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COST ACCOUNTING STUDY IN PILOT HOSPITALS

TECHNICAL REPORT

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ACRONYMS

ALOS	Average Length of Stay
CC	Cost Centers
CD	Cost Driver
CMI	Case Mix Index
DRG	Diagnosis Related Group (DRG)
EEHR	Enabling Equitable Health Reform Project
HII	Health Insurance Institute
MOH	Ministry of Health
SDCA	Step-down cost accounting
SMCA	Standard Methodology of Cost Accounting and Analysis
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

The USAID/Albania's Enabling Equitable Health Reforms (EEHR) project is a five-year project (2010-2015) to address the identified barriers and obstacles to more effective health policy and reform implementation in order to increase access to health services, particularly for the poor. EEHR is organized around three strategies to meet the goal of the project:

- Improve capacities to implement a set of health reform interventions in selected sites;
- Improve health reform policy and planning; and
- Enhance non-state actors' participation and oversight of health systems performance.

EEHR will lead the implementation of a set of interventions in selected hospitals. When implemented together, the interventions will test a holistic model for improving the organization and delivery of hospital services as a key component in improving overall health system performance and expanding access to health care services in the long term.

The study described herein aimed to analyze the costs of three health facilities as described in the current report, in order to help hospital managers to better understand the cost structure of their facilities and to enhance their knowledge and abilities to use such cost data for analysis and decision-making.

The study also informs the payer of services, the Health Insurance Institute (HII) with information that is needed for the development of new financing mechanisms ("per discharged case" or "global budget"). Similar technologies are widely used internationally and have proven their effectiveness.

The three hospitals - Queen Geraldine Maternity Hospital, Tirana, Korca Regional Hospital, and Lezha Regional Hospital, participated in the study. For these three hospitals:

- Centers responsible for costs (cost centers) were determined;
- Direct costs were calculated;
- Indirect costs were distributed based on a set of defined criteria; and
- Costs of all hospital departments were allocated to clinical (discharging) departments.

A standard methodology of cost accounting and analysis (step-down cost accounting method) was used as the methodological instrument of the study.

The resulting cost-accounting tables in the MS Excel format (which are provided separately along with this report) allow health managers simulating various scenarios reflecting changes in the cost, structure and array of services, and trace the impact of these changes on the cost of discharged cases by department.

In the process of implementation of the current study, certain problems and issues related to the availability of disaggregated statistical and financial information were revealed; accordingly, recommendations on improving the data collection system were developed. The consultant also studied the existing information system employed to collect data and used by the HII for cost accounting purposes. Based on the findings, recommendations were developed for improvements to increase the effectiveness of the system and expand its application area.

As the next step it is recommended to organize a workshop for representatives of the pilot hospitals to present the results of the analysis and design various practical scenarios applying the methodology to practical choices and issues faced in managing the hospitals and delivering services cost-effectively.

1. BACKGROUND

The USAID/Albania's Enabling Equitable Health Reforms (EEHR) project is a five-year project (2010-2015) to address the identified barriers and obstacles to more effective health policy and reform implementation in order to increase access to health services, particularly for the poor. EEHR is organized around three strategies to meet the goal of the project:

- Improve capacities to implement a set of health reform interventions in selected sites;
- Improve health reform policy and planning; and
- Enhance non-state actors' participation and oversight of health systems performance.

EEHR will lead the implementation of a set of interventions in selected hospitals that fall under the six health systems strengthening building blocks of: Service Delivery, Health Workforce, Health Information Systems, Medical Products and Technology, Health Financing, and Governance. When implemented together, the interventions will test a holistic model for improving the organization and delivery of hospital services as a key component in improving overall health system performance and expanding access to health care services in the long term.

In its work plan, EEHR defines access as availability and coverage of needed services when consumers arrive at pilot hospitals, which are Lezha and Korca Regional Hospitals and Queen Geraldine Maternity Hospital. The interventions will prepare pilot hospitals to be fully autonomous and test increased levels of hospital autonomy in one or more mature sites, providing a successful hospital governance model that may be replicated by the MOH and other hospitals in additional sites. Effective hospital autonomy relies on the capability of hospital managers to use resources efficiently by allocating them with priority to areas of hospital operations dictated by the changing needs of clients/patients. This includes the capability to measure, monitor and control facility and services costs.

This consultancy supports Strategy 1: Improve Capacities to Implement a Set of Health Reform Interventions in Selected Sites as fully detailed in the Work Plan Activities for Year Two of the Enabling Equitable Health Reforms Project in Albania. This report provides the results of a study and workshops conducted on two field trips to Albania in 2012 by the consultant, international costing specialist, Alexandr Katsaga.

The health care system of Albania is undergoing intensive reform. Due to sustained economic growth and social priorities the country has consistently increased health care funding in recent years and is undertaking other measures to improve the population's access to quality health services. In this context it is critically important to increase the efficiency of health care system resources, particularly at the health provider level, as an inefficiently operating system is at risk of consuming additional financial inputs without real impact.

With regard to the above, as international practice proves, the following factors are critically important:

- Health provider autonomy;
- The possibility for health providers to respond to incentives created by the Payer (funding agent);
- The capacity of health managers to efficiently manage their resources;

For effective management health managers should have a possibility to analyze the cost structure of their facilities and make evidence-based management decisions based on verified and up-to-date information.

2. OBJECTIVES

This report is and the technical assistance provided in relationship to it, including excel worksheets provided separately, aim to achieve the following objectives:

- Strengthen the capacity of hospitals to effectively manage budgets and finance as a step toward their eligibility to assume greater management autonomy from the Ministry of Health (MOH);
- Improve hospital directors and hospital management teams' capacity to understand the cost of operations across hospital departments/services and use costing information as a guide for effective and evidence-based decision making;
- Design a methodology for costing hospital operations to be implemented at EEHR pilot hospitals;
- Provide training to the hospital management teams on application of the costing methodology; and
- Coordinate cost accounting activities with HII's planned development of hospital provider payment systems and EEHR development of hospital information systems.

3. COST ACCOUNTING: APPROACHES AND METHODS

3.1 INTRODUCTION

Health provider cost accounting is an important feature of financing the majority of health systems. While determining financial and tariff setting policies the payer (funding agency) generally needs to monitor costs at health provider level. The payer requires an objective costing of economic parameters of provider payment methods -such as global budget or diagnosis related groups (DRGs) - and ideally takes adequate measures to optimize costs. In turn, health managers under new payment arrangements are encouraged to analyze expenditures and seek ways to maintain financial sustainability of their health facilities and service delivery in conditions of permanent funding deficits.

In these conditions modern theories consider hospitals as independent economic business entities producing discharged patients as their product. Similar to other sectors of the economy, hospitals need to balance the price of provided services reimbursed by the funding agency with the cost of discharged patient cases (hospital costs). In this process correct costing of ancillary hospital departments/units (administrative, technical support, diagnostic) within the overall structure of discharged cases is one of the key challenges.

For these purposes three major costing methods are generally used in international practice:

- The direct method, which is the most widely used allocation method, allocates each service department's costs directly to the production departments, ignoring services rendered to other service departments.
- The step-down method, also widely used, allocates costs of service departments to both production and service departments. The sequence of allocation usually begins either with the department rendering service to the greatest number of other service departments (or,

alternatively, the most costly service department) and progresses all the way to the one rendering service to the smallest number of other departments (or to the least costly department). Once service department's costs have been allocated, no subsequent service - department costs are allocated back to it.

- The reciprocal method is the most accurate allocation method. This method recognizes reciprocal services among service departments. It requires solving a set of simultaneous linear equations.

The Direct Method is the simplest however least accurate method.

The Reciprocal Method, in turn, while assuring the maximum accuracy of calculations, requires a large amount of information reflecting economic relations between all hospital departments on one hand and the availability of specific knowledge with health managers and financiers on the other.

Thus, considering the available data sources in Albania it is recommended to use a standard **step-down cost accounting (SDCA)** methodology, which represents a good compromise as being fairly simple to implement, however allowing for sufficiently objective cost figures.

The table below summarizes the information on using cost accounting methodologies in European countries: [1]

TABLE 1 STEP-DOWN COST ACCOUNTING (SDCA) METHODS USED IN EUROPEAN REGION

	Number (share) of cost collecting hospitals	Overhead allocation	Data checks on reported cost data
Austria	20 reference hospitals (about 8% of all hospitals)	varying by hospital	regional authority, regularly
England	all hospitals	direct method	national authority, annually
Estonia	hospitals contracted with the national health insurance fund	direct method	national authority, annually
Finland	5 reference hospitals meeting particular cost accounting standards (about 30% of specialized care)	direct method	no (responsibility of hospitals)
France	99 volunteering hospitals participating in the hospital cost database ENCC (about 13% of inpatient admissions)	step down method	regional authority, annually
Germany	about 225 volunteering hospitals meeting In EK cost accounting standards (about 13% of all hospitals)	preferably step down method	national authority, annually
Netherlands	resource use: all hospitals; unit costs: 15-25 volunteering general hospitals (about 24% of all hospitals)	direct method	national authority, annually
Sweden	hospitals with case costing systems (about 62% of inpatient admissions)	direct method	national and regional authority, annually

[1] Diagnosis-Related Groups in Europe: Moving towards transparency, efficiency and quality in hospitals, Reinhard Busse, Alexander Geissler, Wilm Quentin, Miriam Wiley, European Observatory on Health Care Systems, Berlin Technical University, Berlin Technical University, Economic Social Research Institute

3.2 POTENTIAL AREAS OF STANDARD METHODOLOGY APPLICATION BY A FUNDING AGENCY (PAYER)

Development of an effective payment system

A more effective system presupposes transition from a funding mechanism based on actual cost estimates, when funds are allocated in accordance with the specifics of budget classification, to a payment mechanism based on the amount and complexity of health services provided. Such approach comprises tariff and fee-for-service systems for various types of health services. The accounting and analysis of costs incurred by health facilities to provide health services are an integral part of tariff policy development, and therefore, of tariff design.

Monitoring and anti-monopoly regulation

The methodology allows comparing costs of a single facility during different operation periods. This allows fund holders to monitor changes at the health service market and the trends of cost increase for those types of services, which cannot be provided by alternative sources, as well as to evade monopolist health facilities.

Rationalization and reorganization of the network

Using the cost analysis by hospital, health agencies will be able to define the least efficient facilities in order to either reduce or reorganize them within the hospital network.

3.3 POTENTIAL AREAS OF METHODOLOGY APPLICATION BY HEALTH FACILITIES

Broader application of this methodology by managers of health facilities during transition to a new payment method provides for the following opportunities:

Optimization of hospital operation program

Detailed cost accounting and analysis allow demonstrating what happens to the hospital budget as a result of planned changes of the health service amount, taking into account the demand for certain types of health services.

Improvement of organizational structure

The step down cost accounting methodology allows calculating total costs for the maintenance of each hospital unit, which makes it possible to define the most efficient and cost-consuming ones to be enlarged, closed or re-organized.

Optimization of hospital production capacity

Systematic analysis of specific costs allows managers to determine how changes in the volume of health services activities of a facility/unit impact costs. With this methodology, managers can project potential losses caused by the inefficient use of fixed assets, and calculate the potential economic benefits of reducing the amount of overhead (for instance by selling or abandoning the lease of premises, facilities, or equipment).

Establishing a mechanism of internal revenue allocation

The methodology provides for the development of an effective mechanism of income allocation within a facility.

Improvement of a hospital status during negotiations with a funding party

Cost calculation and projection according to the proposed methodology allow a hospital to justify its financial resource needs.

Improvement of cost effectiveness

By establishing an environment which considers economic efficiency and enabling the ability for cost analysis, hospital managers have an increased interest in reducing direct and indirect costs.

Initially a similar methodology was used in the USA to determine costs for the federal Medicare program; later it was adapted to the needs of various countries with country-specific changes introduced in the methodology. Specifically, the publication "Designing and Implementing Health

Care Provider Payment Systems: How-To Manual", Edited by John C. Langenbrunner et al., USAID, WB, 2009, describes the application of this methodology in a number of countries in Central Asia.

4. SUMMARY OF THE CURRENT SITUATION AT PILOT HOSPITALS

4.1 MAJOR FINANCIAL FLOWS AT THE HOSPITAL LEVEL

Hospitals in Albania are currently funded by the HII on a flow through process with the money coming from the Ministry of Health. This process began in 2009 and almost all the funds are passed on from the MOH through HII to the hospitals. The budgets of hospitals are determined by the Ministry of Health on a historical basis using previous years' allocations with possible adjustments for salary increases and inflationary costs. The budgets are allocated with amounts for salaries, insurance (benefits such as health premiums paid on behalf of employees by employers), drugs and other materials.

The hospitals are not permitted any significant latitude in being able to transfer funds from one budgetary category to another. Indeed, even within the salaries budget, there is limited ability to transfer individuals, positions or salary funds from one area of the hospital to another.

In addition to funding received from HII, hospitals have other sources of funding called secondary income. This includes funds from the following sources:

- Registration fees at hospitals;
- Fees for services accessed by the uninsured (those without a Health Booklet);
- Fees for self-referral (people who are admitted to hospital without referral from their doctor or from a lower level hospital);
- Co-payments for examinations at tertiary hospitals (10% for insured and 100% for uninsured; exceptions are made for World War II veterans and invalids from the war);
- Fees collected from uninsured patients at specialty outpatient clinics; and
- Fees collected from the uninsured for examinations at regional and municipal hospitals.

Hospitals are currently permitted to keep the secondary revenue they collect and it may be applied as follows: 30% for investments in the hospital, 40% for operational costs such as goods and services and 30% may be used for rewards and bonuses for staff, based on good performance. If a hospital runs a deficit or has a debt, the secondary income may be applied to that. Finally, secondary income may be retained by the hospital and used the following year unlike government funds which are recovered if unused at year end. The current cost accounting study described herein examines only financial flows received from HII.

4.2 COST ACCOUNTING TECHNOLOGIES AND INSTRUMENTS

In January 2011 HII developed and approved a cost accounting methodology and developed a respective software program. Today, the software program is applied in each Cost Center in 40 hospitals. Basic information is gathered from clinic files of patients. The Patient Clinic File is unified; files are filled out manually by the health personnel of hospitals. The Clinic File model is a new one, implemented this year in every hospital; it also enhances new rubrics (entries) on codification of ICD9, patient, insurance status, etc.

Electronic registration of clinic files is made by the Cost Center operators in each hospital after the patient is discharged from the hospital. Each Cost Center in each hospital uses 1 to 5 computers connected in a small LAN and the data are registered in the system by a qualified staff, hired according to criteria specified in the hospital's contract.

A Patient Clinic File is the basic official document registered in the system; it is managed and stored according to specific documentation management rules. The rubrics of clinic files must be filled out by the medical staff before transferring the files to the information system center. If a clinic file contains incorrect data it is sent back to be filled again correctly.

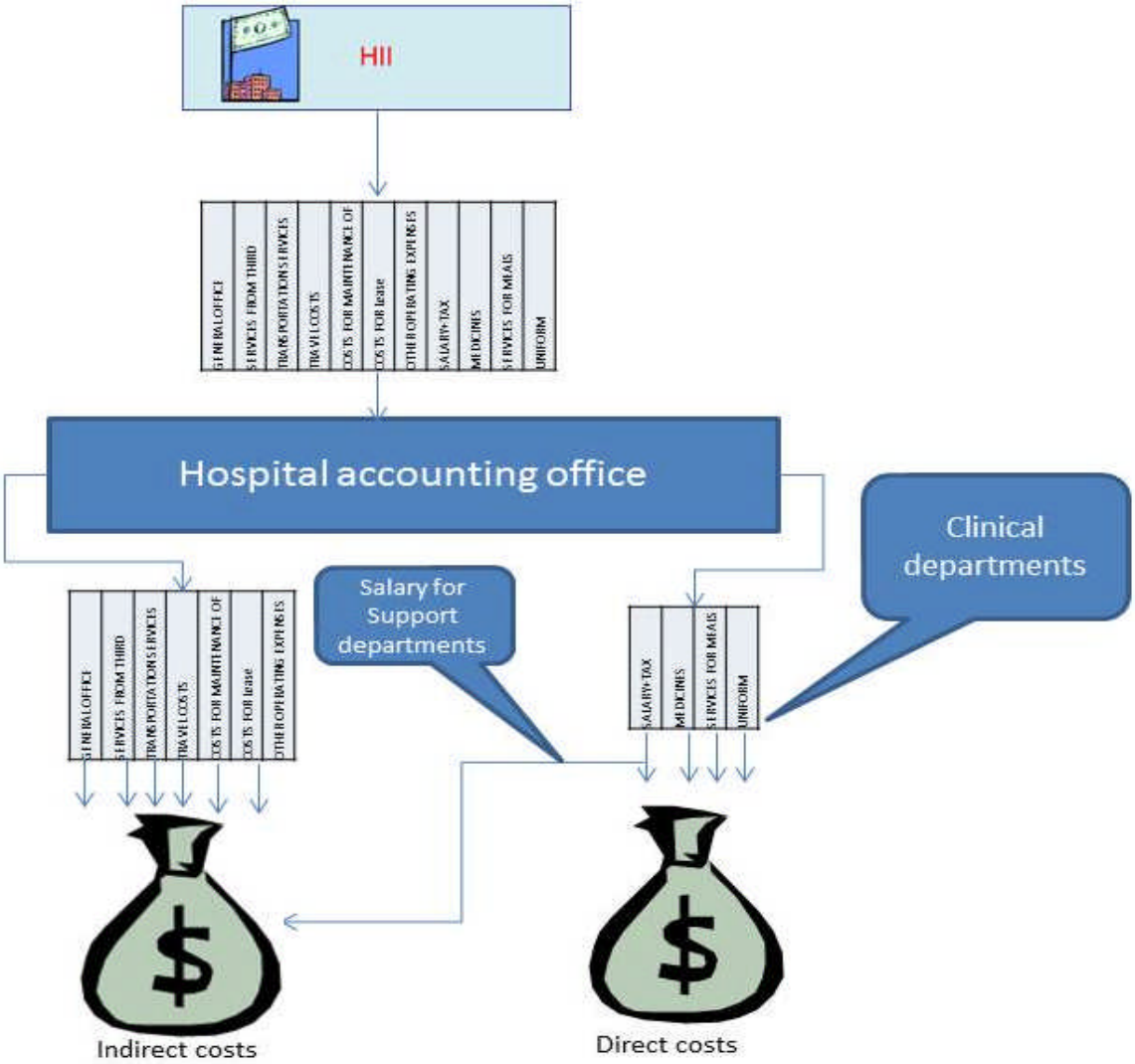
The summary of data registered manually in clinic files is verified against the summary of data calculated electronically by software programs. At the end of each month other financial data gathered from financial reports prepared by finance unit of the hospital, such as expenses for salaries and other administrative expenses are also transferred to the system.

Methodologically, the costing process goes through three major stages:

Step 1. Grouping of all costs into Direct Costs and Indirect Costs

All resources received by health facilities through the HII should be grouped into two categories: Direct cost and Indirect cost.

FIGURE 1. STEP 1 DESCRIPTION



Step 2: Allocation of Direct and Indirect Costs to Clinical Departments

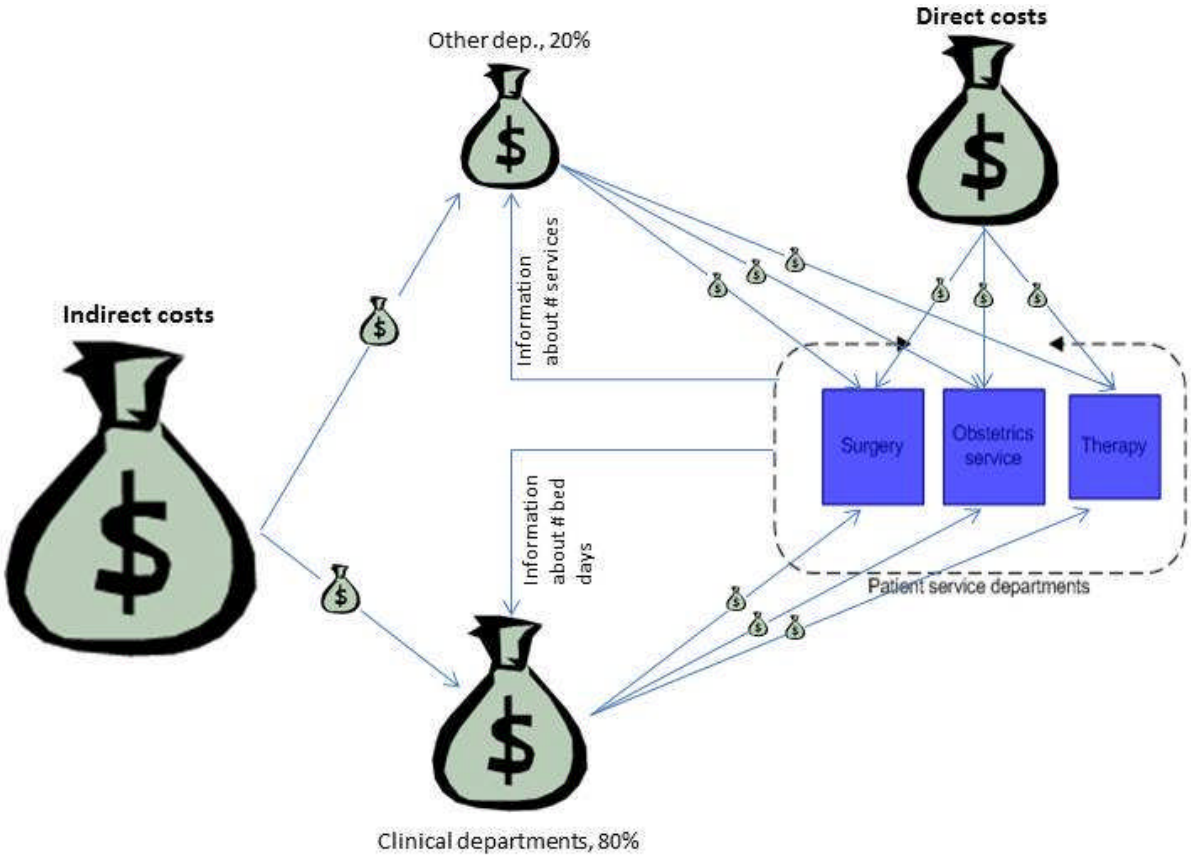
All direct costs are allocated directly to clinical departments.

Indirect costs are split into two groups:

- 80% of indirect costs are allocated to clinical departments proportionally to bed-days of each clinical department within the structure of total bed-days in hospital.
- 20% of indirect costs are allocated to ancillary and para-clinical departments.

Further, these costs are allocated to clinical departments in proportion to the amount of services provided to patients in these departments.

FIGURE 2. ILLUSTRATIVE STEP 2



Step 3. Allocation of costs per each individual case (diagnosis code)

In Stage 3 all costs allocated to a clinical department are allocated further to discharged cases by Diagnosis Code (ICD9) breakdown in the following way:

- 20% of indirect costs of paraclinical departments are allocated in proportion to the amount of serivces provided to a patient with this diagnosis[2];
- 20% of indirect costs are allocated in proportion to the number of bed days spent by patients with this diagnosis in this department.

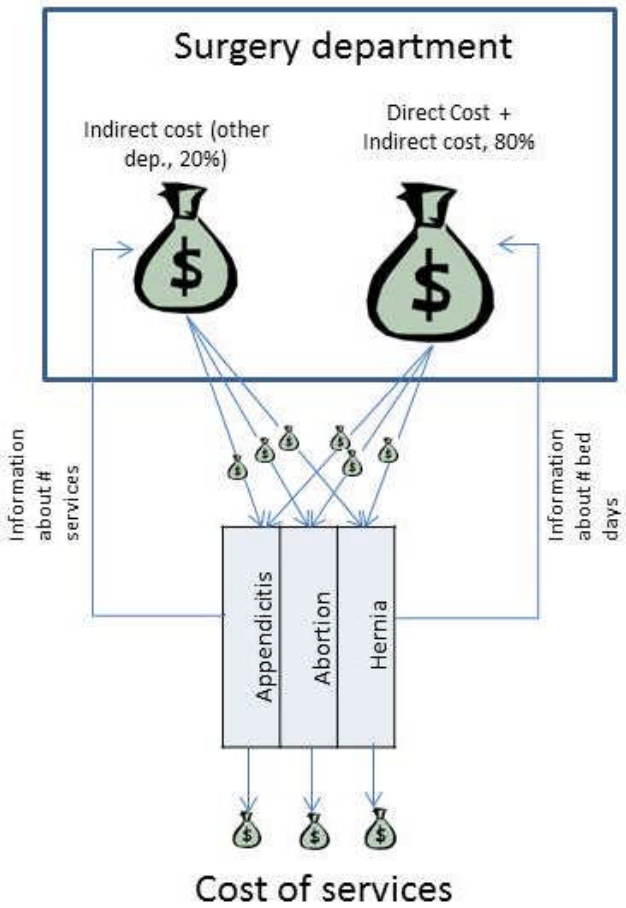
[2] Paraclinical departments include units and services, their activities being of medical nature, thus ensuring curative and diagnostic process both for patients, who undergo treatment in clinics, and for outpatients. This category includes all kinds of lab and apparatus diagnostics, provision of medications, surgical operations, pathology anatomy, physiotherapy etc. Clinical departments are units, providing health services, which a health facility is paid for within a finished case item.

Thus, the costing of discharged cases is done by diagnosis.

This cost accounting model is standard across the country allowing the HII to collect data and make proper comparisons of various indicators of hospitals of different level and type.

The system is generally oriented toward its use for decision making and assessing the situation at country level.

FIGURE 3. ILLUSTRATIVE STAGE 3



4.3 MAJOR DIFFERENCES BETWEEN THE PROPOSED APPROACH TO COST ACCOUNTING AND THE ONE USED BY HII

The proposed step down cost accounting (SDCA) methodology used by this study has the following methodological and practical differences from the HII model:

- Cost allocation under the HII model is performed based on two criteria: ***number of bed days*** and ***amount of services provided by paraclinical departments***. Under the SDCA model allocation of costs is performed based on a set of criteria (cost drivers) ***specific for each cost item***. For instance, electricity and heating costs are allocated to departments in proportion to occupied premises sq. m., while stationary costs are allocated in proportion to staff schedules, etc.
- While under the HII model costs are allocated only to clinical departments, the SDCA model ***allows for costing the maintenance of each hospital department including administrative departments***. This allows managers to receive additional information for making management decision and finding opportunities for savings. In addition, the system provides for assessing the weight of each non-clinical department in the discharged case cost structure.
- Information supporting the HII system is collected on a regular basis along with the monthly reporting process. The analysis made on the SDCA basis is done, as a rule, based on annual results or in some cases based on semi-annual results.
- Calculations under the HII system result in costing of discharged cases by diagnosis, while the SDCA model produces the cost of discharged case and bed-day by hospital department.

In general, one can conclude that the HII system is standardized and generally purposed to address ***global sectoral issues***, while the SDCA system is largely oriented toward its application at hospital level to address ***internal management issues.***

This is conditioned by the fact that the SDCA model reflects the entire hospital structure and allows for receiving more information on the efficiency of its structural units. In addition the SCDA model allows a flexible simulating of consequences of various management decisions as well as selecting

criteria for allocation of indirect costs with the consideration of hospital-specific characteristics. This would also help develop analytical and managerial skills of health managers.

To conclude, both models serve different key objectives and can very well interact and complement each other.

The proposed methodology is presented in the MS EXCEL table submitted separately and allows health managers prompt simulation of consequences of various management decisions, evaluating the impact of such decisions on actual cost of discharged cases which is critically important in transition to a new health financing system.

Thus, utilization of the proposed methodology does not compete with the HII methodology, rather, it equips the HII staff and health managers with an additional analytical tool enabling evidence –based management decision making.

4.4 MAJOR CONCLUSIONS AND RECOMMENDATIONS REGARDING THE HII COST ACCOUNTING MODEL

The cost accounting system developed by the HII is fairly complicated, detailed and costly in terms of its implementation. Such approaches are not frequently used in international practice for the following reasons:

- The attempt to do detailed costing per each case in all hospitals creates incentives for hospitals to administer patients ***as many procedures, medications and other interventions as possible*** (or inflate prescriptions so that after a patient is discharged it is difficult to verify). Currently this challenge of the methodology does not have much impact as hospitals are not independent and are still funded based on historical budget. However, as hospitals will be gaining more autonomy and transiting to new provider payment methods, this factor may become critical.
- In the United State, for example, the detailed accounting of all services and further costing by principle "fee for service" resulted in ***intensive increase of health expenditures***. Contrary to the detailed cost accounting methods and costing per each discharged patient, costing methods allowing for larger-scale aggregated indicators are used more frequently in international practice. Costing of hospital case by department, by bed profile or by DRG can serve as an example of such methods.
- As of now, it is difficult to justify the introduction of the system in all hospitals. Even in rich countries (Table 1) a centralized cost accounting process is i***mplemented only in some hospitals*** that can provide amassed and standardized types of health services. The system incurs significant administrative costs. Hospitals create special units that collect and do data entry using special software operation programs that require maintenance and support.
- The respective cost analysis does not generally require doing it in ***real time mode***. Approximate results in terms of their analytical and practical value can be received by analyzing summary data for specific final periods, say, annual data.

The introduction of a similar system in Kazakhstan may serve as a negative example. In 2010, instead of amassed aggregated data by DGR breakdown, Kazakhstan introduced a new information system that collected detailed data on costs per each case with the subsequent data on expenditures per each case followed by the development of payment bills based on actual expenditures. Within one year hospital expenditures increased by 80%; starting from 2012 Kazakhstan has abandoned this model.

Conceptual proposal:

- Given the large amount of work carried out and accumulated experience it is proposed to upgrade the existing information system into a system collecting and processing data from electronic patient records (discharged patient statistical forms). This system generates a large volume of information supporting the health care quality monitoring system, as well as the development and operation of new provider payment systems.
- Hospital cost analysis is made once a year. Once a system of discharged patient record entry is

created and put in place, the efficiency of cost analysis would increase through the use of verified statistical data.

This proposal is made for the consideration of the HII to support future decision making. The remaining proposals provided in this report refer to the current system.

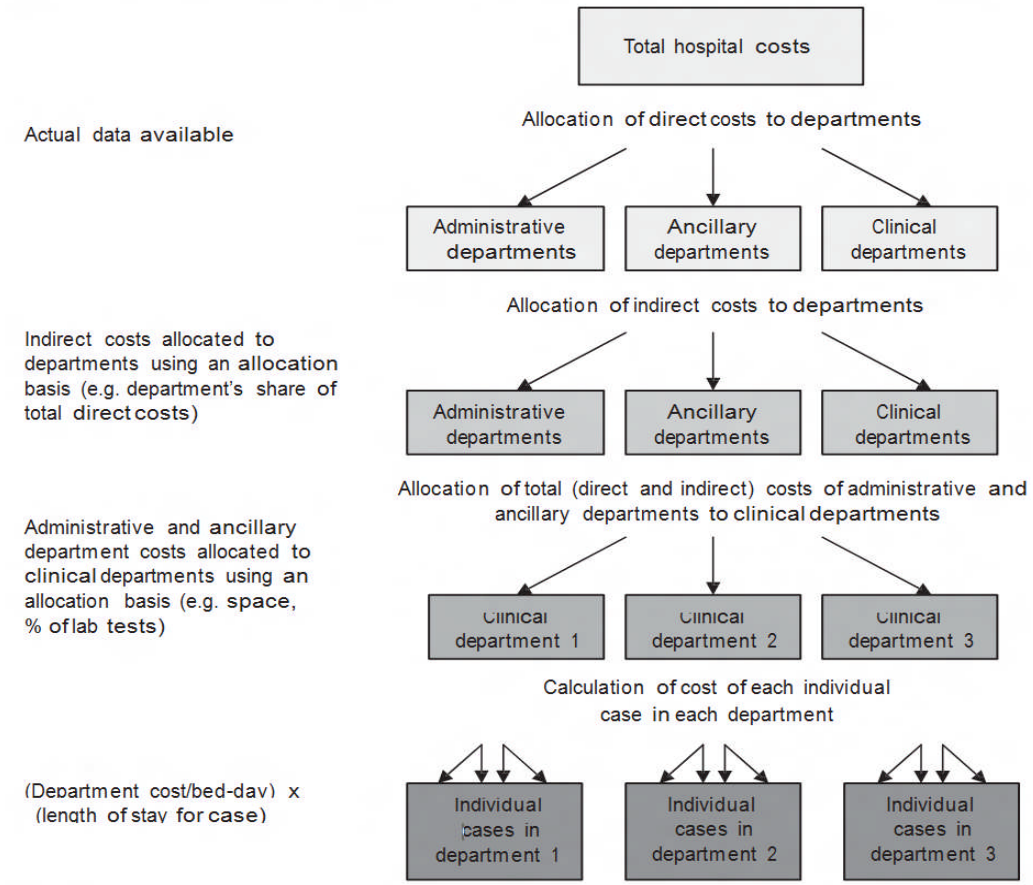
5. METHODOLODY OF THIS STUDY

This section of the report describes methodological approaches that were used in conducting the study. The methodology was adapted from the Medicare Cost Reports used in the United States to determine costs for the federal Medicare program.

While there are lots of variations of this methodology described in literature, all of them employ similar principles and terminology. For this reason, managers familiar with this method will be able to use other, more complicated and comprehensive approaches in the future should they wish.

The general algorithm of the step-down cost accounting model is presented in Figure 4 and in the subsequent sections of the report with the description of major stages.

FIGURE 4. GENERAL ALGORYTHM OF STEP-DOWN COST ACCOUNTING MODEL



5.1 COST CENTERS

The cost center (CC) approach is the most developed and widely used methodology for calculating hospital costs. The hospital's organizational structure is analyzed as a combination of CCs, each producing functionally distinct services and using inputs of production that can be easily identified. CCs largely match the structural units of the institution and/or may be distinguished as clusters of human and material resources focused on specific functions.

A qualitative analysis of the organizational structure and operational framework of the hospital is crucial for classifying costs centers. Information (initially in descriptive form) must be developed on the services that define relationships among departments. The hospital's final output should be delineated along department-specific lines, in a way that emphasizes customer-supplier relationships between cost centers. Such analysis would be similar to the input-output method of data generation and analysis in macro accounting.

Cost Center (CC) is **a)** either a hospital unit, **b)** or the existing hospital units with consolidated *functions, technologies, and organizational structures*, **c)** or a combination of elements of the existing hospital units.

Persons in charge of defining CC structure in health facilities shall be designated by a manager of the health facility. These should be the staff who are well familiarized with the technology of hospital operation, staffing, job responsibilities, specifics of accounting in the health facilities (doctors, an economist, an accountant, a medical statistician). CC structure is defined only for the purpose of cost accounting; ***it should not be the same as the administrative structure of the hospital***.

For the establishment of CC, a qualitative analysis of the existing hospital staff is required. Each hospital unit should be categorized as one of the standard CCs. CC can be established by any of four ways:

- CC can be based on one of the existing units. Clinic and intermediate clinic CCs are established by this way. Clinic and intermediate clinic units cannot be grouped or divided. One clinic unit comprises one CC.
- Several units can merge into one CC, thus total costs and total statistical data should account for all units within the CC's framework.
- A unit can be divided into several CCs. Part of costs and statistics of the unit shall be accounted in one CC, and another part – in the other CC.

It should be noted that dividing and regrouping of units will complicate accounting in CCs, formed in such ways. Heads of health facilities may consider a possibility to modify the facility structure.

The classification comprises five CC categories:

- Administrative and management CCs
- Paraclinical CCs
- Intermediate clinic CCs
- Policlinic CCs
- Clinic CCs

Administrative and Management CCs

The main feature of the administrative and management CC is the non-medical nature of activities.

Functionally, this category includes all types of administrative activities (general management; finance, staff and inventory management, documentation keeping); technical and maintenance services, and housekeeping.

All these functions are aimed at creating general conditions for a hospital to operate as a legal entity, i.e. independent business entity, equipped with engineering utilities and technological outfit.

As a rule, CC costs of this category are included into total overheads of a hospital.

Administrative and management units do not produce services, which the hospital is paid for by a funding agency.

Paraclinical CCs

Paraclinical CCs include units and services, their activities being of medical nature, thus ensuring curative and diagnostic process both for patients, who undergo treatment in clinics, and for outpatients.

This category includes all kinds of lab and apparatus diagnostics, provision of medications, surgical operations, pathology anatomy, physiotherapy; intensive therapy and admission room can be also included into this category.

A hospital receives payment for the services, provided by these units to inpatients, within the payment for a finished case.

A hospital receives payment for the services, provided by these units to outpatients, within the payment for total services produced.

Policlinic CCs

Policlinic CCs include units and services, which provide various health services mainly for outpatients.

This category includes such units as units or rooms of pre-physician examination care, units or rooms of narrow specialists, procedures room, traumatology center, etc.

A hospital receives payment for the services, provided by these units to outpatients, within the payment for total services produced.

Intermediate Clinic CCs

This category includes CCs, which carry out **a)** ancillary functions by supporting curative process in clinic units, **b)** conduct major curative process, i.e. have beds, and discharge patients from hospitals upon completion of treatment. Intermediate Clinic CCs may (but should not) include intensive therapy units and admission rooms in larger hospitals.

Like clinic units of health facilities, such units cannot be combined with other units into one CC or separated into several CCs.

Clinic CCs

Clinic CCs are units, providing health services, which a health facility is paid for within a finished case item. The structure of clinic CCs should be completely similar to that of clinic units of a health facility.

Table 2 summarizes examples of grouping departments by cost centers.

TABLE 2. EXEMPLARY GROUPING OF DEPARTMENTS BY COST CENTER

Administrative	Paraclinical	Policlinic CCs	Intermediate Clinic CCs	Clinical
General administration	Physiotherapy/ Exercise Therapy	Outpatient Policlinic	Emergency	Surgical
Accounting	X-ray/Ultrasound	Woman's Center	Surgical Room	Traumatology
Security	Autopsy		Intensive Care	Urology
Medical Transport	Endoscopy		Admission	Otolaryngology
Laundry	General Clinic			Ophthalmology
Kitchen	Dental Care			Internal Medicine
Methodology and Organization				Cardiology
	Pharmacy			Neurology
	Clinical Laboratories			Infectious Diseases

5.2 CLASSIFICATION OF COSTS

Operating costs for each department have been classified as direct or indirect.

Direct costs are those that relate to a department's operations and can be linked to specific CC based on the CC's structure and use of resources. Thus, for each CC, direct costs will include Budget Chapter *Wages and Salary,* which will be based on the department's personnel.

Indirect costs are chapter (budget item) costs that do not relate directly to a specific CC but can be spread among all CCs based on a common functional use. These chapter costs are identified and recorded by functional area and by CC classification (administrative, paraclinical, clinical etc.) and assigned based on functional allocation statistics. For example, indirect costs include Chapter *Office Supplies,* which are used by all departments and recorded to specific departments based on the supplies used.

If these data are not available, the cost allocation is done by the staff size (second choice option). Allocation of costs for heating generally done in proportion to the area of premises is another example.

Full Costs. Full costs for each CC shall be calculated as total direct costs of the CC plus a share of indirect costs of the facility, which falls on this particular CC. CC's share in indirect costs of the facilities, shall be calculated in accordance with the procedure described above.

Final Costs. Final costs of CCs shall be calculated as total full costs plus the share of costs incurred by all higher CC, falling on this particular CC in accordance with the step down cost accounting method.

5.3 COST POOL

A cost pool is the *overhead amount* to be allocated. In general, a cost pool consists of the *full costs* of one overhead department (or cost center). If the costs of a single overhead department *differ substantially* in nature and are *used in different proportions*, multiple cost pools should be used.

5.4 COST DRIVER

A cost driver is the *basis* on which the cost pool will be allocated. In traditional costing *the volume of output* was used as a cost driver to allocate indirect cost to cost objects. With the change in business structures, technology and thereby cost structures it was found that the volume of output was not the only cost driver.

For example, the cost driver for facilities overhead (building space depreciation, maintenance, utilities, and so on) might be the amount of space used by each patient service department.

The selection of cost drivers is critical to the cost allocation process. Cost drivers should create an allocation that is highly correlated with the actual amount of overhead services consumed. Good cost drivers will have these two important attributes:

- They should be perceived as being *fair*.
- They should promote *organizational cost reduction*.

Table 3 summarizes examples of cost drivers of standard hospital departments.

TABLE 3. COST DRIVERS EXAMPLES

Centers Responsible for Costs (CC)	Optimal Criteria for Step-Down Cost Allocation
Administration	Full Costs
Maintenance And Supply Department/Supporting Technical Unit	Area
Transportation Service	Bed-days
Accounting Office	Direct cost
Laundry	Bed-days
Food/Catering Unit	Bed-days

Pharmacy	Direct cost (medicines and medical material)
Registrar's/Reception	Number of patients
Sterilization Unit	Bed-days
CAT	Number of CATs
X-Ray Unit	Number of X-rays
Fluorography	Number of examinations
Physiotherapy	Number of physio-therapeutic procedures
Ultra-Sound	Number of examinations
Functional Diagnostics	Number of examinations
Blood Bank /Blood Transfusion	Amount of stored blood through direct recording (or number of surgeries)
Rehabilitation	Number of sessions
Endoscopy	Number of examinations
Laboratory	Number of analyses
Planned, Emergency And Consultative Care	Number of served calls
Anatomy-Pathology	Number of autopsy, histological examinations (number of death cases)
Surgery Unit	Number of surgeries
Admission Department	Number of patients
Intensive Care Unit (Resuscitation)	Transferred patients
Stomatology	Number of services
TB Prevention & Diagnosis	Number of services
Primary Physician And Nurse Encounter Department	Number of services
Narrow Specialists Department (Rooms)	Number of services
Procedures Room	Number of services
Traumas' Post	Number of services
Outpatient Surgery Center	Number of services

5.5 STEP-DOWN COST ACCOUNTING ALGORITHM

Step-down accounting is the method of analyzing costs of a facility, when the costs incurred by administrative and management CCs, part of the costs incurred by policlinic, paraclinical and intermediate clinic CCs are accounted (or assessed) within the CCs, producing the «final product» or the output of the facility's activities.

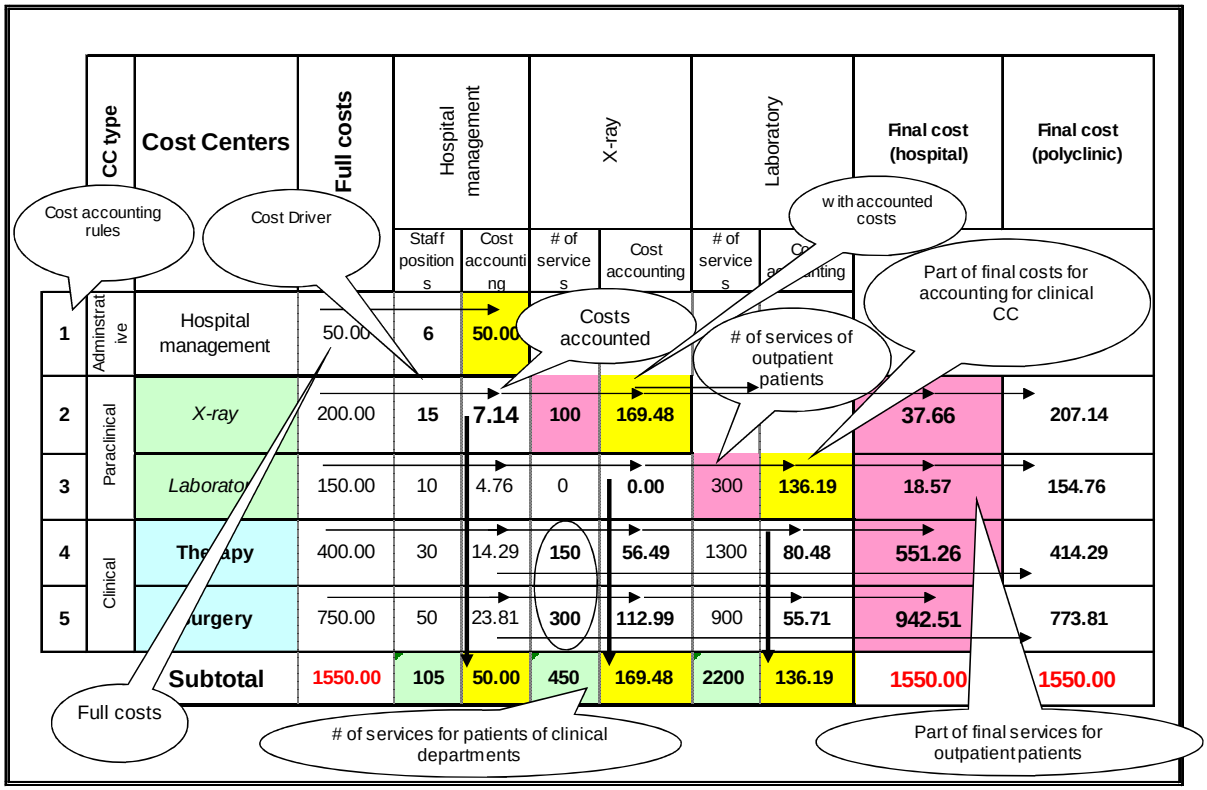
When the step-down cost accounting method is applied, all CCs of the facility are enlisted in the following order: the activities of the CCs, enlisted at the top of the inventory, are of general nature, thus «servicing» the activities of the CCs, located at the bottom of the inventory.

After having assessed full costs for each CC, the costs incurred by administrative and management CCs, part of the costs incurred by policlinic, paraclinical and intermediate clinic CCs are reflected in accordance with the step-down method at clinic CCs.

Costs are accounted in proportion to statistical data, or cost drivers. Accounting means assessing the share of costs for each of the lower CCs.

Table 4 presents a simple example of cost calculation by the stepped down method. A number of definitions related to cost accounting will be illustrated in this Table.

TABLE 4. COST ALLOCATION PROCESS CHART



Accounted costs are the share of costs incurred by *higher CC*, assessed for this particular CC, in proportion to the Cost Driver.

> *Cost Driver (another term- Accounting Index)* – is the amount of statistical units, which are the criteria for accounting to a higher CC.

For CC with a number of N, the share of costs of the CC with the number of N-k will be calculated in accordance with the following formula:

$$CostAcc_N = Cost_{N-k} \times \frac{CostDriver_N}{\sum_{i=(N-K)+1}^{i=MAX} CostDriver_i}$$

Where,

CostAcc$_N$ - the share of costs of the CC with the number of N-k, accounted for the CC with the number of N,

Cost$_{N-k}$ - full costs of the CC with the number of N-k, the accounted costs of higher CC included,

Cost Driver$_i$ - the value of *Cost Driver* of costs of the CC with the number of N-k accounted at the CC with the number of *i*.

Totaling of accounting indices shall be made for all CCs, which are below the CC with the number of N-k, its costs subject to accounting.

Cost Accounting for Intermediate Clinic Units

The share of final costs of an intermediate clinic unit shall be calculated, related to the patients discharged from this unit (or in proportion to the number of bed-days, or to the number of cases).

The share of final costs of intermediate clinic unit, related to the patients transferred to other clinic units of the hospital, shall be accounted to lower clinic units.

Cost Accounting for Paraclinical and Policlinic Units

The share of final costs shall be accounted, related to the services provided to outpatients. The share of final costs, related to the services provided to inpatients, shall be accounted for clinic units of the hospital in proportion to the amount of services provided to inpatients of those clinic units.

If rates for services or cost effectiveness ratios are available, the costs shall be accounted in proportion to such values rather than to the amount of services.

Specifics of Step-Down Cost Accounting Method to Be Applied for Calculating Cost of Outpatient-Policlinic Services and Cost of Inpatient Treatment

When calculating the cost of inpatient treatment, the step-down cost accounting method allows including the cost of paraclinical and policlinic services into the cost of inpatient's treatment by accounting the share of costs, incurred by paraclinical and policlinic CC, into clinic CCs, as described above.

When calculating the cost of paraclinical and policlinic services, paraclinical and policlinic CCs shall be recognized as final. Thus, the calculations are based on the final costs for paraclinical and policlinic CCs *prior to accounting* their share of costs to clinic CCs.

Therefore, in the step-down cost accounting process (refer to Table 4), final costs are calculated twice.

In the column «Final Costs (Hospital)», final costs shall be calculated for clinic CCs, including the share of costs incurred by paraclinical, policlinic, and intermediate clinic CCs, as well as part of the final costs, not accounted to clinic CCs, shall be calculated for paraclinical, policlinic, and intermediate clinic CCs.

In the column «Final Costs (Policlinics) », final costs of all CCs shall be calculated prior to accounting the share of costs of paraclinical, policlinic, and intermediate clinic CCs to clinic CCs.

In the first case, the step-down accounting has been completely accomplished, and in the second case – only partially – up to the paraclinical level. Accordingly, in the first case, the results are used for further calculation of costs for finished cases, and in the second case – for further calculating the cost of outpatient-policlinic services.

5.6 STEP-DOWN COST ACCOUNTING ALGORITHM

Let us consider the algorithm of calculating costs of X-Ray Diagnostics - CC with the number of N=2 on our list, costs of higher CCs included (in this example, those of the Hospital Management).

Each step of the algorithm illustrated below consists of two phases. (Refer to Table 4 for the source of numbers used in the algorithm)

> Full costs of CC with a smaller number shall be accounted for all lower CCs in proportion to the value of accounting criterion, defined for this particular CC:

Costs related to a unit of cost driver shall be calculated, for which the share of final costs subject to accounting shall be divided by the total of indices for all lower CCs, this driver not included into the current CC. (*E.g., costs of the Hospital Management are accounted for lower units in proportion to the number of personnel. The number of Hospital Management staff has not been included into this value.*)

$$SpCosts_{N-1} = \frac{Costs_{N-1}}{\sum_{i=N}^{i=MAX} CostDriver_i} = \frac{50}{15+10+30+50} = 0.476$$

Where,

SpCosts- Costs related to a unit of cost driver:

For each lower CC, the share of accounted costs shall be calculated by multiplying the cost driver for each CC by specific costs. E.g., the share of the Hospital Management's costs related to the *«X-*

Ray Diagnostics» shall be calculated by multiplying specific costs of the Hospital Management per one staff by the amount of staff of X-Ray Diagnostics unit.

$$CostAcc_N = SpCosts_{N-1} \times CostDriver_N = \left(\frac{50}{15+10+30+50} \right) \times 15 = 7.14$$

Final costs of the CC with the number of N shall be calculated, accounted costs of higher CC included. For administrative and management CCs, the result shall be calculated in the column of «Accounting» for an appropriate CC. For paraclinical and policlinic CCs, calculation shall be made in the column of «Final Costs (Policlinics) ». *In the example given, final costs incurred by X-Ray Diagnostics for all x-ray examinations, shall be calculated according to the following formula, all costs accounted to higher CCs included:*

$$FinCostsp_N = TotCosts_N + \sum_{i=1}^{i=(N-1)} CostAcc_N^i = 200 + (7.14) = 207.14$$

The remaining part of phase 2 of the algorithm is carried out only for paraclinical, policlinic, and intermediate clinic CCs:

The share of final costs of this CC, related to patients of clinic units, in its turn, will be also accounted. The value of such costs shall be calculated in the column of «Accounting» of an appropriate CC. *In the example given, the share of X-Ray Diagnostics, related to the services provided to inpatients, will be calculated as follows:*

$$FinCostAcc_N = \frac{FinCosts_N \times NumSer_{IP}}{NumSer_{IP} + NumSer_{OP}} = \frac{207.14 \times (150+300)}{(150+300)+100} = 169.48$$

For intermediate clinic CCs, the number of discharged and transferred patients rather than the amount of services provided to outpatients and inpatients should be used in the formula.

The share of final costs of this CC, related to outpatients, should not be accounted to lower CCs. Such share will be calculated in the column of «Final Costs (Hospital) » according to the following formula:

$$FinCostsOP_N = \frac{FinCosts_N * NumSer_{OP}}{NumSer_{IP} + NumSer_{OP}} = \frac{207.14 \times 100}{(150+300)+100} = 37.66$$

Total of the columns of «Final Costs» is an indicator of a properly accomplished stepped down accounting procedure. **Total final costs of final CCs should be equal to total full costs prior to the stepped down accounting for all CCs** (refer to «Full Costs» in Table 4).

The procedure described shall be applied to all lower administrative and management, paraclinical, policlinic and intermediate clinic services of a health facility, which allows calculating the cost of patient treatment in each clinic unit of the health facility. It should be noted that for paraclinical, policlinic, and intermediate clinic CCs, at each consequent stage, *the share* of full costs should be accounted, all costs of higher CCs included, which is calculated at the prior stage in the column of «Accounting». For administrative and management CCs, *all* costs should be accounted, the costs accounted at prior stages included.

Thus, as a result of the step-down accounting, final costs for clinic CCs are calculated, including the costs of all administrative and management, paraclinical, policlinic, and intermediate clinic services of a health facility, which allows to calculate the cost of patient treatment in each clinic unit of the health facility.

For each clinic CC, the share of costs per one bed-day can be calculated by dividing final costs by the number of bed-days of patient's staying in the unit. Such data are required for further tariff design by clinic/cost categories.

For each clinic CC, average cost of a finished case can be calculated by dividing final costs by the number of finished cases in the unit.

For paraclinical and clinic CCs, final costs are (*data of the column «Final Costs (Policlinics)* required for further calculation of units' overheads during tariff setting of outpatient-policlinic services. In addition, average cost of services provided by the unit can be also calculated.

6. DESCRIPTION OF THE STUDY

This section of the report describes practical application of the methodology in three pilot hospitals and the major findings of the study. Sections of the costing tables in Picture format are integrated in the body of the text for quick reference.

The costing tables are attached to the report separately. The full costing tables retain all formulas and references. This way the tables may be used in the future for replicating the initial study in the pilot hospitals or serve as examples for replicating similar studied in other hospitals.

6.1 DEFINING COST CENTER STRUCTURE

Compliant with the approaches outlined in earlier sections of the report, all hospital departments were grouped into CCs.

6.1.1 LEZHA REGIONAL HOSPITAL CC

Administrative Structure	Centers Responsible For Costs (Cost Centers)
Administrative And Management CCs	
Administration	Hospital Management
The Maternity Files	
Maternity Reception	
Technical Support Division	Technical Support Division
Para-Clinic CCs	
Pharmaceutical Service	Pharmaceutical Service
Clinical-Biochemical Laboratory	Laboratory
Laboratory Anatomy-Pathology	
The Imaging Service	The Imaging Service
Sterilization Center	Sterilization Center
Blood Bank	Blood Bank
Intermediate Clinic CCs	
Service Receipt and Emergency	Service Receipt And Emergency
Intensive Therapy Service	Intensive Therapy Service
Resuscitation –Surgical Obstetrics-Gynecology Service	Resuscitation –Surgical Obstetrics-Gynecology Service
Policlinic CCs	
The Woman's Consultation Room	Polyclinic
Hydrate Anti Pneumoftiziatrise & Dispanserise T.B.C	
Polyclinic	

Clinic CCs	
Gynecology Clinic	Gynecology Clinic
Obstetrics-Gynecology Service	Obstetrics-Gynecology Service
Neonatology Clinic	Neonatology Clinic
Surgery Department	Surgery Department
Pediatrics Department	Pediatrics Department
Hospital Service	Hospital Service
Infections Department	Infections Department

Thus, it is proposed to group several sub-departments into larger CCs in this hospital, because some of the sub-departments are very similar from point of view of their "cost nature". For example "Administration," "The Maternity Files" and "Maternity Reception" sub-departments could be easily combined into "Hospital Management" Cost Center.

6.1.2 KORCA REGIONAL HOSPITAL

Given the administrative structure of this hospital consists of a small number of structural sub-units, and none of these subunits meets respective criteria for its possible integration into larger CCs, each subunit is proposed to be considered as a separate CC.

Administrative And Management CCs
Administration
Technical Support Division
Para-Clinic CCs
Pharmaceutical Service
Clinical-Biochemical Laboratory
Laboratory Anatomy-Pathology (Forensic Medicine)
The Imaging Service
Blood Bank
Intermediate Clinic CCs
Service Receipt and Emergency
Intensive Therapy Service
Policlinic CCs
Polyclinic
Clinic CCs
Infections
Hydrate Anti Pneumoftiziatrise & Dispanserise T.B.C
Obstetrics-Gynecology Service
Pediatrics Department
Surgery Department

6.1.3 QUEEN GERALDINE MATERNITY HOSPITAL – TIRANA

As the administrative structure of this hospital consists of a small number of structural sub-units, and none of these subunits meets respective criteria for its integration into larger CCs, each subunit is proposed to be considered as a separate CC.

Administrative And Management CCs
Administration
Supporting Technical Unit
Para-Clinic CCs
Pharmacy
Clinical Laboratory – Biochemical
Prenatal Diagnosis Laboratory
Quote Histopathological Laboratory
Blood Bank
Sterilization
Radiology Room
Pathology for Pregnancy
Intermediate Clinic CCs
Intensive Therapy Services
Women's Center
Clinic CCs
Neonatology Service
Obstetrics Service
Gynecology Service

6.2 CLASSIFICATION OF COSTS

6.2.1 DIRECT COSTS

Direct costs are those for specifics, which can be reflected directly within a CC. The following types of costs shall be recognized as direct:

Code	Specific Name
600	SALARY+TAX
6021003	MEDICINES AND MEDICAL MATERIAL
6021004	FOOD SUPPLIES AND SERVICES FOR MEALS
6021001	UNIFORM AND OTHER SPECIAL CLOTHING

Direct costs of each CC shall be calculated as total costs of the specifics enlisted.

If for some specific cost accounting by department is not carried out (only total figures are available), total direct costs for Specifics 6021003 and 6021004 shall be allocated for CC in proportion to patient's bed-days, for Specific 6021001 total direct costs shall be allocated for CC in proportion to the total staff.

6.2.2 INDIRECT COSTS

Code	Specific Name
6020	MATERIALS AND SERVICES AND GENERAL OFFICE
6021007	PROFESSIONAL BOOKS AND PUBLICATIONS
6021009	MATERIALS AND EQUIPMENT LABORATORY OF PUBLIC SERVICE
6021010	SPECIFIC DOCUMENTATION FOR PRODUCTION COSTS

6021099	OTHER SPECIAL MATERIALS AND SERVICES
6022	SERVICES FROM THIRD (electricity, water, telephone service)
6023	TRANSPORTATION SERVICES
6024	TRAVEL COSTS
6025	COSTS FOR MAINTENANCE OF THE ORDINARY
6026	COSTS FOR Lease
6027	COSTS FOR LIABILITIES AND LEGAL Compensation
6027	OTHER OPERATING EXPENSES

Indirect costs are those, which are not directly recorded within CC. As a rule, these are the following:

- Total indirect costs for Specifics 6021007, 6021009, 6021010, 6021099 and 6027 shall be assessed for CC in proportion to direct CC costs.
- Total indirect costs for Specifics 6020, *6022,* 6025, 6026 shall be assessed for CC in proportion to the area of CC premises
- Total indirect costs for Specifics 6023, 6024, *shall* be assessed for CC in proportion to the total staff.

All hospitals that participated in the study provided financial information on allocation of costs by department breakdown only by budget item 600 «Salary + tax». For this reason all other cost items were allocated using the allocation criteria recommended earlier.

Tables 5-7 summarize initial budget data and calculations of Direct Costs, Indirect Costs and Full Costs.

For convenience all cost items grouped into Indirect Cost are highlighted compliant with the allocation criteria.

Assessement legend	
	direct cost
	assessment for CC in proportion to direct CC costs
	assessment for CC in proportion to the area of CC premises
	assessement for CC in proportion to the total staff.

TABLE 5. LEZHA HOSPITAL CALCULATIONS

	Salary+tax	MATERIALS AND SERVICES AND GENERAL OFFICE	UNIFORM AND OTHER SPECIAL CLOTHING	MEDICINES AND MEDICAL MATERIAL	FOOD SUPPLIES AND SERVICES FOR MEALS	PROFESSIONAL BOOKS AND PUBLICATIONS	OTHER SPECIAL MATERIALS AND SERVICES	SERVICES FROM THIRD	TRANSPORTATION SERVICES	COSTS FOR MAINTENANCE OF THE ORDINARY	COSTS FOR LIABILITIES AND LEGAL Compensation	OTHER OPERATING EXPENSES	Direct	Inderect	Total costs
TOTALS:	**157513008**	**1970000**	**954000**	**40725000**	**6201000**	**1191000**	**223000**	**23240000**	**6068000**	**8770000**	**2685000**	**37000**	205393008	38116000	243509008.0
Hospital management	10833384	0.0	59832.8	0.0	0.0	63165.8	11827.0	0.0	380571.4	0.0	142401.6	0.0	10893217	217394.4	11110611.2
Technical Support Division	17335584	418253.8	119665.5	0.0	0.0	101216.7	18951.6	4934120.6	761142.9	1861972.4	228183.7	7855.5	17455250	7570554.3	25025803.8
Pharmaceutical Service	2024880	49497.5	13296.2	0.0	0.0	11818.6	2212.9	583919.6	84571.4	220351.8	26644.1	929.6	2038176	895374.1	2933550.3
Laboratory	5694720	0.0	33240.4	0.0	0.0	33214.4	6219.0	0.0	211428.6	0.0	74878.8	0.0	5727960	114312.1	5842272.5
The imaging service	5034240	89095.5	26592.3	0.0	0.0	29345.9	5494.7	1051055.3	169142.9	396633.2	66157.7	1673.4	5060832	1639455.6	6700288.0
Sterilization Center	909600	22273.9	6648.1	0.0	0.0	5313.0	994.8	262763.8	42285.7	99158.3	11977.7	418.3	916248	402899.8	1319147.8
Blood Bank	651000	0.0	3324.0	0.0	0.0	3794.2	710.4	0.0	21142.9	0.0	8553.7	0.0	654324	13058.3	667382.3
Service receipt and Emergency	9342840	0.0	46536.6	0.0	0.0	54445.6	10194.3	0.0	296000.0	0.0	122742.6	0.0	9389377	187382.5	9576759.1
Intensive Therapy Service	5879880	59397.0	36564.5	0.0	0.0	34307.3	6423.6	700703.5	232571.4	264422.1	77342.7	1115.6	5916444	1143711.9	7060156.3
Reanimator -operational Obstetrics-Gynecolo	6864840	94045.2	39888.5	0.0	0.0	40038.0	7496.6	1109447.2	253714.3	418668.3	90262.1	1766.3	6904729	1761723.9	8666452.4
Polyclinic	25880880	0.0	139609.8	0.0	0.0	150883.4	28251.1	0.0	888000.0	0.0	340152.8	0.0	26020490	519287.3	26539777.1
Gynecology Clinic	4967400	123743.7	29916.4	6648238.2	1012295.3	73398.3	13742.9	1459799.0	190285.7	550879.4	165469.7	2324.1	12657850	2389357.2	15047207.0
Obstetrics-Gynecology Service	11818200	158392.0	79777.0	5244611.1	798571.7	104034.3	19479.1	1868542.7	507428.6	705125.6	234535.8	2974.9	17941160	3093084.4	21034244.3
Clinic of Neonatology	7133520	98995.0	39888.5	3458977.4	526681.9	64707.4	12115.7	1167839.2	253714.3	440703.5	145876.9	1859.3	11159068	1932097.0	13091164.7
Department of Surgery	16355520	247487.4	106369.3	6194674.0	943233.2	136846.7	25622.9	2919598.0	676571.4	1101758.8	308508.3	4648.2	23599797	4744470.4	28344266.9
Department of Pediatrics	12142200	227688.4	79777.0	8429468.4	1283514.6	127192.9	23815.3	2686030.2	507428.6	1013618.1	286744.8	4276.4	21934960	4369366.0	26304326.1
Hospital Service	9091680	207889.4	56508.7	9445584.3	1438233.7	116158.4	21749.2	2452462.3	359428.6	925477.4	261868.4	3904.5	20032007	3989509.7	24021516.4
Infections depart	5552640	173241.2	36564.5	1303446.6	198469.5	41118.9	7699.0	2043718.6	232571.4	771231.2	92698.7	3253.8	7091121	3132961.2	10224081.8
	157513008.00	1970000.00	954000.00	40725000.00	6201000.00	1191000.00	223000.00	23240000.00	6068000.00	8770000.00	2685000.00	37000.00	205393008.0	38116000.0	243509008.0

TABLE 6. KORCA HOSPITAL COSTING

	Salary+tax	MATERIALS AND SERVICES AND GENERAL OFFICE	UNIFORM AND OTHER SPECIAL CLOTHING	MEDICINES AND MEDICAL MATERIAL	FOOD SUPPLIES AND SERVICES FOR MEALS	OTHER SPECIAL MATERIALS AND SERVICES	SERVICES FROM THIRD	TRANSPORTATION SERVICES	TRAVEL COSTS	COSTS FOR MAINTENANCE OF THE ORDINARY	OTHER OPERATING EXPENSES	Direct	Inderect	Total costs
	357709091	**6469028**	**3130200**	**80073495**	**9205603**	**3813202**	**83088697**	**16854812**	**3446536**	**9473060**	**444000**	450118389	116923839	567042228
Administration	11520555	88512.3	149057.1	0.0	0.0	98859.7	1136858.8	802610.1	164120.8	129614.9	6075.0	11669612	2338139.3	14007751.4
Technical Support Division	35608988	275456.4	452311.3	0.0	0.0	305495.2	3537983.0	2435506.5	498021.6	403370.4	18905.9	36061299	7199282.6	43260582.0
Pharamaceutical Service	3144970	54938.7	41119.2	0.0	0.0	26991.1	705636.5	221409.7	45274.7	80450.6	3770.7	3186089	1083533.3	4269622.5
Clinical-Biochemical Laboratory	12398000	56973.4	71958.6	0.0	0.0	105639.9	731771.2	387466.9	79230.7	83430.3	3910.4	12469959	1391449.4	13861408.0
Laboratory Anotomy-Pathology	1779000	63586.4	15419.7	0.0	0.0	15201.5	816708.9	83028.6	16978.0	93114.1	4364.2	1794420	1029395.4	2823815.1
The imaging service	6678000	86477.5	66818.7	0.0	0.0	57139.1	1110724.1	359790.7	73571.4	126635.2	5935.4	6744819	1733795.9	8478614.6
Blood Bank	2091646	54938.7	20559.6	0.0	0.0	17893.7	705636.5	110704.8	22637.3	80450.6	3770.7	2112206	941093.7	3053299.3
Service receipt and Emergency	14405000	292497.5	205596.1	0.0	0.0	123774.4	3756861.0	1107048.4	226373.5	428325.0	20075.5	14610596	5662457.8	20273053.9
Intensive Therapy Service	14006597	474609.0	185036.5	0.0	0.0	120225.2	6095915.3	996343.6	203736.1	695003.9	32574.7	14191633	8143798.7	22335432.2
Polyclinic	33376000	563121.3	169616.7	0.0	0.0	284183.5	7232774.0	913314.9	186758.1	824618.8	38649.7	33545617	9480299.1	43025915.8
Infections	49643273	662570.5	447171.4	28238439.5	3246415.9	691069.5	8510106.8	2407830.3	492362.3	970249.3	45475.3	81575300	13117093.5	94692393.3
Hydrate Anti Pneumoftiziatrise & Disp	25509233	1115051.5	210736.0	15777305.2	1813828.8	366912.3	14321807.3	1134724.6	232032.8	1632849.5	76531.3	43311103	17764857.9	61075960.8
Obstetrics-Gynecology Service	61405467	604834.0	452311.3	9918600.6	1140286.2	617717.4	7768535.1	2435506.5	498021.6	885701.7	41512.6	72916665	12246994.9	85163660.1
Department of Pediatrics	38469932	1576943.2	334093.6	8598386.6	988508.5	409946.3	20254380.8	1798953.7	367856.9	2309230.6	108233.1	48390921	25248601.3	73639522.1
Department of Surgery	47672430	498517.5	308394.1	17540763.1	2016563.7	375684.9	6402997.8	1660572.6	339560.2	730014.8	34215.6	67538151	9543046.0	77081196.8
	357709091.00	**6469028.0**	**3130200.0**	**80073495.00**	**9205603.00**	**3616733.87**	**83088697.00**	**16854812.00**	**3446536.00**	**9473060.00**	**444000.00**	**450118389.0**	**116923838.9**	**567042227.9**

TABLE 7: QUEEN GERALDINE MATERNITY HOSPITAL COSTING

	Salary+tax	MATERIALS AND SERVICES AND GENERAL OFFICE	UNIFORM AND OTHER SPECIAL CLOTHING	MEDICINES AND MEDICAL MATERIAL	FOOD SUPPLIES AND SERVICES FOR MEALS	OTHER SPECIAL MATERIALS AND SERVICES	SERVICES FROM THIRD	TRANSPORTATION SERVICES	TRAVEL COSTS	COSTS FOR MAINTENANCE OF THE ORDINARY	**OTHER OPERATING EXPENSES**	Direct	Inderect	Total costs
	229190122	**4070000**	**14996000**	**90338000**	**15936000**	**4141000**	**41833000**	**1185000**	**3000**	**7458000**	**153000**	350460122	54773000.0	405233122.0
Administration	16011616.9	341513.8	1110814.8	0.0	0.0	0.0	3510208.5	87777.8	222.2	625801.0	12838.2	17122432	4236847.8	21359279.5
Supporting technical sector	22843609.6	323910.0	2658021.2	0.0	0.0	0.0	3329269.9	210039.7	531.7	593543.3	12176.5	25501631	4145561.0	29647191.8
Pharmacy	1808712.3	60557.1	158687.8	0.0	0.0	0.0	622428.7	12539.7	31.7	110966.8	2276.5	1967400	748243.4	2715643.5
Clinical Laboratory - Biochemical	9653512.7	45065.7	595079.4	0.0	0.0	0.0	463202.8	47023.8	119.0	82579.9	1694.1	10248592	594619.7	10843211.7
Prenatal diagnosis laboratory	2123093.9	66190.3	158687.8	0.0	0.0	0.0	680329.1	12539.7	31.7	121289.3	2488.2	2281782	816678.0	3098459.8
Quote histopathological laboratory	1944729.6	45065.7	119015.9	0.0	0.0	0.0	463202.8	9404.8	23.8	82579.9	1694.1	2063746	556905.4	2620650.9
Blood Bank	553678.5	11266.4	39672.0	0.0	0.0	0.0	115800.7	3134.9	7.9	20645.0	423.5	593350	140012.1	733362.5
sterilization	1502996.8	15491.3	158687.8	0.0	0.0	0.0	159226.0	12539.7	31.7	28386.9	582.4	1661685	200766.6	1862451.2
Cabinet of Radiology	1402877.5	42249.1	79343.9	0.0	0.0	0.0	434252.6	6269.8	15.9	77418.7	1588.2	1482221	519545.2	2001766.7
Intensive Therapy Services	16848762.1	140830.4	833111.1	0.0	0.0	0.0	1447508.7	65833.3	166.7	258062.3	5294.1	17681873	1776865.1	19458738.2
Pathology for pregnancy	13708355.7	315460.2	714095.2	0.0	0.0	0.0	3242419.4	56428.6	142.9	578059.5	11858.8	14422451	3888909.1	18311360.1
Women's Center	8544299.0	246453.3	555407.4	0.0	0.0	0.0	2533140.1	43888.9	111.1	451609.0	9264.7	9099706	3038013.8	12137720.3
Service of Neonatology	41913772.4	230961.9	2300973.5	34016316.1	6000620.0	1559272.6	2373914.2	181825.4	460.3	423222.1	8682.4	84231682	4547377.0	88779059.1
Obstetrics service	65163654.4	1221000.0	3967195.8	43265498.2	7632214.3	1983245.5	12549900.0	313492.1	793.7	2237400.0	45900.0	120028563	17130731.2	137159293.8
Gynecology Service	25166450.5	963984.4	1547206.3	13056185.7	2303165.6	598482.0	9908196.7	122261.9	309.5	1766436.3	36238.2	42073008	12431924.7	54504932.8
	229190121.96	**4070000.00**	**########**	**90338000.00**	**15936000.00**	**4141000.00**	**41833000.00**	**1185000.00**	**3000.00**	**7458000.00**	**153000.00**	**350460121.96**	**54773000.00**	**405233121.96**

6.3 COST DRIVERS

6.3.1 LEZHA REGIONAL HOSPITAL

Table 8 summarizes statistical information that was provided by Lezha hospital for determining the allocation criteria.

Note: information on laboratory and X-ray tests was provided in an aggregated form and allocated to clinical departments in proportion to the number of discharged (treated) patients. Similar approach was used with other hospitals. This was done with the purpose to simplify future costing as well as replicate the analysis next year. Actual numbers will have to be inserted in place of the numbers taken for the initial calculation and presented in the Excel Tables attached to this report. Thus, the results will be recalculated automatically.

TABLE 8: STATISTICAL INFORMATION FOR CALCULATING ALLOCATION CRITERIA FOR LEZHA HOSPITAL

	TOTAL STAFF	Space of units, sq.m.	Number of 24 hour beds	Number of discharged patients from the full time hospital	Transferred to other departments	Transferred to other health facilities	Number of deaths	LOS at the full time hospitals	The imaging service	Laboratory
TOTALS:	**287**	**3980**	**181**	**7906**	**52**	**122**	**15**	**36993**	**3698**	**24753**
Hospital management	18	0								
Technical Support Division	36	845								
Pharmaceutical Service	4	100								
Laboratory	10	0								
The imaging service	8	180								
Sterilization Center	2	45								
Blood Bank	1	0								
Service receipt and Emergency	14	0								
Intensive Therapy Service	11	120								
Reanimator -operational Obstetrics-Gynecolo	12	190								
Polyclinic	42	0								
Gynecology Clinic	9	250	14	889	1	7	0	6039	416	2783
Obstetrics-Gynecology Service	24	320	33	1619	10	18	0	4764	757	5069
Clinic of Neonatology	12	200	25	1317	0	8	0	3142	616	4123
Department of Surgery	32	500	34	1056	20	12	2	5627	494	3306
Department of Pediatrics	24	460	27	1708	6	44	1	7657	799	5348
Hospital Service	17	420	32	1075	13	25	12	8580	503	3366
Infections depart	11	350	16	242	2	8	0	1184	113	758
	287	3980.00	181.00	7906.00	52	122	15	36993	3698	24753

6.3.2 KORCA REGIONAL HOSPITAL

Table 9 provides statistical information that was provided by Korca hospital for determining the allocation criteria.

Note: information on laboratory, the Imaging Service Department and Intensive Therapy Service was provided in an aggregated form and allocated to clinical departments in proportion to the number of discharged (treated) patients.

TABLE 9. STATISTICAL INFORMATION FOR CALCULATING ALLOCATION CRITERIA FOR KORCA HOSPITAL

	TOTAL STAFF	Space of units, sq.m.	Intensive Therapy Service	The imaging service	Clinical-Biochemical Laboratory	Laboratory Anotomy-Pathology	Number of 24 hour beds	Number of discharged patients from the full time hospital	LOS at the full time hospitals
	609	**25434**	12246	31310	141769	922	**486**	**9298**	**58893**
Administration	29	348	0	0	0	0			
Technical Support Division	88	1083	0	0	0	0			
Pharamaceutical Service	8	216	0	0	0	0			
Clinical-Biochemical Laboratory	14	224	0	0	0	0			
Laboratory Anotomy-Pathology	3	250	0	0	0	0			
The imaging service	13	340	0	0	0	0			
Blood Bank	4	216	0	0	0	0			
Service receipt and Emergency	40	1150	0	0	0	0			
Intensive Therapy Service	36	1866	0	0	0	0			
Polyclinic	33	2214	0	0	0	0			
Infections	87	2605	3170	8105	49996	239	130	2407	20769
Hydrate Anti Pneumoftiziatrise & Disp	41	4384	1563	3997	27933	118	65	1187	11604
Obstetrics-Gynecology Service	88	2378	2816	7199	17561	212	100	2138	7295
Department of Pediatrics	65	6200	2049	5240	15223	154	91	1556	6324
Department of Surgery	60	1960	2647	6768	31056	199	100	2010	12901
	609.00	**25434.00**	**12246.00**	**31310.00**	**141769.00**	**922.00**	**486.00**	**9298.00**	**58893.00**

6.3.3 QUEEN GERALDINE MATERNITY HOSPITAL

Table 10 summarizes statistical information that was provided by Queen Geraldine Maternity Hospital for determining the allocation criteria.

TABLE 10. STATISTICAL INFORMATION FOR CALCULATING ALLOCATION CRITERIA (COST DRIVERS) FOR QUEEN GERALDINE MATERNITY HOSPITAL

	TOTAL STAFF	Space of units, sq.m.	Clinical Laboratory - Biochemical	Prenatal diagnosis laboratory	Quote histopathological laboratory	Number of 24 hour beds	Number of discharged patients from the full time hospital	LOS at the full time hospitals
	378	**5780**	32158	100	4249	218	18113	50164
Administration	28	485						
Supporting technical sector	67	460						
Pharmacy	4	86						
Clinical Laboratory - Biochemical	15	64						
Prenatal diagnosis laboratory	4	94						
Quote histopathological laboratory	3	64						
Blood Bank	1	16						
sterilization	4	22						
Cabinet of Radiology	2	60						
Intensive Therapy Services	21	200						
Pathology for pregnancy	18	448						
Women's Center	14	350		90				
Service of Neonatology	58	328	6644	10	1597.04	66	6808	18889
Obstetrics service	100	1734	18298		1855.32	111	7909	24025
Gynecology Service	39	1369	7216		796.64	41	3396	7250
	378.00	**5780.00**	**32158.00**	**100.00**	**4249.00**	**218.00**	**18113.00**	**50164.00**

6.4 CONCLUSIONS ON THE COST DRIVERS SECTION

Unfortunately, the statistical information provided by the hospitals did not allow determining optimal criteria for allocating cost of all ancillary departments. As an example, for paraclinical department services all hospitals provided aggregated data without a breakdown by clinical department (**Queen Geraldine Maternity Hospital was the only hospital that provided data on laboratory services by clinical department breakdown). This is why in a number of cases the so called "reserve" allocation criteria were used. Table 11 gives examples of optimal criteria while the** Step-Down Cost Allocation Criteria Used in This Study column summarizes the criteria that was used as needed in absence of required information.

TABLE 11. EXEMPLARY COST-DRIVERS FOR VARIOUS DEPARTMENTS

Cost Centers	Optimal Criteria for Step-Down Cost Allocation	Step-Down Cost Allocation Criteria Used in This Study
Administration	Full Costs	
Maintenance And Supply Department/Supporting Technical Unit	Area	Staff
Transportation Service	Bed-days	
Accounting Office	Direct cost	
Laundry	Bed-days	
Food/Catering Unit	Bed-days	
Pharmacy	Direct cost (medicines and medical material)	
Registrar's/Reception	Number of patients	
Sterilization Unit	Bed-days	
Cat	Number of CATs	Number of patients
X-Ray Unit	Number of X-rays	Number of patients
Fluorography	Number of examinations	Number of patients
Physiotherapy	Number of physio-therapeutic procedures	Number of patients
Ultra-Sound	Number of examinations	Number of patients
Functional Diagnostics	Number of examinations	Number of patients
Blood Bank /Blood Transfusion	Amount of stored blood through direct recording (or number of surgeries)	Number of patients
Rehabilitation	Number of sessions	Number of patients
Endoscopy	Number of examinations	Number of patients
Laboratory	Number of analyses	Number of patients
Planned, Emergency And Consultative Care	Number of served calls	
Anatomy-Pathology	Number of autopsy, histological examinations (number of death cases)	Number of patients
Surgery Unit	Number of surgeries	
Admission Department	Number of patients	
Intensive Care Unit (Resuscitation)	Transferred patients	
Stomatology	Number of services	
Tb Prevention And Diagnosis	Number of services	
Primary Physician And Nurse Encounter Department	Number of services	
Narrow Specialists Department (Rooms)	Number of services	
Procedures Room	Number of services	
Traumas' Post	Number of services	
Outpatient Surgery Center	Number of services	

6.5 STEP-DOWN COST ALLOCATION TO CLINICAL DPARTMENTS

The results of step-down cost allocation and the costing of Full Costs (Cost of the Department) are presented in Tables 12-14. The cost allocation was done based on the methodology and criteria described earlier. In the tables in top cells highlighted green the size of the «cost pool» is indicated, while in the lower cells cost driver is indicated.

For instance, in the Lezha hospital costing table, the «The imaging service» department cost pool or center (CC) is the total of the Total Cost of this department (6700288.0 lek) + part of allocated costs of Hospital Management (320330.5 lek) + part of allocated costs of the Technical Support Division (847250.9 lek) = **7867869 lek.** *Accounting index (cost driver)= 3698 is a number of discharged patients in all departments.*

TABLE 12. FINAL RESULTS OF STEP-DOWN COST ALLOCATION IN LEZHA HOSPITAL

	Total costs	Hospital management	Technical Support Division	Pharmaceutical Service	Laboratory	The imaging service	Sterilization Center	Blood Bank	Service receipt and Emergency	Intensive Therapy Service	Reanimator - operational Obstetrics-Gynecology Service	Cost of Department
TOTALS:	243509008.0	11110611										
Hospital management	11110611.2	232398397	26222249									
Technical Support Division	25025803.8	1196445.3	207372593	3444746								
Pharmaceutical Service	2933550.3	140248.5	370947.2	40725000	6860338							
Laboratory	5842272.5	279310.1	738754.9	0.0	24753	7867869						
The imaging service	6700288.0	320330.5	847250.9	0.0	0.0	3698	1549020					
Sterilization Center	1319147.8	63066.4	166806.1	0.0	0.0	0.0	36993	783679				
Blood Bank	667382.3	31906.5	84390.4	[illegible]	0.0	0.0	0.0	7906	11245590			
Service receipt and Emergency	9576759.1	457850.2	1210980.5	[illegible]	0.0	0.0	0.0	0.0	7906	8290448		
Intensive Therapy Service	7060156.3	337535.3	892756.2	0.0	0.0	0.0	0.0	0.0	0.0	7906	10176654	
Reanimator -operational Obstetrics-Gynecolo	8666452.4	414329.8	1095872.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7906	
Polyclinic	26539777.1	1268826.1	3355952.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31164556.0
Gynecology Clinic	15047207.0	719383.9	1902718.2	562344.8	771419.2	884712.4	252873.1	88121.8	1264524.3	932229.7	1144326.6	23569861.0
Obstetrics-Gynecology Service	21034244.3	1005615.0	2659778.6	443618.3	1404868.0	1611191.6	199484.6	160482.8	2302885.1	1697727.7	2083987.3	34603883.2
Clinic of Neonatology	13091164.7	625868.5	1655376.8	292579.5	1142811.1	1310648.1	131566.0	130547.1	1873316.7	1381042.2	1695250.9	23330171.7
Department of Surgery	28344266.9	1355096.0	3584130.5	523979.8	916331.5	1050906.9	235621.3	104675.6	1502067.1	1107350.5	1359290.0	40083716.1
Department of Pediatrics	26304326.1	1257569.5	3326180.1	713011.1	1482096.7	1699762.3	320624.2	169304.9	2429479.8	1791055.5	2198548.7	41691958.8
Hospital Service	24021516.4	1148431.9	3037519.0	798959.8	932818.5	1069815.3	359273.2	106559.0	1529093.0	1127274.4	1383747.0	35515007.4
Infections depart	10224081.8	488797.7	1292834.4	110252.7	209992.6	240832.8	49578.0	23988.2	344223.7	253767.8	311504.0	13549853.8
	243509008.0	11641792.5	26222249.1	3444746.0	6860337.6	7867869.4	1549020.4	783679.3	11245589.7	8290447.8	10176654.4	243509008.0

Cost Pool

Accounting index

TABLE 13. FINAL RESULTS OF STEP-DOWN COST ALLOCATION IN KORCA HOSPITAL

	Total costs	Administration	Technical Support Division	Pharamaceutical Service	Clinical-Biochemical Laboratory	Laboratory Anotomy-Pathology	The imaging service	Blood Bank	Service receipt and Emergency	Intensive Therapy Service	Cost of Department
	567042228	14007751									
Administration	14007751.4	553034476	44356325								
Technical Support Division	43260582.0	1095742.7	509773894	4749275							
Pharamaceutical Service	4269622.5	108144.8	371507.4	58893	15418608						
Clinical-Biochemical Laboratory	13861408.0	351094.1	1206105.5	0.0	141769	3141044					
Laboratory Anotomy-Pathology	2823815.1	71524.1	245705.1	0.0	0.0	9298	9431108				
The imaging service	8478614.6	214753.9	737739.2	0.0	0.0	0.0	31310	3396309			
Blood Bank	3053299.3	77336.7	265672.9	0.0	0.0	0.0	0.0	9298	22550542		
Service receipt and Emergency	20273053.9	513494.0	1763994.1	0.0	0.0	0.0	0.0	0.0	9298	24844609	
Intensive Therapy Service	22335432.2	565731.8	1943445.3	0.0	0.0	0.0	0.0	0.0	0.0	9298	
Polyclinic	43025915.8	1089798.8	3743760.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47859475.4
Infections	94692393.3	2398453.6	8239352.0	1674862.7	5437472.4	813131.2	2441458.0	879212.3	5837723.7	6431595.4	128845654.4
Hydrate Anti Pneumoftiziatrise & Disp	61075960.8	1546986.5	5314326.9	935774.8	3038010.0	400991.6	1203992.8	433579.1	2878844.2	3171709.1	80000175.8
Obstetrics-Gynecology Service	85163660.1	2157101.3	7410240.1	588286.5	1909883.1	722257.8	2168607.1	780953.8	5185315.0	5712817.2	111799121.9
Department of Pediatrics	73639522.1	1865207.6	6407504.5	509982.7	1655668.3	525646.9	1578275.3	568364.9	3773784.0	4157691.1	94681647.5
Department of Surgery	77081196.8	1952381.4	6706970.7	1040368.0	3377573.9	679016.9	2038774.6	734198.8	4874875.2	5370796.4	103856152.8
	567042227.9	**14007751.4**	**44356324.6**	**4749274.7**	**15418607.7**	**3141044.4**	**9431107.7**	**3396308.9**	**22550542.0**	**24844609.3**	**567042227.9**

TABLE 14. FINAL RESULTS OF STEP-DOWN COST ALLOCATION IN QUEEN GERALDINE MATERNITY HOSPITAL

	Total costs	Administration	Supporting technical sector	Pharmacy	Clinical Laboratory - Biochemical	Prenatal diagnosis laboratory	Quote histopathological laboratory	Blood Bank	sterilization	Cabinet of Radiology	Intensive Therapy Services	Cost of Department
	405233122.0	21359280										
Administration	21359279.5	383873842	31296803									
Supporting technical sector	29647191.8	1649611.4	354226651	3106680								
Pharmacy	2715643.5	151102.2	239933.8	90338000	12404568							
Clinical Laboratory - Biochemical	10843211.7	603331.5	958024.6	0.0	32158	3544619						
Prenatal diagnosis laboratory	3098459.8	172402.7	273756.6	0.0	0.0	100	2998009					
Quote histopathological laboratory	2620650.9	145816.7	231541.0	0.0	0.0	0.0	4249	838962				
Blood Bank	733362.5	40805.3	64794.4	0.0	0.0	0.0	0.0	18113	2130633			
sterilization	1862451.2	103629.4	164552.2	0.0	0.0	0.0	0.0	0.0	50164	2290009		
Cabinet of Radiology	2001766.7	111381.1	176861.1	0.0	0.0	0.0	0.0	0.0	0.0	18113	22260678	
Intensive Therapy Services	19458738.2	1082711.5	1719227.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18113	
Pathology for pregnancy	18311360.1	1018869.8	1617854.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20948084.0
Women's Center	12137720.3	675359.8	1072397.7	0.0	0.0	3190157.1	0.0	0.0	0.0	0.0	0.0	17075634.9
Service of Neonatology	88779059.1	4939791.5	7843850.1	1169804.5	2562844.4	354461.9	1126839.4	315334.6	802279.0	860728.8	8366957.0	117121950.2
Obstetrics service	137159293.8	7631735.7	12118363.8	1487879.3	7058236.9	0.0	1309073.6	366330.9	1020422.1	999927.1	9720073.9	178871337.1
Gynecology Service	54504932.8	3032731.0	4815646.0	448995.8	2783486.6	0.0	562095.6	157296.7	307931.7	429353.0	4173646.6	71216115.8
	405233121.96	**21359279.51**	**31296803.13**	**3106679.58**	**12404567.90**	**3544619.01**	**2998008.61**	**838962.22**	**2130632.80**	**2290008.85**	**22260677.52**	**405233121.96**

6.6 CASE COSTING BY DEPARTMENT BREAKDOWN AND CALCULATION OF OTHER STANDARD INDICATORS

After costing final costs of departments and based on the statistics on the number of discharged patients, bed days and number of beds the following major indicators were calculated:

Cost per Case
Cost per Bed/day
Relative weight
Bed occupancy rate
Bed turnover
Average Length of Stay (ALOS)

The calculation results are summarized in Table 15. In addition, for each hospital ***charts demonstrating the cost structure by budget item breakdown*** as well as charts characterizing the ***share of all non-clinical departments in total hospital costs*** were made. This kind of analysis allows determining priorities while looking for opportunities to save resources and increase efficiency.

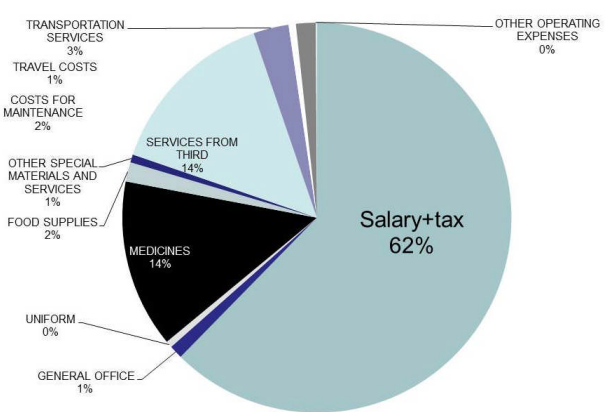
TABLE 15. COSTING OF HOSPITAL CASE AND MAJOR HOSPITAL PERFORMANCE INDICATORS

	Cost of Department	Cases	Cost per Case	Cost per Bed/day	Relative weight	Bed occupancy rate	Bed turnover	ALOS
Queen Geraldina Maternity Hospital								
Service of Neonatology	117121950.2	6808	17203.6	6200.5	0.8	286.2	103.2	2.8
Obstetrics service	178871337.1	7909	22616.2	7445.2	1.1	216.4	71.3	3.0
Gynecology Service	71216115.84	3396	20970.6	9822.9	1.0	176.8	82.8	2.1
Korche Hospital								
Infections	128845654.4	2407	53529.6	6203.7	0.9	159.8	18.5	8.6
Anti Pneumoftiziatrise	80000175.82	1187	67396.9	6894.2	1.2	178.5	18.3	9.8
OBG services	111799121.9	2138	52291.5	15325.4	0.9	73.0	21.4	3.4
Department of Pediatrics	94681647.49	1556	60849.4	14971.8	1.1	69.5	17.1	4.1
Department of Surgery	103856152.8	2010	51669.7	8050.2	0.9	129.0	20.1	6.4
Lezhe Hospital								
Gynecology Clinic	23569860.97	889	26512.8	3902.9	0.9	431.4	63.5	6.8
OBG services	34603883.21	1619	21373.6	7263.6	0.7	144.4	49.1	2.9
Clinic of Neonatology	23330171.69	1317	17714.6	7425.3	0.6	125.7	52.7	2.4
Department of Surgery	40083716.07	1056	37958.1	7123.5	1.2	165.5	31.1	5.3
Department of Pediatrics	41691958.84	1708	24409.8	5444.9	0.8	283.6	63.3	4.5
Hospital Service	35515007.39	1075	33037.2	4139.3	1.1	268.1	33.6	8.0
Infections depart	13549853.81	242	55991.1	11444.1	1.8	74.0	15.1	4.9

The cost structure in chart format is presented in Figures 5-7. The charts demonstrate that the cost structure across hospitals does not vary significantly. In budget items salary/wages costs prevail while in ancillary departments the costs of Technical Support Division are the highest.

FIGURE 5. COST STRUCTURE IN KORCA HOSPITAL

Cost items



Subdivisions

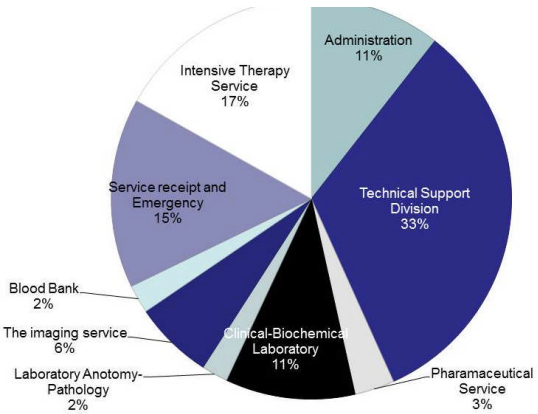


FIGURE 6. COST STRUCTURE IN LEZHA HOSPITAL

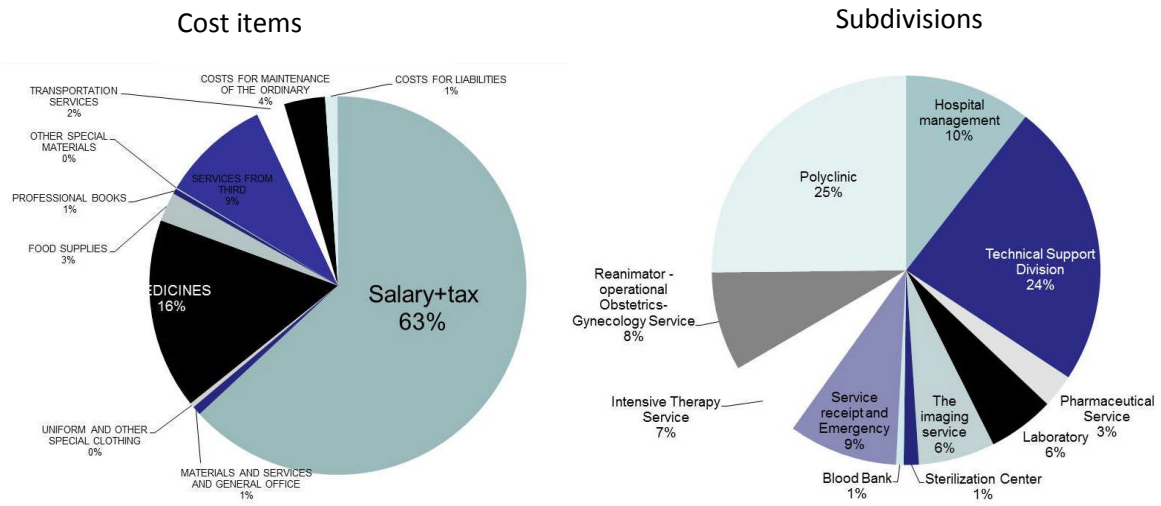


FIGURE 7. COST STRUCTURE IN QUEEN GERALDINE MATERNITY HOSPITAL

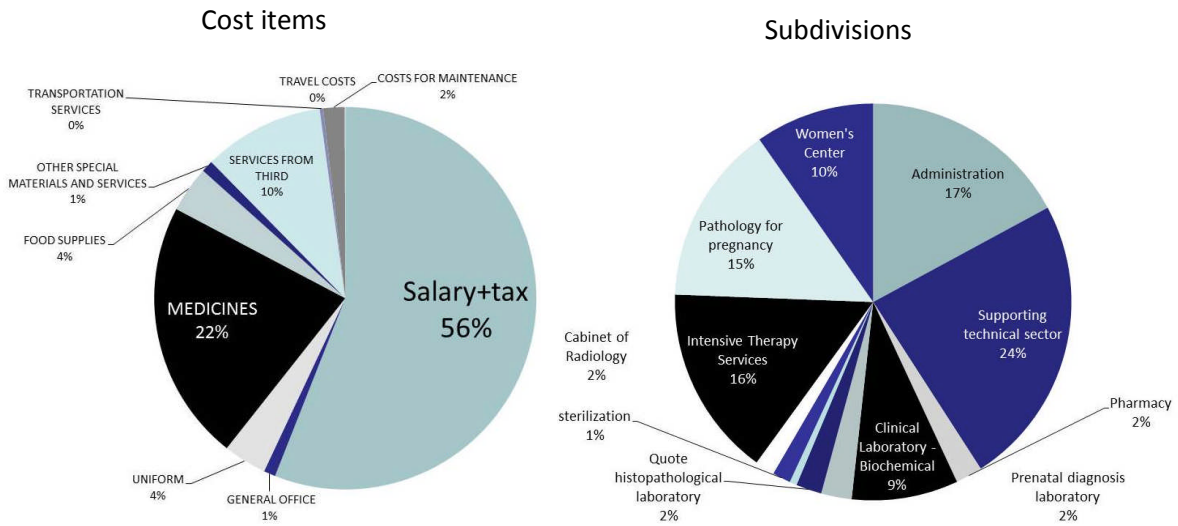


Figure 8 presents a chart illustrating case average cost in the hospital departments, while Figure 9 illustrates case average cost in the hospital as a whole. Based on the data one can conclude that the highest cost of discharged case is in Korca hospital.

Probably this is explained by a very low bed turnover rate in this hospital (Figure 10).

FIGURE 8: AVERAGE COST OF DISCHARGED CASE BY HOSPITAL DEPARTMENT BREAKDOWN

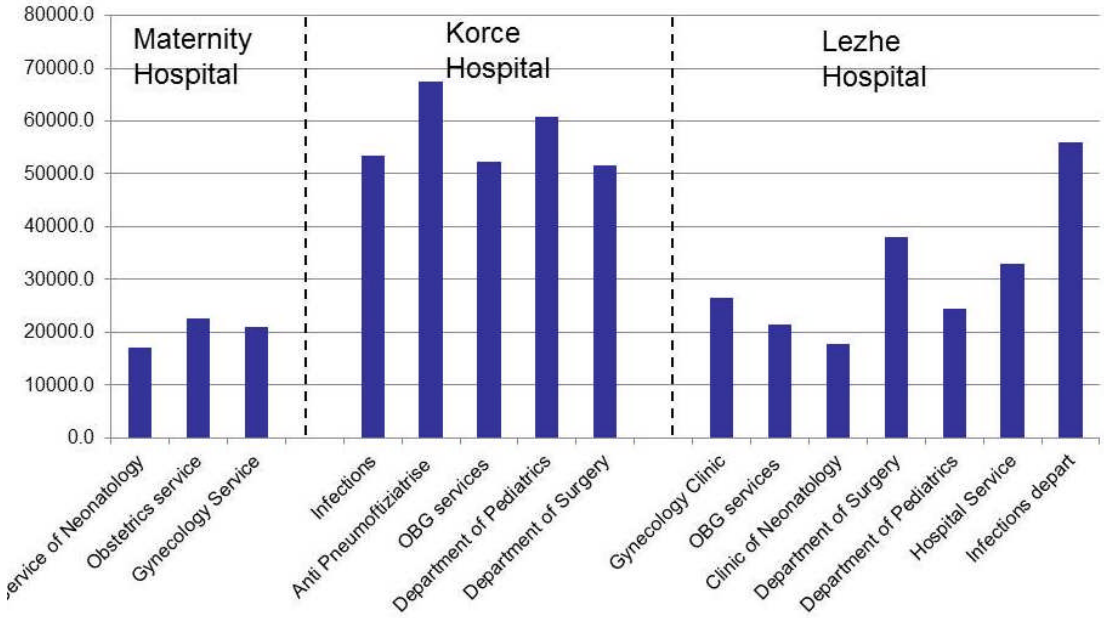


FIGURE 9. AVERAGE COST OF DISCHARGED CASE IN HOSPITALS

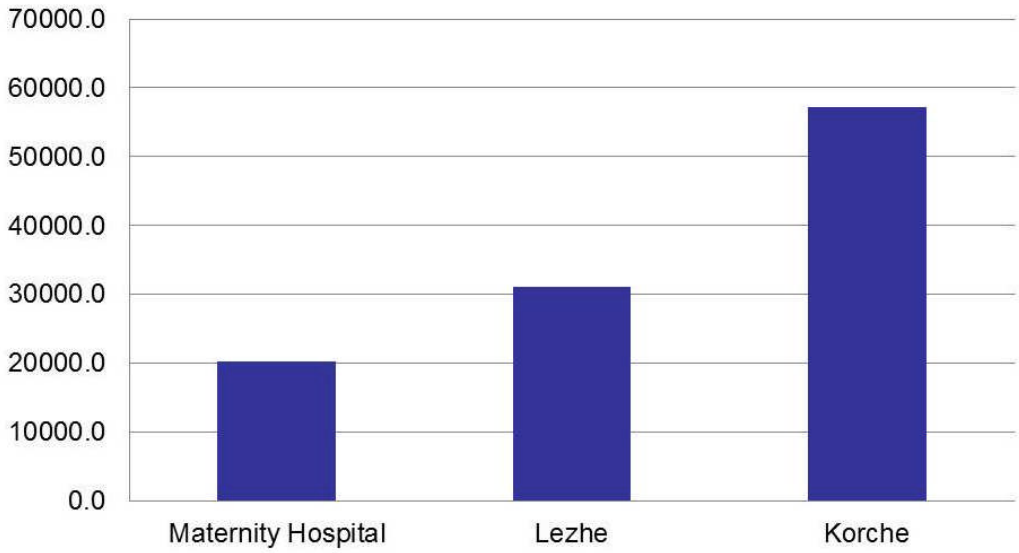
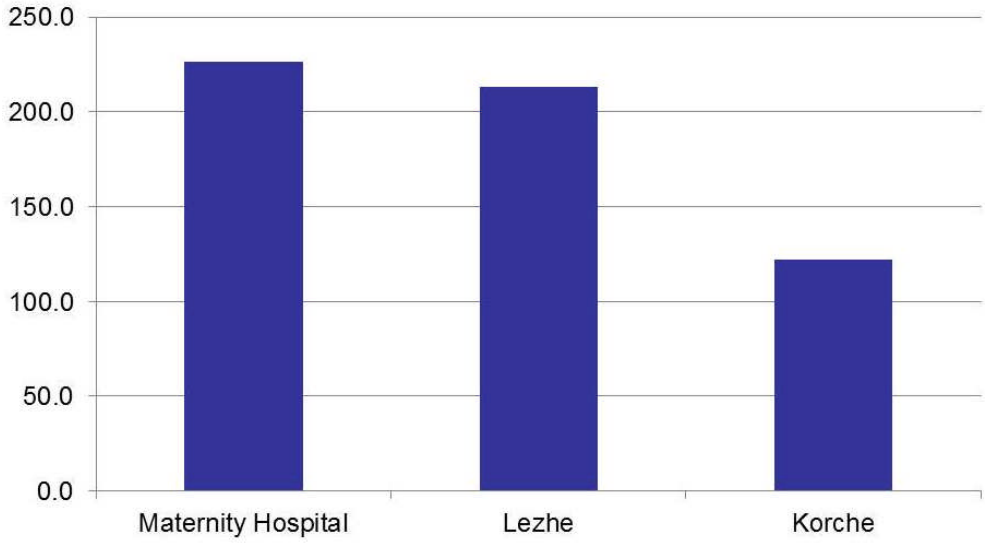


FIGURE 10. BED TURNOVER RATES



Analysis of major performance indicators

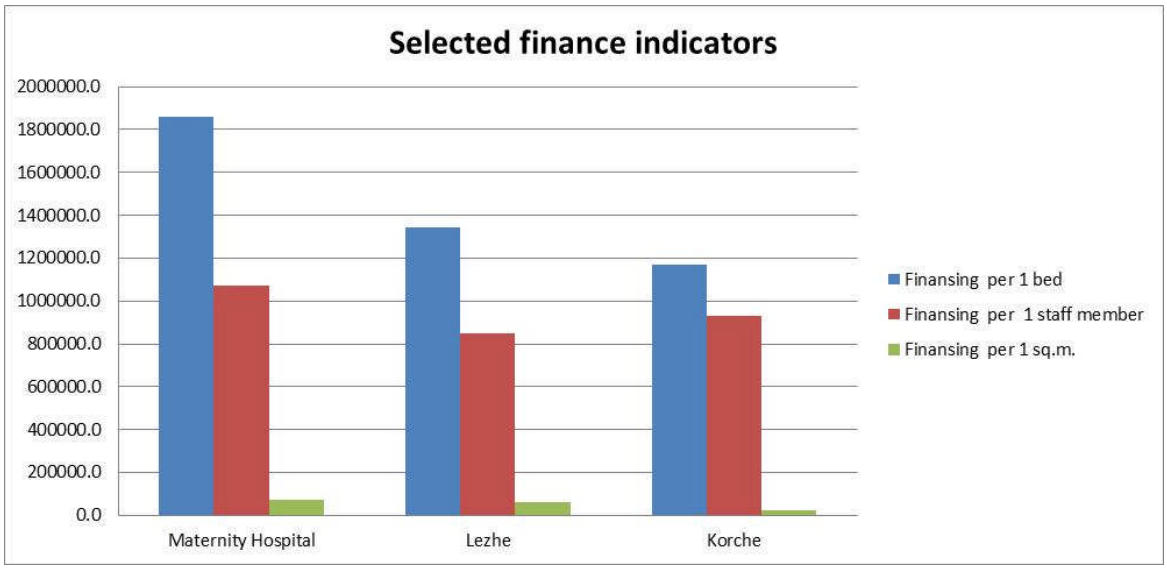
The international practice in assessing structural efficiency of health facilities often uses financing indicators per one staff member, per bed, per unit and per floor square unit. These indictors allow comparing various hospitals and using the results for management decisions on improving hospital efficiency, budgeting and other purposes.

Figure 11 illustrates such analysis. The chart demonstrates that the Queen Geraldine Maternity Hospital has highest volume of financing for all items. This could be probably explained by a tertiary status of the facility, receiving priority funding.

In addition, Queen Geraldine Maternity Hospital has a minimal cost per case and best bed turnover rates. This proves that the hospital works more efficiently compared to others and treats more patients per bed and per staff unit, and, as a result receives more funding through economy of scale rather than through high cost per treated patient.

Clearly the value of such studies increases significantly when a larger number of hospitals are included in the analysis.

FIGURE 11. ANALYSIS OF MAJOR INDICATORS OF STRUCTURAL EFFICIENCY



7. CONCLUSIONS

The conducted study and the subsequent workshop on cost accounting for hospital managers were useful in terms of assessing the current situation, determining the priorities for further development of the cost accounting system and its practical application. Below is the summary of major conclusions:

- Based on the conducted study, meetings and discussions with hospital leadership we can conclude that the current cost accounting methodology presents interest to health managers as a theory. However it has a potential to find practical implementation on condition of the increased autonomy of health providers and introduction of new hospital payment methods (such as global budget or DRGs).
- With some upgrading, the cost accounting system employed by the HII for the purpose of a centralized data analysis will be able to generate reports that would contain information needed for increasing the efficiency of cost accounting by using a step-down cost accounting method. The upgrading recommendations are provided in Annex 1.
- The HII plans to develop and implement a new hospital payment method – global budgeting. To ensure a prompt operational analysis of hospital performance efficiency and budgeting, it makes sense to monitor key structural indicators. For this purpose it is recommended to add a cost accounting software package with a module "Hospital Passport" that would contain key structural indicators. Proposals on the structure of such information are included in Annex 1.
- DRGs are most popular instruments of structural assessment as they allow calculating Case Mix Index (CMI). CMI is the average diagnosis-related group weight for all of a hospital's hospitalization volume. It can be used to adjust the average cost per patient (or day) for a given hospital relative to the adjusted average cost for other hospitals by dividing the average cost per patient (or day) by the hospital's calculated CMI. For this reason it is recommended to initiate preparations for the development or adaptation of an international DRG model. Recommendations on this process are included in Annex 2.

ANNEXES

7.1 ANNEX 1. RECOMMENDATIONS ON UPGRADING THE EXISTING HII COST ACCOUNTING SYTEM

As described in section 4.2 «Cost accounting technologies and instruments used» the existing cost accounting system uses largely bed days as criteria for allocating indirect costs. We would suggest upgrading this methodology by introducing economic criteria of cost allocation such as, the ones recommended in Section 4.2 «Cost Accounting Technologies and Instruments Used».

To implement this recommendation it is necessary to ensure the collection of additional information on hospital infrastructure. For this purpose it is recommended to develop a Hospital Passport in form of a statistical table updated on a regular basis (once a year, or possibly, once a quarter), as well as a Register of Departments.

As a minimum the Hospital Passport should include the following parameters:

Hospital Passport

	Field	Comment
	Health Facility Code	Individual identifier
	Health Facility Name	
	Administrative level identifier	village, city, national level
	Clinical Level identifier	Primary, secondary, tertiary
	Medical School Clinical Teaching Base identifier	Yes\No
	Address	Full postal address
	Telephone	
	Type identifier	Polyclinic, hospital, diagnostic center, etc.
	Profile identifier	General adult, general pediatric, dispensary, maternal hospital, etc.
	Ownership and autonomy code	State institution, state enterprise, private, departmental
	Number of beds	
	Number of clinical departments	
	Heating type	Centralized, own boiler, other.
	Water supply type	
	Total premises area in sq.m.	
	Physician FTE	
	Number of mid-level personnel	
	Number of other personnel	
	Staff schedule total	
	Beds total	

To determine optimal cost drivers the availability of statistical information on utilization of services in ancillary departments, paraclinical, and intermediate clinical and clinical departments is critically important.

To implement these potential opportunities, the following changes are proposed:

- Develop a register of structural subdivisions with assigned codes for each subdivision in the software module; below is the illustrative structure of a subdivisions register:

Structural subdivisions register

	Field	Comment	
	Health facility code		
	Subdivision code		
	CC subdivision type	Administrative, Clinical, Paraclinical, Intermediate clinical	
	Subdivision name		
	Department profile code	For clinical departments	
	24 hour beds number	For clinical departments	
	Bed days number	For clinical departments	
	Physicians	By staff schedule	
	Mid-level personnel	By staff schedule	
	Junior medical staff	By staff schedule	
	Other staff	By staff schedule	

- Envisage the possibility of one-digit identification of patient with a clinical department in "kartela" table in an appropriate format. If within one admission case the patient was shifted to various departments, the final form should indicate a discharging department.
- In the accounting process services provided by laboratories, imaging department, intensive care unit and other ancillary departments must be identified by the code of the department from where the patient was discharged. The same methodology should be applied to drugs, food and other supplies accounting.
- Envisage the possibility of generating reports at hospital level based on annual results in the format presented below: (example)

Department	Biochemical Laboratory	General Laboratory	Functional Diagnostics	Intensive Care	X-Ray
Therapy	3455	55			
Surgery	52	5425			
Obstetrics-Gynecology	2545	25			

Thus, the proposed minimal changes while allowing partial automation of the step-down cost accounting system would allow analysis of additional health facility structural efficiency indicators: level of costs per bed, staff position, area of occupied premises etc.

7.2 ANNEX 2. RECOMMENDATIONS ON PRIORITY MEASURES ON IMPROVING THE INFORMATION SYSTEM AND STATISTICAL REPORTING FOR EFFECTIVELY USING THE DRG INSTRUMENT

The HII appears to be favoring a future hospital funding based on a global budget principle. If this becomes the chosen hospital funding method, it would make sense to implement global budget funding work in parallel to creating additional tools which have the effect of neutralizing certain negative aspects of the global budget. The most negative result to try to avoid will be the reduction in either volumes or the quality of services provided to patients[3].

For example, international practice is to along with a global budget, use case mix systems similar to DRGs. These systems help develop global budgets (with consideration of admission structure) or otherwise determine part of a budget funded on an activity-based principle. This approach can help to mitigate the main risk described above.

Further, basic theoretical aspects related to DRG application and recommendations on key steps that need to be taken for potential utilization of DRGs in Albania are outlined.

7.2.1 MAIN AREAS OF DRG APPLICATION

The Diagnosis Related Group (DRG) system was initially developed in the Yale University in the 1970s as a tool for monitoring and evaluation of efficiency of hospitals and "measuring" results of their work. Further, the model was initially used in the US Medicare system with the main purpose of contributing to cost containment in the hospital sector. Based on international experience, the DRG system can be used in Albania for several purposes, including: ***method of payment for hospital medical care, tool for improvement of the resource management and utilization, as well as monitoring and comparative evaluation of hospitals activities.***

The most common area of DRG application is its use as a method of payment for hospital care. A relatively small number of groups, reduction in stimulus to manipulate diagnoses at the expense of grouping, a possibility to stimulate priority lines via correction of weight coefficients and other factors have conditioned the extensive use of this model in the world. Meanwhile, two versions of the DRG usage may be distinguished:

- Payment for each treated case;
- Financing via determination of the global budget amount of the hospital with the use of DRGs.

Financing of a treated case

In the simplest form, the cost of one treated case is determined according to the formula:

$$\text{Payment per case}_i = \text{BR} * \text{CGW}_i$$

where,

Payment per case$_i$ = price paid by purchaser for cases in case group *i*

BR = base rate, or global average cost per case

CGW$_i$ = case group weight for case group *i*

The total payment that a hospital receives in the billing period is based on the number of cases that it treats:

$$\text{Total payment}_h = \sum_i (\text{cases}_{i,h}) * (\text{CGW}_i) * \text{BR}$$

[3] HOSPITAL GLOBAL BUDGETING, Robert Dredge, 2004 The International Bank for Reconstruction and Development / The World Bank

Global budget formation

The global budget at the hospital level represents previously established payment for coverage of general expenses of such hospital for provision of the agreed complex of services for certain period.

In order to form the global hospital budget with regard to hospitalizations structure, the **Case Mix Index** (CMI) is calculated. The Case Mix Index equal to the average weight coefficient value of Diagnosis Related Groupings, reflecting complexity, volumes of treatment and resource utilization intensity. The CMI for a certain hospital is determined by the formula:

$$CMI_h = \frac{\sum_i (Cases_{i,h}) * (CGW_i)}{\sum_i Cases_{i,h}}$$

where,

CMI_h – Case Mix Index of the hospital,

Further, the annual hospital budget is determined by the formula:

$$\text{Hospital Budget} = BR*(CMI)*\left(\sum_h \sum_i Cases_{i,h}\right)$$

Thus, the global budget formation is performed with regard to the hospitalization structure and CMI plays the role of a "measuring device", enabling to account for results of hospital activities for the past year.

The international practice has a lot of examples when countries, after introducing payment under DRGs "per case", with the course of time start using a combination of DRGs and global budget. It allows neutralizing a stimulus to increase the number of hospitalizations. But on the other part, a threat is created to reducing the care accessibility. That is why this or that approach should be applied, proceeding from the healthcare system priorities at a certain stage.

Monitoring the efficiency and comparative evaluation of hospital activities

In the financing system under DRGs, each group has its own weight coefficient, reflecting how much the case that has been attributed to such group is more expensive or cheaper than the "average" case within the system. Thus, the structure of hospitalizations of treated patients under DRG will testify to the economic and clinical result of hospital activities.

In so doing, there arises the possibility for correct cross-comparison of hospitals based on the average weighted coefficient of all patients treated in the hospital (CMI). The higher the coefficient, the more effective is the work of the hospital. This indicator may be also used for preliminary evaluation of the level of unjustified hospitalizations in the process of concluding agreements and determining targets for hospitals.

7.2.2 CLASSIFICATION OF TREATED PATIENTS IN A DRG SYSTEM

When introducing a DRG system in the international practice, two main approaches can be distinguished: ***development of the national model*** or ***adaptation of one of the existing models***. In so doing, there exist examples when countries, having adapted a "foreign" model, have further developed their own versions (e.g., Australia), as well as examples when countries, having developed their own system, further adapted the borrowed model (e.g., Germany). Table 16 gives examples of approaches from a number of countries.

TABLE 16. ANALYSIS OF APPROACHES TO INTRODUCTION OF DRG SYSTEMS IN SOME COUNTRIES

Country	Year	DRG Model	New/ Adapted	Basis for adaptation
Australia	1992 1999	AN-DRG AR-DRG	Adaptation New	AP-/APR-DRG AN_DRG 3.1, RDDRG

Denmark	2002	DkDRG	New	NordDRG
Germany	1995 2003	FP/SE G-DRG	New Adaptation	AR-DRG 4.1
France	1986 1997 1999	GHM 0-3 GHM EfP	= Adaptation New	HCFA-DRG 3.0 GHM-3/AP-DRG GHM
Great Britain	1992 1995 1998	HRG HBG HCF	New New New	
Japan	1998 2003	J-DRG DPC	New New	
Holland	2003	DBC	New	
Austria	1997	LDF	New	
Scandinavian countries	1996	NordDRG	Adaptation	HCFA-DRG 12.0
Hungary	1995	HBC	Adaptation	HCFA-DRG12.0
Romania	2007		Adaptation	AN-DRG
Moldavia	2010		Adaptation	AN-DRG
Kazakhstan	2001	KZDRG	New	AN-DRG

There is no clear evidence which approach is better, and each country takes a decision, considering a multitude of criteria that include: availability of necessary information, coding systems for clinical and economic information available with the country, the healthcare system purposes. Table 17 presents a brief analysis of advantages and disadvantages of "purchase" and "development" of DRG system.

TABLE 17. BRIEF ANALYSIS OF ADVANTAGES AND DISADVANTAGES OF APPROACHES TO DRG SYSTEM INTRODUCTION

	Advantages	Disadvantages
Purchase of "ready-made" model	• Adaptation of the best examples from international practice to the conditions of Albania • Reducing time for model design • Methodological support and update • Weighty argument in negotiations with medical public and heads of hospitals	• Necessity for review of the data coding system • Western systems use grouping criteria that may create negative stimuli under the conditions of Albania • Weight coefficients may not be relevant for the Albanian structure • Financial dependence from the developer and restrictions in model modernization
Development of "own" model	• Use of effective reference guides and coders • Development of "own" developers' potential • Possibility for inclusion of different grouping criteria • More flexible use of the model as a tool for implementation of the healthcare financing policy • Economic feasibility	• Premature model design may have negative results • Low level of trust for domestic developments • Lack of financial information may result in incorrect calculation of coefficients • Risk of "conservation" of existing "infrastructure errors"

Thus, it is necessary to make a decision on either developing the national model or adapting the international one. In case of adapting the international one, the next step would be to select the appropriate model.

For decision-making, it is also reasonable to analyze main models from the point of view of classification criteria which determine a DRG structure, as well as reference guides that are used for coding the main clinical parameters. See Table 18 for the types of criteria used in a number of different countries' DRG models.

TABLE 18. CLASSIFICATION CRITERIA OF DIFFERENT DRG MODELS

Country	**USA**	**Australia**	**Germany**	**France**	**Scandinavian countries**	**Great Briatain**	**Japan**	**Austria**	**Holland**
Model	**AP-DRG**	**AR-DRG**	**G-DRG**	**GHM**	**NordDRG**	**HRG**	**JGP**	**LKF**	**DBC**
Characteristics of a patient									
Age	x	x	X	x	x	x	x	x	-
Sex	-	-	-	-	x	-	-	-	-
Diagnoses	x	x	X	x	x	x	x	x	x
Neoplasms/ malignant	x	x	X	-	-	-	-	-	-
Body weight (of newborn)	x	x	X	x	-	-	-	-	-
Mental health	-	x	X	-	-	-	-	-	-
Variable parameters of clinical and management decision									
Types of hospitalization	-	-	-	-	-	x	x	-	-
Surgical operation	x	x	X	x	x	x	x	x	x
Artificial ventilation	-	-	X	x	-	-	-	-	-
Treatment outcome	x	x	X	x	x	x	x	-	-
Duration of stay	-	x	X	x	x	x	x	-	-
Structural characteristics									
Conditions (hospital, outpatient, intensive therapy etc.)	-	-	-	x	-	-	-	-	x
Hospitalization to a specialized department	-	-	-	-	-	-	-	x	-
Medical profile	-	-	-	-	-	-	-	-	x
Requirements to medical care	-	-	-	-	-	-	-	-	x
Severity/complexity level	3*	4	unlim	5**	2	3	3	unlim	-
Summary index of case complexity PCCL = clinical complexity level	-	PCCL	PCCL	x	-	-	-	-	-

* not specified exactly (great complexity on the level of multi-field clinic + 2 levels of severity on DRG level)
** 4 levels of severity + 1 GHM at short-term hospitalization or outpatient treatment

As seen in Table 18 above, ***all DRG systems use three parameters as classification criteria: diagnosis, age, and surgical operation***. Results from various studies show the high correlation between the three parameters and treatment costs. This presents a compelling evidence that ignoring any one of the parameters will result in raising risks and increasing the unfairness in the health financing system.

Table 19 presents an analysis of the main diagnoses and surgical operations' coding systems.

TABLE 19. CODING OF DIAGNOSES AND OPERATIONS IN EUROPEAN COUNTRIES

Country	Coding of diagnoses	Coding of procedures
Austria	ICD -10-AT	Leistungskatalog
England	ICD -10	OPCS – Bureau of the Census and Research
Estonia	ICD -10	NCSP – Classification of surgical operations Nomesco
Finland	ICD -10	NCSP - Classification of surgical procedures Nomesco
France	ICD-10	CCAM - Classification Commune des Actes Médicaux
Germany	ICD-10-GM	OPS - Operationen- und Prozedurenschlüssel
Ireland	ICD-10-AM	ACHI – Australian classification of medical procedures
Netherlands	ICD-10	Elektronische DBC Typeringslijst
Poland	ICD-10	ICD-9-CM
Portugal	ICD-9-CM	ICD-9-CM
Spain	ICD-9-CM	ICD-9-CM
Sweden	ICD-10	NCSP - Classification of surgical procedures Nomesco

As seen in Table 19, standardization is observed in approaches to coding of diagnoses (use of ICD 10 reference guides), while at the same time approaches to coding of operations (surgeries) are not standardized and countries in their majority use the national reference guides.

7.2.3 RECOMMENDATIONS FOR ALBANIA

The analysis of the situation in Albania has shown that there are no standards for coding operations (surgeries). This is a major technical problem which needs to be solved as soon as possible. The surgery coding system can be used not only for DRG development, but for patient's structure monitoring system within the Global Budget and for improvement of the health care statistic system in general.

Clinical diagnoses in Albania are coded by using simplified ICD 9 codes that creates certain difficulties as the simplified coding (without a digit after a decimal point) does not allow creating an effective model. In addition, the absolute majority of countries have shifted to ICD 10 (or plan to do so in the near future); this hampers cross-country comparisons and adaptation of promising grouping systems to country's specific needs.

Thus, the key to the development of national model or adapting an international model to country's needs is to fix the issue of the clinical information coding process and accumulation of respective amassed statistical data. For this purpose the following major measures are recommended:

- At the MOH level decide to make a universal shift to ICD 10 coding of clinical diagnoses. Complete the translation of the ICD10 book, print and train physicians on how to use it;
- Develop a Surgery Register for national use. It is proposed to adapt one of the existing international registers. Translate the register to the Albanian language and provide trainings.
- Establish and maintain the process of collecting data from all hospitals by data entry of discharged patient record into the information system. Figure 12 illustrates forms that were used in a number of countries in the course of reforms.

The above measures are large scale and require financial and organizational resources. However they are critical not only for the development of the DRG system, but also for the improvement of the entire statistical system bringing it in line with the best international standards.

FIGURE 12. HOSPITAL DISCHARGE FORM AND DATA FIELDS

Code and Name of the Hospital

Clinical Record Number

Date and Time of Admission (DDMMYY,HHMM)

Date and Time of Discharge (DDMMYY, HHMM)

Beddays

Type of Admission

- Planned
- Emergency before 24 hours
- Emergency after 24 hours

Department

Bed profile

Patient referred by: PCF | Policlinic | Self referred | Ambulance | Other hospital | Othert

Code and Name of referring Facility

Code and Name of Enrollment Facility

Treated in ICU | Days in ICU

Outcome of Hospital Admission: Discharged | Transferred | Died

Outcome of Hospital Treatment: Recovered | Get better | No Changes | Aggravation

Last Name

First Name

Mid Name

Date of Birth (DDMMYY)

Sex F M

Medical Registration Number

Category of Privileges

Home Address: Urban | Rural

Oblast

Rayon

Locality

Citizenship

Diagnosis of Referring Facility

Final Clinical Diagnosis

Complications of the Main Diagnosis

Comorbidity 1

Comorbidity 2

Pathologoanatomic Diagnosis

Main Surgry (Code)

Anaesthesia (Cod)

Date (DDMMYY)

Fill only for Surgical DRG

Surgeon / Assistant / Anaesthetist — Codes

Surgery 2 (Code)

Anaesthesia (Code)

Date (DDMMYY)

Surgeon / Assistant / Anaesthetist — Codes

Surgery 3 (Code)

Anaesthesia (Code)

Date (DDMMYY)

Surgeon / Assistant / Anaesthetist — Codes

Surgery Complication

Source of Finance: Budget | HIF | Pay Services | Other

Physician: Name _____ Code _____ Signature _____

Head of Department: Name _____ Code _____ Signature _____

Code of Medical Chart

Statistical Form of Discharged Hospital Patient

8. REFERENCES

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