	-
Maternal & Child Health (MCH)	748,357	27.7
Indigenous Unit	-	-
Total	**2,706,415**	**100.0**

TOTAL COST FOR FINAL COST CENTRES		
	BTN	**PERCENT**
Outpatient department	**1,305,463**	**48.2**
Inpatient department	**269,092**	**9.9**
- All Medical	269,092	9.9
- Surgical & Medical	-	-
Maternal & Child Health (MCH)	**1,131,860**	**41.8**
Indigenous Unit	**-**	**-**
Total	**2,706,415**	**100.0**

Thinleygang Basic Health Unit, Grade II

TOTAL COSTS		
	BTN	PERCENT
Recurrent cost	**1,732,746**	**80.5**
- Staff	1,000,000	46.5
- Drugs and medical supplies	310,059	14.4
- Other	422,687	19.6
Capital cost	**419,656**	**19.5**
- Buildings	319,656	14.9
- Equipment	100,000	4.6
- Vehicles	-	-
TOTAL COST	**2,152,402**	**100.0**

FIXED vs. VARIABLE COSTS		
	BTN	PERCENT
Fixed costs	1,442,343	67.0
Variable costs	710,059	33.0
Total	**2,152,402**	**100.0**

TOTAL COST FOR FINAL COST CENTRES AND UNIT COSTS				
	Cost	Activity	Number	Unit Cost
Outpatient department	910,780	OPD-visits	7,119	128
Inpatient department	244,519	Admissions	NA	NA
		Beddays	NA	NA
- *All Medical*	244,519	Admissions	NA	NA
		Beddays	NA	NA
- *Surgical & Medical*	-	Admissions	NA	NA
		Beddays	NA	NA
Maternal & Child Health (MCH)	996,633			
Indigenous Unit	-			
Total	**2,151,932**			

RECURRENT COSTS			
	BTN	PERCENT	Cost Type
STAFF	**1,000,000**	**57.7**	**F**
Pay and allowances	860,000	49.6	F
Other personal emoluments	75,000	4.3	F
Contributions Provident Fund	65,000	3.8	F
Retirement benefits		-	F
DRUGS AND MEDICAL SUPPLIES	**310,059**	**17.9**	**V**
Drugs	225,575	13.0	V
Medical supplies	84,484	4.9	V
- Anastethics	1,837	0.1	V
- General consumables	49,485	2.9	V
- Gynaecology	2,289	0.1	V
- Operating Theater	-	-	V
- Pediatric	21,976	1.3	V
- Physiotherapy	-	-	V
- Imaging (x-ray/ultra-sound)	-	-	V
- Sutures	8,427	0.5	V
OTHER RECURRENT COSTS	**422,687**	**24.4**	
Utilities	**8,360**	**0.5**	F
- Water, electricity, sewerage	2,031	0.1	F
- Fuel wood		-	F
- Telephone, postage, fax, etc.	6,329	0.4	F
Stationary, office supplies	**6,712**	**0.4**	F
Uniforms and linen	**3,000**	**0.2**	F
Patient Diet		**-**	V
Transport		**-**	V
Maintenance	**4,615**	**0.3**	F
- Buildings	4,615	0.3	F
- Vehicles		-	F
- Equipment		-	F
Travel allowances	**400,000**	**23.1**	V
Other		**-**	F
Total	**1,732,746**	**100.0**	

CAPITAL COSTS - annual depreciation cost			
	BTN	PERCENT	COST TYPE
Buildings	**319,656**	**76.2**	**F**
- Health facility	159,828		F
- Out-Reach Sheds	50,854		F
- Staff quarters	108,974		F
Equipment	**100,000**	**23.8**	**F**
- General	-		F
- In-Patient Dep	-		F
- Out-Patient Dep	-		F
- Operating Theater	-		F
- Laboratory	-		F
- Kitchen	-		F
- Imaging (x-ray/ultra-sound)	-		F
- Maternal & Child Health	-		F
- Dental	-		F
- Other	-		F
Transport	**-**	**-**	**F**
Total	**419,656**	**100.0**	

DIRECT COST PER COST CENTRE		
	BTN	**PERCENT**
Overhead Cost Centres	**471,124**	**21.9**
Administration	176,503	8.2
Transport	-	-
Staff quarters	108,974	5.1
Security & Maintenance	185,648	8.6
Intermediate Cost Centres	**309,589**	**14.4**
Imaging	-	-
Kitchen	-	-
Laboratory	-	-
Operating Theater	-	-
Pharmacy/Dispensary	309,589	14.4
Final Cost Centres	**1,371,219**	**63.7**
Outpatient department	432,752	20.1
Inpatient department	190,987	8.9
- All Medical	*190,987*	*8.9*
- Surgical & Medical	-	-
Maternal & Child Health (MCH)	747,480	34.7
Indigenous Unit	-	-
Total	**2,151,932**	**100.0**

TOTAL COST FOR FINAL COST CENTRES		
	BTN	**PERCENT**
Outpatient department	**910,780**	**42.3**
Inpatient department	**244,519**	**11.4**
- All Medical	244,519	11.4
- Surgical & Medical	-	-
Maternal & Child Health (MCH)	**996,633**	**46.3**
Indigenous Unit	**-**	**-**
Total	**2,151,932**	**100.0**